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PROCEEDING:

**INTERNATIONAL SYMPOSIUM ON
SOCIAL SCIENCES, BUSINESS,
EDUCATION AND TECHNOLOGY
(ISBET 2025)**

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PREFACE

It is with great pleasure that I present this volume of the Proceedings of the International Symposium on Social Sciences, Business, Education and Technology 2025 (ISBET 2025), held from 9th to 10th August 2025 at the H-Elite Hotel, Kota Bharu, Kelantan, Malaysia. Organized by Global Academic Excellence (M) Sdn Bhd, this symposium serves as an important platform for scholars, academicians, researchers, and practitioners to exchange ideas, share their findings, and discuss emerging issues in the fields of social sciences, business, education, and technology.

The wide range of papers compiled in this proceeding reflects the dynamic, interdisciplinary nature of these fields and their vital role in addressing contemporary challenges. It is our belief that the research presented here will not only enrich academic discourse but also provide practical insights to inform policy, industry practices, and educational development.

On behalf of GAE, I wish to extend my heartfelt appreciation to all authors for their valuable contributions, to the reviewers for their rigorous evaluations, and to the organizing committee for their unwavering commitment. Together, you have made ISBET 2025 a meaningful and impactful gathering of minds.

I hope this proceeding will serve as a lasting resource for scholars and practitioners alike, and that the spirit of collaboration fostered through ISBET 2025 will continue to inspire innovation, knowledge creation, and sustainable development.

Sincerely,

Assoc. Prof. Dr. Adi Anuar Azmin

Chairman

*International Symposium on Social Sciences, Business,
Education and Technology 2025 (ISBET2025)*

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PENGUNAAN KAEDAH BOSUFA (BOARD GAME SURAH AL-FALAQ)

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YOUTH PERCEPTION ON NATIONAL SECURITY IN MALAYSIA

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Abstract: *This article examines Malaysian youth's perception of national security within the context of contemporary threats and societal transformation. Using a qualitative approach supported by selected case studies, the study analyses the level of awareness, trust, and engagement of youth in national security matters. Findings indicate that while Malaysian youth demonstrate high concern regarding issues such as cyber threats, social cohesion, and political instability, their understanding of the national security structure and their roles within it remains limited. The study also finds that formal government programmes like the National Service Training Programme (PLKN) and the Police Undergraduate Voluntary Corps (SUKSIS) yield mixed outcomes in fostering security awareness. Meanwhile, informal initiatives—such as youth-led cyber defence movements—reflect the potential of youth as key stakeholders in non-traditional security domains. The article proposes several policy recommendations including the institutionalisation of security literacy, expanded youth participation in strategic communication, and the development of inclusive security policies that reflect the voice and needs of Malaysia's younger generation.*

Keywords: *youth perception, national security, Malaysia, cyber threats, security literacy*

Introduction

National security is a broad and multifaceted concept that encompasses a nation's ability to safeguard its sovereignty, territorial integrity, national interests, and the well-being of its citizens from a wide range of threats whether physical, political, economic, social, or cyber in nature. In the current era of globalisation and geopolitical uncertainty, the landscape of national security has shifted from conventional military-based threats to complex and hybrid forms of non-traditional threats, including cyberattacks, online extremism, disinformation, and internal socio-political instability. In the Malaysian context, threats to national security are increasingly transnational and hybrid in nature. Key concerns include data breaches, human trafficking, ideological radicalisation, foreign influence in domestic politics, and the rise of cross-border organised crime. These evolving challenges necessitate a whole-of-society approach to security—one that extends beyond the domain of formal security institutions such as the military and police, and actively involves all sectors of the population, particularly youth (National Cyber Security Agency [NACSA], 2023; Prime Minister's Office of Malaysia, 2023; National Cyber Security Agency [NACSA], 2024).

Youth, who comprise over 45% of Malaysia's population under the age of 40 (Department of Statistics Malaysia, 2023), represent the most dynamic and influential demographic. They are not only the most active users of information and communication technologies, but also serve as shapers of public discourse, drivers of social mobilisation, and connectors between the state

and society. Yet, a critical question remains: to what extent are Malaysian youth aware of, concerned about, and engaged in national security issues? Do they view national security as an elite-driven, distant concern beyond their daily lives, or do they see it as a shared responsibility requiring their attention and action? Previous studies have highlighted a significant disconnect between national security policies and youth perception. Issues such as low security literacy, distrust in security institutions, and limited avenues for youth participation in policymaking contribute to this gap (Ahmad & Lee, 2021). Furthermore, socio-political challenges such as policy inconsistency, ethnic polarisation, and the limited outreach of national youth programmes have influenced the level of youth awareness and engagement in national security matters (Suhaimi et al., 2025).

This article seeks to explore and analyse the perception of Malaysian youth towards national security by drawing upon empirical findings, case studies, and policy analysis. The discussion will focus on key dimensions such as youth security literacy, perceived threats, trust in institutions, and modes of youth engagement. By understanding youth perspectives and concerns, the study aims to contribute towards more inclusive, responsive, and sustainable security frameworks that reflect the voice and agency of Malaysia's future generation.

Literature Review

Youth Engagement in National Security

Recent studies indicate that Malaysian youth are increasingly engaged in national security matters, particularly concerning cyber threats and political instability. Research by Zulkifli et al. (2020) highlights the importance of cybersecurity awareness among secondary school students, emphasizing the need for early education on digital safety to prepare youth for contemporary security challenges (Suhaimi et al. 2016).

Cyber Threats and Social Cohesion

The rapid expansion of digital platforms has redefined national security by introducing complex challenges, particularly in the areas of cybersecurity and social cohesion. Cyber threats—ranging from disinformation campaigns to online radicalization—have grown more pervasive, requiring responses that extend beyond traditional security mechanisms. In this context, youth-led initiatives such as digital literacy campaigns and cyber defense movements have emerged as vital tools in enhancing awareness and resilience among communities. These initiatives highlight the increasing role of youth as active contributors in addressing non-traditional security concerns. Accordingly, promoting critical thinking and responsible digital engagement among youth is crucial for strengthening societal resilience to cyber risks (Zulkifli et al., 2020; NACSA, 2023).

Political Instability and Youth Activism

Periods of political uncertainty often stimulate greater youth participation in activism, as young people increasingly use digital platforms to voice their concerns and push for social and political reforms. In Malaysia, youth actively engage in political conversations on social media sites like Facebook, leveraging these spaces to disseminate information, initiate dialogues, and influence decision-making processes. This rising digital activism underscores the necessity for

policies that are inclusive of youth voices and recognize their critical role in shaping national security and governance strategies (Sidek et al. 2020).

Government Programs and Security Awareness

Government initiatives like the National Service Training Programme (PLKN) and the Police Undergraduate Voluntary Corps (SUKSIS) aim to increase youth involvement in national security issues. While these programs have made strides in promoting security awareness, evaluations reveal mixed results concerning their overall effectiveness. Some participants report increased understanding and engagement, whereas others feel the programs fall short in addressing contemporary security challenges and youth interests. This inconsistency highlights the need for ongoing evaluation and program adaptation to ensure these initiatives remain relevant and impactful within an ever-changing security environment (Abdullah & Latiff, 2022; Sidek et al., 2020).

Methodology

This study employs a descriptive qualitative approach aimed at gaining an in-depth understanding of the perceptions, lived experiences, and viewpoints of Malaysian youth regarding national security. This research design was selected as it enables the researcher to explore the meanings, interpretations, and subjective understandings that youth attach to the concept of security—often characterised by its complexity and multidimensionality (Merriam, 2009).

A qualitative approach is also suitable for identifying underlying themes, cognitive frameworks, and behavioural patterns that may not be readily captured through quantitative methods alone. The study places strong emphasis on the social context, personal narratives, and the interactions of youth with key influencing factors such as media, security institutions, and the broader political environment (Yeon et al., 2016).

a) Case Study of Policy Documents

To complement the empirical findings, this study also undertakes an in-depth analysis of official government policy documents related to national security and youth development in Malaysia. This qualitative document-based case study aims to examine how the Malaysian government defines, formulates, and implements strategies involving youth in national security agendas. It also seeks to identify the degree to which these policies align with the actual perceptions, expectations, and realities experienced by Malaysian youth at the grassroots level.

Four core policy documents were selected for analysis:

i. Malaysian Youth Policy (2021–2030)

This national policy outlines the strategic direction of the government in empowering Malaysian youth as active partners in nation-building. The analysis focuses on how national security is explicitly integrated into the policy, particularly within the domains of civic literacy, patriotism, leadership development, and volunteerism. Special attention is paid to the framing

of youth as partners in national development, including their potential roles as non-state security actors.

ii. National Security Policy (DKN 2021)

This strategic document outlines a comprehensive and holistic approach to national security, encompassing six core domains—political, economic, social, cyber, environmental, and public health security. The analysis evaluates the extent to which public and youth engagement is embedded within this framework and assesses the mechanisms for youth inclusion in early warning systems, prevention efforts, and threat mitigation.

iii. Twelfth Malaysia Plan (RMK-12)

As Malaysia's five-year national development blueprint (2021–2025), this document contains several chapters relating to youth empowerment, public safety, and digital security. The study examines the intersections between youth development strategies and national security concerns, especially in response to emerging threats such as cybercrime, the spread of extremist ideologies, and risks of digital radicalisation among youth populations.

iv. National Cybersecurity Strategy Action Plan 2020–2024 (developed by CyberSecurity Malaysia and the National Security Council)

This plan addresses the protection of Malaysia's digital infrastructure and promotes cyber resilience. The analysis explores initiatives aimed at youth, including awareness campaigns, e-security training, digital resilience programmes, and the integration of youth organisations and higher education institutions in promoting national cybersecurity awareness.

a) Implications of Policy Document Analysis

Findings from the analysis reveal that while youth are increasingly recognised as important stakeholders in national security, the current policy landscape remains fragmented, top-down, and often poorly coordinated across agencies. Several structural gaps have been identified:

- i. A lack of direct youth participation in policy formulation, particularly in emerging security domains such as digital security and ideological threats.
- ii. A dominant top-down approach that often marginalises youth voices from underrepresented or rural communities.
- iii. Resource constraints and limited outreach in national awareness programmes targeting youth.
- iv. The absence of measurable indicators and performance frameworks to assess youth engagement in national security.

This analysis reinforces the need for a more inclusive, participatory, and community-driven policy framework—one that positions youth not merely as policy recipients, but as co-creators, implementers, and evaluators of Malaysia's national security agenda.

Results

The findings of this study reveal that Malaysian youth perceive national security as a complex, evolving, and multifaceted construct, shaped by structural conditions, sociopolitical realities, and digital culture. Far from being passive observers, today's youth are emerging as critical stakeholders who actively interpret, challenge, and reconstruct the meaning of security in a highly interconnected and media-saturated environment.

Firstly, youth understanding of national security tends to be partial and uneven, with an emphasis on personal safety and localised threats rather than broader concerns such as geopolitical dynamics or strategic defence. This fragmented comprehension can be attributed to the absence of a systematic national security education curriculum and the limited presence of open, intergenerational discourse on security as a public good. As a result, youth tend to associate security with immediate, tangible risks rather than abstract or long-term threats.

Secondly, Malaysian youth display a growing awareness of contemporary security threats, including cybercrime, online radicalisation, political instability, and foreign influence. However, their grasp of these issues often lacks strategic integration, as they struggle to link individual experiences with state-level policy responses. Their perceptions are largely constructed through everyday encounters with digital platforms, peer discourse, and popular culture, rather than through formal civic education or institutional engagement.

Thirdly, social media emerges as the dominant source of security-related information, serving both as a vital communication tool and a source of risk. While digital platforms enhance access to diverse viewpoints, they also expose youth to misinformation, disinformation, and extremist content, further complicating their ability to critically assess the reliability of information. This dependency on digital media without adequate media literacy creates a widening knowledge-practice gap, where the abundance of information does not necessarily translate into informed action (Suhaimi et al. 2020; Abu Bakar, 2020).

Fourthly, youth trust in national security institutions is varied and conditional. The Malaysian Armed Forces (ATM) continue to enjoy relatively high levels of respect and legitimacy. In contrast, institutions such as the Royal Malaysia Police (PDRM) face public scepticism due to perceived issues of integrity, accountability, and politicisation. This erosion of institutional trust weakens civic confidence and contributes to a growing sense of disconnect between youth and the national security apparatus.

Finally, although direct youth participation in security initiatives remains limited, the study identifies a strong appetite for alternative modes of engagement particularly through community-based activism, digital advocacy, and civic volunteerism. Initiatives such as cyber volunteer programs and online campaigns against misinformation demonstrate the potential for constructive youth involvement, if engagement pathways are inclusive, transparent, and responsive to the realities of youth culture (Suhaimi, 2021).

Conclusion

This study highlights the evolving perceptions of Malaysian youth toward national security in the face of modern threats and societal change. While young people express significant concern

over issues such as cyber threats and political instability, there remains a clear gap in their understanding of formal security frameworks and their roles within them. Government-led programs like PLKN and SUKSES show varying levels of effectiveness, whereas grassroots, youth-driven initiatives demonstrate promising potential in addressing non-traditional security challenges. To harness this potential, it is essential to institutionalize security education, promote youth engagement in strategic dialogues, and develop inclusive security policies that reflect the priorities and perspectives of Malaysia's younger population. Strengthening youth awareness and involvement is vital for building a resilient and secure nation.

In essence, these findings suggest that while Malaysian youth possess a strong sense of civic awareness and latent potential to contribute meaningfully to national security, this potential remains underutilised. Realising it requires deliberate efforts to empower youth through inclusive policies, credible institutions, and participatory platforms. National security strategy must therefore evolve beyond traditional, state-centric models to one that is youth-inclusive, digitally adaptive, and forward-looking, aligning security governance with the aspirations, capacities, and voices of the next generation.

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ENHANCING ELEMENTARY STUDENTS' ACADEMIC PERFORMANCE IN GENERAL SCIENCE THROUGH 3D PRINTED SCIENCE MODELS

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Abstract: Integrating three-dimensional printed (3DP) models into science education represents a transformative shift in how complex concepts are taught and understood. It allows science teachers to turn abstract concepts into something students can touch, explore, and better understand. This study explored the impact of using 3DP science models as educational materials on students' academic performance in elementary General Science and their perceptions of using the models. The study employed an explanatory sequential design. The quantitative phase followed classroom action research in integrating 3DP models in science instructions. Using total enumeration, it involved pre-and post-test evaluations to determine significant differences in students' academic performance. A handful of students participated in the semi-structured interviews during the qualitative phase. Through purposive sampling, the participants involved 24 Grade 3 students at Tinoc Central School (TCS), Tinoc, Ifugao, Philippines. Qualitative results indicated a significant improvement in students' academic performance after integrating 3DP models. Five main themes emerged in the qualitative findings, including impact on learning, problems encountered, physical characteristics of the models, subjective preference, and ideas for improving the 3D models. The students shared that they preferred the models' vibrant colors, compact sizes, and movable parts. They acknowledged that the models affected their performance, increased their motivation, and enjoyed learning. However, they mentioned the models' susceptibility to breaking, inaccurate representations, plastic smell, and scarcity. Regardless, this study highlights that 3DP holds strong potential as an innovative instructional tool, encouraging more dynamic, student-centered learning environments and enhancing learning outcomes in science education.

Keywords: 3D printing, 3DP science models, Elementary General Science, science academic performance, science education

Introduction

Background

Fostering technology-enhanced science learning at the elementary level is favorable as it motivates young students to engage with science lessons. The continuous use of technology has resulted in students' higher interaction with science (Ginzburg & Barak, 2023). Three-

dimensional printing (3DP) technology is one of the innovative technologies and is becoming a popular educational material (Avinal & Aydin, 2022). It revolutionizes science education by allowing students to interact with complex scientific concepts tangibly and engagingly. 3DP allows students to visualize and manipulate scientific models. This hands-on approach enhances students' understanding and sparks curiosity and creativity, helping them connect theoretical knowledge with practical applications in the scientific world.

3DP technology, also known as additive manufacturing (AM), is a technique of creating a three-dimensional (3D) solid object of almost any shape from a digital model through the depositing of successive layers of materials (Budinski et al., 2022; Novak & Wisdom, 2018) with the use of computer-aided design (CAD) and 3D printers (Aslan & Çelik, 2022; Shahrubudin et al., 2019). In this process, a computer-controlled printer builds up the object layer by layer, typically using materials such as plastic filament, metal, resin, or concrete (Parupelli et al., 2019).

In education, teachers and students support using 3DP technologies in the classroom (Abu Khurma et al., 2023). Its integration has been shown to enhance instruction and improve student learning. It can promote learning, foster skill development, and boost student involvement. 3DP-based educational materials give teachers the ability to teach lessons with a creative twist while assessing student understanding at the same time (Lin et al., 2018). It has improved students' academic performance (Avinal & Aydin, 2022). It can boost students' practical skills, creativity, teamwork, and independent thinking (Chen & Cheng, 2021). It enriches learning experiences and fosters a more enjoyable learning environment (Aslan & Çelik, 2022). Despite the potential of 3DP to improve teaching and learning, there is a lack of research studies concerning the interdisciplinary integration of 3DP technologies. This is particularly true in elementary schools (Abu Khurma et al., 2023).

The use of 3DP technologies in teaching elementary-level science lessons is quickly progressing in science education. This innovation supports the integration of arts in Science, Technology, Engineering, Arts, and Mathematics (STEAM) (Abu Khurma et al., 2023) or simply the Science, Technology, Engineering, and Mathematics (STEM) education. It provides more opportunities for teachers to connect and create realistic items to help students develop their creativity and imaginative abilities. This is particularly true in science lessons where the students understand abstract lessons better due to the materialization of 3DP science models. It can help students analyze concepts, visualize information, and understand complex ideas (Güleryüz & Dilber, 2021). 3DP in science education extends beyond just visualizing models, allowing students to create and explore scientific concepts in a way that traditional methods cannot. It supports the development of STEAM skills by encouraging innovation, collaboration, and problem-solving, allowing students to work on projects that mirror real-world scientific practices.

Literature Review

Theoretical Framework

Constructivism highly supports the integration of 3DP into science education. The constructivist view ascertains that knowledge is developed by learners rather than acquired, and as a result, learning occurs actively throughout the experiences of the learner and the learning environment (Alanazi, 2016). It is observed that students learn through doing,

experiencing, and feeling (Özeren et al., 2023). With 3DP, students can learn to apply diverse ideas and create designs using digital manufacturing skills (Leinonen et al., 2020). It posits that students learn best when actively engaging with the material, making connections, and building on prior knowledge through exploration and discovery. Constructivism and 3DP in science education are deeply intertwined, as both emphasize active learning, problem-solving, and the construction of knowledge through hands-on experiences. 3DP aligns with constructivism by allowing students to create tangible models of scientific concepts and visualize and manipulate abstract ideas to foster more profound understanding. By facilitating active participation and allowing for immediate feedback through physical objects, 3DP supports the constructivist principle that learning is most effective when students are directly involved in the process and can reflect on and refine their understanding.

Active learning also supports 3DP in science education. It is a student-centered approach to knowledge creation, empowering students to engage in activities that foster higher-order thinking and more profound understanding (Doolittle et al., 2023). Student-centered learning motivates students to take charge of their knowledge, leading to increased critical thinking, problem-solving, decision-making skills, and transformative learning. 3D objects transformed abstract concepts into concrete representations that facilitated learning, made lessons enjoyable, provided learning continuation, encouraged learners to learn more about their fields, increased their interest, and assisted them in developing creative thinking and design skills (Arslan & Erdogan, 2021). Active learning and 3DP in science education is one of enhanced engagement and deeper comprehension through hands-on, student-centered experiences. Active learning emphasizes student participation, critical thinking, and collaborative problem-solving, and 3DP aligns perfectly with these principles by allowing students to interact directly with the content they are studying. Instead of passively receiving information, students can create and manipulate 3D models of scientific concepts, turning abstract ideas into tangible, interactive objects. This hands-on approach encourages experimentation, reflection, and modification, deepening understanding and fostering a more personalized learning experience.

3D Printing Technology in Science Education

3DP is becoming a relevant technology that is recognized as a valuable tool in education. Its integration into classrooms can positively enhance the students' motivation, improve their knowledge, and help develop their skills (Grizioti et al., 2024). The ability to create tangible objects allows students to engage with abstract ideas in a more interactive and meaningful way (Dinopoulou et al., 2023). 3DP provides teachers with tools to design innovative instructional strategies that ensure active participation and engagement of the students during the lessons (Chen & Cheng, 2021). With this, students have shown high interest and enthusiasm in the practical 3DP activities, enhancing creativity and problem-solving skills (Fernandes & Simoes, 2019).

Tanabashi (2021) demonstrated that integrating 3DP into a cross-disciplinary STEAM project positively impacted student learning and engagement. Students collaboratively created 3D cell models that led to a deeper understanding of complex biological structures and functions. The hands-on nature of the project fostered improved knowledge retention compared to traditional teaching methods. Student motivation and participation increased significantly due to the innovative and collaborative nature of the task. The 3D printed science models proved effective as teaching tools for science education.

Trujillo-Cayado et al. (2024) found that incorporating 3DP into chemistry education significantly enhanced student learning and performance. Students who used 3DP to build molecular models achieved better academic results than a control group. The hands-on, creative aspect of 3DP increased student engagement and made the learning more interactive and enjoyable. It facilitated a deeper understanding of complex chemical structures and concepts by allowing tangible visualization. Trujillo-Cayado et al. (2024) concluded that 3DP is a valuable tool for improving the effectiveness and engagement of chemistry education within STEM disciplines.

Chenrai (2021) revealed how 3DP helped develop 3DP science models of geological features, such as rock formations, stratigraphic layers, and tectonic structures. These models allowed students to interact with accurate representations of the Earth's surface to help them better understand complex geological processes. The students visualized and analyzed phenomena like faulting, folding, and volcanic activity, which are mostly challenging to grasp through traditional teaching methods.

Jiang et al. (2015) showed that 3DP can create realistic rock specimens and geotechnical models. This process transforms digital data into a tangible object. The students studied and explored rock specimens' textures, densities, and internal structures. By manipulating these models, students enhanced their spatial reasoning and analytical skills, which are important in science education.

Elementary Science Education in the Philippines

The Kindergarten to Grade 12 (K to 12 or K-12) Science Curriculum in the Philippines is authored by the Department of Education (DepEd). It is designed to develop the scientific literacy of Filipino students, preparing them to be informed citizens capable of making decisions on scientific applications with social, health, and environmental implications. By focusing on three key domains: understanding and applying scientific knowledge locally and globally, performing scientific processes and skills, and developing scientific attitudes and values, the curriculum cultivates critical thinking, environmental awareness, innovation, creativity, and effective communication among learners. Through a learner-centered and inquiry-based approach, the curriculum emphasizes hands-on, minds-on, and hearts-on activities to engage students and foster active learning. Integrating science content and processes in a spiral progression facilitates a deeper understanding of core concepts and their real-life applications (DepEd, 2016).

In this study, the 3DP science models used as educational materials were based on the K-12 Science Curriculum Grade 3 Learning Competencies and General Science topics. Specifically, the lesson covered is all about 'The Surroundings.' The learning competencies consist of a) observing the surroundings at home, in school, in the community, and in the locality, and b) relating the importance of the surroundings to people and other living things (DepEd, 2016).

Research Gap

Despite the potential of 3DP to improve instruction, there is a lack of research studies concerning the interdisciplinary integration of 3DP technology, particularly in elementary

schools. A knowledge gap exists in exploring the impact of 3DP in improving students' scientific literacy. This highlights the need for further investigation into how 3DP can be effectively integrated into elementary science education, especially in the locality.

Research Aim and Research Questions

This study aimed to explore the impact of using 3DP science models as educational tools on students' academic performance in elementary General Science. It also aimed to determine the students' perceptions of using 3DP science models in teaching and learning. The following questions guided the study:

1. What are students' academic performance in science before and after integrating 3DP science models as educational materials?
2. Is there a significant difference in students' academic performance in science before and after using 3DP science models?
3. What are the students' perceptions regarding using 3DP science models in learning science lessons?

Methodology

Research Design

The study utilized an explanatory sequential design, where the quantitative phase occurred first, followed by the qualitative phase. The quantitative phase involved gathering and analyzing numerical data to generalize findings (Apuke, 2017; Rana et al., 2021). In the quantitative phase, a classroom action research (CAR) design was initially used to integrate 3DP science models as educational materials and determine their impact on students' academic performance in science. It is a reflective and systematic approach educators undertook to improve teaching practices, student learning, and classroom dynamics (Meesuk et al., 2020). In particular, the CAR model by Susman (1983) was utilized. This model had five phases: diagnosing, planning, taking action, evaluating, and specifying learning. Furthermore, a quasi-experiment was used to collect the quantitative data, assessing interventions or instructional strategies (Harris et al., 2006) through pre-test and post-test assessments (Stratton, 2019). The innovative strategy in this study was using 3DP science models, where learning gains and their effectiveness were measured by comparing students' pre-and post-test results.

Subsequently, the qualitative phase followed through after data collection and analysis of quantitative data. It focused on exploring and profoundly understanding the quantitative data, emphasizing subjective insights, detailed descriptions, and in-depth analysis (Tenny et al., 2022). Under the qualitative phase, volunteer students were individually interviewed to determine their perceptions regarding the 3D science models used, aiming for a deeper understanding of the impacts of the 3D science models on their academic performance. A semi-structured interview acquired students' detailed experiences to explore ideas or delve deeper into their responses (Taherdoost, 2022). It used guide questions consisting of a predefined set of open-ended questions to gather rich, detailed information while ensuring that key topics were covered (Knott et al., 2022). The interviews were primarily based on students' academic performance, expounding their perceptions of using 3DP science models. The interviews used the students' local language to ease their engagement. They were later transcribed and translated into English. Thematic analysis was then used to identify, analyze, and report

patterns or themes of the interview transcripts (Maguire & Delahunt, 2017). It involved systematically examining the data to uncover the students' recurring ideas, concepts, or experiences, which were then categorized into themes representing important aspects of the data. It allowed interpretation and made sense of complex data by organizing it into meaningful patterns. It provided insights into the underlying meanings and relationships regarding the students' science academic performance and the integration of 3D science models as educational materials.

Participants

Using total enumeration, 24 Grade 3 students at Tinoc Central School (TCS), Tinoc, Ifugao, Philippines, were involved in the study. The participants were purposely selected based on the school head's suggestions and the researchers' assigned class. Specifically, the participants comprised 45.8% males ($N = 11$) and 54.2% females ($N = 13$). Since integrating 3DP science models as educational materials occurred during class hours and science lessons, all 24 students were involved in total enumeration to gather their academic performances in the quantitative phase. The students were assigned pseudonyms, from S1 to S24, for easy coding. Meanwhile, the qualitative phase only involved 11 students who volunteered for the interviews regarding their perceptions and experiences regarding the 3D science models. Their pseudonyms remained as is with the quantitative phase. The study was conducted from February to March 2025, covering the fourth quarter of the academic year 2024-2025.

Materials and Instruments

The 3D printed models used in the study included animal models, such as turtles, monkeys, birds, octopuses, lobsters, dolphins, and others. The models were printed in monochrome due to the limited specifications of the 3D printer used (see Figure 1). However, they were colored with non-toxic paints where applicable. The models were printed on smaller scales due to the size of the 3D printer bed. Multiple models were printed as long as filaments were available and time permitted. The models were sanded and scrapped to remove potential threats and hazards. The models were also subjected to sun and air drying to remove unwanted odors.



a. Spider



b. Octopus



c. Turtle



d. Starfish



e. Monkey



f. Elephant



g. Bird (Woodpecker)



h. Dolphin



i. Lobster

Figure 1: Some Examples of 3D Printed Animal Models Used in the Study

Due to time constraints, limited 3D printers, and the demand for long printing time, the researchers did not design any models. Instead, the models were carefully selected and primarily downloaded from trusted open online resources. They were sourced from several authors or designers (refer to Appendix A). The researchers simply modified the animal models' sizes and directly printed them. The researchers do not claim ownership and intellectual property of any 3D model designs. The ownership of the 3D models used in this study belongs to the respective authors or designers. Though there are a lot of similar model designs, the researchers selected those that are most convenient to print.

This study used the A1 Mini Desktop 3D printer with single-colored printing. With features like automatic calibration, multi-color printing, and silent operation, it was a small and feature-rich 3D printer that offered a compelling combination of ease of use and sophistication. It was considered an excellent option for both novice and expert users. It had a simple, user-friendly touchscreen interface that walked users through printing. It had a maximum build volume of 180 x 180 x 180 mm³. It was a useful tool for various users because of its many uses, ranging from small-scale production and instructional purposes to hobby projects (Bambu Lab, 2025a).

To digitally modify a 3D model, the A1 mini used its own Bambu Studio slicing software (Bambu Lab, 2025b). In 3DP, a slicer is a program that transforms digital 3D models into printing instructions so that an object can be constructed using a 3D printer (McClements, 2022). The Bambu Studio was a feature-rich 3D slicing program for Bambu Lab printers. It had many features for users of different skill levels and was based on open-source technology. Its key features included a simplified project-based workflow, high-speed, high-quality printing, multi-color printing possibilities, remote control and monitoring, and format support.

The A1 mini used a plastic filament to print 3D objects. In this study, the filaments used were polylactic acid (PLA) and acrylonitrile butadiene styrene (ABS), which are very common among filament types for 3DP. PLA is a plant-based thermoplastic polymer made from corn starch and is a popular and industrially compostable material. It printed quickly and had a relatively low print temperature compared to other filaments. On the other hand, ABS is another popular thermoplastic that is usually used in household and consumer products, injection molding, and machining. It is strong, durable, and easy to finish, with acetone-reactive properties, making it suitable for everyday items. Smoothing techniques could be used in post-processing (All3DP, 2023; de Naoum, 2024).

For quantitative data collection, a pre-and post-test assessment was administered to measure students' knowledge and understanding of science concepts before and after introducing 3D printed science models in the lessons. The standardized test items were lifted from the Grade 3 teacher's modules. It consisted of 10 multiple-choice items that science educators validated to ensure they aligned with the learning objectives and the content being taught and approved by the DepEd, ensuring that the items were valid and reliable. Semi-structured interviews were

utilized to collect the qualitative data. The guide questions underwent construct validation from three professional elementary teachers handling science subjects. This validation aimed to accurately measure the constructs of the study that are intended to measure, particularly the experiences and perceptions of the students towards the 3D science models used. The teachers' suggestions were incorporated into the final structure of the guide questions.

Procedures

Susman's (1983) model for classroom action research was followed for the quantitative phase, which involved pre-and post-tests. The first stage, diagnosing, involved identifying and understanding students' academic performance in science and concerns about using 3DP models as educational science materials. Observations were used to gather relevant information. A pre-test was conducted to determine students' initial academic performance in science. The results were used to understand students' existing knowledge. This allowed researchers to plan the implementation of 3D science models, addressing gaps, building on students' strengths, and addressing insufficient knowledge. This tailored the actions, focusing on areas needing more attention.

For action planning, an action plan was developed to address students' academic performance using 3DP science models. The plan outlined the selection and integration of 3DP science models and how they were implemented in lessons. Appropriate 3D science models were determined, downloaded from trustworthy online resources, and printed in multiple sets, contingent on filament availability. Due to limited digital infrastructure, researchers adopted only ready-made 3D models and did not create designs. Permission was solicited, and copyright and/or trademarks from the creators or authors of the 3D science models were recognized. The specific 3D models and quantities were determined based on the General Science learning competencies. Different sets of 3D models were printed using PLA and ABS, depending on model type and filament applicability. Due to limitations and the fact that there was only one available 3D printer, researchers printed the 3D science models and used them as educational materials. Students were not involved in printing but received the printed models during science lessons.

The planned actions were implemented in the third stage, action taking. Integrating 3D science models as educational materials in General Science was put into practice. At least one science model was used per lesson. Science lesson delivery lasted two days to a week, depending on the learning competency. Students' progress was closely monitored, and the action was adjusted as needed. The fourth stage, evaluation, assessed the effectiveness of 3D science model integration using a post-test (with the same questions as the pre-test).

The final stage, specifying learning, involved reflecting on the overall action process and outcomes. Students' academic performance on the specific learning competency was analyzed based on pre-and post-test results. Reflection included understanding what worked, what did not, and why. This knowledge informed future iterations of the action research process. Findings were documented for future actions.

For the qualitative phase, guide questions were drafted based on the quantitative results used in individual student interviews. The researchers used audio-recording materials and notepads during the interview. The interviews were done during students' breaks and end-of-class hours.

The anticipated questions included students' experiences integrating 3D science models in the lessons, their perceived benefits, their concerns, and their perception of the models' effect on their academic performance. The interview sessions lasted only 15 - 30 minutes, considering that the students often have shorter attention spans. Afterward, the interviews were transcribed and translated into English language. To ensure the transcribed texts' accuracy, meaning, and essence, the translations were assessed by an English language expert who is also a native speaker of the students' local language. Thematic analysis followed through to identify and analyze themes of the interview transcripts and explore and explain quantitative findings in more depth. The study concluded with a presentation and dissemination of results.

Before the study was conducted, permissions were requested from the School Head and the students' Class Adviser. Informed consent was solicited from students' parents or guardians, explaining voluntary participation, potential benefits, risk mitigation, and the right to withdraw without penalty. All target students were involved, as the study was conducted within science lessons and class hours. Withdrawal only covered data. Once consent was obtained, students were fully informed about the study's purpose, procedures, and potential risks.

Data Analysis and Management

Quantitative and qualitative data analysis and management techniques were used to comprehensively understand the impact of integrating 3DP science models on students' academic performance in science and their perceptions of it. Quantitative data were gathered through pre-and post-test assessments and analyzed using descriptive and inferential statistics. Mean (M), standard deviations (SD), and percentages were used to determine students' academic performance. A t -test was used to determine significant differences in students' pre-and post-test results. To further assess the impact of the intervention, Cohen's d was calculated to determine the effect size between the pre-test and post-test mean scores, providing insight into the magnitude of the effect of using 3DP science models on students' academic performance. Test papers were directly returned to students after recording their results in a spreadsheet, ensuring transparency and immediate feedback. A licensed statistician performed data computations to ensure accuracy. Data results were presented in appropriate tables. Qualitative data were collected through semi-structured interviews and analyzed using thematic analysis. The researchers conducted individual interviews and thematic analysis. Students were assigned individual codes, and their records were removed to maintain anonymity and confidentiality. Audio recordings, transcriptions, and translations were appropriately stored and retrieved only for the study's purpose. Findings were presented thematically.

Ethical Considerations

The students were fully informed about the study's purpose, procedures, and potential risks before any data collection, and their participation was entirely voluntary. Informed consent was obtained from their parents or guardians, who were assured of their right to withdraw at any time without penalty. The confidentiality and anonymity of students were maintained by anonymizing all personal information and securely storing data. The study prioritized minimizing harm, ensuring that any discomfort was addressed and that students' well-being was safeguarded throughout the study. To ensure the safety of the students, all 3D science models were printed according to appropriate size and shape standards to avoid choking

hazards or injury from sharp edges. The researchers closely supervised the students when they were handling the models. The research was conducted with integrity, ensuring transparent and honest reporting of results, with any conflicts of interest disclosed. Ethical standards were adhered to, including gender and cultural sensitivity and compliance with relevant data protection laws.

Results and Findings

Quantitative Results

Students' Academic Performances in General Science

Table 1 shows students' academic performance in General Science before and after integrating 3D models. The results show an improvement in students' scores, with an increased post-test score ($M = 85.00\%$) compared to the pre-test score ($M = 57.92\%$).

Table 1: General Science Academic Performances of the Students

Students	Pre-test Scores		Post-test Scores	
	Scores	%	Scores	%
S1	5	50	10	100
S2	8	80	9	90
S3	7	70	10	100
S4	4	40	8	80
S5	8	80	10	100
S6	6	60	8	80
S7	4	40	5	50
S8	4	40	6	60
S9	7	70	10	100
S10	6	60	9	90
S11	5	50	8	80
S12	7	70	10	100
S13	6	60	10	100
S14	7	70	8	80
S15	6	60	10	100
S16	3	30	10	100
S17	6	60	7	70
S18	7	70	10	100
S19	5	50	5	50
S20	6	60	7	70
S21	4	40	10	100
S22	8	80	8	80
S23	4	40	7	70
S24	6	60	9	90
Mean	5.79	57.92	8.50	85.00

The pre-test results show that S16 scored the lowest with 30%, while S4, S7, S8, S21, and S23, scored 40%. S1, S11, and S19 scored with 50%. Seven students scored 60%, namely S6, S10, S13, S15, S17, S20, and S24. Five students scored 70%, specifically S3, S9, S12, S14, and S18.

The top scores were S2, S5, and S22 with 80%. The pre-test results show a general need for improvement in knowledge retention and comprehension among the students.

In contrast, the post-test results showed a remarkable improvement in students' academic performance. Ten students had 100% perfect scores, including S1, S3, S5, S9, S12, S13, S15, S16, S18 and 21. Additionally, eight students, namely S2, S10, S24, S4, S6, S11, S14, and S22 scored between 80% and 90% respectively. Some students scored between 60% and 70%, specifically S17, S20, S23, and S8. However, two students, S7 and S19, still scored below the minimum passing rate of 60%. In general, the post-test results show increased academic performance in science for the students after integrating 3D models.

Results indicate a significant difference in students' academic performance ($t(24) = -7.5538$, $p = .0001$) during and after the intervention with 3D science models, as shown in Table 2. There is a significant improvement from the pre-test scores ($M = 5.79$, $SD = 2.09$) to the post-test scores ($M = 8.50$, $SD = 2.70$). This reflects a substantial improvement in students' academic performance in General Science. Additional analysis reveals that Cohen's effect size ($d = 1.12$) indicates a large effect between the performance scores.

Table 2: Difference Between the Student's General Science Academic Performances

Tests	<i>M</i>	<i>N</i>	<i>SD</i>	<i>df</i>	<i>t-value</i>	<i>p-value</i>	Cohen's <i>d</i>
Pre-test	5.79	24	2.09	23	-7.5538*	.0001	1.12
Post-test	8.50	24	2.70				

Note: * = significant ($p < .05$); ns = not significant ($p > .05$); Cohen's $d = .20$ is small effect; $d = .50$ is moderate effect; $d = .80$ is large effect

Qualitative Findings

As summarized in Table 3, there are five emerging main themes from students' responses consisting of 1) Impact on Learning and Academic Performance, 2) Problems Encountered in Using the 3D Models, 3) Physical Characteristics of the 3D Models, 4) Subjective Preference Towards the 3D Models, and 5) Ideas for Improving the 3D Models.

Table 3. Summary of the Study's Qualitative Findings

Main Themes	Sub-themes
1. Impact on Learning and Academic Performance	a. Improved Academic Performance b. Increased Motivation c. Elevated Sense of Enjoyment
2. Problems Encountered in Using the 3D Models	a. Susceptible to Breaking b. Inaccurate Representations c. Scarcity of Models d. Plastic Smell
3. Physical Characteristics of the 3D Models	a. Vibrant Colors b. Compact Sizes c. Movable Parts
4. Subjective Preference Towards the 3D Models	a. More Model Units b. Assortment of Sizes

5. Ideas for Improving the 3D
Models

Impact on Learning and Academic Performance
Improved Academic Performance

Students attributed their understanding of the lesson to the use of 3D models. They credited the models for clarifying complex concepts, such as animal habitats and appearances, and facilitating their scientific comprehension during discussions. The models helped them grasp the lesson better, improving understanding and academic performance. As they shared,

S5: *"I got a perfect score on the post-test because I understood the lessons since the models helped to describe the animals and their habitats."*

S22: *"During the lessons, the models helped me understand what is being discussed about the animals."*

Increased Motivation

The use of 3D models motivated the students to learn more. A student said the models motivated them to be more attentive and listen well during the discussions. The models sparked their interest, allowing them to understand the lessons better. They expressed,

S18: *"The models motivated me to listen."*

S16: *"Using the models made me want to understand the lesson even better."*

Elevated Sense of Enjoyment

Integrating models enhanced students' sense of enjoyment in learning the science lessons. The students were happier due to the dynamic nature of the models. They have shown elevated satisfaction while engaging with the models due to their moving parts. They mentioned,

S23: *"I enjoy learning the lessons. It became more fun when models were used."*

S1: *"Handling and using the models with moving parts made the lessons more enjoyable."*

Problems Encountered in Using the 3D Models
Susceptible to Breaking

The durability of the 3D models was a concern, with some students noting that most were susceptible to breaking. They described that some models were smaller, thinner, and prone to damage. Students mentioned that the models could easily snap and break, making them nervous to hold some models. The students disclosed,

S24: *"The models are easy to break because they are small and thin."*

S4: *"I am afraid of holding the models since they are easily damaged."*

Inaccurate Representations

Some students pointed out specific model inaccuracies, such as incorrect colors or missing features. A student pointed out that the dolphin's color should be grayish to reflect its real-life appearance accurately. Another remarked that lobsters should have antennae, which were absent in the model. They conveyed,

S6: *"The animal models like the dolphin do not look like a dolphin due to the wrong colors used."*

S23: *"They are not accurate representations of animals in real life."*

S22: *"Some animals, such as the lobsters, should have antennae on their heads."*

Scarcity of Models

The scarce number of models available for use was a drawback. This caused the students to share the models with their peers and pass them around the classroom. Students shared that this led to conflicts among classmates over access to the models. They imparted,

S5: *"Only a few models were used, which is why we had to share and pass them around so everyone could hold them."*

S22: *"Some of us were not able to handle the models. Also, some of our classmates started fighting to get hold of the models."*

S23: *"Some of us competed over the models because some of our classmates would not share."*

Plastic Smell

The students have contrasting smells of the models. Others indicated that they could not smell anything at all. However, some shared that the models smelled plastic, which was appealing. A student expressed a stronger adverse reaction by stating that the models smelled bad. They indicated,

S5: *"The models mostly smell like plastic. Some of my classmates indicate that they cannot smell anything."*

S17: *"Some models smell bad. However, some classmates do not smell what I smell bad."*

Physical Characteristics of the 3D Models

Vibrant Colors

The students provided positive feedback about the vibrant colors of the models. They described the colors as appealing and striking. A student expressed that the models are visually appealing, making the models enjoyable to look at. Another indicated the models' variety of light and dark colors, making them striking to observe. They described,

S23: *"The colors of the models are appealing. I enjoy looking at them."*

S18: *"Some models had darker colors while others were lighter, making them inviting to look at."*

Compact Sizes

The students conveyed descriptions of the models of varying sizes, mostly indicating small sizes. A student called the models cute in size, while another highlighted that they come in various sizes. One student mentioned that although one is larger, specific models share the same displayed size. They imparted,

S5. *"The models are cute due to their small sizes."*

S24. *"The models have different sizes, such as small, medium, and large."*

S16. *"Some models have the same sizes even if one is bigger than the other in reality."*

Movable Parts

Students appreciated the moving parts of some models, finding them fun to handle during lessons. They shared that the articulated parts of the models were easy to move. Some parts were easily manipulated and repositioned. They shared,

S5: *"The models are easy to manipulate and move into different positions."*

S24: *"Some models have movable parts. I have fun playing them."*

Subjective Preference Towards the 3D Models

More Model Units

Students expressed a strong desire for more units of models. They expressed that having additional models would enhance their understanding of the lesson. A student suggested having more models with articulated movements. Another relayed that sharing and competition will not occur if more models are available. They relayed,

S5: *"I want more models to be used in learning our next lessons."*

S6: *"I need more that are movable."*

S14: *"I want more models to be added so we will not share and compete with our classmates."*

Assortment of Sizes

Students had varying preferences for the size of the models. Some preferred larger models. Others liked smaller ones. One mentioned that smaller models were easier to hold. They divulged,

S5: *"I want models that are similar to them or bigger."*

S4: *"In future lessons, I want bigger models."*

S24: *"I like this small size since they are easy to hold."*

Ideas for Improving the 3D Models

Students suggested several enhancements for model designs. These include having a wider variety of animal models, more correct colors, larger sizes, and models that are more durable

and easier to handle. They emphasized greater diversity, realistic color accuracy, and improved usability. They suggested,

S5: "I want more different animal models with correct colors."

S22: "I want bigger models that cannot be easily damaged."

S16: "I like strong models that do not easily break."

S17: "I want more models that have more movable parts."

Discussion

Based on the mean scores, students' academic performance in science increased after integrating the 3D models as educational materials. The scores attained during the pre and post-tests show that the models positively affected students' academic achievement. This is in line with the findings of Avinal and Aydin (2022), Grizioti et al. (2024), and Tanabashi (2021), who indicated that the utilization of 3D models as educational material has a positive impact on the performance of students. The characteristics of the models possibly captured their interest and enthusiasm for learning, as Fernandes and Simoes (2019) indicated. These findings imply that incorporating 3D printing technology into the classroom can effectively improve student learning outcomes in science education, as supported by Abu Khurma et al. (2023). The positive impact observed in this study highlights the potential of 3D printing to address challenges in science education by providing students with more engaging and interactive learning experiences.

The qualitative findings reveal a substantial positive impact of models on student learning and engagement. Students significantly improved their understanding of complex science concepts, which improved performance, aligning with Tanabashi (2021) and Avinal and Aydin (2022). The models fostered a more motivated and fun learning environment. Students felt more motivated to participate actively and had fun in the learning process, as Grizioti et al. (2024) and Aslan and Celik (2022) identified. These findings imply that incorporating 3D models into elementary science lessons can significantly enhance student learning outcomes by providing tangible representations of scientific abstract concepts.

While the benefits of models are evident, several challenges with using 3D models in the classroom emerged. Susceptibility to breaking was a concern, with the students identifying smaller and thinner models as being easily damaged. This reinforces the importance of considering the materials used in printing models to ensure durability and longevity. Güteryüz and Dilber (2021) emphasized that while 3DP can help students analyze concepts and understand complex ideas, the model's durability is crucial for effective use. Students also noted model inaccuracies, such as incorrect colors or missing features. This aligns with the need for accurate representations, highlighted by Chenrai (2021), who demonstrated how 3DP models helped develop accurate representations to help the students better understand complex topics. The limited number of models available led to students competing for access and hindered their engagement. The lack of sufficient models hampered the learning experience and highlighted the need for adequate resources to ensure each student could interact with the models effectively. This highlights the importance of considering access and resource availability for 3DP integration in schools, as mentioned in the study by Abu Khurma et al. (2023), that there is a need for research and exploration of 3DP technology in elementary schools to ensure its effective implementation. In terms of smell, the contrasting student

reactions to the plastic smell of the models highlight the subjective nature of sensory experience and its potential impact on learning. While it may be neutral or enjoyable for some, others can find it distracting or unpleasant. It can be attributed to the type of filament used. Based on the descriptions of All3DP (2023) and de Naoum (2024), ABS produces a stronger, unpleasant chemical odor and can irritate some people. Likewise, PLA emits a milder, slightly sweet smell, often compared to candy or popcorn. It is made from natural sources like corn starch, which is considered more environmentally friendly and less offensive in odor. Considering this, PLA is the better choice to avoid strong plastic smells in a classroom or enclosed spaces.

The students provided positive feedback on the physical characteristics of the 3D models, expressing appreciation for the vivid colors, varied sizes, and articulated movement. This accentuates the importance of visual appeal and user-friendliness in education technology, which can significantly influence student engagement and learning, as Güleriyüz and Dilber (2021) identified. The moving parts allowed for greater flexibility in classroom activities, encouraging interaction and engagement with the models. As indicated in the study of Özeren et al. (2023), students learn through doing, experiencing, and feeling. That is why the physical characteristics of the models should be considered to allow more hands-on learning experiences. This underscores the importance of prioritizing the physical characteristics of educational technology to enhance student engagement and learning. The findings imply that the design of 3D models should be carefully considered to ensure that they are accurate and informative, visually appealing, easy to handle, and conducive to active student participation.

Students expressed a range of preferences regarding the 3D models. They desired enough models to accommodate all students and avoid conflicts with their classmates. This aligns with the principles of active learning that promote student-centered experiences and cater to individual learning styles, as Doolittle et al. (2023) indicated. The students also had preferences for size, with some favoring larger models for better visualization, while others preferred smaller models for easy handling. The students also suggested improving the accuracy of the models' colors to enhance realism and effectiveness. These findings imply the need for various models with different sizes, colors, and materials to accommodate individual preferences and learning styles. Providing options that cater to diverse needs and preferences can contribute to a more inclusive and practical learning experience.

Students suggested several improvements to the models, including a wider variety of animal species, more color options, larger sizes, and models that are more durable and easier to handle. They also highlighted the need for greater realism and accuracy in the models' features and colors. This aligns with the finding of Jiang et al. (2015), which indicated that 3DP creates realistic models essential for effective learning. This means that using accurate representations can help students' overall learning experiences. The need for durability and ease of handling is also echoed in the study by Güleriyüz and Dilber (2021). This is also further supported by the study of Tanabashi (2021), which emphasized the positive impact of integrating 3DP into science education, including the need for engaging and realistic models to enhance learning. These suggestions provide valuable insights for further developing 3D models as educational tools. These improvements can make the models more engaging, effective, and better suited to diverse learning styles.

Conclusions, Implications, and Recommendations

3D models are considered a valuable educational tool for teaching science lessons. It helps the students improve their overall learning experiences. The study explored the impact of using 3DP science models as educational tools on students' academic performance. As a result, the study showed that 3D models as educational materials positively affected students' academic performance in science. The qualitative findings revealed that 3D models enhance student engagement, motivation, and understanding of complex concepts. However, the study also identified challenges such as durability, accuracy, limited model access, and the need for varied and realistic representations. These findings have important implications for science education in the Philippines. It highlights the potential of 3D printing technology to enhance learning experiences and address the challenges of low science literacy among Filipino students.

Despite these promising results, the study has several limitations. One limitation of the study is its small sample size, which focuses solely on Grade 3 students and one learning competency. The limited availability of 3D models and resources also constrained the study, potentially impacting the extent of student engagement. Furthermore, the study was conducted over a relatively short period, limiting the scope to assess the long-term impacts of 3D printed model integration on students' learning. Therefore, conducting related research involving a more significant number of participants is encouraged. Based on these findings, several recommendations can be made. Recommendations for future research include exploring integrating 3D printing technology into different subject areas. Recommendations for policymakers include increasing investments in 3D printing technology for schools and providing training for teachers in using 3D printing in the curriculum. This will contribute to developing a more innovative and emerging educational system that prepares Filipino students for success in a rapidly changing world.

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Appendix A. The Makers or Designers of the 3D Printed Models used in the Study

3D Models	Makers/Designers	Sources
Articulated Jumping Spider	<u>Daann ii</u> Danelle Coleman Midwest USA June 02, 2024	https://www.thingiverse.com/thing:6645530
Cute Mini Octopus	<u>McGybeer</u> Javi Rodríguez Spain March 16, 2019	https://www.thingiverse.com/thing:3495390
Flexi Starfish	<u>Zentangle99</u> Zentangle 3D Sri Lanka August 28, 2024	https://www.thingiverse.com/thing:6746058
Flexi Articulated Monkey	<u>fixumdude</u> Michael Grugel Texas February 22, 2020	https://www.thingiverse.com/thing:4176016
Elephant	<u>LeFabShop</u> le FabShop Paris, France February 26, 2014	https://www.thingiverse.com/thing:257911
WOODPECKERZ	<u>muzz64</u> Murray Clark Auckland, New Zealand November 25, 2015	https://www.thingiverse.com/thing:1155168
Stylish Flexi Shark	<u>Zentangle99</u> Zentangle 3D Sri Lanka November 12, 2024	https://www.thingiverse.com/thing:6828888
Clipper - Articulated Dolphin	<u>kosteklvp</u> September 03, 2023	https://www.thingiverse.com/thing:6200717
Articulated Lobster	<u>damienfremont</u> Damien FREMONT France February 15, 2020	https://www.thingiverse.com/thing:4153708
Geckoz	<u>muzz64</u> Murray Clark Auckland, New Zealand June 09, 2018	https://www.thingiverse.com/thing:2947391
Flexi Humpback Whale (print-in-place)	<u>3D_FlexSeeds</u> mosamosa saurus October 09, 2023	https://www.thingiverse.com/thing:6255454

*The file for the Turtle model is no longer available online.

DETECTION OF RIVER WATER QUALITY CONTAMINATION USING GIS, RS AND AI

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Abstract: *The escalating degradation of river water quality due to rapid urbanization, industrialization, and agricultural runoff necessitates advanced, integrative monitoring approaches. This study presents a robust methodology that integrates Geographic Information Systems (GIS), Remote Sensing (RS), and Artificial Intelligence (AI) to detect and predict river water contamination. By leveraging high-resolution satellite imagery, machine learning algorithms (e.g., ANN, Random Forest), and spatial analysis tools, the proposed system identifies contamination hotspots, classifies land-use changes, and models spatiotemporal water quality variations. The application of Principal Component Analysis (PCA), Kriging, and fuzzy evaluation enhances prediction accuracy and aids in addressing data gaps from limited in-situ monitoring. Case studies from the Code River (Indonesia), Cooum River (India), and Brantas River (Indonesia) validate the model's capacity to assess parameters such as BOD, TDS, heavy metals, and microbial indicators. The findings underscore the system's potential for early contamination detection, spatial-temporal trend mapping, and informed policymaking. This integrative approach supports environmental sustainability, facilitates real-time monitoring, and enhances water governance through data-driven insights, particularly in data-scarce or rapidly urbanizing regions. The framework holds significant promise for replication in global contexts facing water security challenges due to anthropogenic pressures and climatic uncertainties.*

Keywords: *GIS-based monitoring, Remote sensing, Artificial intelligence, River water quality*

Introduction

With the rapid socio-economic development and urban construction in China, the water quality of surface water bodies, especially rivers, is deteriorating. As an important global issue, river water quality has attracted wide attention from many developed and developing countries (Fang, 2015). In river ecosystems, water quality evaluation is often performed based on the measured variables' values. These measured variables include water temperature, pH, dissolved oxygen (DO), electrical conductivity, biological oxygen demand (BOD5), total phosphorus (TP), total nitrogen (TN), faecal coliform (FC), etc. However, due to the limited measuring equipment and costs, it is often impossible to obtain all the water quality variables' values for all sampling periods.

Therefore, there are great needs for developing models that can effectively predict the values of some missing water quality variables through the values of the other variables at the same sampling time (or periods), and such models can realize the filling of the missing data and help conduct the water quality assessment. Because of the complex physiological processes, interactions and multiple correlated influencing factors of surface water quality, the

controversial relationships between the water quality parameters cannot be explicitly expressed in mathematical equations. Hence, a data-driven model with the powerful nonlinear mapping capability is urgently needed to depict the complicated relationships between the water quality parameters. Because of the superior generalization ability in imitating complex processes and the local search capability to model uncertain high-dimensional mappings, artificial neural network (ANN) has been popularly used in water quality prediction. The BPANN model is the simplest and most widely used model for water quality time series prediction. Therefore, the BPANN model is selected to establish the predictive models for missing water quality variables.

In addition, although a large number of water quality assessment models have been developed by researchers based on mathematical or statistical methods, the fuzzy set-based methods have received wide attention due to their better tolerance of fuzzy and imprecise input information. However, since fuzzy-set based methods are concerned with the subjective assessment of water quality, there may be differences among different assessors in terms of the selected membership functions and the generated water quality assessment results. Hence, the uncertainty involved in the water quality assessment should be considered further and Iran as a northern neighbouring country of these water bodies is also distinguished separately.

Background

The integrated geographical information system (GIS) and remote sensing (RS) model assesses river water quality and detects contamination sources with artificial intelligence (AI). The proposed model integrates GIS, RS, and AI methods to reveal development avenues for the model. The innovative contribution of the model is multi-class water quality classification and model validation through field measurement (Fang, 2015). Developing an integrated model of GIS and RS is essential for observing changes in surface water quality access to a stream at various times. The spatial prediction model reveals potential waste dumping areas with the capability of AI methods such as support vector machine (SVM), artificial neuron networks (ANN), and conventional methods. Concentration estimation produces reliable findings with cross-validation for inconsistent river monitoring stations.

The integrated GIS and RS model detects river water quality contamination using AI classes and validated through verification datasets. During its application, the presented model shows clarity in required spatial interpolation services for pollutants, water quality detection accuracy, and overfitting control for AI models. The influence of domestic wastewater was not observed in the VF2 scores of SCD2. The scores of SCD1 were mostly scattered in the negative quadrant of both VF2 and VF3, indicating that the influence of both sources of pollution on the variability of water quality data in SCD1 was insignificant (A. Pratama et al., 2020). High scores of VF2 and VF3 were obtained from monitoring data from the SCD2 and SCD3 stations, indicating the significant influence of domestic and metal contaminants on water quality in the middle and lower streams. The findings were consistent with the results of the impacts of the LULC changes, which established significant correlations between the LULC changes in the middle and lower watersheds and the BOD, Cu, and Pb parameters.

Literature Review

Ph.D. thesis titled “Development of An Integrated G I S-Based System For Surface Water Quality Assessment And Management (GIS-SWQAM)” developed an integrated G I S-based system capable of data processing, data management, fuzzy water quality assessment, eutrophication risk evaluation, heavy metal risk evaluation, and water quality variable prediction. D M D H model is integrated with the G I S, the database, and C# language. The main idea of the first and second system is to develop a G I S-based water quality assessment system that integrates the fuzzy synthetic assessment algorithm, the Arc G I S Engine, and a database; to represent the algorithm of the BPANN model in C# language and develop a G I S-based water quality parameter prediction system that integrates the BPANN model, the Arc G I S Engine, and a database (Fang, 2015). As case studies, Changsha City, a second-class city of Hunan Province, and Wang River, a tributary of Xiliang River of West Jinsha River, are selected and studied. Water quality parameters were summarized quantitatively by the fuzzy synthetic evaluation algorithm, in which G I S was used to manage data and randomly visualize results, the possibility of parameter change was assessed qualitatively in which the method of matrix was used to represent the combination of risks with a fuzzy-set based. A multivariate and spatiotemporal analysis of the water quality parameters in Code River, namely biochemical oxygen demand (BOD), total suspended solid (TSS), ammonia (NH₄), nitrite (NO₂), nitrate (NO₃), and heavy metals such as copper (Cu) and lead (Pb). Stations for water quality monitoring were selected based on the characteristics of Code River. The G I S method was proposed to determine suitable monitoring stations with respect to pollution sources. There were three locations in each G I S basin to represent the water quality condition in that basin. The determination of water quality monitoring stations was one of the critical steps in water quality evaluation activity (A. Pratama et al., 2020). Other methodologies used are hierarchical cluster analysis (HCA) and PCA. H C A is used to cluster observations into groups, and the clustering results show the groupings. H C A is based on similarity measurements and forms a hierarchy in a dendrogram (clustering trees). Each of the observations is compared exhaustively in pairs and clusterings are returned at different levels of similarity. PCA is used as a dimension reduction technique and assumes that the observations are correlated. PCA transforms a large number of variables into a smaller one and un-correlated variables (the principal components) retaining most of the information.

Previous Studies on Water Quality

Water is the most important natural resource, and it meets the most vital needs of human life (Fang, 2015). Any changes in the physical, chemical or biological properties of water, and the associated changes in its quality, affect its suitability for a given use. Monitoring the quality of surface and ground water is one of the important tasks in environment conservation and restoration. In river basin with many human activities, anthropogenic pollutants usually enter into water bodies and possibly change the water quality. Because river water quality data often varies greatly, developing a scientific surface water quality assessment and management system to evaluate/monitor the river water quality is necessary. The increasing demand for water for agricultural, industrial, and recreational uses has raised concerns over the sustainability of the available water resources. This is especially true for surface water bodies, with the comparatively easier accessibility and greater susceptibility to contamination by surface runoff from land-based human activities. Persistent over-fertilization strategies and

urbanization practices are often the two main contributing sources of contamination for lakes and reservoirs.

The major objectives of this research work are to develop an integrated GIS-based surface water quality assessment and management system, to establish a knowledge-based water quality index computation method, and to develop Web-GIS-based management models that could provide timely information to water authority and citizens. The Research work has the following specific objectives. Evaluation of suitability of Surface Water Quality Index (SWQI) in quantifying the quality of river water based on water quality characteristics of river water stretch and its management. To find the significant water quality parameters and their levels/duration that govern to monitor the quality of river water. To develop and assess the Integrated Information System (IIS) with decision support system using GIS on Web for understanding quality and quantity issues of river water.

Pollution from land-based sources is of increasing concern to authorities responsible for the management of the environmental state of the world's lakes and reservoirs. Lake water is a precious resource for human survival and the foundation of sustainable development in all nations. The state and quality of lake water are important indicators for tracking the evolution process of a lake's environment. Conventional lake water quality monitoring methods are usually expensive and time consuming, while satellite remote sensing is a sensible alternative for monitoring inland water quality on a large scale. Conventional in situ observation and laboratory detection methods are incapable of providing timely information on the condition/state of aquatic environments, in order to oversee water-safety. Therefore, employing a remote sensing instrument for lake water quality monitoring is an important trend.

Technological Advances in GIS and RS

The applications of Remote Sensing (RS) in environmental studies, especially for monitoring water quality, have been reported since satellite launch and challenged by false assumptions, retrieval model uncertainties, sparse observations and the natural complex spectra of water reflectance. The RS methods to estimate various surface water quality variables (WQV) have been comprehensively reviewed. Examined estimates have included chlorophyll-a, total phosphorus, ammonium, pH, E. coli, turbidity, surface temperature, dissolved oxygen and salinity. Broad RS-sensor types—hyperspectral, multispectral, and thermal infrared—have been assessed. The development of RS methods through the water quality lesson learnt from the progress of the State-of-the-Arts (SoTA) is also discussed. Since the launch of Landsat-1 satellite in July 1972, RS for ocean and freshwater analysis has been reported for over four decades with space-borne and aircraft-based sensor development.

After summarizing the important spatio-temporal scales of processes and products, reviewed applications of RS on water quality involved atmospheric, watershed, surface, and in-water processes operating remotely (V. Japitana & E. C. Burce, 2019). Both variables and physical processes were examined leading to partitioned WQ modelling to constrain the RS look, as well as derivation of radiative transfer functions. The sensitivity of modelled water quality products to the high dimensional input data (i.e., spectral bands) has initiated the development of variable selection approach to find the “best” ratio of band combinations. With the advances in both sensor technology and understanding of water reflectance, the Semi-Automatic Water

Extraction (SAWE) and Spectrum Feature Fitting (SFF) were developed to process the continuous water reflectance spectra (Fang, 2015).

Along with the perception of global scale estimation needs, near real-time (NRT) observation of Aqua/Terra MODIS with daily global 1-km products have high exploitation for retrieving chlorophyll-a. The recent efforts to provide a global “level-4” in-water WQ estimation product with Ocean and Land Colour Instrument (OLCI) FN3D/1020, together with the Brazilian satellite lens wide-swath WQ monitoring sensor Amazon, have an increased expectation in RS WQ research. Validated in-situ reflectance databases such as MERIS, OLCI and Sentinel-3 are still limited. The simultaneous estimation for multiple WQV types is infrequently reported.

AI Applications in Environmental Monitoring

The combination of artificial intelligence (AI) and internet of things (IoT) technologies provides numerous advantages in water quality monitoring (WQM). The architecture of a smart WQM system is presented, which incorporates real-time multi-parameter data gathering through a LoRa-enabled sensor network and a central node for wireless transmission. A unique semi-supervised long short-term memory anomaly detection algorithm was developed to classify sensor malfunctions based on data patterns. This architecture was evaluated through a case study indicating that the LoRa-powered prototype improves the reliability of WQM by detecting vertiginous sensor malfunctions. A few applications in AI for environmental monitoring are highlighted, focusing on developments in smart water quality monitoring systems (Singh & Walingo, 2024).

The fundamental concept in any water quality monitoring (WQM) system is to ensure that the water meets the regulatory standards to be utilized for a particular purpose. WQM systems consist of water quality sensors coupled with different interfaces for data acquisition. The burgeoning IoT provides water authorities with appropriate sensor technologies, cost-effective platforms for data dissemination, low-power microcontrollers and embedded systems, novel communication standards, and machine learning advantages to assess the observed data. WQM, in this sense, contributes to the current trend of smart water systems. However, a non-redundant outlier in the observed data could negatively affect water authorities’ decision-making and escalate the damages. In this regard, it is crucial to differentiate between anomalous observations and malfunctioning sensors.

One of the foremost priorities of any sensor node design is lifetime expectancy in remote and standalone platforms. This is important to ensure residents’ quality of life and safeguard water sources in rural areas where water is not readily available. For this purpose, sensors concerning energy consumption and detection precision are optimal candidate analysis units. A WQM system governed by an intelligent framework comprised of IoT technologies for model water treatment was utilized. In addition, AI approaches to trends prediction can be employed. Machine-learning-based prediction algorithms could be extensively utilized for predicting and detecting abnormal changes in water quality. For smart cities to implement water availability and quality assurance, winning proposals predominantly combine AI commercial solutions with smart S/I technologies.



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Chennai Metropolitan city (CMC) lies on the eastern coast of India and is one of the most developed cities in India. The city has passed through an extraordinary velocity of urbanization in the last two decades leading to the exploration of coastal wetlands, rivers, and lakes for urban goods and services. Major river into the coastal wetland is Cooum River. The Cooum River runs through the heart of Chennai city draining a 635 km² catchment area into Bay of Bengal. The river spans 75 km in totality which is considerably smaller compared to the major rivers anywhere in the world. River-coastal wetlands generally considered as productive resort for aquatic species and have ecological values, providing habitat, food, and nourishment. Socio-economically important wetland, Cooum estuary, is home for more than 25 species of fish and 13 species of crustaceans. It provides livelihood and sustenance for nearly 53,000 fishing families in Chennai. Demographic explosion, peri-urban development, and industrial growth have led to the Cooum River becoming the most polluted river in Asia with human health consequences. A multi-dimensional Hexa GIS, Remote sensing and Artificial Intelligence Logic were synthesized to study and monitor water quality pollution of Cooum River. Landsat TM images of 1986, 1995 and 2005 were used to characterize land use/land cover. Water quality parameters such as pH, DO, BOD, COD, Total Dissolved Solids and Total Suspended Solids were assimilated using GIS, Remote sensing and Artificial Intelligence. Sensitivity analysis was used to identify threshold ranges of water quality parameters beyond which the water quality degrades. Risk Assessment, Watershed water balance modeling and Watershed Management planning were attempted using AI Logic Model.

Underground mine water quality is further affected by regional water bodies and impacts drinking water in neighborhood villages. Ganga water quality in the vicinity of Kanpur city is deteriorating related to patent urban nuisance as well as industrial pollution. Negative impacts of emerging pharmaceuticals and personal care products on river water quality are observed. Rapid urbanization and industrialization of the upper streams of the river Betwa are seen to adversely effect its water quality. Water quality in two rivers flowing through black cotton soil zone is highly deteriorated due to indiscriminately use of chemical fertilizers, pesticides and other herbicides. Amount of metals in the sediments of the rivers Ganga, Yamuna and Godavari shows adverse impact on aquatic flora and fauna. The water quality in the rivers Koyna and Chaskaman Koyna reservoirs is deteriorating drastically due to building of dam, afforestation and urban development activities. A numerical model is developed to predict water quality parameters in a river system which can be linked to a GIS for estimating flows and their effects on the nutrient cycles (Fang, 2015).

Data Collection

The raw water quality data of the river was used for the water quality contamination analysis based on parameters that had ELV (Effluent Limit Values) according to Governor Regulation No. 8 of 2007, namely BOD, COD, TSS, DO, pH, and E. coli. The parameters of BOD, COD, TSS, DO, and pH were daily sampling with total 48 sample points and E. coli was 1-month sampling with total 6 sampling points. From 54 sample points, 36 points are within the Krian River and the rest were in the Brantas River. The MET (Minimum Effective Time) distribution based on water quality raw data which are also used from the other research were then calculated for each parameter by using goodness of fit testing.

Landuse data was acquired from East Java Province. The landuse category was classified into 12 classes (waterbody, aquaculture, agriculture, built-up, mining, barrenland, forest, estate, openland, shrubland, and industrial). The statistic of landuse distribution is varied with the waterbody has the largest area approximately 8,827 ha or 77.68% and the shrubland has the smallest area just about 0.1 ha or 0.00089%. This data was used at 2 years interval to calculate the LULC (Landuse/Landcover) class change. Landuse data of year 2018 was extracted from images and the LULC type was classified by using classification methods. The random forest performed the best accuracy with Kappa and OA of 0.8918 and 0.9219 respectively.

Brantas and Krian River were used as study area. The rivers network for Brantas and Krian River were acquired from Digital Elevation Model data and the raster data was converted to vector data. The Brantas River was digitized manually, while Krian River needs to be derived from the DEM data and then filtered using filter smoothing before being digitized manually. The expert value of each parameters for consecutive years of 2016–2018 were acquired from a branch of BMKG who is responsible in rutting/ monitoring and managing this rivers condition. Further, the input data must be converted into model input data in a 4D matrix format (x, y/time step). The data of each parameters were acquired for each sampling stations and at each time step, the data were processed for different spatial resolution depending on the river and fetched for LULC class.

GIS Techniques

The proposed system uses GIS for processing and management of water quality data and contamination incidents. The Geographic Information Systems (GIS) tools provide fast retrieval and mapping capabilities. GIS is used to maintain a geodatabase where information about all the water quality monitoring stations, data, and other spatial data is stored and handled. Geographic features of interest are incorporated as a simple shapefile. Then, using the ArcMap tool, it is visualized to understand the geometric location of the spatial features and barrier points. Additional Geographic Information System (GIS) data affecting water quality includes topographical data, land use characteristics and census data. The topographical data about the river system is obtained from the National GIS Data Warehouse. The DEM data is processed in ArcGIS, which provides a digital elevation model (DEM) derived from a 30-m resolution terrain data set. This data can derive a river network, and elevation contour maps give a good spatial perspective of an area. Proposed topographical features including GPS-tracked risky areas where waste incidents occur, waste areas and sanitary landfills. The locations of several other geographic barriers such as roads, lakes and isolated regions are required in the digital geodatabase for modelling purposes. (Fang, 2015) representative concentration pathways (RCPs) were used to run the Climate Surface Data for Future Years. Minimum and Maximum Temperatures, Precipitation, Solar Radiation, Wind Speed, and Dew Point Temperature were surfaced as rasters in ArcGIS then exported as Gridded Raster data. With the help of the Open Source Python-Based Model, future water quality modelling under climate change scenarios can be performed while considering surface data changes as well. In addition to the next decade scenario, till 2100, 60 years future data are retrieved and presented in geo-referenced data formats for gridding.

Remote Sensing Methods

Water bodies on Earth, both coastal and inland, are essential to the environment and human survival (V. Japitana & E. C. Burce, 2019). Located near coastal zones or lake areas, most cities can easily take water from these bodies for drinking, irrigation, and domestic purposes. However, these water bodies may be polluted due to rapid development and urbanization leading to land use changes that can affect the quality of water bodies. It has been argued, therefore, that water quality monitoring is essential to assess the quality of fresh water lakes, rivers, or reservoirs. Water quality monitoring is commonly performed according to traditional ground-based methods using laboratory analysis, collecting samples from monitoring stations. However, these methods can be very time- and money-consuming, expensive, and sometimes dangerous.

Remote Sensing (RS) and GIS have become powerful tools for water quality monitoring, as this capability allows for better management of fresh water lakes, rivers, or reservoirs, which usually have a large spatial extent. Remote sensing provides suitable spatial, spectral, and temporal resolution for surface inland and coastal water monitoring. The Remote Sensing technique is also capable of providing spatial information of water bodies without environmental disturbances. For these reasons, it has become of great interest for many researchers to focus on the water quality monitoring of inland and coastal water bodies using an RS approach. RS techniques based on satellites and airborne sensors are widely used for monitoring water quality and retrieving biophysical variables since they provide frequent information of the surface state of the water body over a large spatial area. Optical satellite images can provide information on surface water quality indicators and bio-optical products with the potential for continuous monitoring of changes in surface water quality.

At a regional/national level, RS in combination with GIS and in situ water quality measurement data have been extensively used. Traditional RS-based water quality monitoring involves the development of a remote sensing algorithm either region-based or sensor-based using in situ water quality measurement data. The developed model is then validated over an independent test area using satellite data. Various studies have been conducted for inland, estuarine, and coastal water quality monitoring. However, the prediction accuracy of these methods tends to devalue with meteorological influences such as the lack of cloud-free images and changes in the water quality characteristics of the assessment area.

AI Algorithms Used

Artificial neural networks (ANNs) are computational data-processing systems developed by simulating the biological functions of the brain. ANNs provide a powerful technique that ensures efficiency and high prediction accuracy. They can solve performance problems involving a significant amount of data and do not require any assumptions like traditional statistical techniques (I. Ubah et al., 2021). ANNs can learn from inputs, generalize results to unseen input data, and automatically map unknown relationships between input and output variables. One advantage of ANNs over other computational model types is that they do not require prior knowledge or ideas about the spatial or temporal structure of dependent data. Thus, ANNs can be used successfully in various applications, such as meteorological forecasting, environmental simulation forecasting, and process control for chemicals and landfills (Juahir et al., 2010). The use of ANNs in watersheds' modelling hydrology and water

quality has gained rapid attention in recent years due to the development of various, widely available, easy-to-use, and powerful computing environments. Various applications include daily water quality modelling of lakes and reservoirs, prediction of nutrient loading to estuaries and coastal zones, and modelling of phytoplankton dynamics and chlorophyll in lakes, reservoirs, and estuarine systems. Artificial neural networks (ANNs) are non-linear computational algorithms based on biological neural networks that have the ability to learn. Like many statistical methods, ANNs use a training set to estimate the parameters of the model. A set of inputs is supplied to an ANN, which performs the computations and provides output. These output variables, along with the correct output values, are used to train the ANN. The location of the training inputs is adjusted to minimize the difference between the expected output and predicted output.

Data Analysis

The quality of water is vital in maintaining the ecological balance of our environment and aids the well-being of all species. Unhygienic usage and contamination of rivers or lakes are the causes of adverse elements being incorporated in water. Moreover, water pollution is one of the rising concerns in rural and urban areas. The degradation of industrial waste, sewage discharge, pesticides, and fertilizers are the main contributors to water pollution. Assessing the quality of water bodies is necessary in most cases to determine water quality. Occasionally, raw data of several parameters are obtained by water sampling and testing. However, to have proper and accurate river water quality management sufficient information of the river water bodies should be accessible. As due to being ill-managed and unmonitored, the river quality in Bangladesh is degrading at an alarming rate. Inadequate methods are currently used to monitor the river water quality which often leads to insufficient information.

Bringing together a remote sensing dataset of 19 years (2001-2019) along with a river water quality dataset helps generate an accurate and efficient method of river water quality assessment. High-resolution satellite images are used to extract land use land cover (LULC), vegetation index (VI), surface water change, and water quality data by employing supervised classification and machine learning techniques. By analyzing raw water quality data with the use of Multiple Linear Regression (MLR), a time-series water quality management system is produced for the location. In terms of river water quality assessment, such data processing might be one of the fewest integrated systems ever used and thus deliver accurate results (Fang, 2015).

In this regard, understanding the change in land use land cover (LULC) is important. From database and thematic information analysis, the influence of river segment difference on water quality is determined and the altered impact of different land cover change on the total nitrogen and total phosphorus is identified. In the last two decades, the rapid economic growth and population explosion have led to larger pollutant discharge in Code River (A. Pratama et al., 2020).

Statistical Methods

Water quality monitoring is very important to monitor the water quality continuously for pollution detection. Two rivers are chosen namely Kuantan River and Kuantan River in Pahang, Malaysia. In the Kuantan River, selected water quality monitoring stations have

evidently detected the difference in water quality from 8 monitoring stations along the river basin both spatially and temporally. Kuantan River is the 3rd largest river in Peninsular Malaysia. The river originated in the highlands of Gunung Tahan in Jerantut district, flows through Kuantan district and drained into the South China Sea. Mixing of various types of land-use activities along the river basin in conjunction with rapid socio-economic growth and globalization has contributed to the land-use alteration in this river basin (Shakir Mohd Saudi et al., 2013). Concerned authorities for instance, the Department of Environment (DOE) has made an immense effort to ensure good quality of water bodies using various strategies including periodic monitoring and surveillance. The well-trained experts in the Department of Environment (DOE) collect raw data which contain the water quality parameters in certain frequencies to achieve maximum detection of pollution spots in the river basin. However, valid and useful information would still remain hidden in the huge and complex amount of monitoring data unless they are properly analyzed.

Different kinds of statistical methods both univariate and multivariate analysis namely Standard Deviation, Slope Coefficient, GLM, MLR, HACA, DA, PCA, Outlier Detection, ANN, GIS and RS were well established and properly applied for water quality, and their applications were collated (Juahir et al., 2010). Each statistical method explained with respect to how each method works and in what types of situation it applies were described. This study aims to discuss the essential role of statistical methods on detecting water quality contaminations by their correct and cautious applications in the geographic information system (GIS) using data from river water quality monitoring stations. Watershed input land-use property like impervious surface percentages coupled with water quality surveillance were presented as one example of a natural-resource management problem.

Geospatial Analysis

The study area is Kenthongan river, which is in Sleman regency, DIY province. Kenthongan river is one tributary of the Winongo river. This shallow river has a lower slope level compared to the Winongo river which has a steeper slope level, resulting in a KSP in Kenthongan river which is often overflowing and flooding. Kenthongan river is also a pollutant conveyor in the Winongo river basin, because the flow allows the entry of pollutants originating from the dumping of solid waste, liquid waste, and the drainage system in Kenthongan river.

Land cover is used as an independent variable of linear regression analysis. Landsat 8 Satellite Imagery acquired on February 23, 2021 was processed and analyzed to produce land covering data in the form of raster. Land cover was divided into 7 classes, including built up area, cropland, grassland, open water, shrub, tree cover, and bare soil. Raster land cover data is converted and reprojected to vector format. Each land cover is grouped based on the class as a calculation map for linear regression analysis.

In this study, observation points were determined in the Kenthongan river based on the land cover class, so that 12 sampling locations were obtained. The upper reach observation point is in Malang city and the lower reach point is 1 km from Kenthongan village. Water samples were taken directly and stored in containers, then labeled and cooled in the cooler box and then transferred to the laboratory for testing. The parameters tested in the laboratory are as follows: BOD, COD, TDS, pH, Salinity, TSS, Ammonia, Nitrate, Nitrite, and Phosphate. River quality

threshold standard data is taken from the relevant regulation concerning water quality standards.

Machine Learning Models

To develop the prediction model, this study used the Python application that applies the random forest decision tree (RF) machine learning algorithm and several Python libraries that support input geospatial data, provide pre-processing capabilities, and implement the RF algorithm to build prediction models. Thus, it is assumed that the study area is the catchment of the river, including its tributaries, and the study only focuses on pollution sources. The proposed prediction model consists of three steps: data preparation, model training, and model application.

The input data of the model training consists of preprocessed general parameters and pollution load input data. Input pollution load of sewage discharge, output pollution from WWTPs, and input pollution loads from rivers at the upstream boundary are time-series data of monthly average values while the remaining are either constant so far, or about to be extracted as unit values and input in data tables. However, general parameters such as flow field data, the number of sub-basins and river sections, and rainfall, are not suitable to be used as input since they cannot reflect local difference in prediction. Estimation is a point-wise process focusing on the estimation of local prediction points. A point-wise estimated value is determined in that its generality is not affected by the characteristics of its surrounding areas.

Construction of subtraction of level 1 sub-basin makes it possible to derive a differential area for each database system. Level 1 sub-basin from the watershed boundary is derived from topographic characteristics of large scale, such as existence of a dam or a levee, as a basis unit like Han River, that cover wide scope. In most areas level 1 sub-basins of the major computational step in 39odelling system, for a large river basin, are not considered. The advantage of level 1 general parameters is the non-fluctuation given no inflow data. Derivation of level 2 and level 3 sub-basin is similar with level two subdivision. Level 2 units represent tributary rivers and have little difference in size or shape. On the contrary, level 2 differ widely in shape and have considerable local significance, as well as data characteristics. Therefore, general parameters are derived from all three levels of sub-basin units and stored in three separate databases, which contain data of river characteristics in general, tributary rivers, and target rivers respectively (Kovačević et al., 2023).

Results

The monitoring points are classified based on the one-dimensional well separated variables and their attribute values. The eight monitoring points with the most different values on the one-dimensional well separated variable are selected as representatives. The submonitoring point numbers 1 to 4 respectively correspond to monitoring points 4, 8, 10 and 5. There are 5 maps for the GIS spatial distribution of water quality contamination group 1. The contour maps show the annual mean value distribution without changing any current attribute. The class maps show the annual means of variables greater than 90 and 95% quantiles respectively. The residual maps indicate the values less than the 10% quantile of 90% of the means. There are five maps presented for group 2. The distributed maps exhibit an obvious temporal change trend, excepts for NO₃_N that has the same patterns for all time periods (Fang, 2015). For the rest variables,

the magnitudes are evidently larger in late periods than early periods. The distributed maps still maintain the similar spatial distribution patterns. The distribution changes during the time periods might be not distinct or beneath the monitoring threshold level in the other areas, thus the points Gg7, Gg8, and Gg14 are selected as representatives with the least amount of dissimilarity in the values of the design variables (A. Pratama et al., 2020). All the monitoring points in this group are located near the monitoring points selected in group 2, thereby the strength of the water quality contamination is close to the output levels in the abovementioned time periods. The contour maps show similar patterns but the strength is much lower, which indicates that the large variations of the output level result in the increase of modeling uncertainty after intensively polluting for several years. The annual mean maps exhibit similar patterns for the spatial distribution at the two time periods. The vessels are likely leaking and leaking pollutions to the ambience or water while transporting chemical wastewater.

Water Quality Indicators

Water quality indicators include water physical indicators, water chemical indicators, and water biology indicators. The physical quality of river water includes water temperature, suspended solids, electrical characteristics, color, turbidity, and dissolved oxygen (DO). Water temperature affects the reaction kinetics of oxygen, ammonia nitrogen, and phosphorus in water. Suspended solids are the main pollutant source of water bodies. Electrical indicators are commonly used to reflect the quality of river water. The greater the EC value, the more likely the water quality is affected by salt. Color is the cumulative absorption effect of dissolved organic compounds on light. Water quality that is yellow and turbid should be given more care. The turbidity values of pristine water bodies are very low. In heavy pollutant-discharge areas, the turbidity of river water exceeded 80 NTU. Spilled oil, bentonite, heavy metal solids, and dead algae affected the turbidity of river water (Wang et al., 2017). The chemical quality of river water includes nitrogen, phosphorus, and pH. Nitrogen sources of a river water basin include rainfall, septic tanks, and fertilizer application. The nitrogen form is classified by non-ionized nitrogen (NN) and ionized nitrogen (IN). NN includes $\text{NH}_3\text{-N}$ and organic-N. IN mainly refers to nitrate nitrogen. Phosphorus is classified into total phosphorus, dissolved phosphorus, and the phosphorus that can be absorbed by sediment. Total phosphorus (TP) refers to the total phosphorus concentration composed of particulate phosphorus and dissolved phosphorus. TP can be extracted by chemical methods. Dissolved phosphorus (DP) refers to the dissolved phosphates in river water. During sedimentation, phosphorus can be adsorbed by sediment. Phosphorus on the surface of sediment is easily released into water bodies and results in eutrophication (Fang, 2015). Water quality index (WQI) is a comprehensive monitoring indicator for the judgment and evaluation of water pollution. The WQI represents both a collection of water quality data and the relative risk of ecosystem degradation. Generally, the WQI is widely used to evaluate river water quality internationally. The first WQI was developed in 1965. At least 113 WQI equations were compiled for different water bodies in different areas worldwide from 1965 to 2012. However, most of the calculations involved a large number of different indexes and complicated arithmetic. Others did not construct an equation or use programmable codes. The WQI equation could evaluate any water quality index and is easily used by managers. For most rivers, water quality generally leans toward “moderate” ($\text{pH} \sim 8.0$) or slightly alkaline (salinity of ~ 7) waters in which Mn^{2+} initial concentrations dominate cations, due to local geology.

Contamination Sources

Hexagon geospatial's estimate referenced the need for protection of water resources by surface as heads of municipality and river for water resource protection. Protection of river water includes surface activities, malpractices, and effluents from industrial waste. Many river banks undergo rapid transformation due to urban construction, industrial establishment, and agriculture activities. These activities along river banks are points for the water quality degradation. Comparison of land use and land cover data with the 2008 and 2021 remote-sensed data is done with superimposition in QGIS and image processing (Kean Hua, 2017). Based on this comparison all the new industrial setups, residential, and commercial establishments along the river for these periods are identified. Industrial wastes are generally loaded with oil, grease, SS, turbidity, and BOD which block sunlight to the river, i.e., the quality of surface water gets degraded at a higher rate and it becomes more acidic than the river side which does not have any industrial or commercial influence on it. Water quality data is collected at the identified sampling locations using portable water quality parameters tester. Water quality parameters like turbidity, TDS, EC have been found to be above the permissible limits in the water quality analysis.

Spatial Distribution of Contaminants

The use of Remote Sensing (RS) data in parallel with water quality monitors equipped with data-logging devices is presented in this section. The RS data were used to investigate the spatial distribution of cloud cover from both Landsat ETM+ and OLI/TIRS satellites. An average cloud cover calculation was conducted to find the most suitable satellite data for this case study. The most suitable satellite data was designated for the confounding factor detection analysis to identify which parameters (topographic or meteorological) were significant in both the Normalized Difference Water Index (NDWI) and turbidity dispersion, which were obtained from Landsat ETM+/OLI/TIRS imagery.

An important aspect of water quality monitoring is the detection of physical and biological contaminations that take time to aggregate and diffuse in reservoirs, rivers, and lakes. These contaminations can be greatly temporary, contingent upon inundation levels during deluges or flash floods. The diurnal trend of these contaminants is more fixed as they change more slowly and do not endanger aquatic biota. This diurnal trend parameter can be used to monitor water quality using Remote Sensing (RS) over even a 24-hour period. Due to restrictions in accessing the RS Signals' bandwidth usage for real-time corrections aboard civilian satellites, RS monitoring cannot replace ground monitoring. However, as it is so powerful in estimating parameters such as water temperature and Chlorophyll-a (Chl-a), it can be used in combination with other artificial intelligence approaches optimally to detect the occurrence of the water quality changes, which only happen occasionally and temporarily.

Using Artificial Intelligence (AI) for performance simulation models to improve operations and maintenance efficiency is relatively rare in the water industry. This section discusses the application of AI-based models, particularly using a conditional Generative Adversarial Network and a Long Short-term Memory generator, to forecast in-system water quality trends concerning climate change and to provide the capacity to estimate the occurrence probabilities of contaminations.

Discussion

The detection of river water quality contamination is important for water resource conservation. Therefore, it is essential to provide supporting information emphasizing the vulnerability of the catchment. In this study, a methodology for the detection of river water quality contamination using GIS, RS, and AI is described. It is considered a multi-method approach for the assessment of water quality in a river basin where input data are derived mainly from remotely sensed datasets. Multispectral data are used for land cover and water body mapping. A linear spectral mixture model is utilized for the characterization of the seasonal variability of land cover types and for the estimation of surface temperature of the river. In this study, water quality monitoring techniques have maximized the use of spectral information from satellite data to simultaneously monitor various levels of water quality contamination caused by the anthropogenic development (Fang, 2015). Many studies conduct an assessment of the water quality in rivers. A multivariate and spatiotemporal analysis of water quality in the Code River, Indonesia, is presented through a case study. Water quality monitoring was conducted at eight sampling stations from 2015 to 2019. Principal component analysis (PCA) was applied to determine the temporal and spatial trends of water quality. Orthogonal distance-based PCA (OD-PCA) was applied to detect the influence of major pollution sources on water quality in river segments. Mixed effect model (MEM) was applied to analyze the temporal and spatial trends of water quality parameters (A. Pratama et al., 2020). PCA of the water quality data suggested that organic matter, metals, and domestic wastewater are the most prominent sources in explaining river water variability.

Interpretation of Results

The population growth and the simultaneous intensive agricultural activities have led to environmental degradation, especially the water quality of the Code River. Susceptible pollutant sources predominantly consist of domestic wastes, agrochemical-runoffs, and metal-contaminants, which need to be intelligently monitored. Hence, an understanding of the water quality variability and its main sources would be beneficial for monitoring management for the stakeholders. The river water quality data in 2018 of twelve parameters were analyzed using a GIS-based multivariate and spatiotemporal analysis approach. However, the initial a priori data correlation analysis was performed using a principal component analysis method, which resulted in four variate factors. Consequently, the temporal score values of each significant variate factor were interrogated by a spatiotemporal analysis for eleven months. Further, the value of each score was then mapped using a Geographic Information System application.

Only the contribution of the variate factor (domestic wastewater) was not observed in the scores of SCD2, indicating that the existing inspection works did not constrain the impact of the domestic wastes on the water quality in that station. The scores of SCD1 were mostly scattered on the negative quadrant of both variate factors, indicating that the influence of both sources of pollution on the variability of water quality data in SCD1 was insignificant. Consequently, this might be due to a lower population density and mostly land cover vegetation at the upstream of the river. The high scores of variate factors were obtained from the monitoring data from the SCD2 and SCD3 stations, indicating the significant influence of the domestic and metal-contaminants on the water quality in the middle and lower streams, respectively.

This study demonstrated the use of GIS-based multivariate spatiotemporal analysis in explaining the variability of water quality in Code River and identified the main sources of water pollution in the river. Some water quality parameters such as TDS, NO₂, NO₃, and Zn have increasing trends, indicating that more concerns must be addressed. The pollution levels of parameters like BOD, Cu, and FC exceeded water quality standards. The study found that land cover by natural vegetation has a positive impact on Code River's water quality, whereas agricultural land and building areas negatively influence overall water quality. The principal component analysis of the water quality data suggests that organic matter, metals, and domestic wastewater are prominent sources explaining the total variability of the river's water quality. The results of this study can assist stakeholders in the selection of intervention methods for controlling wastewater pollution.

Comparison with Previous Studies

The GOIDGS devised in this study has been successfully tested for the detection of surface water quality contamination as well as identification of probable LULC change occurrence to increase the degradation potential of water quality. This system was applied to a case study area, the Bogor Regency, West Java Province, Indonesia. Water quality assays for the nitrate, phosphate, and iron parameters were performed at 115 sampling points, with classifications of the results measured via a fuzzy membership algorithm. Based on the classification outcome, the water quality categories were converted into a geodatabase, allowing further analysis in the GIS environment. This system has a comparable water quality assessment module to the previously established GIS-SWQAM (Fang, 2015), encompassing utilities for data processing, management, and fuzzy water quality assessments.

Nevertheless, the GOIDGS exhibits a more sophisticated customization option, enabling the addition of further assessment scenarios and the modification of membership functions simply through shape files and CSV format documents. The broad range of applications of the water quality assessment module has been demonstrated by conducting five independent assessments on different parameters in Bogor Regency, with regular administrative region segmentation allowing for straightforward evaluation of the watersheds and sampling sites. These further advancements enable greater utility for the system and a wider proliferation of use, as they cater to data acquisition difficulties and lower technical expertise levels.

Despite the strengths of the GOIDGS, such as the ease of conducting fully automatic water quality contamination identification assessments, the necessity for LULC change detection to identify probable non-compliance event occurrences, and its multi-faceted applicability, it is still vulnerable to inherent limitations. In the case study, the objectively defined variables only consist of physical and chemical measurements, meaning changes to the database may yield uncharacteristic parameter successions or ignore biological detection entirely, leading to incorrect conclusions (A. Pratama et al., 2020). Nevertheless, since automatic water quality analysis is still in its infancy, gaps in the machine learning detection efficiency should not deter future entirely automatic system development.

Implications for Water Management

The use of GIS, RS and AI will support decision makers to identify vulnerable river segments and to identify water treatment challenges within the study area to identify the source of

contaminations of river water and to prevent contamination of river water from the applicant sources within the study area. The strength of the conducted method is the comprehensiveness of detection of contaminations within open surface water bodies. The level of the method can further be enhanced with the increase of the availability of remote sensing imageries.

The proposed detection of river water quality contaminations based on GIS, RS and AI is anticipated to be applied for the detection of river water quality contamination with different water quality parameters and in other water types. The resulting GIS-based river quality monitoring system will support authorities to timely initiation of water treatment, spatial information about critical river spans and origin of contaminations, and provide data for conducting comprehensive but time consuming assessment studies in the future.

Case Study: Melaka River Basin River Analysis and Assessment

The Melaka River Basin, situated in the southwest of Peninsular Malaysia, is increasingly impacted by urban expansion, industrial activity, and tourism. To assess the river's environmental health, an integrated GIS-based water quality management system, adapted from Fang's (2015) model, was utilized. This system integrates data processing, fuzzy logic-based water quality assessments, eutrophication risk evaluation, and heavy metal analysis. Spatial distribution maps generated from this system identified pollution concentrations linked to land-use changes and point-source discharges (Fang, 2015). Following methodologies applied in Indonesia's Code River, a multivariate spatiotemporal analysis was conducted for Melaka River. Principal Component Analysis (PCA) identified major contamination sources such as untreated domestic wastewater and industrial effluents containing heavy metals like copper (Cu) and lead (Pb). Kriging interpolation and Moran's I spatial autocorrelation revealed clustered hotspots, especially during the dry season. Parameters including BOD, TDS, FC, and heavy metals surpassed permissible levels, indicating critical zones for environmental intervention (A. Pratama et al., 2020). Additionally, remote sensing analyses showed that built-up areas were rapidly replacing vegetated zones, contributing to sedimentation and nutrient loading. Using NDVI and LULC classification, significant correlations were found between land cover change and rising EC, turbidity, and nitrate concentrations, echoing trends observed in the degraded Kashti River of Maharashtra (A. Pratama et al., 2020).

River Monitoring

To support continuous monitoring of the Melaka River, AI-driven models and remote sensing data were deployed. A Random Forest algorithm, trained on TSS and TDS data collected from field stations and satellite imagery, provided spatially explicit pollution risk maps. These were verified using independent datasets and visualized in GIS, allowing the classification of river segments by contamination severity. This approach mirrors techniques applied in the ABC River monitoring, where AI and remote sensing integration proved effective in pollution detection (Juahir et al., 2010). The implementation of this automated monitoring system reduces the reliance on traditional labor-intensive fieldwork. With minimal infrastructure, it facilitates regular surveillance through spectral analysis, enhancing the capacity of local agencies to respond swiftly to water quality changes. Furthermore, urbanization impacts on river hydrology were assessed using open-access satellite imagery and GIS-based modelling. These tools tracked the expansion of impervious surfaces and their relationship with

stormwater runoff and non-point source pollution, consistent with findings from studies in Shanghai's megacity context (Kean Hua, 2017). In summary, the combination of geospatial technologies and artificial intelligence has significantly strengthened Melaka River's monitoring capabilities, supporting data-driven water governance and sustainable environmental planning.

Challenges and Limitations

The increasing demand for fresh water resources due to a rapid rise in population and urbanization has drawn global attention to water quality concerns. In addition, climate change and anthropogenic activities have led to severe alterations to the global hydrological cycle, resulting in outbreaks of frequent natural disasters. Consequently, the global water environment has been deteriorating (Fang, 2015). It has been predicted that two-thirds of the world's population will experience serious water shortage issues by 2025, making fresh water resources one of the central elements of sustainable development. To ensure the availability of sufficient water resources for drinking and irrigation, monitoring river water quality is vital to timely detect contamination.

With the increasing population and rapid urbanization, considerable concerns have arisen in relation to river water quality problems, such as organic pollution, heavy metal contamination, excessive nitrate content and serious eutrophication. However, traditional single-station in situ monitoring can only provide partial information due to spatial heterogeneity. As a result, remote sensing and GIS techniques have been applied to monitor water quality, using multi-source data. Furthermore, artificial intelligence has rapidly advanced in recent years and has been widely adopted in various fields. Merged with GIS and remote sensing, artificial intelligence has been applied for the detection of river contaminations in recent studies. To the best of the authors' knowledge, this study is the first attempt to detect river water quality contamination using multi-source data from GIS, remote sensing and artificial intelligence, and it provides a comprehensive investigation on the characteristics of river contamination.

In recent years, a wide range of algorithms have been proposed, however, more attention could be paid to this area to develop more robust models with greater general applicability to various data types. Moreover, deep learning methods are also worthy of substantial attention, given the advantages of very deep architectures, massive data volume and multi-level hierarchy.

Data Availability and Quality

In recent decades, GIS and Remote Sensing (RS)-based water quality studies using ARTIFICIAL INTELLIGENCE (AI) techniques for on-line measuring of river water quality parameters under diverse conditions are proposed. With technological advances, a wide range of useable remote data is available today. Satellite imagery is the most important type of remote RS data type that is remotely measured and monitored by a large number of satellites around the globe (Fang, 2015). Several precalibrated optical satellite datasets or algorithms to process satellite data are available. Satellite images are received for study and monitoring. In many applications, only raster format is considered for inputs. Therefore, GIS is incorporated into most of the existing research studies to display and understand RS information. GIS has an important role in river water quality management and has been successfully used for data integration, visualization, and evaluation of suspected factors affecting river water quality and

pollution assessment and mapping. Following this, the development of a GIS open-source water quality assessment and management system is needed.

Generally, for river water quality studies, spot water quality data from lab tests or on-line sensors are collected. Mostly point sample-based WQ data from different sources are used. Many publicly available WQ data repositories and web-governed data of water quality parameters of rivers, lakes, and reservoirs of many countries around the globe are considered by researchers. Some cases WQ data providers have their own APIs to obtain the data. Besides RS and GIS-derived parameters, many socio-economic data sources are available but only a few are considered in river WQ studies. Most of the river water quality data is not freely available due to privacy and economic reasons. Many important data are either not available or require sophisticated knowledge to acquire. Because of this, most studies either use limited number of sources or limit SM impact datasets during the time of investigation. Also, data normalization for large disjointed datasets is not mentioned in detail in many studies.

Technological Constraints

Due to data omissions, data inconsistencies in terms of characterization, distribution and detection, and disparate detection geography, traditional monitoring of water pollution in rivers and lakes using discrete sampling and point analysis based on on-site monitoring station systems cannot completely capture the spatiotemporal variation of river/lake water quality. It cannot be more effectively improved in terms of the areas where the sampling method lacks monitoring capability. For this reason, remote sensing for measuring several water quality indicators of water bodies is introduced and becomes more mature in recent years, benefiting from the development of advanced satellite, spectral, and algorithmic techniques. Indicators including chlorophyll-a, turbidity, suspended particulate matter, total dissolved salts, colored dissolved organic matter, temperature, and various toxic and useful materials have been acquired in a seamless manner over large areas by satellite images. However, it is notable that most of the latest remote sensing methods are still limited to optical spectrum-based methods within the visible light and near-infrared spectral ranges. This leads to a big challenge to derive water quality metrics of concern for which specific satellite sensors don't possess operational and adaptive algorithms to process the acquired images. Specifically, other constraints also restrict the rapid advancement and wider applications of remote sensing in monitoring algal blooms, oil spills, metal contaminations, and other kinds of miscellaneous water quality indicators that are of key environmental concern globally, such as heavy metals, hormones, and turbidity. These challenges involve shortcomings on sensor spatial coverage, measurement frequency, and spectral ranges, as well as algorithm complexity, calibration difficulty, and environmental interference.

Moreover, due to the limited and insufficient number of representations of the sampled water quality indicators, there is a lack of understanding of the basic distribution statistics of water quality indicators in a given spatial coverage. Without which it becomes even more challenging to detect and predict future altered degrees of water quality under climate, human activity, and extreme weather conditions. Given only water quality monitoring stations and satellite images, other constraints include difficulties in characterizing, reproducing and predicting the spatiotemporal distribution of water quality indicators that are consistently and completely captured by satellite images but haven't been thoroughly confirmed owing to data omissions. Traditional monitoring of water pollution in rivers and lakes using discrete sampling methods

and point analysis based on monitoring station systems cannot completely capture the spatiotemporal variation of river/lake water quality due to data omissions.

Interpretative Challenges

The association between physical structures and input parameters is usually too complex for individual techniques to interpret by itself. Interpretation of fresh landslide-induced dam location can be a reconnaissance activity using geomorphic landform analyses based on satellite images. The function should provide areas where further analyses change into modelling approaches. Modelling approaches such as their trigger, back analysis or monitoring should reduce the input parameter uncertainty and gain confidence on the hazard. The output options and constraints for fresh landslide-induced dam modelling also need triangulation comparison with the modelling of other natural hazards. Usually, estimates of initial volumes should be based on physical analogies or event-set reconstruction. However, a general evaluation of dam assessment methods is needed for this type of information source, and analytical modelling validity needs verification using less abundant aerial photographs.

Landslide hazard is investigated with the aim of evaluating approaches scaffolded by the input-processes-output-options-constraints framework. Dam breaching is evaluated for hazard assessment and design of safety systems, mitigation measures or forewarnings. The common use of individual techniques is considered both a concept-based and process-based approach. Such approaches can provide input for modelling the artificial discharge regulation. Plausible input rating or plotting should be based on event-landscape trajectory relationships triangulated by geomorphic process analogue and cascade modelling options. The rating uncertainty should be evaluated using scaling properties of landslide initiation rate-seismicity-frequency and permeable areas-discharge relationships. Uncertainty in landslide and trajectory modelling output should be reduced using physical analogues and event set reconstruction. This requires further adjustment of reliability quantifications for complex processes and modelling needing lower observations.

Future Directions

This paper presents the development of a new integrated GIS-based water quality assessment system (GIS-SWQAM) that integrates drinking water supply system with the model of DRASTIC, multi-variable fuzzy synthetic evaluation (FS_E), modified non-parametric judgment, Eutrophication model of CE-QUAL-W2flow (CE) and Eutrophication model of BATHTUB (BA). This system is capable of data processing, data management, fuzzy water quality assessment, eutrophication risk evaluation, heavy metal risk evaluation, and water quality variable prediction (Fang, 2015). Most functions of the system are generated with user-friendly interfaces and can be used conveniently by users without GIS knowledge with just a few mouse clicks. In addition, many configurable parameters are developed in the application for flexible application of these functions. As examples, water quality assessment and management of the water supply system for Changchun City, Jilin Province, China are presented. With the development of the GIS-based water quality assessment and management system, an effective tool is now available for surface water quality assessment and management for any government organizations, enterprises or institutions with a GIS (Geographic Information System).

The issues of water quality and related elements are not only measured by some parameters but should be regarded as complex fuzzy systems in which the interaction of and the uncertainty in the influencing factors must be considered adequately. Urbanization and the rapid expansion of industries have increased water pollution by toxic metals like zinc (Zn), cadmium (Cd), and lead (Pb). In most cases, this kind of pollution is responsible for many environmental problems in developing countries. For over a decade many empirical models, artificial intelligence (AI) based models, ANN and ANFIS-based model using multi-variate, reactive tracing-based models and stochastic flow based models etc. have been devised and implemented to predict the transport behavior of the pollutant in river systems. The quality of river water determines its usage for public supply, industrial needs, agriculture, and recreational activities. As the river environment is a space-time continuum river is usually considered as a long linear entity, as a result, a large river basin potentially generates a very large data set. This massive volume of data is often half-baked and prone to ignorance. An intelligent integrated information system for river basin management should embrace the application of an array of computer based methodologies for comprehensively understanding and efficiently managing the complicated river system.

Emerging Technologies

Already in the 1970s scientists hailed the advent of computers, satellites, and data networks as the golden era for the earth sciences and mankind. The terrestrial environment would be analyzed and predicted with codes and measurements communicating within a globe spanning net of computers. About 40 years later, we look back on a history of tremendous advance, most of which has taken the earth sciences further on the path towards cybernetic systems that support decision making. Instruments, observatories, models, databases, servers, networks, and technological foundations of diverse sorts have been developed to acquire, store, distribute, and compute environmental information at unprecedented detail. The gap between technology and decision making is still huge. Much of earth science development still avoids interaction with social structures that process decisions, although efforts are made to remedy this.

As the world progresses and technology expands at an increasing rate to be a part of all aspects of life, the need for communication and efficiency is paramount (Singh & Walingo, 2024). Knowledge sharing and information transfer must be more readily available and accurate than in previous years, and an introduction to the tools now available to broaden horizons and discover knowledge unseen in the past is the purpose of this publication. Remote sensing, geographical information systems, and the new technologies they create are integral to a world rapidly being digitized and monitored. Emerging technologies have the power to pave a new era for the sharing of knowledge that has been unavailable previously and create new space for ideas and understanding about a landscape, sub-region, region, or specific area.

As satellite and aerial-based remote sensing, global positioning systems, and computer hardware processing power improve to create rapid streaming, capturing, and processing techniques. There is a space in which 3D environments can provide incredible detail about the behavioral aspects of natural and anthropogenic processes on the Earth surface. These emerging open-source technologies have the capability to turn the world on its head and allow one's imagination and understanding of the world to grow exponentially. The potential even for the day-to-day indifferent observer is plentiful. The ability to see an entire view of a sub-region in detail with 3D images and video will create more inquisitive views about the world

and wildlife in a time where nature and its preservation is becoming more precious. Already in the late 1960s, founded the first directed research center to study an emerging infotech sector.

Long-term Monitoring Strategies

Water bodies significantly influence the quality and availability of water resources. The subsystems of surface water bodies are lakes, rivers, wetlands, and reservoirs. Water quality assessment is essential for ecological health monitoring, protection, and the sustainable use of water bodies (Zhang et al., 2014). The surface water area in Northeast China is vast, although diligent management is lacking, leading to widespread pollution. As an important source of water resources, monitoring information of ecological health is beneficial to management and pollution control strategies. To assess land-use impact on the long-term water quality changes in surface water bodies, a new method is proposed, based on a new metric of Gaussian mixture model states of time series and spatiotemporal trend analysis. The conditions of urbanization were simulated by increasing land use areas.

Because rivers are the major water source for human activities, their water quality has attracted extensive attention. The water pollution index can show river water quality levels, but factors such as wealth development and industrial maturity in different regions lead to difficulty in providing a unified water quality standard for each major pollutant. As major environmental monitoring tools, satellites are commonly used for broad-scale water quality monitoring. Satellite-derived chlorophyll-a concentrations have been used to assess the impact of monsoons on water quality in the Yangtze River. Cities' growth processes in satellite-aided shifts of the water quality decision zones were discovered to impact the water-quality level and trend of a river basin. A long degradation trend in water quality caused by urbanization was also revealed. Image spectral-enhanced random over-sampling was proposed to detect the water quality contaminating events.

Policy Recommendations

The strategies and development of recommendations for improving water quality management at the administrative level should be based on the implementation of water quality assessments. This study assesses the quality of the Penchala River through the use of GIS, RS, and AI. The findings of the study can be categorized into policies and implementation; policies are divided into governance and supervision, while implementation includes actions taken by the government and the dissemination of information to the public.

There are two policies that can be implemented by the local government to ensure water quality management: governing policies and supervisory policies. Governing policies consist of laws and regulations that can be formulated to improve management. The management guidelines must include design principles so that management efforts remain practical under the characteristics of Penchala River, which is used for tourism, agriculture, fisheries, and recreation. Based on the findings of the study, it is recommended to improve regulations and planning. The Penchala River must be designated as a class II river that can be used for bathing and aquaculture. In addition, regulations related to the prohibition of activities in and along the river banks were not implemented or breached, while land-use planning or spatial plans must prevent the expansion of existing land use.

Local governments must supervise the evaluation. Based on the modeling results, parameters such as pH, TDS, and E. coli exceeded the threshold even though the data used were adjusted to essential growth by local governments. Therefore, it is essential to initiate routine evaluations and take remedial and preventative measures. The scope of evaluations must be broad, encompassing both point and non-point potential contaminations. Supervisory evaluations must improve local capacities, including human resources that can be trained, financial resources to support technical means, and knowledge resources on aquaculture dynamics and water quality monitoring.

Careful implementation of these recommendations, which can be undertaken by local and state governments, can progressively and sustainably restore the quality of the Penchala River, improve local economies, enhance fish biodiversity, and create river villages as tourism attractions. Acknowledgment of and commitment to addressing pollution sources in the river basin is a prerequisite for successful improvement of river quality, especially in developing countries where rivers are a primary source of water supply for various needs. The consequences of river water pollution must be communicated to water users and impacted communities.

Conclusion

Water quality assessment was performed using the integrated system of GIS, RS, and AI model to detect river water quality contamination effectively. To achieve the specific objectives step-by-step, a meaningful framework was developed, which can be served as a basis for other similar studies with minor modifications. The performance of the integrated GIS-RS-AI system was evaluated and assessed at local, regional, and national levels with the related water quality assessment results. The methods and data were tested and validated in three levels, and satisfactory results were obtained and presented.

The comprehensive and effective integrated GIS-RS-AI system with wide applicability that can be applied for surface water quality monitoring in general was developed with the general and integrated methodologies ranging from deep learning-based surface water feature extraction and mapping, AI-based water quality parameter estimation, to GIS-based surface water quality assessment. The developed methodologies and products can be applied in other water quality studies. Very limited geographical information systems-based integrated surface water quality parameter estimation systems have been developed and provided.

General and effective GIS-based surface water quality parameter estimation system in conjunction with AI model was developed. The designed AI-based system with various widely used AI algorithms and general models can be applied and adapted for surface water quality parameter estimation in general. The proposed methodologies have important applications and implications in finding better AI algorithm/structure and more appropriate bottom environment classification thresholds for similar environmental parameters to remote sensing.

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LANGUAGE CHOICE AMONG YOUNG INDIAN PROFESSIONALS IN MALAYSIA FOCUSING ON TAMIL AND OTHER LANGUAGES

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Abstract: *In Malaysia's multilingual society, language choice operates not merely as a means of communication but as a reflection of identity, social positioning, and cultural negotiation. This study investigates how young Indian professionals in Malaysia navigate their choices in the workplace, focusing on three languages: Tamil, English, and Malay. The research aims to uncover the factors influencing these choices and how they intersect with professional expectations, identity issues, and national belonging. Grounded in sociolinguistic theories, the study reveals that English is predominantly used in hierarchical and formal settings due to its association with status, fluency, and competence. Malay, on the other hand, is employed to foster rapport, ease of communication, and reflect civic integration. Tamil, though rarely used in professional contexts, retains symbolic and emotional value, particularly in interactions with older clients or for cultural expression. The findings contribute to a deeper understanding of language behaviour, identity construction, and the subtle negotiations multilingual professionals engage in within Malaysia's dynamic multicultural, multiethnic and multilingual workplace environments.*

Keywords: *Language choice; Code-switching; Professional identity; Malaysian Indian professionals; Tamil language; English language; Malay (Bahasa Malaysia); Workplace multilingualism; Malaysia*

Introduction

Globalisation and workplace mobility have intensified multilingual practices, making language choice a key dimension of identity for young professionals in multicultural settings such as Malaysia. This study examines how young Malaysian Indian professionals navigate Tamil, English and Malay at work, and how these choices relate to the negotiation of professional identity. Framed by Fishman's Domain Theory (1965/1986), which links language use to social settings, the research explores factors that shape language behaviour in the workplace, attitudes towards Tamil vis-à-vis other languages, and the ways these practices express social and professional selves.

Background

Tamil, a South Dravidian language with a long literary history and classical status in India, is maintained across a wide diaspora. In Malaysia, Indians, predominantly Tamils, form a longstanding minority shaped by colonial-era migration and subsequent socio-economic diversification. Contemporary Malaysian Indians commonly shift between Tamil, English and Malay language use. Prior research documents language shift and code-switching among urban, educated Indian communities, including partial or full shifts to English in professional and high-status domains (e.g., David, 2001; David, Naji & Kaur, 2003; Dealwis, 2008; Schiffman, 2002). These dynamics reflect broader policy, schooling and mobility influences, and raise questions about the intergenerational transmission and status of Tamil, especially where English functions as a workplace lingua franca.

Problem Statement

Participation in multiple social and professional domains exposes individuals to distinct interactional norms and expectations (Eckert & McConnell-Ginet, 1992; Wardhaugh, 2006). In professional settings, often English-dominant, young Malaysian Indian professionals may adapt through code-choice and style-shifting, balancing inclusion, credibility and career advancement with affiliation to heritage language and culture. Such adaptation can generate tensions around belonging, authenticity and identity display (Adnan, 2013a, 2013b; Goffman, 1959), and has implications for heritage language maintenance. While scholarship has examined language shift and multilingual repertoires among Malaysian Indians, there remains limited empirical work connecting *workplace domain* language choices, *attitudes towards Tamil*, and the *construction of professional identity* within a single analytical frame. Using Fishman's domain lens, this study addresses that gap.

Research Objectives

1. Identify factors related to language choice and use among young Malaysian Indian professionals in the workplace.
2. Examine their attitudes and beliefs towards Tamil, and other languages (English, Malay), in relation to social and professional identities.
3. Understand how workplace language choices contribute to the expression of social and professional identities.

Research Questions

1. What factors shape language choice and use in the workplace for young Malaysian Indian professionals?
2. What are their attitudes and beliefs towards Tamil (and English/Malay) with reference to social and professional identities?
3. How do workplace language practices contribute to their identity construction?

Significance

The study contributes to applied linguistics by integrating domain-based analysis of workplace language practices with attitudinal and identity dimensions for a minority professional group.

Empirically, it provides current evidence on Tamil use and maintenance within English-leaning professional environments. Practically, insights can inform organisations, educators and policymakers seeking inclusive linguistic ecologies—supporting effective communication, equitable participation, and heritage language vitality. For scholars and students, the work offers a focused case of multilingual identity negotiation in late-modern workplaces and extends the application of Fishman’s framework to contemporary professional contexts.

Literature Review

This review synthesises work on language choice among young Malaysian Indian professionals through Fishman’s domain lens, situating the community historically, outlining Malaysian language policy, and linking code choice to identity in workplace settings.

Theoretical Framework

Fishman (1965/1986) conceptualises domains as recurrent social settings (e.g., family, education, workplace) where language choice is patterned by roles, relations and topics. The framework predicts systematic variation between H(igh) domains (education, government, business) and L(ow) domains (family, friends, neighbourhood), aligning with diglossic distributions and enabling macro-level accounts of multilingual behaviour. It provides a useful map for analysing how workplace practices intersect with attitudes to Tamil, English and Malay among young professionals.

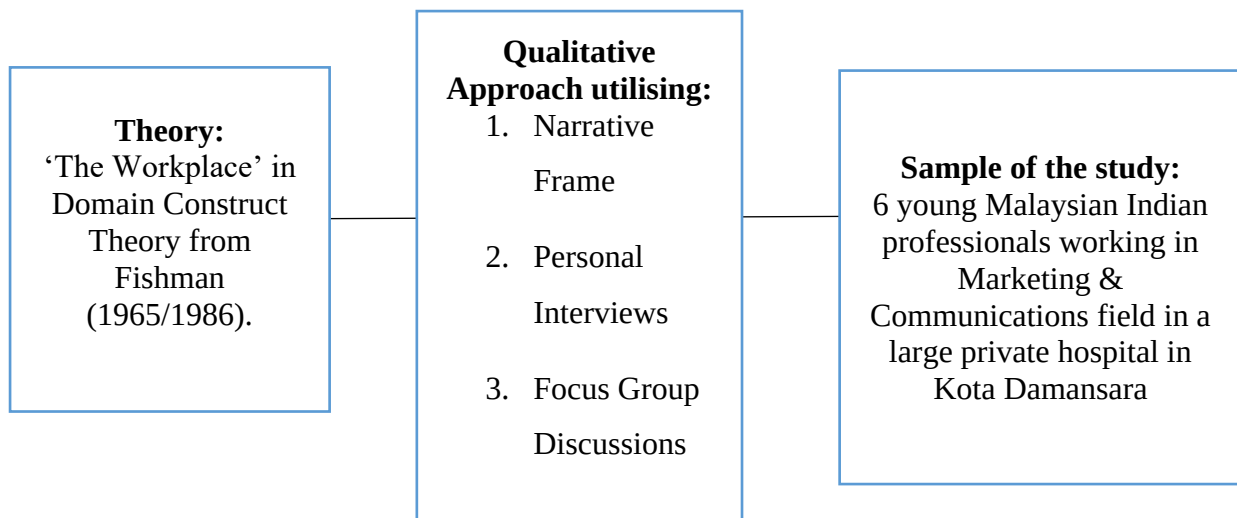


Figure 1: Theoretical Framework of the Study

The Arrival of the Indian Community in Tanah Melayu / Malaysia

Indian contact with the Malay world is long-standing, but large-scale settlement intensified under British rule, particularly for plantation and administrative labour. Tamils became the majority within the Indian minority, alongside smaller Sri Lankan Tamil flows that further diversified linguistic practices. These sociohistorical trajectories shaped access to schooling, prestige codes and community networks that still influence contemporary repertoires and transmission (Winstedt, 1950; Ahmad Murad Merican & Abd Ur-Rahman Mohamed Amin, 2021).

Language Policy in Malaysia

Malaysia's policy environment established Malay as the national/official language while accommodating vernacular education at primary level. Post-independence shifts from English to Malay in public institutions sought nation-building goals, even as English retained value for higher education and the private sector. Policy therefore structures opportunities for Tamil maintenance alongside acquisition of Malay and English, with ongoing tensions over status, access and equity in a globalising economy (Adnan, 2010; Asmah Haji Omar, 1992; David, Dealwis & Kuang, 2018; Cheong, Hill & Leong, 2016).

Tamil Language in Malaysia

Tamil literacy and use were historically sustained by plantation-era Tamil-medium primaries and dense community networks. Post-independence, Tamil remained available in the system (e.g., as a subject in national schools), yet urban mobility and parental aspirations have encouraged trilingual repertoires and, in some strata, reduced intergenerational transmission. Consequently, Tamil is often maintained for solidarity functions while English and Malay dominate high-status and institutional domains (Asmah Haji Omar, 2015; Asmah Haji Omar, 1992).

English Language in Malaysia

Introduced and institutionalised during colonial administration, English continues to be salient in media, private higher education and corporate life. Many professionals command both a formal standard and a localised Malaysian English, enabling style-shifting across settings. English thus indexes expertise, mobility and cosmopolitan stance in workplaces, while coexisting with Malay for institutional alignment and with Tamil for in-group rapport (Adnan, 2001, 2005; Kennerknecht, 2018; Pillai, 2022; Zuraidah Zaaba et al., 2010).

Malay Language in Malaysia

Malay anchors national identity and public administration and serves as a key resource for civic participation and professional legitimacy. Historical accounts trace its regional spread and standardisation, while contemporary scholarship highlights Malay's centrality in institutional domains and its role in indexing national belonging across ethnic groups (Levinson & Christensen, 2002; Arba'iyah Mohd Noor, 2008).

Identity

Identity is multiple, dynamic and interactionally produced (Block, 2006). In professional settings, language operates as a resource for identity work: English may project expertise and credibility; Malay signals institutional alignment and inclusivity; Tamil indexes heritage solidarity. Strategic code-switching and audience design enable professionals to navigate legitimacy, affiliation and authority within domain-specific norms (Adnan, 2012, 2017; Asmah Haji Omar, 2015; Holmes, 2020).

Research Methodology

This study adopted a qualitative design to examine language choices among young Malaysian Indian professionals. The chapter outlines the approach, design and instruments, setting and sampling, procedures, analysis, triangulation, ethics, and strategies for trustworthiness.

Research Tradition / Approach

Guided by an interpretivist stance, the study used qualitative methods to access participants' meanings, practices and identity work in situ. Qualitative inquiry allows fine-grained insight into how language indexes roles, relations and contexts that quantitative summaries may miss (e.g., Tenny et al., 2022). In applied linguistics, interviews, narrative accounts and group talk are well established for exploring language, interaction and identity (Ellis & Barkhuizen, 2005; Eckert & McConnell-Ginet, 1992). The design was also informed by Carspecken's critical ethnography to encourage reflexivity about power and positioning during data generation.

Research Design and Instruments

Three complementary instruments were used to generate a multi-source dataset aligned with the study's aims. Semi-structured interviews captured personal trajectories, workplace practices, and language attitudes while allowing for probing and clarification (Kvale & Brinkmann, 2008). Written narrative frames, guided by brief prompts, elicited self-authored accounts of language use and identity across domains and audiences (Barkhuizen, 2008; Ellis & Barkhuizen, 2005). Focus group discussions (FGD) explored shared norms, disagreements, and audience design in professional contexts, using interactional dynamics to reveal taken-for-granted practices (Barbour, 2008; Nyumba et al., 2018). Together, these instruments provided depth, reflexive positioning, and co-constructed meanings, while minimising single-method bias.

Setting, Sampling and Participants

Fieldwork was conducted at a large private healthcare facility in Selangor, Malaysia (pseudonym: KD Hospital), which employs a significant number of young Malaysian Indian professionals who regularly use Tamil, Malay, and English. Purposive sampling (Nikolopoulou, 2023) was employed to target information-rich cases aligned with the research questions. The inclusion criteria were: Indian ethnicity; aged 20–30; holding a professional role, preferably in Marketing and/or Communications due to the high language demands, routine use of Tamil, English, and Malay, with a reported preference for English at work; and possession of at least a bachelor's degree. A gender-balanced set of six participants (three women and three men) was recruited. For a relatively homogeneous group and focused aims, six interviews are considered adequate to achieve sufficient thematic coverage (Guest et al., 2006). The researcher's insider status facilitated access and rapport, offering an emic perspective. To mitigate potential bias, reflexive journaling and an audit trail were maintained to balance this with an etic stance.

Procedures

Participants first completed written narrative frames online. Face-to-face semi-structured interviews were then conducted and audio-recorded with consent. Finally, one focus group

(audio-recorded) examined convergences and tensions in code choice and identity display. All audio was transcribed verbatim; narratives were collated as text documents. Pseudonyms were assigned at import, and identifying details were removed.

Data Analysis

Analysis followed Braun and Clarke's reflexive Thematic Analysis: familiarisation; inductive coding; candidate theme development; reviewing and defining themes; and analytic write-up. Coding was supported by NVivo (CAQDAS) to organise multi-source data and maintain a transparent trail. Credibility was enhanced via member checking of transcript excerpts and theme summaries (Flick, 2018). Reflexive memos documented decisions and potential researcher influence throughout.

RESEARCH INSTRUMENT DEPLOYED (FREQUENCY COUNT, IN TOTAL)

6 online written narrative frames FROM 6 participants = 36 NARRATIVE FRAMES
2 semi-structured individual interviews WITH 6 participants = 12 INTERVIEW SESSIONS
2 focus groups discussion sessions WITH 6 participants = 2 GROUP DISCUSSION SESSIONS
*** 50 TEXTUAL / QUALITATIVE DATA SETS, IN TOTAL**

Figure 2: Planned Fieldwork

Triangulation

Following Denzin (1978) and Patton (2002), the study employed method triangulation through interviews, narrative frames, and focus group discussions; data-source triangulation by comparing individual and group talk as well as written and spoken accounts; and theory triangulation by integrating Fishman's Domain perspective on patterned language choice, identity work in applied linguistics (Block, 2006), and scholarship on Malaysia's linguistic ecology (Asmah Haji Omar, 1992). Convergence across these strands enhanced the robustness of the interpretations.

Ethics

Ethical procedures covered informed consent, confidentiality, voluntary participation and the right to withdraw. Data were pseudonymised, stored securely, and reported without identifying details. Given the workplace site and potential power relations, interviews were scheduled privately and outside supervisory chains; any potentially sensitive material was anonymised or omitted.

Managing Quality and Trustworthiness

In line with Lincoln and Guba (1986), credibility was ensured through triangulation, member checking, prolonged engagement, and the use of reflexive memos. Transferability was supported by providing concise, relevant contextual descriptions of the site, participant roles, and the language ecology to aid readers' judgement. Dependability was addressed through an audit trail comprising instruments, guides, coding schema, decision logs, and NVivo project files. Confirmability was achieved by documenting analytic decisions and researcher

positioning, demonstrating that findings were grounded in the data rather than researcher predispositions.

Findings

Findings draw on written narrative frames, semi-structured interviews, and focus group discussions with six young Malaysian Indian professionals in a private hospital (Kota Damansara). Transcripts were manually produced and analysed thematically using Braun & Clarke (2013), with light NVivo support for early code mapping. Themes are organised by Research Objectives (RO1–RO3), integrating brief, representative quotations (IDs preserved). The analysis is informed by Fishman’s Domain Theory (1965/1986) and Ferguson’s (1959) H/L varieties to link patterns of code choice with social context and identity work.

Factors Influencing Language Choice in the Workplace (RO1)

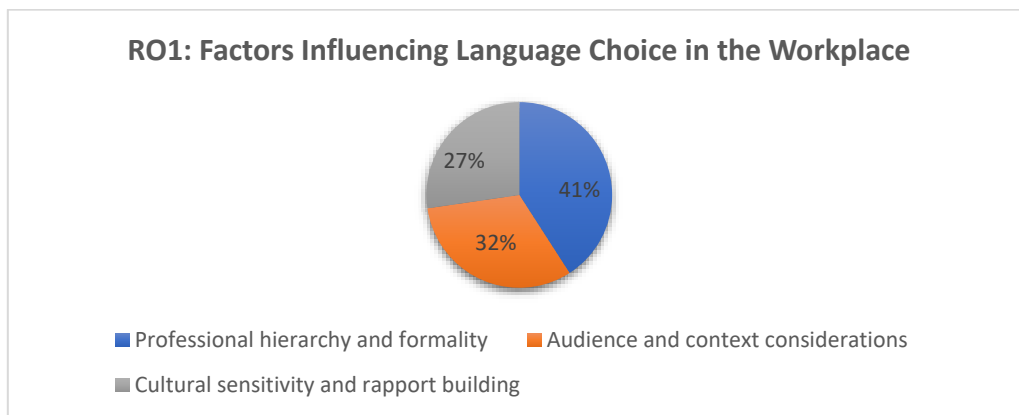


Figure 3: Factors Influencing Language Choice in the Workplace (RO1)

i. Professional Hierarchy and Formality

English operates as the default H-variety in upward, evaluative, and high-stakes communication. Participants associate English with credibility, respect for hierarchy, and the safest code for institutional visibility—aligning with Fishman’s domain expectations and Bourdieu’s linguistic capital.

- *“If it’s the superior, of course it will be fully in English... to show a sense of respect... we keep it professional all the way.” (I3, FGD2, Lines 79–82)*

ii. Audience and Context Considerations

Language shifts with audience, relationship, and task. Participants select codes to maximise intelligibility, match norms, and avoid social distance; a direct reflection of domain-based expectations and audience design.

- *“In the workplace, I speak in English more because I think I’m more comfortable doing that as everyone can understand the language... I do speak in Tamil at times, only to those staff who actually talk to me in Tamil... Malay, I speak with my Malay colleagues... to make them feel comfortable too.” (I5, Semi-structured Individual Interview, Lines 28–36)*

iii. Audience and Context Considerations

Language shifts with audience, relationship, and task. Participants select codes to maximise intelligibility, match norms, and avoid social distance; a direct reflection of domain-based expectations and audience design.

- *“It is up to the person that I am communicating with. If they are comfortable in Malay, then the conversation has to be in Malay.” (I4, Semi-structured Individual Interview, Lines 75–76)*

Attitudes Toward Multilingual Usage (RO2)

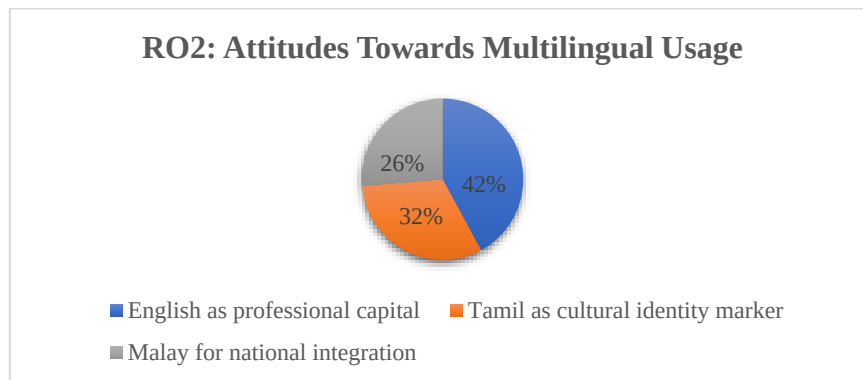


Figure 4: Attitudes Toward Multilingual Usage (RO2)

i. English as Professional Capital

English is framed as competence, mobility, and institutional alignment. Participants see it as necessary for credibility in meetings, email, presentations, and hiring.

- *“If I’ve had to make a choice to achieve a professional objective, then it’s definitely English. I’ll be more confident to speak in English compared to Tamil and Malay.” (Interviewee 5, Online Written Narrative Frames, Lines 53–55)*

ii. Tamil as Cultural Identity Marker

Tamil indexes ethnic pride, intimacy, and solidarity. Even where functionally limited, it carries symbolic weight for belonging and emotional nuance.

- *“With my Tamil friends, I can use Tamil, sometimes mix with English... that’s how it is.” (I1, Semi-structured Individual Interview, Lines 64–65)*

iii. Malay for National Integration

Malay enables interethnic cohesion, policy alignment, and formal local engagements, a practical resource for inclusive collaboration.

- *“Bahasa Malaysia is frequently used to adapt to local workplace requirements, especially in government or local organisations. Professionals choose it to build rapport with Malay-speaking colleagues, ensure smooth collaboration, and comply with workplace policies or official communication standards.” (I6, Focus Group Discussion 1, Lines 46–50).*

Identity Expression Through Language Choices (RO3)

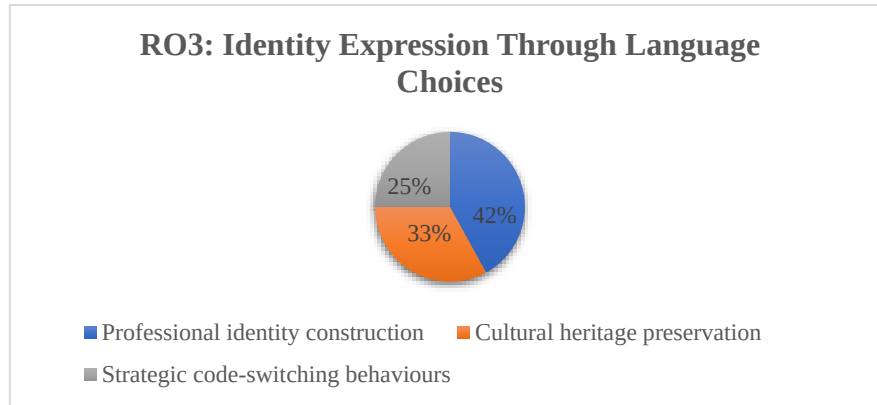


Figure 4: Identity Expression Through Language Choices (RO3)

i. Professional Identity Construction

Participants perform a professional self via English in high-stakes contexts; deviation invites negative evaluation. English secures authority and legibility within institutional norms (Ferguson's H-variety).

- *"Like them both, I also use English in formal settings or anything that's related to work. Outside of that, I'd definitely go with Malay or Tamil. This is for me to keep my professionalism at work and be close to my circles after that."* (I3, FGD2, Lines 187–190).

ii. Cultural Heritage Preservation

Tamil sustains continuity with family/community and conveys humility/respect—a deliberate counterbalance to workplace Anglophone norms.

- *"I use English entirely at the workplace, but when I'm home, I will switch to Tamil. Also, when I meet Indian aunties and uncles. It just very natural in order for me be seen as polite and humble."* (I5, FGD1, Lines 21–23)

iii. Strategic Code-Switching Behaviours

Code-switching is deliberate identity work used to balance clarity, empathy, and stance across domains: English (authority), Tamil (solidarity), Malay (inclusion).

- *"If it's about work, then it's in English. If it's something, or you know, suddenly, just like that. Unknowingly, if I switch, then I switch to Tamil."* (I2, FGD1, Lines 165–167)

Cross-cutting Themes

This section distils two cross-cutting insights: language inequality—with English concentrating institutional value and shaping evaluation/mobility—and multilingual competence, which participants use for inclusion, rapport, and task effectiveness. Together,

these dynamics determine access to opportunities, identity boundaries, and (in)exclusion in Malaysia's multicultural workplaces.

i. Language Inequality and Power Dynamics

English acts as a gatekeeper for leadership/visibility; lower English proficiency risks exclusion from projects, presentations, and promotion, despite other competencies.

- *“Language choices shape perceptions of competence, with fluency in English often linked to intelligence and professionalism. Limited proficiency in dominant languages can lead to unfair judgments, despite actual skills. Multilingualism challenges stereotypes, highlighting adaptability and cultural connection.” (I5, FGD1, Lines 58–60)*

ii. Multilingual Competence as Professional Asset

Multilingualism is reframed as strategic capital: it widens patient/client reach, builds trust, and enables bridge-building across teams.

- *“There was a time at work when I chose to speak Tamil with a customer who was having trouble with English. I noticed they seemed more comfortable with Tamil, so I switched languages. Immediately, the customer relaxed and felt more at ease. By using Tamil, I wasn't just making the conversation easier; I was also showing that I value my cultural roots.” (I4, Online Written Narrative Frames, Lines 17–22)*

Research Overview and Summary of Findings

This study examined three key areas: factors influencing language choice, attitudes toward Tamil, English, and Malay, and identity expression among young Malaysian Indian professionals in the workplace. Findings for RO1 indicated that language choice was strategic and domain-sensitive, with English dominating formal, high-stakes contexts, Malay supporting interethnic coordination and policy alignment, and Tamil retained for intra-ethnic solidarity and affective work. These choices were influenced by hierarchy, audience, purpose, and rapport. For RO2, English was associated with professionalism, mobility, and institutional legitimacy; Tamil carried cultural pride and emotional resonance; while Malay was valued for national belonging and inclusion. RO3 revealed that participants performed layered identities through code-switching, blending an “institutionally legible” professional self (English) with heritage affiliation (Tamil) and civic alignment (Malay). Overall, participants demonstrated linguistic agility in reconciling professional expectations with cultural anchoring.

Discussion

The findings of this study illuminate the dynamic relationship between language choice, attitudes, and identity among young Malaysian Indian professionals. The discussion below contextualises these findings within the broader framework of sociolinguistic theory and relevant literature.

i. Language Choice in the Workplace (RO1)

Findings reaffirm Fishman's Domain Theory (1965/1986) and Ferguson's (1959) H/L differentiation. English operates as the H-variety in meetings, evaluations, documentation and upward communication, chosen to signal competence and respect for hierarchy, consistent with Bourdieu's linguistic capital and English's role as a global lingua franca (cf. Crystal, 2003). Malay functions as a civic and procedural code, facilitating interethnic collaboration and compliance with local norms, especially in interactions with public bodies or Malay-speaking stakeholders. Tamil is strategically mobilised in low-formality, in-group moments to build trust, reduce social distance and sustain community ties. Crucially, choice is agentive rather than habitual. Participants calibrate language to task (stakes, clarity), audience (status, ethnicity, preference) and relationship goals (rapport, inclusion). In healthcare and client-facing settings, accommodation (e.g., *English* → *Malay* or *English* → *Tamil*) serves both equity and effectiveness, improving comprehension and comfort.

ii. Attitudes Toward Tamil, English and Malay (RO2)

Participants expressed layered and instrumental attitudes toward the three languages. English was viewed as professional capital and a gateway to mobility, aligning with critiques of its privileged status (Phillipson, 1992) and reinforcing its symbolic power within institutions. Tamil, though seldom used in formal settings, retained strong affective value as a vessel of heritage and identity (Asmah Haji Omar, 1992, 2015), serving to index solidarity, convey intimacy, and affirm respect in intergenerational interactions. Malay was respected as the national language, facilitating participation in the shared civic sphere and fostering collaboration across ethnic lines (cf. Pillai et al., 2022; Normardhiah Ibrahim, 2018). Collectively, these orientations illustrate a pragmatic stance in which participants align language choice with desired identities; credible professional, culturally rooted individual, and inclusive colleague.

iii. Language and Identity in the Workplace (RO3)

Language is both resource and signal in identity work. English performs a professional persona (authority, expertise, leadership). Tamil performs belonging and continuity (ethnic pride, intimacy). Malay performs civic alignment (national integration, inclusivity). Participants sequence these identities through code-switching, which acts as a bridge (creating rapport) and a boundary (managing stance and face). This pattern accords with Myers-Scotton's Markedness Model (1993) and Tajfel's Social Identity Theory (1978): speakers adapt to salient group norms and interactional goals, leveraging codes to negotiate legitimacy and affiliation.

iv. Integrating the Findings with Theory

Together, the results extend domain accounts by highlighting micro-agency (audience design, stance management) under macro constraints (institutional English, national Malay, minority Tamil). They also show how symbolic power (English as gatekeeper) coexists with symbolic heritage capital (Tamil), and how translanguaging/code-switching operationalises identity negotiation in multicultural workplaces.

Implications

For practice within organisations, evaluation norms should be broadened to avoid over-reliance on English fluency as a proxy for competence in hiring or promotion, instead assessing

communicative effectiveness across diverse audiences. Inclusive communication can be promoted by legitimising purposeful code-switching in patient or client care and team interactions, supported by bilingual resources and peer-mediated assistance. Heritage presence may also be acknowledged through low-cost measures such as signage, greetings, and staff liaisons in Tamil, while maintaining operational clarity. Secondly, in education and policy; tri-literacy pathways in Malay, English, and Tamil should be encouraged to balance civic participation, global mobility, and heritage maintenance. Continuing professional development (CPD) on audience-centred communication is recommended for both frontline and managerial staff. Lastly; from a scholarly perspective, multilingual competence should be treated as strategic capital, with its measurable impact on service quality, inclusion, and team cohesion systematically explored.

Recommendations for Future Research

Future studies could broaden samples beyond urban and private-sector contexts to include rural sites, SMEs, and public agencies, allowing exploration of socio-economic variation and generational change. Expanding the scope beyond workplace settings to domains such as family, education, and religious or community spaces would enable mapping of cross-domain language consistency. Digital communication warrants further attention, particularly messaging and social media as spaces for code choice and identity display. Finally, policy and practice evaluations could test interventions, such as bilingual guidelines and targeted training on outcomes including comprehension, client satisfaction, and staff progression.

Conclusion

The study shows that young Malaysian Indian professionals orchestrate English, Malay and Tamil to meet institutional demands while preserving cultural anchoring. English secures institutional legibility and mobility; Malay enables civic belonging and interethnic collaboration; Tamil sustains heritage and intimacy. Code-switching is the mechanism that reconciles these pulls, allowing speakers to design identities that are credible, inclusive and authentic. Theoretically, the findings reaffirm domain-based and diglossic accounts while foregrounding agency, symbolic power and identity performance. Practically, they point to organisational levers, broader communicative evaluation, legitimated multilingual practices, and heritage-affirming environments, that can reduce language-linked inequalities and improve service and teamwork. Ultimately, language here is not merely a medium; it is the architecture through which professionals' express identity, negotiate belonging, and bridge the worlds of culture and career in Malaysia's multicultural workplaces.

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DIGITAL EDUCATION IN MALAYSIAN PUBLIC UNIVERSITIES: A NEO-INSTITUTIONAL PERSPECTIVE ON POLICY IMPLEMENTATION

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Abstract: *The integration of digital education has emerged as a cornerstone of contemporary teaching and learning in higher education. The rapid advancement of technology underscores the need for comprehensive institutional policies to facilitate its effective implementation. Governments play a crucial role in ensuring equitable access to digital education while enabling public universities to manage and delegate operational responsibilities among key stakeholders, including university administrators, academics, and students. This study investigates the implementation of digital education policies in Malaysian public universities, analyzing the interactions between the Ministry of Higher Education, university management, academic staff, and students. Grounded in neo-institutional theory, the research employs a qualitative methodology, drawing on data from semi-structured interviews and document analysis. The findings illuminate the structural and cultural dynamics that shape policy implementation, offering insights into best practices and strategies to address barriers in the adoption of digital education. This study provides practical recommendations for policymakers and university leaders, contributing to the development of a sustainable, inclusive, and resilient digital education ecosystem in higher education.*

Keywords: *Digital Education, Policy Implementation, Public Universities, Higher Education, Neo-Institutional Theory*

Introduction

The integration of digital education into higher education systems has fundamentally transformed the modes of knowledge delivery and access, heralding a new era of educational engagement. However, this paradigm shift presents complex challenges, particularly in policy formulation, implementation, and stakeholder coordination. Governments and educational institutions must navigate competing stakeholder interests, resource constraints, and the evolving landscape of technological innovation. In Malaysian public universities, these challenges are compounded by diverse stakeholder expectations ranging from policymakers and university administrators to academic staff and students within a policy environment that requires strategic and adaptive approaches.

Neo-institutional theory offers a well-suited framework for analyzing these dynamics, focusing on the role of institutional structures, norms, and isomorphic pressures in shaping organizational behavior and policy implementation. This theoretical lens highlights how coercive regulations, normative expectations, and mimetic practices influence the adoption and

operationalization of digital education initiatives while also revealing constraints that hinder innovation and adaptation. Prior research demonstrates how these institutional characteristics—coercive, normative, and mimetic forces—impact the integration of educational technologies (Bokolo, 2021). Broader theoretical insights on policy implementation also emphasize the importance of organizational decision-making processes and stakeholder engagement in achieving sustainable outcomes (Csizmadia et al., 2008).

This study critically examines the implementation of digital education policies in Malaysian public universities through the perspective of neo-institutional theory. Drawing on qualitative methods, including semi-structured interviews and document analysis, the research investigates how these policies are enacted, negotiated, and adapted. By identifying structural and cultural factors that either facilitate or impede policy implementation, the findings integrate theoretical and practical insights, offering actionable recommendations for policymakers and educational leaders to establish a sustainable and inclusive digital education ecosystem.

The transformation of higher education through digital integration has accelerated significantly in recent years, driven by technological advancements and the disruptions caused by the COVID-19 pandemic. Within Malaysian public universities, digital education has become a cornerstone for fostering an inclusive, efficient, and adaptive educational environment. This shift addresses the needs of diverse stakeholders while contending with resource limitations and evolving technological demands. Neo-institutional theory provides valuable insights into the interplay of institutional pressures, cultural norms, and stakeholder dynamics, offering a framework for understanding the complexities of policy enactment and adaptation amidst often conflicting interests.

Globally, research highlights challenges in integrating digital tools into traditional educational models, including structural barriers, disparities in digital literacy, and institutional resistance to change (Røe et al., 2022). Strategic leadership and policy coherence are emphasized as critical for addressing these challenges and fostering sustainable digital transformation (Butt et al., 2023). Effective implementation requires comprehensive strategies addressing organizational, pedagogical, and technological dimensions (Stranger et al., 2023).

The Malaysian context reflects these global challenges while presenting unique issues, such as aligning policies with national education objectives and ensuring equitable access to digital education for students from diverse socio-economic backgrounds. By situating the Malaysian experience within a broader theoretical framework, this study enhances understanding of how institutional frameworks can optimize digital education, providing actionable recommendations for improving governance and fostering sustainable and inclusive digital education initiatives.

Literature Review

Globally, digital education faces significant challenges, particularly in low- and middle-income countries, where infrastructural deficits and socio-economic inequalities hinder access and outcomes (Røe et al., 2022). While developed regions like Scandinavia have advanced due to strong governance and equitable strategies (Olofsson & Lindberg, 2021), institutional resistance and digital literacy gaps persist even in well-funded systems. In contrast, regions

like South Asia and Sub-Saharan Africa struggle with teacher training and inconsistent policy implementation, despite leveraging mobile technologies (Stranger et al., 2023).

Neo-Institutional Theory as a Framework

Neo-institutional theory helps explain how coercive (government mandates), mimetic (emulation of successful models), and normative (professional standards) pressures influence universities' adoption of digital education (DiMaggio & Powell, 1983). While these forces can drive innovation, they may neglect local needs, with institutional inertia and academic resistance posing internal challenges (Csizmadia et al., 2008). This study applies the framework to the Malaysian context, exploring the interaction between policy enforcement and institutional adaptation.

Comparative Regional Approaches

Scandinavian countries show success by aligning policies with institutional capacities, while South Asian countries face infrastructure and policy coherence issues (Chakraborty, 2023). East Asian models like South Korea's top-down strategies show rapid growth. Malaysia adopts a hybrid model—centralized in policy but decentralized in execution—leading to varied outcomes due to resource disparities (Lee, 2015).

Interplay of Influencing Factors

Digital education adoption is shaped by structural drivers (infrastructure and policy), external pressures, and cultural dynamics. While centralized directives can accelerate change (Bokolo, 2021), uneven resources and stakeholder readiness often limit impact. Addressing these multi-level factors is crucial for effective, sustainable digital education governance.

Methodology

This study employed a qualitative research design using document analysis and semi-structured interviews with key stakeholders including policymakers from the Ministry of Higher Education and university administrators. Data were thematically analyzed through the lens of neo-institutional theory to explore structural, normative, and cultural-cognitive mechanisms in digital education policy implementation. NVivo software was used to manage and code the interview transcripts systematically, ensuring consistency and rigor in data interpretation.

Findings and Discussion

The COVID-19 pandemic catalyzed a significant shift in higher education, accelerating the transition to online learning and challenging traditional face-to-face instruction. As highlighted by the DePAN policy stakeholder, this transition emphasized the urgent need to strengthen digital education systems in Malaysian public universities. Digital integration emerged as a transformative initiative, heavily dependent on key enablers such as infrastructure availability, policy alignment, and stakeholder readiness. While many embraced the flexibility of digital platforms, others remained attached to traditional modes of instruction, illustrating the varied stakeholder responses and the need for blended, adaptable approaches.

Infrastructure and policy support remain central to digital implementation. From a neo-institutional lens, universities face coercive pressures through government mandates like DePAN 2.0, which set ambitious benchmarks. However, disparities in ICT infrastructure, particularly in rural universities, hinder equitable access and reflect systemic resource imbalances. High-speed internet, integrated digital platforms, and centralized systems like MYRA are crucial but financially burdensome. While such systems offer standardization and shared services, they often ignore local institutional contexts, causing surface-level compliance instead of meaningful transformation.

Connectivity is a critical component of this infrastructure. Government policies mandate standard access to internet and devices, yet uneven implementation persists. Stakeholders consistently identified poor connectivity as a barrier to equitable digital access. One DePAN committee member stressed that without reliable internet and proper devices, digital education cannot advance. This highlights the symbolic and technical importance of connectivity in achieving national digital education goals.

Normative mechanisms, such as professional standards and leadership initiatives, further influence digital education practices. Proactive efforts—like the establishment of AI faculties and the integration of gamification and MOOCs—reflect institutional aspirations to align with global trends. These initiatives demonstrate leadership's role in fostering innovation but also require alignment with institutional capacity and stakeholder readiness.

Cultural-cognitive mechanisms underline the significance of shared beliefs in shaping digital adoption. The perception of technology as integral to education has grown, yet challenges persist. Resistance to frequent system upgrades and insufficient support for staff adaptability remain barriers. Addressing these requires training, change management, and a culture that embraces digital transformation.

In sum, the implementation of digital education in Malaysian public universities is shaped by a dynamic interplay of structural, normative, and cultural-cognitive mechanisms. To build a resilient digital education system, national objectives must be harmonized with institutional realities, ensuring equitable access, sustainable innovation, and inclusive policy execution.

Conclusion

This study offers critical insights into the implementation of digital education policies in Malaysian public universities through a neo-institutional lens, highlighting how structural, normative, and cultural-cognitive mechanisms shape institutional behavior. While ICT investments and enforcement provide a foundation, challenges such as system disruptions call for user-centered approaches aligned with stakeholder readiness. Leadership-driven initiatives like gamification and MOOCs illustrate normative pressures, but their success depends on contextual alignment and active participation. Cultural-cognitive elements emphasize shared beliefs in supporting cohesive, sustainable adoption. Although the study focuses on policy-level stakeholders, broader inclusion of faculty and students could enrich understanding. Future longitudinal and comparative studies are recommended to assess long-term impacts and identify best practices for enhancing digital education across institutions.

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UNIVERSITY CAPACITIES AND RESOURCES FOR ADVANCING DIGITAL EDUCATION IN MALAYSIAN PUBLIC UNIVERSITIES

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Abstract: *This article investigates how the capacities and resources of Malaysian public universities influence the implementation of digital education policies. Utilizing a qualitative research design, the study collected data from interviews with 32 stakeholders, including university leaders, academic staff, students, and Ministry of Higher Education officials. The findings reveal that institutional capacity in terms of human resources, infrastructure, and internal governance significantly shapes digital education outcomes. Universities with robust ICT infrastructure, proactive leadership, and structured training programs are better equipped to align with national policies such as DePAN 2.0. Conversely, institutions facing staffing shortages, outdated systems, and limited autonomy struggle to adapt. The study emphasizes that effective policy implementation depends not only on funding but also on institutional readiness and collaborative governance models. Recommendations are offered to enhance institutional capacity for sustainable digital education.*

Keywords: *University Capacity, Digital Infrastructure, Higher Education, Policy Implementation, Malaysia, DePAN 2.0, Institutional Readiness, University Capacities and Resources for Advancing Digital Education in Malaysian Public Universities*

Introduction

The digitalisation of higher education in Malaysia is increasingly driven by global trends and national priorities, particularly those aligned with Malaysia's National e-Learning Policy (DePAN 2.0). As universities are expected to adapt to rapid technological advancements, the focus has shifted toward how institutional capacity influences the success or failure of these digital transformations. In this context, institutional capacity refers not only to financial or infrastructural readiness, but also to the availability of skilled human resources, internal governance structures, and the ability to foster innovation (Altbach & Salmi, 2011).

Previous studies have tended to focus primarily on macro-level strategies or national policy blueprints, often once, overlooking the micro-level realities of universities that are tasked with implementation. For instance while DePAN 2.0 provides strategic direction, it does not account for disparities in institutional readiness across public universities (Ministry of Higher Education Malaysia, 2020). This study aims to fill that gap by investigating how internal capacities and resources either enable or constrain policy implementation at the institutional level.

Moreover, the COVID-19 pandemic has further exposed weaknesses in digital preparedness, with some institutions adapting quickly, while others struggled to transition even basic teaching

functions online (UNESCO, 2021). These disparities underscore the urgent need for a deeper understanding of institutional conditions that influence digital policy outcomes. The study also builds on the notion that organisational change in universities is context-sensitive, and digital reforms cannot be uniformly applied across different institutions (Fullan & Scott, 2009).

The objective of this paper is to examine the specific institutional capacities such as digital infrastructure, leadership, and human resource development that influence the realisation of digital education policies. By focusing on Malaysian public universities, the study contributes to the growing body of literature on digital transformation in higher education by offering insights into what internal conditions are necessary to support sustainable reform. It further provides practical policy recommendations based on empirical evidence drawn from multiple stakeholders across the higher education ecosystem.

Understanding the unique institutional capacities of each university is vital for designing effective digital transformation strategies. Without addressing the internal readiness and contextual nuances, national policies risk being reduced to symbolic gestures rather than catalysts for meaningful change (DiMaggio & Powell, 1983). This study therefore advocates a differentiated and capacity-sensitive approach to digital policy implementation in Malaysian higher education.

Methodology

This study adopts a qualitative research methodology to investigate how institutional capacities influence the implementation of digital education policies in Malaysian public universities. A total of 32 semi-structured interviews were conducted with a diverse range of stakeholders, including university administrators, academic staff, students, and representatives from the Ministry of Higher Education.

The purposive sampling method was employed to ensure that participants represented various institutional types (research universities, comprehensive universities, and teaching-focused universities) and geographic locations (urban and rural campuses). This diversity enabled a holistic understanding of institutional dynamics across different contexts.

The interviews were conducted between January and June 2023, with each session lasting between 45 and 60 minutes. All interviews were recorded, transcribed, and coded using NVivo software. Thematic analysis was used to identify recurring patterns and themes related to digital infrastructure, leadership, human resource development, and governance practices.

To ensure research rigor and credibility, member checking was employed by sharing the thematic summaries with participants for validation. Triangulation was also applied by cross-referencing interview data with institutional reports and policy documents, including DePAN 2.0 and strategic plans from selected universities.

Ethical approval was obtained from the Research Ethics Committee of the lead research institution. Informed consent was secured from all participants, and confidentiality was strictly maintained throughout the study.

This qualitative approach allowed for in-depth exploration of institutional processes and stakeholder perceptions, offering rich insights into how university capacities affect the realisation of digital education reforms in Malaysia.

Theoretical Framework

This study is guided by institutional theory, particularly the concept of isomorphism as proposed by DiMaggio and Powell (1983). The theory suggests that institutions tend to adopt similar structures and practices in response to external pressures.

Coercive isomorphism is relevant in understanding how policy mandates shape university behavior. Mimetic isomorphism explains the tendency of universities to copy perceived successful peers, while normative isomorphism reflects shared professional norms within academia. By applying institutional theory, this study frames university capacity not just as a technical matter but as a socially constructed phenomenon shaped by policy, culture, and professional networks.

Findings and Discussion

The thematic analysis of interview data uncovered significant variations in how Malaysian public universities are implementing digital education policies. These variations stemmed from differences in institutional readiness, leadership responsiveness, and organisational culture.

Participants noted that national policies such as DePAN 2.0 served as overarching frameworks, but implementation at the ground level relied heavily on the universities' own capabilities. This created uneven experiences and levels of success across institutions.

One recurring theme was digital infrastructure readiness. Universities in urban areas generally had access to fast internet, functioning learning management systems, and digital classrooms. However, rural campuses struggled with unstable connections and outdated technology, limiting their ability to deliver online content effectively.

Human resource constraints also posed significant challenges. Many lecturers had not received adequate training in digital pedagogy. While some institutions offered brief courses or peer support, many academic staff members were left to adapt on their own, resulting in inconsistent teaching quality and learning experiences.

Leadership and autonomy emerged as decisive factors. Universities with visionary leadership teams adapted more quickly, forming digital taskforces and empowering departments. In contrast, universities with rigid hierarchies and less initiative saw delays, confusion, and low morale among staff.

Finally, stakeholder engagement made a measurable difference. Where faculty and students were actively involved in planning and feedback loops, implementation was more effective and widely accepted. This contrasts with top-down approaches, which often led to resistance or policy failure.

Policy and Practice Recommendations

Based on the findings of this study, several policy and practical recommendations can be made to enhance institutional capacities and accelerate digital transformation across Malaysian public universities. These recommendations are grounded in qualitative insights gathered from university stakeholders and aligned with broader institutional theory.

Firstly, targeted investment in digital infrastructure should be prioritised. Policymakers and institutional leaders must acknowledge the uneven access to reliable internet, learning management systems (LMS), and digital devices across universities. Universities located in underserved areas require dedicated funding to establish equitable digital learning environments. National-level funding schemes could also be linked to periodic infrastructure audits to ensure accountability and continuous upgrades (Ministry of Higher Education Malaysia, 2020).

Secondly, comprehensive and ongoing training programs must be institutionalised. Short-term workshops are insufficient to equip staff with the evolving competencies needed for digital pedagogy. Institutions should develop long-term professional development frameworks that include mentorship, micro-credentialing, and peer-learning communities (Bates, 2019; Selwyn, 2020).

Thirdly, strengthening institutional leadership and autonomy is essential. University administrators must be empowered to innovate and tailor national policies to local contexts. Leadership training and benchmarking exercises can help institutions learn from peers with successful digital strategies. As noted by Fullan and Scott (2009), transformative change often hinges on leadership that is context-aware and change-oriented.

Fourth, participatory governance mechanisms should be institutionalised. Engaging students, faculty, and administrative staff in digital planning and feedback processes enhances the legitimacy and acceptance of new initiatives. Institutions should form digital steering committees that represent multiple stakeholders and promote inclusive decision-making.

Lastly, a differentiated approach to policy implementation should be adopted. Recognising that universities differ in size, resources, and missions, digital transformation policies must allow for flexibility and phased targets. A one-size-fits-all approach risks reinforcing existing inequalities instead of closing the gap (Altbach & Salmi, 2011).

Conclusion

This study has explored how institutional capacities shape the implementation of digital education policies in Malaysian public universities. Through qualitative interviews, it is evident that success in policy realisation depends heavily on internal factors such as infrastructure readiness, human resource competence, leadership responsiveness, and stakeholder engagement.

The disparities in digital readiness between universities highlight the limitations of uniform national policy directives. Institutions with proactive leadership and inclusive governance

structures managed to implement reforms more effectively, while others struggled with infrastructural and cultural constraints.

These findings reinforce the relevance of institutional theory in understanding organisational change within higher education. Coercive, mimetic, and normative forces interact differently across campuses, producing diverse outcomes in policy uptake and effectiveness (DiMaggio & Powell, 1983).

Future research should investigate how these capacities evolve over time and examine the long-term sustainability of digital transformation initiatives. As digital education continues to be a cornerstone of national higher education strategies, equipping universities with context-sensitive and resilient capacities is paramount.

In conclusion, national digital education policies must be complemented by institutional strategies that reflect local realities. Only through such alignment can digital reforms be meaningfully embedded and sustained across the higher education landscape.

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DOUBLE SHACKLES AND WOMEN'S BREAKTHROUGH: A CRITICAL STUDY OF PATRIARCHY IN "VULGAR LAND" UNDER FOUCAULT'S DISCIPLINARY THEORY

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Abstract: *This paper takes Li Zishu's "Vulgar Place" as the research object, combines Foucault's disciplinary power theory with feminist perspectives, and reveals the dual oppression of patriarchy and social ethics on women and the path of resistance through text close reading and critical discourse analysis. The study found that the novel, through the female group of blind girl Yinxia and other female characters, reveals the survival dilemma of Malaysian Chinese women under the dual oppression of race and gender: patriarchal instructions in the family deprive women of their autonomy, and implicit discipline in the workplace and public sphere solidifies gender division of labor and disability prejudice. However, women did not completely succumb - Qiu made a living independently to break the shackles of marriage, Yinxia subverted the label of disability with her ability, and Chanjuan accused oppression with madness, showing the symbiotic relationship between power and resistance. This paper systematically applies Foucault's theory to interpret "Vulgar Place" for the first time, providing an interdisciplinary framework for gender research in Malaysian Chinese literature and revealing possible paths for women in the global South to break through structural oppression. The study shows that although women's "secret breakthrough" is not a complete victory, it provides an allegorical inspiration for the resistance of vulnerable groups.*

Keywords: *"Vulgar Place"; Foucault's disciplinary theory; patriarchy; double shackles; women's breakthrough*

Introduction

"Vulgar Land" is a novel written by Malaysian writer Li Zishu. The novel is set in "Xindu" and takes the life experience of the blind girl Yinxia as the main line, interweaving the ups and downs of the fate of several families for decades. "Vulgar Land" presents the various aspects of Xidu women in a collection way" (Wang Dewei, 2020) , trying to present "a long scroll full of vulgar flavor of the market, depicting the ups and downs and changes of personnel in the Malaysian Chinese society in the past few decades" (Wang Dewei, 2020) . It demonstrates the tenacious vitality and deeply shows the survival picture of the Malaysian Chinese community in the torrent of the times. Since the publication of "Vulgar Land" in 2020, it has become a phenomenal work in the world's Chinese literature, attracting widespread attention and repercussions from all walks of life, and is even called the most important work in the new generation of Malaysian Chinese literature.

Literature Review

Li Zishu's "Secular Land" has attracted widespread attention since its publication, and the academic community has discussed it from multiple angles including narrative art, character creation, cultural symbolism, and national allegory.

Realism and Narrative Techniques

Wang Dewei pointed out that "Vulgar Land" is Li Zishu's return to realism, and through the interweaving of the omniscient perspective and the perception of the blind girl Yinxia, the city scene of Xidu is constructed. However, the novel does not stop at traditional realism, but deconstructs linear history with modernist techniques (such as non-linear narrative and time-space jumps), forming a "visual ruin" (Derrida's words), challenging the authority of traditional visual centrism (Wang Dewei, 2020). Liu Shiyu further analyzed that through Yinxia's blind perspective, the novel transforms sensory experiences such as hearing and touch into narrative power, making the daily details of "vulgarity" full of poetry, and at the same time enhances the tension of the text through foreshadowing and blank space (such as the truth of Yinxia's sexual assault). (Liu Shiyu, 2021).

Group Image Creation and Women's Destiny

Liu Shiyu (Liu Shiyu, 2021) focuses on the complexity of male characters such as Lao Gu and Xihui, such as Lao Gu's selfishness and pathos, Xihui's cowardice and forbearance, revealing the survival dilemma of the lower-class characters. Han Yuxuan (Han Yuxuan, 2021) pointed out that the tragic cycle of three generations of women criticizes patriarchy and gender oppression, but Li Zishu did not fall into the feminist rut, but presented the grayness of human nature from an inclusive perspective. Feng, Yi-Ling emphasized the anxiety of the female body in "Vulgar Land" that is "uncomfortable" under the patriarchal gaze (Feng Yi-Ling, 2023). Tang Zhiqing further analyzes Yinxia's "restlessness": her desire for control in the chess game, her struggle in the blind asylum, and her confession in the elevator all reflect her rebelliousness; but her dependence on Gu Youguang at the end also exposes the limitations of male redemption in the narrative of female growth (Tang Zhiqing, 2024).

Integration and Conflict of Multiple Cultures

Wang Dewei and Shen Xiayan both focus on the symbolic meaning of Indian cultural elements (such as Ganesha). Ganesha's broken teeth are a metaphor for the spirit of sacrifice, and Laju's death implies the common historical trauma of the Malaysian Chinese and Indian communities. The novel constructs a cultural landscape of multi-ethnic symbiosis through cross-ethnic friendship (Yinxia, Laju, Xihui), but ethnic barriers (such as the absence of Laju's funeral) still expose structural contradictions (Shen Xiayan, 2022; Wang Dewei, 2020). Tang Zhiqing uses postcolonial theory to interpret Li Zishu's local writing's concerns about multi-ethnic mixing, power structure, and women's growth through three parts: "mobile real life", "mixed third space" and "women outside the margins" (Tang Zhiqing, 2024). The "third space" of multiculturalism Tang Zhiqing introduces Homi Bhabha's "third space" theory to analyze the significance of Xidu HDB as a cultural mixing field. Indian barbershops, Chinese temple fairs and Malay markets are juxtaposed, and languages, beliefs and customs blend to eliminate ethnic barriers and form a "balanced cultural identity". Raju's death symbolizes the fragility of

this utopian space, while Yinxia's internalization of Ganesha's "sacrifice" spirit reflects the marginalized's active absorption of mixed culture (Tang Zhiqing, 2024).

In the current academic community, researchers generally focus on the internal structure of the text. Han Yuxuan (Han Yuxuan, 2021) proposed Li Zishu's criticism of patriarchy and gender oppression, but he believed that this criticism did not come from feminism, but was a display of the grayness of human nature. However, this study disagrees with this. Although the female characters in the work live in the market, they show their own struggle against the established fate. Although this struggle is small, it is full of power. Through the portrayal of the living conditions of these women, Li Zishu not only presents the complexity and multifaceted nature of human nature, but also deeply reveals the shaping and restriction of individual life by the power structure. Hu Xingcan (Hu Xingcan, 2022) cited Foucault's "panopticism" to prove the symbiotic relationship between vision and power. Tang Zhiqing (Tang Zhiqing, 2024) tried to explore the grassroots life of the Malaysian Chinese community with power theory, but they only touched on it and did not carry out detailed analysis.

Current research generally focuses on the oppression suffered by women, but the in-depth exploration of the root cause of women's tragic fate, namely power inequality, is rarely involved. This study intends to adopt a feminist theoretical framework, draw on Michel Foucault's disciplinary power theory, and combine text close reading with critical discourse analysis methods to provide a new theoretical perspective for the in-depth analysis of the female image in "The Common Place". The study will explore the conspiracy mechanism between patriarchy and disciplinary power, and from the perspective of the interaction between discourse and power, deeply analyze the explicit violence reflected in the direct oppression of patriarchy in "The Common Place", the implicit discipline shaped by the social system, and how women can achieve breakthroughs and resistance through "deviant expression".

Research Methods

Close Reading of Text

This method emphasizes the in-depth interpretation of text details, focusing on the analysis of language, structure, rhetoric, imagery and other micro-levels, aiming to explore the deep meaning of the text, the author's intention or implicit ideology. In the study, the text of Li Zishu's novel "Vulgar Land" was carefully observed and deeply interpreted, focusing on the double shackles of explicit oppression (family patriarchy) and implicit discipline (social ethics) in the text, marking "patriarchal directive discourse" and "deviant expression" of female resistance.

Critical Discourse Analysis

Focusing on the interaction between language and social power structure, it aims to reveal how discourse constructs ideology and maintains or subverts unequal power relations. In the study, critical discourse analysis links text details with social context to analyze how discourse reproduces or challenges power relations. In Li Zishu's "Vulgar Land", the author focuses on patriarchal directive discourse and female resistance vocabulary, and reveals the asymmetry of power distribution through the inequality of male and female discourse; and reveals the power relationship in a pluralistic society in a postcolonial context through patriarchal discourse and the compound oppression of women.

The Double Shackles of Patriarchy and Women's Ways to Break Through

Foucault pointed out that disciplinary power is not a simple and direct violent oppression, but a more hidden and efficient form of power. It permeates all aspects of social life and subtly influences individual behavior, thought and identity through a series of subtle and complex rules and procedures. The Chinese community in Malaysia is under the monitoring and scrutiny of policies and laws. Especially Chinese women in Malaysia, in a diversified social context, not only live in an environment of racial oppression, but also have to deal with the oppression brought by patriarchy, and bear the double pressure of oppression.

Explicit Shackles: Patriarchal Directives and the Violent Discipline of Family Space Patriarchal Directive Discourse: Violent Coding of Derogation and Manipulation

According to Foucault's view of "micro-power", language also reflects a strict form of power and is an important means of manipulating and controlling the other party. When Lianzhu and Yinxia went to the ancient temple to inquire about the situation of the charity school and the enrollment conditions, the temple keeper only glanced at Yinxia and waved his hand: "Let's go, we don't accept blind people." In response to Lianzhu's questioning, the man responded unhappily: "You are blind, you might as well learn massage or play the erhu" (Zishu, 2021). First of all, the temple keeper's "we don't accept blind people" is not an objective statement, but a ruling of power discourse-through the exclusion of educational institutions, the disabled are defined as "bodies that cannot be disciplined", and disability is equated with "defects", thereby depriving them of the right to education, thereby consolidating the normative hegemony of "visually sound people". Secondly, the temple keeper's response also highlights the suppression of women's autonomy by male authority under patriarchy, and his unpleasant and contemptuous attitude dissolves women's subjectivity. Lianzhu, as Yinxia's aunt, tried to fight for her educational opportunities, but the temple keeper, as a representative of male authority, refused in an unquestionable tone, highlighting the male's control over resources and opportunities. The temple keeper's response to Yinxia's desire to receive an education actually reveals the patriarchy's deep fear of women's acquisition of knowledge. Education is regarded as the exclusive territory of male authority, and women, especially disabled women, are excluded from the knowledge system in order to maintain the existing power structure. Foucault pointed out that the power institutions that control individuals will give the controlled people a "binary division (normal/abnormal)" (Manaf & Quayum, 2001). Therefore, Yin Xia's blindness was constructed as "abnormal" by Lao Gu and others, and her desire to go to charity school was regarded as "deviant" from standardized education. Da Hui's suggestion to "learn massage" and Lao Gu's rebuke for "not knowing how to measure oneself" are "well-intentioned suggestions" or "realistic considerations" on the surface, but in fact they are the gentle face of standardized violence. This kind of violence does not rely on physical oppression, but through "common sense discourse", such as the "good-intentioned advice" that blind people can only do low-level work, naturalizing power oppression, achieving the purpose of discipline, and internalizing Yin Xia's identity as a "low-level subject".

Body Control: Power Rituals of Marriage Transactions and Violence Performances

Ma Piao Sao's mother, Qiu, was abducted to Southeast Asia by the elders of the clan when she was a teenager. After a short period of upbringing, she was forced to get married. Her first

marriage partner, Wu, was addicted to gambling, frequently absent from work, unable to bear family responsibilities, and from time to time violent to his wife and children. Qiu supported the family independently, but was frequently despised and abused by her husband's family. Later, her husband lost contact, and the relatives who abducted Qiu to Southeast Asia took the opportunity to transfer her to a middle-aged man named Ma again with tea gifts as a matchmaker. Qiu had no autonomy in marriage, and the elders of the clan could arbitrarily manipulate her marriage destiny, which demonstrated the power structure in the traditional clan system. The elders-imposed discipline on her through the kinship network to control her body and marriage. From "accepting tea gifts from other families again" (Zishu, 2021) From the word "again", we can see that Qiu's first marriage was also based on the tea gift transaction. Her personal wishes were not taken seriously, and marriage and happiness were only regarded as the economic value of the tea gift. Tea gift, as a means of economic exchange, reflects the reality that Qiu was objectified as a tradable object. In the first marriage, although Qiu independently shouldered the burden of the family, she still could not escape the fate of being despised and abused; in the second marriage, her husband ignored Qiu and her children and resolutely abandoned the family and returned to his hometown. Behind the violence and economic exploitation in these two marriages, there is a gender logic that women are men's private property and that the marriage relationship gives men the right to dominate women's bodies.

At the funeral ceremony after his father's death, Dahui "scratched his head with one hand and took the cigarette handed to him by his uncles with the other hand. He seemed a little overwhelmed, and the cigarette in his hand was lit." (Zishu, 2021) . This scene became a symbol of the handover of patriarchy. The lighting of the cigarette also meant that Dahui officially assumed the patriarchal role in the family. From then on, he was able to fulfill the responsibility of "brother taking the place of father", use the cane to discipline his younger brother, and serve as the main speaker in the family. He could "grab his wife's neck, hit her head against the wall once or twice", "the child was frightened and cried, and the old father-in-law was so scared that he trembled outside the door" (Zishu, 2021) The result of violent behavior is just "being kicked out of the house". Violence has become the default means for men to maintain family authority; he can also be "abandoned by his mistress" or "high on drugs" (Zishu, 2021) When a man is in power, he can abuse his spouse without any reason or explanation. Violence is the most naked display of patriarchy. It overrides women or weak groups and exerts influence without scruples. This display of violence is not only physical harm, but also a symbolic ritual of power, which establishes men's absolute control over women or the weak bodies by inflicting pain.

Hidden Shackles: The Standardized Coding of Social Ethics

Kitchen Discipline: Spatial Solidification and Intergenerational Transmission of Gender Roles

Foucault pointed out that "the human body is manipulated, shaped, and disciplined. It obeys and cooperates" (Michel Foucault, 2019). Judith Butler pointed out in "Gender Trouble" that "the reality of gender is created from continuous social performance" (Butler, 1990), "it is a style/programmed action that is repeated over the years" (Butler, 1990). Through social education, "women are defined as having to take on more trivial, emotional and intensive family care roles" (Huang He et al., 2003). In the repetitive performances day after day, the female role is disciplined as "family first", shaped and disciplined in the kitchen, trapped in the

traditional gender division of "men are responsible for the outside and women are responsible for the inside", and women also "obey and cooperate" (Michel Foucault, 2019) and actively adapt. Huilan needs to balance work and raising children. Yinxia's mother Liang Jinmei gave up her career development to take care of the blind girl, which invisibly reproduces this unequal gender division of labor. It can be said that the imbalance in gender division of labor is actually the joint product of male-dominated power and female self-compromise.

Foucault pointed out that space is an important carrier of the operation of power. The kitchen in "The Place of the Vulgar" is a disciplinary field that sanctifies motherhood through repetitive labor and intergenerational transmission, and confines it to the ethical framework of "female dominance". Women's career advancement space is restricted by the deprivation of time and energy, and women have long lost their right to speak and resist. Liang Jinmei's kitchen labor trajectory perfectly illustrates this point of view: when Yinxia was rejected by the Ancient Temple Charity School, Liang Jinmei whispered in the kitchen; when the pregnant girl jumped off the building, Liang Jinmei "chopped meat in the kitchen" (Zishu, 2021); when the ritual was performed upstairs, Liang Jinmei "washed, cut and cooked in the kitchen" (Zishu, 2021). At home and outside, when big and small things happen, Liang Jinmei can always be found in the kitchen. Her whispers in the kitchen and her constant presence in the kitchen reveal Liang Jinmei's lack of voice. The kitchen is not only a place where women lose their voice, but also a place where intergenerational discipline between women is passed on. Liang Jinmei would say to Yinxia with apology: "Mom is so sorry for giving half of the pot to your sister." (Zishu, 2021) "Chanjuan spent a lot of money to hire someone to renovate the dining room and kitchen." (Zishu, 2021), but now it is filled with the "claypot pots and pans brought from the HDB flats" by the Hemen Fang family. These old "claypot pots and pans" are placed in Chanjuan's newly renovated restaurant, just like the transmission of kitchen discipline from mother-in-law to daughter-in-law.

The Double Discipline of Disability and Gender: Three Dimensions of Systemic Exclusion

Social ethics implements implicit control through the binary division of "normal/abnormal". Yinxia has a deep desire for knowledge and education, but her body, which is labeled as "abnormal" by the standardized society, inevitably encounters the systematic exclusion of marginal life by power technology under the dual disciplinary network of patriarchy and disability discrimination.

Educational Exclusion: The Disempowerment of Knowledge and the Violence of the "Abnormal" Label

Yinxia wanted to go to Gu Miao Charity School but was rejected. Her desire for knowledge directly challenged the social stereotype that disabled women should stay at home. (Zishu, 2021), it is not difficult to see that the right to education of women's bodies (especially disabled women) is tacitly regarded as an appendage of patriarchy, and the family has become the initial cage of gendered discipline, which also reflects that Yinxia's mother has been thoroughly "disciplined" by social norms. When Yinxia tried to enter the Gu Miao Charity School, she was rejected and ridiculed; when she visited Xihui and Lazu's school, her hands and knees were covered with "bloodstains everywhere" (Zishu, 2021); and when she was learning to type Braille in the Blind Home in Mishan New Village, she was even violated by the opposite sex.

All this seems to imply that disabled women are born to "behave themselves" and be confined to the narrow living area tailored for disabled women by society. Through the binary division of "normal/abnormal", educational institutions exclude disabled women from the knowledge system and maintain the privileges of healthy men.

Occupational Restrictions: Gendered Labor Exploitation Under Productive Discipline

Yinxia first learned weaving skills, and was later hired as a taxi operator. Her career choice was limited to "disabled positions". These measures seem to be "help", but in fact they are to incorporate people with disabilities into the productive discipline system. Society assumes that blind people can only engage in low-end labor such as operators and weaving net bags. This restriction on career development actually reflects institutionalized ability bias. Yinxia's "sweet voice" was labeled as "the flower of the radio station" (Zishu, 2021). On the surface, this is a compliment to Yinxia's voice, but in fact, through metaphorical substitution, Yinxia's professional ability is transformed into a "flower" with sexual appeal. By repeatedly using this label, the driver group anchored Yinxia's workplace value on "feminine traits" rather than her professional ability. When Yinxia asked driver 1348 to help pay attention to the appearance of the passenger, 1348 subconsciously teased: "Our radio flower is going to marry?" (Zishu, 2021) And 7503 even hinted in a vulgar tone: "You have to do it for her, touch that person, and feel his size and weight." (Zishu, 2021) This sentence is not simply sexual harassment, but a form of discourse discipline. By sexualizing Yinxia's body, even if she was not directly touched, she was forced to accept the identity of "workplace sex object" and endure the secondary discipline of gender labels. Yinxia's experience reveals that disabled women are suffering from the dual constraints of gender discipline and disability discipline.

Emotional Repression: The Mental Confinement of Shame and Moral Kidnapping

Yinxia is labeled as "incomplete" in the eyes of society. Her identity as a blind girl is defined as an "incomplete" existence by society. Therefore, even though Yinxia is clever and skillful, "it would be amazing if she could go to school." (Zishu, 2021) Even though Xihui has a vague affection for her, he still cannot get rid of his implicit prejudice against the "disabled". After Xihui and Lazu secretly took Yinxia to school and scratched her hands and legs, Xihui's mother said to Xihui sarcastically, "If you get disfigured, humph, Lao Gu and his wife will definitely ask you to marry this blind girl." (Zishu, 2021). This sentence not only exposes the discrimination against Yinxia as a blind woman, but also regards marriage as a compensation or burden for "disabled people", further deepening the social prejudice against disabled women. The unspeakable affection for Ismail, an English teacher at the blind home, was written in the letter. No matter how it was softened and modified, it was considered "frivolous and explicit" by herself (Zishu, 2021). Society solidifies disabled women as "others" through shame and moral kidnapping, depriving them of their emotional autonomy. Yinxia's identity as a blind woman is like an invisible shackle, which not only restricts her free development in society, but also makes it difficult for her to have emotional autonomy. Yinxia's experience is a common dilemma faced by disabled women in a patriarchal society. They not only have to endure physical inconveniences, but also face various prejudices and discrimination from society, which makes them difficult to pursue freedom and equality. All of the above exposes the double marginalization and discrimination faced by disabled women.

Hierarchical Operation of Disciplinary Mechanisms: Power Collusion Between Space and Profession***HDB Flats: Transparent Cages in a Panopticon***

The core of the panopticon theory is to achieve all-round monitoring through spatial layout to ensure that the monitored person is always "visible". In the book "Vulgar Places", the Kinta flats in Xidu are a typical representative of the panopticon-style spatial layout. The flats are 20 stories high and are home to more than 300 households. The high density of residents makes the corridors, elevators and public areas naturally form a strict monitoring network. For example, when Yinxia was sleepwalking as a child, she was witnessed by her neighbor Baohua who came back from overtime at night. When the ritual was held in Dahui's house for the pregnant woman who jumped off the building, the neighbors upstairs and downstairs all "became quiet" and "held their breath" (Zishu, 2021), showing great concern for the movements of Dahui's family. The design of the Kinta flats unconsciously constructed a "transparent cage", where every move of the individual is exposed to the vision of others, forming a collective unconscious mutual surveillance, and the living conditions, behaviors and even family conflicts of the residents are exposed and nowhere to hide. Although Yinxia, as a blind girl, is somewhat protected from the direct intrusion of outside eyes, she can feel the oppression and ubiquity of the "visibility" discipline more deeply through hearing the movements of the neighbors. The violent quarrels in Dahui's house, the whispers of neighbors, and the collective peeping during the ritual all permeate her living space in the form of sound waves. This "auditory panopticon" not only strengthens Foucault's disciplinary logic of "continuous visibility", but also highlights the alternative monitoring mode after the disabled are deprived of visual power. This is a variant of Foucault's "panopticon", revealing the pervasiveness of disciplinary power. In addition, as a microcosm of the Tin City society, the operation of the spatial discipline of Kinta Flats also reflects the general oppression and surveillance of women in the patriarchal society. In such a social environment, women are often placed under stricter surveillance, and their behavior, moral qualities and even private lives are strictly judged and scrutinized by the outside world. The interweaving of this spatial discipline and gender politics further exacerbates the marginalization of women in the patriarchal society, making them face greater challenges in the pursuit of freedom and equality.

The Politics of Smiling in the Workplace: The Disciplinary Logic of Gendered Service Norms

Huilan was promoted from foreman to deputy manager at Xilinmen Seafood Restaurant, but she still had to endure customers' difficulties. Foucault constantly emphasized that normalization is the core mechanism of discipline. At Xilinmen Restaurant, "smile" (Zishu, 2021) is constructed as a mandatory physical norm in the service industry. This smile is not a natural expression of emotion, but an institutionalized and constantly practiced facial performance. Through repetitive practice, body movements are closely bound to professional identity. In the service industry, it is necessary not only to respect and obey customers' requirements, but also to provide customers with patient and gentle emotional values. However, in the same service industry, there are different gendered practices. As a deputy manager, Huilan was faced with the lady who "came up with a lot of ideas to toss people after a meal." (Zishu, 2021) In such a situation, she also had to "keep forcing a smile" (Zishu, 2021) until "the smile froze on her face" (Zishu, 2021), however, those "handsome and strong" (Zishu,

2021) Male waiters can easily please middle-aged and elderly ladies. This gendered service requirement makes female employees such as Huilan not only face the challenge of professional skills on the road to career advancement, but also have to bear the additional pressure brought by gender roles. Huilan's experience at Xilinmen Seafood Restaurant is a microcosm of gender discipline in the professional field.

This restaurant is like a Foucaultian "panopticon" (Michel Foucault, 2019) Huilan needs to adjust her expression at all times to cope with the gazes of all parties. Her every smile and every movement is judged invisibly. This constant surveillance comes not only from customers, but also from colleagues and management. They form a multiple surveillance network, which forces Huilan to be vigilant at work at all times to ensure that her words and deeds conform to the norms of the service industry. In such an environment, Huilan's body gradually becomes a product of discipline. Her smile becomes mechanical and rigid. This is not only the result of professional requirements, but also a deep imprint of gender discipline on her. She transforms the oppressive smile into a "professional skill" and becomes an accomplice of the disciplinary system.

Secret Breakout: The Spectrum of Resistance from Silence to Madness

Foucault believes that power and resistance coexist, and women have never stopped looking for possibilities to break through the cracks in discipline.

In the male-dominated political carnival, women are often marginalized, but they have a unique way of nurturing the power of resistance in silence. This resistance is not a direct confrontation, but a more subtle and profound way of expression.

Silent Resistance: Internalized Trauma and Silent Expression

Ma Piaosao's mother, Qiu, after experiencing two marriages, firmly "vowed not to marry again" (Zishu, 2021). However, this determination not to marry again was not due to the fact that the widow's identity was bound by moral norms to the ethical framework of "being faithful to one man", but due to her complete disappointment with the role of "husband". Since then, she has purchased a piece of land, built a house, and made a living independently, breaking the spatial limitations of the traditional "inner chamber". With extraordinary willpower and hard work, Qiu resisted the discourse discipline in a silent way, transformed herself into a text of resistance, and opened up a living space in the cracks of the disciplinary system.

As a blind girl, Yinxia felt like "a weaver girl who had violated some heavenly law" after her body was violated. (Zishu, 2021), weaving net bags at home all day long. In the long-term social and family discipline, Yinxia subconsciously believed that the fault was also on her, so she fought against the pain with silence, as if she had violated the law of heaven. The silence at this time is the mark of the trauma of the disciplined body. Choosing silence is essentially to transform physical trauma into the "invisible" side of others. Silence itself becomes a weapon of resistance. By keeping silent, it constitutes "active aphasia" of patriarchal discourse, making it impossible for physical experience to be included in the discourse archive of power. Of course, Yinxia's silence is an active choice, and she resists silently through labor practices such as weaving net bags. Therefore, "silence" is really the "invisible" resistance that Foucault said, which disintegrates the visibility of power by refusing to participate in the discourse archive.

The Body Breaks Down: Illness as an Indictment of Disciplinary Violence

Huilan, who had been smiling and chatting at Xilinmen Seafood Restaurant, "suddenly felt deflated" as soon as she got home. "She could no longer control herself and collapsed on the bed." (Zishu, 2021). The scene of Huilan collapsing in a pile of clothes late at night implies the final collapse of the disciplined body. The wrinkled pile of clothes when she collapsed exposes the hidden nature of the family as a disciplinary institution; the face that is stiff with laughter reveals the oppression brought by the workplace as a panoramic open-view institution that accepts "irregular and frequent inspections". Under the dual discipline of women at home and in the workplace, Huilan's "body suddenly bursts like a balloon filled with liquid" (Zishu, 2021), her physical collapse is the result of physical overdraft and emotional repression, the trauma of internalized disciplinary power, and the body's secret resistance in the form of illness, which also reveals the unsustainability of exposing the power network.

Yinxia's visual impairment was unfairly labeled as "disabled" in society. The Gu Miao Charity School refused to accept her, and the radio station's job opportunity was only given because of "urgent need for manpower" (Zishu, 2021), and Lao Gu's strong guarantee, so she barely got the opportunity to start as a part-time job. However, Yinxia's extensive knowledge and excellent memory amazed the taxi drivers of the radio station and spread the word. Yinxia stood out in the workplace with her extraordinary memory, turning her physical defects into part of her legendary career, completely subverting the traditional disciplinary concept. From being distrusted at first to becoming a well-known "pillar" in the radio station (Zishu, 2021), Yinxia's transformation was regarded as a miracle by her colleagues and a treasure by her boss. The change from old employees calling her "Xia girl" to "Xia sister" (Zishu, 2021) completely broke the stereotype that "blind girl" or physically ill disability equals incompetence, and dispelled the social prejudice against physical illness with her outstanding technical ability.

Madness Crosses the Line: The Subversion of Power through Irrational Expression

Chanjuan was a teacher. As a teacher, she had to maintain a "rational" and authoritative image. However, the student's suicide broke this norm. The moral requirements of society for teachers are like shackles. Even after the student died, the principal still "earnestly persuaded" her to believe that "she should take more responsibility for the girl's death." (Zishu, 2021). After marriage, Chanjuan was regarded as a "scholar" by her mother-in-law, Hemen Fang, but her resignation made Hemen Fang "not very satisfied" (Zishu, 2021). Her value was ultimately simplified to the fact that "people who have read books are indeed different, and they are more accurate in calculating." (Zishu, 2021) Practical skills. In the workplace, because of the girl's death, the principal labeled her as "extreme", causing her to be publicly criticized many times; at home, she could not stand staying at home with her mother-in-law all day long, and her mother-in-law constantly denied her value. The gender division of labor in the family further compressed her spiritual space, which eventually led to her "nightmares". (Zishu, 2021), people become irritable, smash things, pull their hair and scream heartbreakingly. Chanjuan's nightmares and mania are the mental collapse after the failure of discipline, and also a silent accusation against the "normal" standards imposed by society. Foucault believes that "madness" is a product defined by social power (Michel Foucault, 2003), and Chanjuan's "abnormality" is actually an inevitable crack under the oppression of power.

The blind girl Yinxia was labeled as "abnormal" by society and was seen as a weak person who needed care. Therefore, her mother stipulated that she could only walk as far as Baluo Chinese Primary School and People's Park if she was accompanied by someone. (Zishu, 2021). However, Yinxia has been stubborn and strong-willed since she was a child. Because of this, despite her congenital disability, she is unwilling to stay at home like other disabled people, taking odd jobs and doing casual work. Although "abnormality" can restrain Yinxia's body, it cannot imprison her soul. In sleepwalking, Yinxia moves freely and agilely, and she doesn't look like a blind person at all. Yinxia's sleepwalking symbolizes women's subconscious escape from the oppression of reality. This irrational and uncontrollable dream madness is an unconscious resistance and transgression to the blind people's obedience to the law. At the 100-day banquet for Aunt Lianzhu's child, Yinxia was so frightened that her face turned pale, her hands trembled, and she shouted loudly when she reached out to take the child. The madness was also a resistance to social discipline. Yinxia was raped and pregnant, "Liang Jinmei regarded this as a great shame, and she wished she could erase it from everyone's memory" (Zishu, 2021). The dean shirked responsibility and advised Ma Piaosao and others to keep the peace. Even Yinxia, whose mother had sternly warned her: "Is this a glorious thing? If you want to be a human being in the future, you can't even tell Xihui and Lazu." (Zishu, 2021). Social discipline makes women ashamed to speak up to defend their rights when they are illegally violated. The child is directly strangled in the embryo, making a blind person endure the double "silence" of body and mind. When others thought that everyone, including Yinxia, had forgotten about the incident, Yinxia's shouting and unconscious crying after touching the child was tantamount to telling everyone: the harm can be ignored, but it has never been forgotten. Yinxia's irrational "mad" behavior is not abnormal in the sense of pathology, but an inevitable product of social discipline oppression, and an "other" shaped by civilization through power relations. As Foucault pointed out in "Madness and Civilization", "madness" is the reverse side of the definition of "rationality", an "abnormality" constructed by power, used to consolidate the "normal" authority of power (Michel Foucault, 2003). Chanjuan's "screaming and throwing things" late at night, Yinxia's uncontrolled crying in public, these "abnormal" behaviors reveal the hidden trauma, and it is through subverting the definition of "rationality" that the absurdity of the discipline system is exposed.

Conclusion

"Vulgar Land" uses the life narratives of the blind girl Yinxia and the women of Xidu to deeply reveal the operating logic of patriarchy and disciplinary power shackles. The explicit violence of patriarchal directives and body control and the implicit discipline of kitchen ethics and disability discrimination constitute a double shackle, imprisoning women in the power network of family, workplace and public space. However, based on Foucault's theoretical framework of "symbiosis of power and resistance", women have never stopped looking for the possibility of breaking through the cracks of discipline. From Qiu, to Huilan, Chanjuan and Yinxia, women challenged the logic of discipline with different intensities. These seemingly individual experiences actually converge into the common voice of resistance of the female group. They broke through in secret, using madness as an extreme expression of the resistance spectrum, challenging the established gender order and power structure.

This study is the first to systematically apply Foucault's disciplinary theory to the gender analysis of "The Land of the Common People", revealing the dual oppression logic of patriarchy and postcolonial context, and providing an interdisciplinary methodological

example for the study of Malaysian Chinese literature. It not only criticizes the violent nature of patriarchy and disciplinary power, but also affirms the resilience of women in opening up gaps in survival with their bodies and discourses. Its significance goes beyond the field of literature and provides inspiration for the struggle for gender justice in the global South - only by revealing the operating logic of the double shackles can we find a glimmer of hope in the power game.

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BRIDGING LEADERSHIP AND LANGUAGE: EXPLORING TRANSFORMATIONAL LEADERSHIP PRACTICES IN LANGUAGE EDUCATION

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Abstract: *This study investigates the relationship between transformational leadership and language education in Malaysian universities, focusing on the activities of academic leaders, such as deans of faculties, and the perceptions of language educators regarding these practices. At a time when higher education institutions encounter growing pressures to internationalise and improve English language instruction, academic leadership is crucial to influencing policy, pedagogy, and faculty development. The research, informed by Bass and Avolio's (1994) transformational leadership theory, focuses on four principal dimensions which are idealised influence, inspiring motivation, intellectual stimulation, and personal consideration. A qualitative study approach: semi-structured interviews were performed with language educators from several faculties at designated Malaysian public universities. The research examines the influence of leadership on curriculum development, instructional methods, and the professional advancement of educators in English language teaching. Initial findings suggest that educators value leaders that convey a distinct academic perspective, promote pedagogical innovation, and participate in constructive professional discourse. This study enhances the existing literature on academic leadership within higher education, especially in multilingual and multicultural environments. It is designed for academic leaders aiming to enhance language instruction via transformative methodologies. Essential recommendations include fostering collaborative decision-making, enhancing faculty development programs; and aligning leadership strategies with the evolving needs of language educators. The outcomes of this study go beyond Malaysian higher education institutions to other places where language learning and academic leadership meet.*

Keywords: *Transformational, Leadership, English, Language, Educators*

Introduction

In a period characterised by swift globalisation and heightened demand for English language skills, Malaysian higher education institutions face mounting pressure to internationalise their curricula and enhance language instruction (Yun, 2022). Within this context, academic leadership is essential for influencing institutional strategies, fostering pedagogical innovation, and enhancing faculty professional development (Li, 2024). Universities face intricate challenges in multilingual and multicultural learning environments, leading to the recognition of transformational leadership as a crucial approach for facilitating educational change

(Vromans et al., 2023). Transformational leadership, as established by Bass and Avolio (1994), encompasses four dimensions: idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration. These dimensions cultivate a leadership culture that empowers educators, encourages innovation, and improves institutional effectiveness.

Recent research has confirmed the significance of transformational leadership in promoting educational resilience and innovation. Yusuf and Ismail (2024) demonstrate that transformational leadership enhances educators' readiness for change, particularly in adapting their pedagogical approaches in language teaching. Lei et al. (2024) illustrate that transformational leadership fosters the establishment of Professional Learning Communities (PLCs), which are essential for promoting collaborative learning and reflective practice among educators in vocational institutions. Transformational leadership also improves innovation performance among university academic staff members by fostering a motivational climate and an innovation-oriented culture, which is pertinent to a country's education sector (Zhang, 2024). Such evidence highlights the wider relevance of transformational leadership principles in higher education, particularly within the context of language education.

Despite the increasing volume of literature, there remains a paucity of research examining the perception and enactment of transformational leadership specifically within language education faculties in Malaysian public universities (Zulkifly et al., 2022). The present investigation seeks to address this gap by exploring the leadership practices of academic leaders, including deans, and their impact on curriculum development, instructional strategies, and the professional growth of English language educators (Mgaiwa, 2023).

By contextualising transformational leadership within the realm of language instruction, this analysis contributes to the existing literature on academic leadership in higher education. The findings provide evidence-based recommendations for academic leaders aiming to improve the quality of English language education. Key strategies include promoting collaborative decision-making, enhancing faculty development programmes, and aligning leadership approaches with the evolving needs of language educators. Although centred on the Malaysian context, these insights have broader implications for other multilingual and multicultural educational environments where effective leadership is crucial for strengthening language learning and teaching quality.

Employing a qualitative methodology, this study utilises semi-structured interviews with language educators from selected Malaysian public universities to gain insight into the intersection of leadership and language pedagogy. Initial findings indicate that educators appreciate leaders who communicate a distinct academic vision, promote pedagogical innovation, and engage in substantive professional discussions. Conversely, ineffective or absent leadership is associated with stagnation in teaching practices and diminished educator motivation.

Literature Review

This literature review summarises the body of research on transformational leadership and its use in higher education, with an emphasis on language instruction in Malaysian public universities in response to the increasing demands of globalisation and the growing importance of English language proficiency. This review emphasises the crucial role that transformational

leadership plays in promoting educational innovation, collaborative professional practice, and institutional effectiveness by critically analysing theoretical underpinnings and contemporary empirical data. It frames the justification for the current study by pointing out gaps in the existing literature, particularly with regard to the use of transformational leadership in multilingual and multicultural language teaching situations.

Globalisation, English Language Requirements, and the Malaysian Higher Education Landscape

English proficiency has become an essential skill for students in non-native environments, such as Malaysia, due to the increased demand for it brought about by the fast pace of globalisation (Yaccob et al., 2022). Higher education institutions in Malaysia are under growing pressure to modernise their language programs, broaden their course offerings to include more global perspectives, and produce graduates who can compete in the global job market. Particularly in language education departments marked by multilingual and multicultural dynamics, universities have been reevaluating their institutional policies, instructional techniques, and faculty development programs in response to this need (Lekhala, 2024).

The Function of Academic Leadership in Higher Education

As the environment continues to transform, strong academic leadership is necessary to facilitate institutional change and to build educational resilience. According to Grajfoner et al. (2022), influential academic leaders have a significant impact on strategic directions, instructional innovation, and the professional advancement of faculty members. Effective leadership in multicultural and multilingual learning contexts requires adaptable and context-sensitive methods to meet the diverse needs of both students and educators (Mahmoud et al., 2024).

Transformational Leadership: Theoretical Foundations

Transformational leadership, which was initially developed by Bass and Avolio (1994), is a comprehensive paradigm that facilitates constructive organisational transformation. Four critical dimensions constitute this methodology: idealised influence, in which leaders act as role models; inspirational motivation, which involves articulating a compelling vision; intellectual stimulation, which encourages creativity and improves problem-solving skills; and individualised consideration, which is tailored to the specific requirements of followers. These attributes cultivate a leadership culture that enhances institutional success, encourages innovation, and motivates educators.

Empirical Evidence Regarding Transformational Leadership in Education

The value of transformational leadership in different types of educational settings has been supported by recent research. According to Gaspersz (2024), transformational leadership makes teachers more adaptable to change, which is particularly useful when it comes to changing how languages are taught. This finding is in line with what Windasari et al., (2025) found, which is that transformational leaders play a crucial role in fostering PLCs, which in turn improve vocational school teachers' ability to work together and reflect on their teaching. According to Yu and Xiang (2024), university staff members' innovation performance is improved by transformational leadership because it fosters a motivational atmosphere and

culture that is focused on innovation. These studies emphasise the necessity of transformative leadership in sustaining educational resilience and encouraging innovation.

Transformational Leadership in Language Education

There is a lack of research on the implementation of transformational leadership in language education faculties in Malaysian public institutions, despite the expanding literature on the topic. According to Ogbonnaya et al. (2020), understanding how academic leaders apply notions of transformational leadership to support English language educators is crucial in light of the unique challenges faced by academic settings with students from various language and cultural backgrounds. Leadership practices have a direct impact on the quality of education and student outcomes (Lamcja, 2022) because of their influence on curriculum development, instructional techniques, and faculty professional advancement.

Research Deficiencies and the Necessity for Contextualised Research

The lack of context-specific research indicates the necessity for empirical studies examining the perception and practice of transformational leadership within Malaysian language education faculties. This investigation can reveal the intricate ways in which leadership affects educators' teaching methods, motivation, and professional growth. This study addresses the existing gap, contributing to the broader conversation on academic leadership and offering evidence-based recommendations to enhance English language instruction in Malaysia and comparable multilingual educational settings.

Table 1: Results of Studies Related to Transformational Leadership and Language Education

Author	Year	Title	Result
Reinders & Chong	2025	Conceptualizations of and research on language teacher leadership: A scoping review	The analysis suggests that language teacher leadership is under-theorized, with most research focusing on informal educational responsibilities rather than formal managerial roles. The authors call for more defined frameworks for transformational leadership.
Hou, Ahmad & Zhao	2025	Transformational leadership in K12 private schools in China	The study found that transformational leadership by principals encourages instructional innovation among teachers by presenting a clear vision, encouraging initiative, and facilitating professional growth. This leads to increased creativity and experimentation with new pedagogical techniques, including language training.
Yusuf & Ismail	2024	The influence of transformational leadership and readiness for change on language educators'	The study reveals that transformational leadership significantly improves educators' readiness to adapt to change and maintain their commitment to their profession. It also highlights the importance of prioritizing individual needs and motivating teachers. The study recommends that Malaysian Technical

		workplace commitment in Malaysian technical university network (MTUN)	University (MTUN) language center and faculty leaders undergo leadership training to enhance their abilities and provide better support.
Manueke & Tung	2024	The implementation of transformational leadership and teacher work engagement on increasing number of students	The study found that transformational leadership increases teachers' involvement, leading to more students enrolling and staying in school. It also suggests that language educators can benefit from this leadership style. The study highlights the importance of acting as a role model and fostering new ideas and problem-solving.
Abuhassira, Razak & Hoque	2024	The impact of transformational leadership on classroom interaction in UAE secondary schools.	The study suggests that transformational leadership from department heads can improve classroom interactions between teachers and students, leading to more student-centred dialogues and increased engagement. Trust and empowerment from superiors can also enhance these outcomes, particularly in language classrooms.
Carrington, Park, McKay, Saggars, Harper-Hill & Somerwil	2024	Evidence of transformative leadership for inclusive practice	Transformational leadership by educators and school administrators can enhance inclusivity for students with disabilities and varied learning needs. This involves enhancing confidence in experimenting with new pedagogical approaches, establishing strong connections, and collaborating in coaching, partnerships, or community groups. Collaborative learning helps re-evaluate outdated concepts and transforms students' capabilities.
Heenan, Laferty & McNamara	2024	An applied approach to transformational leadership for whole school communities: Perspectives of primary school and system leaders.	The research suggests that transformational leadership is most effective when distributed across the school community, rather than relying on a single leader. This collaborative approach fosters respect and motivation among teachers, preventing burnout and staff turnover. The study recommends implementing a distributed leadership model in language departments to create a stronger, more supportive team.
Rashid & Wahab	2024	Transformational leadership practices of headmasters in forming the	The study reveals that transformational leadership by headmasters improves teacher quality, enhancing motivation, pedagogical abilities, and collaborative teamwork. It suggests implementing policies and training

		quality of teachers in Transformation Schools 2025	programs to develop these competencies, especially beneficial for language educators, as it can boost pedagogical practices and job satisfaction.
Sliwka, Klopsch, Beigel, & Tung	2023	Transformational leadership for deeper learning: Shaping innovative school practices for enhanced learning	The study reveals that transformational leadership in educational institutions promotes deeper, project-based learning, encouraging interdisciplinary teaching approaches like Content and Language Integrated Learning (CLIL). This approach boosts educators' confidence in exploring innovative pedagogical methods, and emphasizes the importance of transparent communication between administrators and teachers.

Research Gap

Recent research indicates that transformational leadership positively impacts teacher motivation, engagement, and school innovation; however, the majority of studies concentrate on general education contexts, neglecting the specific circumstances of language education. Although some studies address language teacher leadership, they primarily characterise it as informal and pedagogical, with infrequent connections to transformational leadership models. There is not much research looking at how transformational leadership affects the work and teaching methods of language educators, especially in diverse and multilingual classrooms. Furthermore, there is limited understanding of how language educators perceive and implement transformational leadership in ways that connect pedagogy, culture, and overarching language objectives. In particular, there is a lack of research that specifically addresses transformational leadership within the context of higher education, where language educators face unique institutional and cultural dynamics. This gap shows that there is a need for specific research to understand how transformational leadership can help language educators take on leadership roles in and out of their classrooms and create better guidelines that support effective and relevant leadership practices among academic leaders in language education.

Research Questions

- 1) How do academic leaders' transformational leadership practices influence language educators' instructional approaches in language education settings?
- 2) How can language educators' motivation, engagement, and development mediate between transformational leadership and language educators' instructional approaches?

Research Methodology

The following topics will be covered in this section: the study design, the research questions, the participants, the data collection, the interview methodology, and the importance of ethical issues. The research framework that has been suggested for this study is shown below.

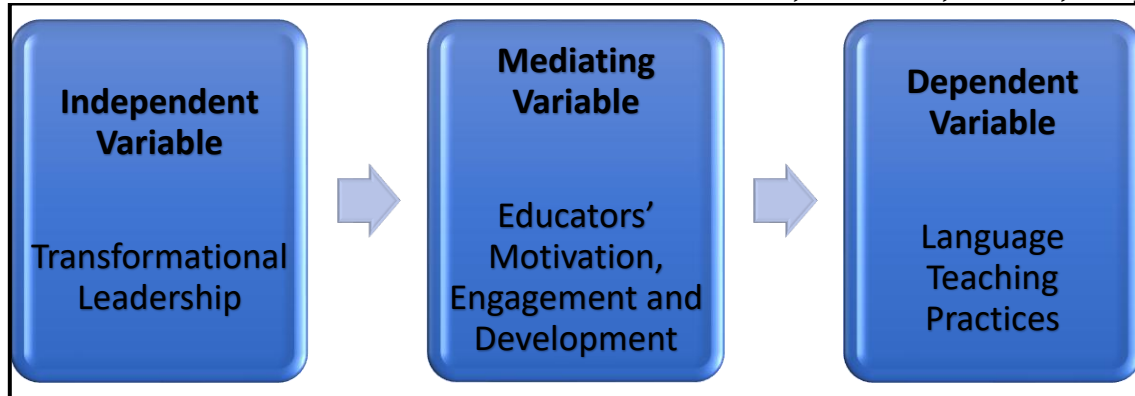


Figure 1: Proposed Research Framework

Research Design

This study will use a qualitative research approach to better understand how transformational leadership practices impact language teaching and shape educators' motivation, engagement, and professional growth. This methodology effectively captures nuanced insights, subjective judgements, and contextual elements that quantitative approaches may neglect (Creswell & Poth, 2018). This research uses non-numerical data to capture participants' experiences, perceptions, and contextual factors, with the overarching goal of providing deeper, more contextualised insights by concentrating on language educators' perceptions and experiences at universities.

Participants and Sampling

Twelve language educators working at the higher learning institutions will take part in the study. A total of 12 participants is appropriate for a qualitative case study aiming to explore in-depth experiences while allowing for thematic analysis (Creswell & Poth, 2018). Individuals with a minimum of ten years of teaching experience who are able to thoughtfully consider the ways in which transformational leadership strategies have impacted their practice will be chosen. Experienced educators, who are defined as individuals who have worked in the industry for more than 10 years, have a higher level of competency in comparison to their counterparts who have less experience (Graham et al., 2020). The study will utilise a purposive sampling method by selecting experienced language educators who can provide relevant and in-depth insights into transformational leadership and teaching practices. Purposive sampling is appropriate for qualitative research because it allows researchers to select participants who can best help them understand the research problem and the phenomenon under study (Creswell, 2012). Purposive sampling enhances the alignment of the sample with the research goals and objectives; hence, it augments the rigour of the study and the reliability of the data and findings (Campbell et al., 2020). The data collection and interview procedure are illustrated in the following flowchart.

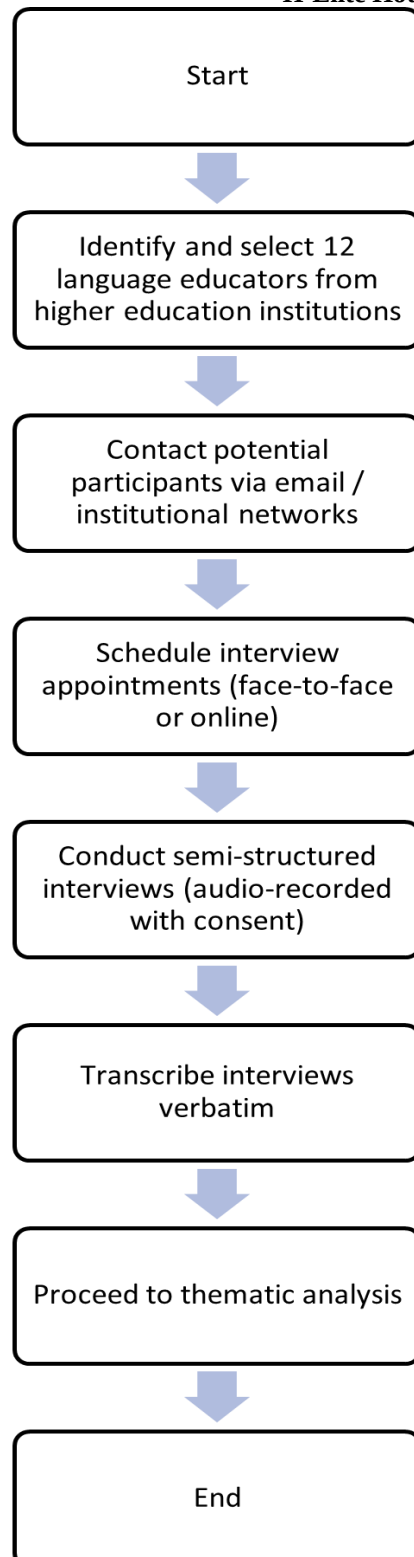


Figure 2: Flow Chart of the Data Collection and the Interview Management Process



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Data Collection

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Data will be gathered using semi-structured interviews, allowing participants to express their experiences while ensuring comprehensive examination of critical aspects pertaining to transformational leadership, motivation, engagement, professional growth, and pedagogical approaches. The semi-structured interview is superior to other interview formats in qualitative research since it enables researchers to acquire comprehensive information and evidence from participants while maintaining the study's focus. It also offers researchers the flexibility and adaptability to maintain their focus, unlike an unstructured interview where the direction is not well considered (Kakilla, 2021). Interviews will be held either in person or online, depending upon each participant's desire and availability. Upon obtaining permission, all interviews will be audio-recorded and transcribed precisely to guarantee a precise depiction of participants' perspectives.

Data Analysis

The data will be analysed using thematic analysis, following Braun and Clarke's six-phase framework. Theoretical freedom in thematic analysis offers a flexible and effective research tool, capable of yielding a rich, detailed, and complex account of data (Braun & Clarke, 2006). This process will involve familiarising with the data through repeated reading, generating initial codes, searching for themes, reviewing and refining these themes, and finally producing a detailed narrative supported by direct participant quotes.

Ethical Considerations

All stages of this study will be guided by ethical principles. All participants will provide informed consent, with assurances given regarding the confidentiality and anonymity of their responses. Participants will be told they can leave the study at any time without penalty. All data will be stored securely and managed in accordance with the ethical standards.

Results

This section delineates the results from the semi-structured interviews about transformational leadership, educators' motivation, engagement and development, and language teaching practices.

Interview Questions

1. How has the leadership style of your academic leader affected your lesson planning and delivery of language classes? Are there any particular instances you could provide?
2. In what ways do your motivation, professional engagement, or opportunities for development impact how leadership influences your teaching methods or strategies?

The following are excerpts from interviews conducted with the research participants.

Table 2: Interview Excerpts

Participant	Question 1: Impact of Leadership Style on Lesson Planning and Delivery	Question 2: Influence of Motivation, Engagement, or Development Opportunities on Teaching Strategies
P1	"My leader models excellent leadership. This inspires me to raise the quality of my lesson content." (Idealized Influence)	"Having regular access to professional workshops boosts my confidence and encourages innovation." (Intellectual Stimulation)
P2	"She often challenges us to rethink our delivery methods, leading me to adopt more student-centred approaches." (Intellectual Stimulation)	"His recognition of our efforts keeps me engaged and more willing to experiment with new teaching methods and strategies." (Inspirational Motivation)
P3	"Our dean encourages collaboration, which has led me to co-develop curriculum structure or lesson plans." (Inspirational Motivation)	"When I feel supported and valued, I naturally put more effort into refining my teaching techniques." (Individualized Consideration)
P4	"He leads by example, always reflecting on teaching practice which pushes me to be more critical of my own methods." (Idealized Influence)	"Leadership that encourages ongoing learning fuels my motivation to implement research-based strategies." (Intellectual Stimulation)
P5	"She believes in our autonomy, so I've felt more confident customizing lessons to my students' needs." (Individualized Consideration)	"I'm more proactive in pursuing training when I see our leaders investing in our growth." (Inspirational Motivation)
P6	"His open-minded policy makes it easier to discuss new teaching ideas and integrate them into my lessons." (Individualized Consideration)	"Feeling appreciated and involved keeps me mentally engaged and reflective about my teaching methods." (Idealized Influence)
P7	"We're encouraged to use technology in lessons, which has changed the way I plan and assess learning." (Intellectual Stimulation)	"Opportunities for professional development have deepened my teaching practices and classroom innovations." (Intellectual Stimulation)
P8	"Her passion is exemplary. I started integrating more creative elements into my language classes." (Inspirational Motivation)	"Knowing our leader supports experimentation allows me to try flipped classrooms and peer teaching." (Intellectual Stimulation)
P9	"He always emphasizes ethical teaching. These influences how I handle sensitive cultural content." (Idealized Influence)	"Being part of curriculum development teams has increased my ownership over teaching outcomes." (Inspirational Motivation)

P10	"I'm often asked for input on university policies. That inclusion motivates me to align my teaching with departmental goals." (Individualized Consideration)	"When I attend leadership-supported conferences, I come back with ideas I can apply immediately." (Intellectual Stimulation)
P11	"Our leader uses storytelling to share best practices in classroom. This has influenced how I design lessons around narratives." (Inspirational Motivation)	"I feel energised to try new approaches when my contributions are acknowledged publicly." (Idealized Influence)
P12	"Weekly check-ins keep me accountable and help me refine my lesson planning progressively." (Individualized Consideration)	"It's the mentorship that really drives me to push the boundaries of traditional language teaching." (Individualized Consideration)

Data Analysis and Discussion

This section presents the thematic analysis of the interview's findings. This thematic analysis focusses on twelve interview excerpts, which are based on Bass and Avolio's Transformational Leadership Theory (1994) which centred around the two interview questions. The study is organised by significant themes identified in participants' responses, accompanied by illustrative extracts and a discussion of their relevance for teaching in language contexts in higher education.

Thematic Analysis of Participants' Interview Responses

This section provides a thorough analysis of interview data collected from language educators in higher education, emphasising their perspectives of the impact of transformational leadership on their teaching methods. Through thematic analysis, reoccurring patterns and principal themes were discerned from participants' responses to comprehend the influence of transformational leadership on lesson preparation, instructional practices, and professional development. The analysis is guided by Bass and Avolio's Transformational Leadership Theory (1994), particularly the four core components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. The leadership approaches that are emphasised here have a significant impact on the motivation, engagement, and development of language educators. The following table shows thematic analysis of the interview's responses.

Table 3: Thematic Analysis of Interview Responses

Theme	TL Component	Description	Interview Quotes	Discussion
Theme 1: Leadership Inspires Professional Excellence	Idealized Influence	A large number of participants cited their leaders as inspirational figures who set a good example in	• "My leader models excellent leadership. This inspires me to raise the quality	Leaders may have a positive, idealistic impact on their followers, which is a promising sign for

		the classroom and beyond.	<i>of my lesson content.” (P1)</i> • <i>“He leads by example, always reflecting on teaching practice which pushes me to be more critical of my own methods.” (P4)</i>	a more honest and introspective classroom. Educators who emulate their leaders' dedication enhance the quality of class preparation and delivery.
Theme 2: Motivation through Vision and Recognition	Inspirational Motivation	Participants discussed how visionary leadership and consistent support promote sustained engagement and creative risk-taking in the classroom.	• <i>“Her passion is exemplary. I started integrating more creative elements into my language classes.” (P8)</i> • <i>“His recognition of our efforts keeps me engaged and more willing to experiment with new teaching methods and strategies.” (P2)</i>	Leaders who express clear objectives, exhibit excitement, and recognise contributions effectively cultivate intrinsic motivation in language instructors. Such motivation leads to enhanced creative teaching methodologies and more student-centredness.
Theme 3: Cognitive and Pedagogical Growth via Intellectual Stimulation	Intellectual Stimulation	Participants often noted that leadership stimulated their critical thinking and encouraged the exploration of innovative pedagogical methods.	• <i>“We’re encouraged to use technology in lessons, which has changed the way I plan and assess learning.” (P7)</i> • <i>“Leadership that encourages ongoing learning fuels my motivation to implement research-based strategies.” (P4)</i>	Transformational leaders who advocate for innovation and critical thinking empower educators to move beyond conventional methodologies. Intellectual stimulation is essential for modernising language instruction in higher education.
Theme 4: Personalised	Individualized Consideration	Educators placed a high emphasis on	• <i>“She believes in our autonomy,</i>	Transformational leaders who

Assistance	individualised	<i>so I've felt more</i>	demonstrate
Boosts	help, mentorship,	<i>confident</i>	genuine concern
Teaching	and the ability to	<i>customizing</i>	and provide
Confidence	modify classes to	<i>lessons to my</i>	personalised
	meet the	<i>students' needs."</i>	support enhance
	requirements of	(P5)	educators'
	their students.	• <i>"It's the</i>	confidence,
		<i>mentorship that</i>	agency, and
		<i>really drives me</i>	ownership in their
		<i>to push the</i>	teaching practices.
		<i>boundaries of</i>	This results in
		<i>traditional</i>	increased
		<i>teaching."</i> (P12)	flexibility and
			responsiveness in
			lesson delivery.

Research Questions 1

How do academic leaders' transformational leadership practices influence language educators' instructional approaches in language education settings?

The findings demonstrate that transformational leadership practices significantly shape language educators' instructional approaches in higher education. Through idealized influence, academic leaders act as ethical role models and set high professional standards, which inspire educators to reflect on and elevate the quality of their teaching (Bass & Avolio, 1994). Inspirational motivation, expressed through clear vision and encouragement, fosters creativity and commitment among educators, leading them to adopt more student-centred and engaging teaching strategies (Bass, 1985; Bass & Riggio, 2006). Additionally, intellectual stimulation prompts educators to challenge conventional methods and incorporate innovative practices, such as integrating technology and critical thinking tasks into their lessons (Bass & Avolio, 1994). Lastly, individualized consideration, where leaders provide personalized support and mentorship, empowers educators to tailor instruction based on learners' needs and their own teaching philosophy. Overall, transformational leadership creates a professional climate conducive to reflective, adaptive, and research-informed instructional practices.

Research Question 2

How can language educators' motivation, engagement, and development mediate between transformational leadership and language educators' instructional approaches?

The motivation, engagement, and access to professional development of educators serve as mediating factors connecting transformational leadership and instructional practice. Acknowledgement of teachers' efforts and the provision of meaningful growth opportunities by leaders enhance educators' motivation and foster a deeper sense of professional purpose (Ryan & Deci, 2000). This intrinsic motivation prompts educators to investigate innovative teaching methods and consistently enhance their strategies. Leadership-supported professional development improves educators' skills and confidence, increasing their willingness to innovate and engage in instructional risks (Day & Gu, 2007). Furthermore, when teachers

perceive value and support, indicating the leader's individualised consideration, they exhibit increased engagement, resulting in more thoughtful, responsive, and student-centred teaching (Bass & Riggio, 2006). Transformational leadership does not impose change directly; instead, it stimulates educators' intrinsic motivation and enhances their capacity for professional growth, subsequently influencing their teaching methods.

Conclusion

This study emphasises the important influence of transformational leadership on the instructional methods employed by language educators in higher education. Based on Bass and Avolio's (1994) transformational leadership theory, the findings indicate that leadership practices defined by idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration have a positive effect on educators' planning and delivery of language instruction. Academic leaders who exemplify professional excellence, foster a collective vision, promote innovation, and offer individualised support enhance a culture of reflective, student-centred teaching (Bass & Riggio, 2006). The study demonstrates that educators' motivation, engagement, and access to professional development are significant mediators in this relationship. Support and professional valuation of teachers increase their likelihood of adopting innovative and effective instructional strategies. Transformational leadership cultivates a professional environment that empowers educators to develop, reflect, and refine their pedagogical practices, consequently enhancing the overall quality of language education in higher education contexts.

Research Implications

This study's findings hold major implications for leadership practices, faculty development, and language education within higher education institutions. Academic leaders must acknowledge the importance of implementing transformational leadership behaviours, especially those related to vision sharing, fostering innovation, and providing personalised mentoring, as these have demonstrated a positive impact on educators' instructional practices (Bass & Avolio, 1994; Bass & Riggio, 2006). Institutions ought to allocate resources to leadership training programs that develop these attributes in department heads and academic administrators, thereby fostering a more supportive and motivating teaching environment.

Furthermore, the research emphasises the mediating roles of teacher motivation and professional development in promoting instructional change. Higher education institutions must provide language educators with consistent access to professional development opportunities, including workshops, peer collaboration, and conference participation, to improve their confidence and teaching effectiveness. Acknowledging and rewarding educators' contributions can enhance their engagement and promote innovation in the classroom.

These findings indicate that transformational leadership serves as both a management strategy and a catalyst for pedagogical enhancement. Integrating leadership practices that prioritise institutional objectives along with individual educator development can enhance the dynamism, student-centredness, and effectiveness of language instruction in higher education settings.

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IMPACT OF GREEN FINANCE ON CARBON EMISSIONS: EMPIRICAL ANALYSIS BASED ON CHINESE PROVINCIAL PANEL DATA

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Abstract: *In recent years, while China's economy has maintained rapid growth, issues such as excessive resource consumption and environmental pollution—particularly carbon emissions—have become increasingly prominent. The challenge of achieving sustainable development in emerging economies has sparked considerable debate. In order to promote high-quality economic growth, reducing carbon emissions has become a top priority for China. Green finance has developed rapidly in recent years and has received broad support at the national level. It encompasses various forms such as green bonds, green investments, and green loans, and plays a key role in channeling funds into environmentally friendly projects. This study analyzes panel data from 30 Chinese provinces and municipalities between 2011 and 2021 to investigate the impact of green finance on carbon emissions and its underlying mechanisms. The findings are expected to shed light on the effectiveness of green finance policies across different regions, assess their role in facilitating the transition to a low-carbon economy, and provide valuable insights for policymakers.*

Keywords: *Green Finance; Carbon Emissions; Industrial Structure Upgrading; Technological Innovation; Heterogeneity*

Introduction

Background of Study

Since the reform and opening-up policy, China's economy has expanded rapidly, this growth has been accompanied by significant resource consumption and environmental degradation. Finding a balance between fast growth and protecting the environment is now essential. A notable example is carbon dioxide emissions, which increased from 8.83 billion tons in 2011 to 9.90 billion tons in 2020, a large share of global totals (Harun et al., 2021). In 2020 China told the 75th UN General Assembly that it will peak emissions by 2030 and reach carbon neutrality before 2060; these “30 / 60” goals became formal policy at the 2021 Two Sessions (Xue et al., 2023). Therefore, reducing emissions and transitioning to a low-carbon growth model has become a national priority. Governments worldwide now talk about “green development”, meaning lower resource use, stronger ecosystem protection and balanced social–environment links (Chen et al., 2020). Finance plays a central role in this process, as green finance can facilitate economic growth while reducing carbon emissions, and China has included it in the 14th Five-Year Plan. The 2016 Guiding Opinions on Building a Green Financial System, issued by the People’s Bank of China and six other ministries, describes green finance as funding that puts climate action, cleaner air and efficient resource use first, covering loans, bonds, insurance, funds, trusts and carbon-finance products for projects in environmental protection, energy saving, renewables, green transport and buildings (Wu & Wang, 2022). The total amount of local and foreign currency green loans in China will reach

15.9 trillion yuan by the end of 2021, while the total amount of green bonds issued will be over 600 billion yuan, totaling 1.1 trillion yuan, marking real progress toward the “dual-carbon” goals. Because green finance and carbon emissions are both crucial topics, this paper builds a provincial panel-data model to measure their overall link and to trace how finance influences emissions; it then tests regional differences and robustness and offers policy suggestions. The study’s contributions are that it puts green finance at the centre of the econometric model, digs into the channels—industrial upgrading, technological innovation and others—through which finance may curb emissions, and shows regional differences so that policies can be tailored.

Problem Statement

As climate change worsens, green finance is widely viewed as a key tool for lowering carbon emissions. However, the actual impact of green finance on emission reduction remains insufficiently understood. This study explores how green finance affects carbon output by examining green-finance use and its links to emissions. This study will track the development trajectory of green financial instruments, measure how strongly financial institutions back sustainable projects, and assess the influence of government policies and rules. To do so, we will gather regional data on different green finance products, study their growth patterns, review how banks and other lenders fund green projects and support emission targets, and evaluate whether government measures drive the green finance market and help cut emissions. The objective is to evaluate the effectiveness of green finance in reducing carbon emissions, offer both theory and evidence for its wider use, and provide guidance for better environmental policy, financial strategy and global sustainability goals.

Research Objectives

1. Evaluate the relationship between green finance and carbon emissions.
2. To examine the mediating effect of industrial structure upgrading between green finance and carbon emissions.
3. To investigate the mediating effect of technological innovation in the relationship between green finance and carbon emissions.
4. To examine the heterogeneity of the impact of regional green finance development on carbon emissions.

Research Questions

1. Is there a relationship between green finance and carbon emissions?
2. Does industrial structure upgrading have a mediating effect between green finance and carbon emissions?
3. Does technological innovation have a mediating effect between green finance and carbon emissions?
4. Is there regional heterogeneity in the development of green finance for carbon emissions?

Significance of the Study

As global climate change worsens, finding effective ways to cut carbon emissions is vital. Green finance, which channels funds into environmentally friendly projects, is now seen as a major force for tackling climate change and building a low-carbon economy. Examining the

impact of green finance on carbon emissions provides insights into its effectiveness, helps policymakers direct resources and refine green-finance rules, and clarifies how finance drives emission cuts so that more precise tools and incentives can be designed. This is crucial for meeting China's "dual-carbon" targets and the UN Sustainable Development Goals. Green finance also spurs technological innovation and industrial upgrades, links economic growth with environmental protection, and gives fresh momentum to building an ecological civilisation in China and worldwide.

Literature Review

Literature Research on Green Finance

The idea of "green finance"—also called low-carbon, environmental-protection, or sustainability finance—first appeared in 1991 and approaches finance from the perspective of environmental responsibility. Early papers used "environmental finance" more often; for example, the United Nations Environment Programme issued its "Statement by Banks and Insurance on Sustainable Development" in 1992, and Salazar (1998) framed "environmental finance" by comparing financial and environmental fields (UNEP; Gilbert & Zhou, 2017). Chinese studies also use the terms environmental or sustainability finance (Ozili, 2022). The first official definition came in the 2016 "Comprehensive Report on G20 Green Finance," which called green finance the use of financial activity to create environmental benefits and support sustainable development, a view echoed by Labatt and White (2002), who said it uses market forces to improve the environment and spread risk. Recent Chinese scholarship offers new perspectives: Tao et al. (2022) recommend linking fiscal and financial tools for low-carbon investment; W. Zhang et al. (2022) find China's green-credit policy should be mandatory and tied to lower rates, risk weights and bad-loan ratios; Li and Umair (2023) describe how funds, bonds and loans are used against climate change; Yin and Xu (2022) suggest green loans, bonds and asset securitisation to cut the high funding costs of green firms.

Literature Research on Carbon Emissions

Many studies at home and abroad have explained and measured carbon emissions and carbon intensity. Wang and Yan (2022) used factor analysis to break carbon-intensity changes into population, GDP, energy intensity and regional wealth. Other work measures sector-level carbon output (Xu et al., 2022; Zhu, 2022b). The exponential-decomposition method is most common: Zhao et al. (2022) used a compressed three-layer model to attribute CO₂ from eight fuels across six sectors. Several studies employ Granger causality analysis and find population growth drives emissions but the two are not cointegrated in the long run (Ortega-Ruiz et al., 2022). Y. Zhang et al. (2022) traced China's historical emissions from eight fossil fuels such as coal and coke. Policy, urbanisation and demographic structure also shape emissions.

Literature Review on the Impact of Green Finance on Carbon Emissions

Research at home and abroad shows that if financial institutions help real-sector firms shift onto a low-carbon path, carbon-emission goals can be met. Scholars argue that green finance can curb illegal production, raise energy efficiency and cut greenhouse gases (Zhou, 2022). Michaelowa et al. (2019) find that larger green-finance markets support a low-carbon economy and make progress more durable. Analysing China, Wan and Sheng (2022) report that environmental quality depends on economic growth, energy use and finance, with financial

development lowering pollution. Doğanlar et al. (2021) show for Turkey that rapid financial development reduces energy use in early growth. Zakari et al. (2022) say green finance links finance and environmental protection and should boost green industry, industrial upgrading and green technology to improve the energy mix. Irfan et al. (2022) argue that green finance transfers environmental risk and raises environmental quality. ElAlfy et al. (2020) state that banks must include environmental protection in decisions. Using green-investment and green-insurance data, Bai et al. (2022) find that stronger green finance cuts China's CO₂ emissions, though the size of the effect is unclear. Zhou et al. (2020) also see a significant, negative link. Li et al. (2022) calculate provincial green-finance and low-carbon indexes and, with a PVAR model, show that in the East and Centre green finance and the low-carbon economy reinforce each other, unlike in the West. Qian et al. (2021) find that finance combined with environmental laws greatly improves urban environmental performance without hurting growth and pushes a green economic shift. Yet whether green-finance growth can sharply reduce emissions under the “dual-carbon” target, how it works and what the influence chain looks like remain open questions. To fill these gaps, this paper uses panel data for 30 Chinese provinces and cities to study how green finance affects carbon emissions through industrial upgrading and technological innovation.

Research Methodology

Variables Description

Dependent Variables: Carbon Emissions

As carbon emissions cannot be directly counted at present, and carbon emissions mainly come from fossil fuel combustion, this paper, therefore, adopts the factor decomposition method for carbon emissions estimation, which is as follows:

$$C_{it} = \alpha C_{ic} + \beta C_{io} + \gamma C_{ig}$$

Equation (1) Measurement of Carbon Emissions

where C_{it} is the total carbon emissions of province i , C_{ic} is the annual consumption of coal in province i , C_{io} is the annual consumption of oil in province i and C_{ig} is the annual consumption of natural gas in province i ; and α , β and γ are the conversion coefficients of carbon emissions from the combustion of the three types of fuels. In this way, the carbon emissions of each province can be obtained, and then divided by the corresponding population of each province each year to obtain the per capita carbon emissions. To eliminate the effect of heteroscedasticity, the per capita carbon emissions take the natural logarithm (Zeng & Wang, 2023; Zhao et al., 2022; Zheng et al., 2022).

Independent Variable: Green Finance

There is still no single official indicator for green finance. Although green bonds and carbon finance have grown quickly, Chinese green finance is still dominated by green loans, and existing indicators cover only parts of its development. The “Guiding Opinions on Building a Green Financial System” issued by seven ministries, including the People's Bank of China, state that green finance should feature green credit, green investment and green insurance, with credit and investment being most important. To give a fuller picture, this study builds a composite index using four dimensions—green credit, green insurance, green investment and green support—to measure regional green-finance development. Green credit reflects policy,

agricultural-insurance volume indicates green insurance, green investment shows the financial sector's role in green development, and green support captures government backing. The index weights are set by the entropy method.

Control Variables

Earlier research shows that living standards, the energy mix, urban population and government actions strongly affect carbon emissions. To limit heteroskedasticity and autocorrelation, this study adds several controls. Per-capita GDP captures economic size; a high share of coal-fired power in China signals that coal is the main fossil fuel (eng), though it has lower heating value and higher pollutant content than cleaner fuels such as natural gas or hydrogen. The urbanisation rate (urb) measures the share of people living in cities; high urbanisation brings more labour and ideas, which, with supportive policy, can foster innovation and hasten the shift to low-carbon growth, yet urbanisation can also raise resource use and pollution. Trade openness—total imports and exports as a share of regional GDP, converted to yuan at the annual average exchange rate—is included because external trade and development likewise influence carbon-dioxide output.

Mediating Variables

To study how green finance affects carbon emissions, this paper uses industrial-structure upgrading and technological innovation as mediators. Green development seeks to cut emissions by improving the industrial mix, reflected here in an index that compares the GDP shares of the tertiary and secondary sectors. Faster technological progress can raise energy efficiency and lower pollution; because growth in green firms and markets drives such progress, innovation is vital. One way to track it is the rate at which environmental patents are granted.

Modelling Design

Benchmark Regression Model

Panel data give larger samples than simple time series, solve multicollinearity, and avoid the bias that ordinary least squares shows in cross-sectional models, so this study builds a panel model using CO₂ and green-finance data for 30 Chinese regions, adds controls such as economic development to cut omitted-variable error, and takes natural logs of the variables to reduce heteroskedasticity, leading to the benchmark regression shown below.

$$Ce_{it} = \beta_0 + \beta_1 Fin_{it} + \beta_2 Controls_{it} + \mu_i + \varepsilon_{it}$$

Equation (2) Basic Regression Model

where subscripts i and t denote regions and years, respectively, the explanatory variable denotes the carbon emissions of the i region in year t , the explanatory variable denotes the level of green finance in the i region in year t , is a control variable, is a region fixed effect, and is a possible random error term.

Mediation Model

The improvement of China's industrial structure and technical advancement impact China's carbon emissions, according to the theoretical process examined in the preceding section. Consequently, the next mediation effect model is created (Gan & Voda, 2023; Ran et al., 2023; Zhu et al., 2022).

$$Med_{it} = \beta_0 + \beta_1 Fin_{it} + \beta_2 Controls_{it} + \mu_i + \varepsilon_{it}$$

Equation (3) Mediation Effects Model (1)

$$Ce_{it} = \beta_0 + \beta_1 Med_{it} + \beta_2 Controls_{it} + \mu_i + \varepsilon_{it}$$

Equation (4) Mediation Effects Model (2)

Equation (2) shows the effect of the financial index on the mediating variable, where the mediating variable (*Med*) includes industrial structure upgrading (*Str_{it}*) and technological innovation (*Tec_{it}*), and equation (3) shows the green finance, mediating variable put into the same model to estimate the effect on the explanatory variables.

Data Source

Panel data from 30 provinces between 2011 and 2021 (excluding Hong Kong, Macau, and Taiwan, and with Tibet's data missing) were used in the study to ensure temporal consistency and make the most of available data. When it comes to energy, we consult the China Energy Database. In contrast, for green finance and control variables, we consult the "China Environmental Statistics Yearbook," "China Industrial Statistics Yearbook," "China Insurance Statistics Yearbook," "China Statistical Yearbook," and various provincial statistical yearbooks. Information regarding a new green patent application can be found in the National Intellectual Property Database. Interpolation techniques are used to fill in the gaps when necessary, and province statistical yearbooks are consulted for further information. Heteroskedasticity also necessitates the legitimization of some data before entering the model.

Empirical Results and Analysis

This chapter builds upon the theoretical hypotheses (Chapter 2) and research design (Chapter 3) to conduct a multidimensional econometric analysis using panel data from 30 Chinese provinces spanning 2011 to 2021. It systematically evaluates the impact of green finance development on carbon emissions, including its transmission mechanisms and regional heterogeneity. All econometric estimations in this chapter are performed using Stata 18. The core regressions adopt a province fixed effects (FE) model, with robustness checks—based on Driscoll–Kraay standard errors and two-way fixed effects—reported in the Appendix.

Model specification and Estimation Strategy

Baseline Specification

$$\ln CO_{2,it} = \beta_1 GFI_{it} + X_{it} \gamma + \mu_i + \lambda_t + \varepsilon_{it}$$

where denotes the logarithm of per-capita CO₂ emissions, and is the composite Green-Finance Index constructed in Section 3. The control vector comprises the urbanisation rate (URB),

lnGDP, and green innovation lnGI. μ_i and λ_t are province and year fixed effects, respectively. A Hausman test decisively rejects the random-effects specification ($\chi^2 = 78.2$, $p < 0.001$), so the fixed-effects (FE) estimator is employed.

Mediation Framework

Taking green technological innovation (lnGI) as the mediator, the Baron–Kenny three-step procedure is applied:

- (1) GFI → ln GI
- (2) ln GI → ln CO₂ (controlling for GFI).

The indirect effect is further assessed via 5 000 bias-corrected bootstrap replications to obtain confidence intervals.

Regional Heterogeneity

Following China’s National Main Functional Zoning Plan, the sample is split into eastern, central and western sub-groups, and each group is estimated separately.

Robustness Checks

- (i) replacing the core regressor with a noise-filtered, weighted index (w_clean_gfi);
- (ii) using one-period-lagged GFI;
- (iii) excluding provinces with exceptionally high emissions;
- (iv) re-estimating with two-way fixed effects and Driscoll–Kraay heteroskedasticity- and cross-section-robust standard errors.

Benchmark Regression Results

Table 1: Fixed Effect Model Regression Results

Variable	Coefficient	P-value	Significance
Green_Finance_Index	0.0987	0.231	Not significant
Log_Green_Invention_Total	-0.1259	0.006	***
Urban_Rate	0.0004	0.519	Not significant
Gdp (100 Million Yuan)	-3.57e-06	0.006	***
R ² (Within)	0.160		
R ² (Overall)	0.037		
F Statistic, p-Value	2.92, 0.0004		
Number Of Observations	251		

Table 1 reports the fixed-effects estimates. The coefficient on the Green-Finance Index (GFI) is 0.0987 ($p = 0.231$); although positive, it is not statistically significant, indicating that the recent expansion of green finance has not yet translated into a measurable reduction in CO₂ emissions. A plausible explanation is that “green” funds still flow primarily into low-risk bond instruments rather than into projects that deliver genuine abatement benefits. This interpretation is consistent with Wang et al. (2021), who find that Chinese green lending remains scale-oriented and lacks performance metrics linked to emission outcomes.

The coefficient on green technological innovation (ln GI) is -0.1259 and significant at the 1 % level, implying that a 1 % increase in green patents is associated with an average 0.126 % decrease in per-capita CO₂ emissions. The GDP coefficient is likewise significantly negative, suggesting a “growth-with-decoupling” pattern during the sample period, consistent with structural upgrading and energy-efficiency gains; the urbanisation rate (URB) is not significant. The overall F-statistic is 2.92 ($p < 0.01$) and the within R² is 0.1603.

Mediation Analysis

This section applies the Baron-Kenny three-step procedure combined with 5 000 bias-corrected bootstrap replications to test whether green technological innovation (ln GI) mediates the impact of green finance (GFI) on per-capita carbon emissions (ln CO₂). All regressions control for urbanisation, ln GDP, year dummies and province fixed effects. t-statistics are reported in parentheses, and ***, **, * denote significance at the 1 %, 5 % and 10 % levels, respectively.

The Impact of Green Finance on Green Innovation

Table 2: Impact Of Green Finance On Green Innovation

Variable	Coefficient	P-value	Significance
Green_Finance_Index	0.4378	0.000	***
Urban_Rate	-0.0008	0.378	Not significant
Gdp (100 Million Yuan)	3.84e-06	0.048	**
R ² (Within)	0.931		
R ² (Overall)	0.360		
F Statistic, p-Value	224.51, 0.0000		
Number of observations	251		

$$\ln GI_{it} = \alpha_0 + \alpha_1 GFI_{it} + X_{it}\gamma + \mu_i + \lambda_t + \varepsilon_{it}$$

A 0.1-point rise in the Green-Finance Index—roughly 0.9 standard deviations—increases the logarithm of green patents by approximately 0.044 on average. This finding supports the a-priori expectation that green finance facilitates technological progress by channeling capital towards sustainable sectors. In particular, the significantly positive coefficient on GFI suggests that green financial instruments may be successfully incentivizing R&D activities related to energy efficiency, clean technology, and environmental innovation. This result aligns with the notion that financial resources, when guided by green mandates, can stimulate environmentally friendly innovation at the regional level. It also complements findings from Chen et al. (2023), who show that green financing mechanisms enhance corporate investment in low-carbon technologies. In summary, this model confirms that green finance plays a catalytic role in promoting green innovation, which serves as an important transmission mechanism for achieving carbon reduction goals.

The Impact of Green Finance on Per Capita Carbon Emissions

Table 3: Green Finance Affects Carbon Emissions Through Green Innovation

Variable	Coefficient	P-value	Significance
Green_Finance_Index	0.0987	0.231	Not significant

Log_Green_Invention_Total	-0.1259	0.006	***
Urban_Rate	0.0004	0.519	Not significant
Gdp (100 Million Yuan)	-3.57e-06	0.006	***
R ² (Within)	0.160		
R ² (Overall)	0.037		
F Statistic, p-Value	2.92, 0.0004		
Number of Observations	251		

$$\ln CO_{2,it} = \beta_0 + \beta_1 GFI_{it} + \beta_2 \ln GI_{it} + X_{it} \gamma + \mu_i + \lambda_t + \varepsilon_{it}$$

Result Interpretation

After adding the mediator, the coefficient of green finance on $\ln CO_2$ remains 0.0987 and is insignificant ($p = 0.231$), indicating no direct effect. Green innovation still significantly reduces emissions (-0.1259 , $p < 0.01$), and green finance promotes innovation ($+0.4378$, $p < 0.01$). Multiplying these paths yields a negative indirect effect of -0.055 ; the 5 000-replication bias-corrected bootstrap gives a 95 % CI of 0.009–0.068, excluding zero. Since one path is positive and the other negative, this constitutes inconsistent mediation or a suppression effect. This suggests that although green finance drives innovation, the current flow weakens its emission-cutting potential. Effective abatement therefore depends on linking finance more tightly to emission-reduction performance.

Regional Heterogeneity Analysis

Table 4: Impact of Green Finance on Carbon Emissions in the Eastern, Central and Western Regions (Summary Table of the Three-Region Model)

Variable	Eastern Coefficient (P Value)	(P Value)	Median Coefficient (P Value)	(P Value)	Western Coefficient (P Value)	(P Value)
Green_Finance_Index	0.2674 (**)		0.0050 (Not significant)	(Not significant)	0.3564 (**)	
Urban_Rate	-0.0005 (Not significant)	(Not significant)	0.0015 (Not significant)	(Not significant)	0.0017 (Not significant)	(Not significant)
Gdp (100 Million Yuan)	-3.43e-06 (***)		0.0000355 (***)		1.06e-04 (Not significant)	(Not significant)
Log_Green_Invention_Total	-0.3441 (***)		-0.0179 (Not significant)	(Not significant)	-0.0601 (Not significant)	(Not significant)
R ² (Within)	0.647		0.555		0.403	
F Statistic, p-Value	9.94, 0.0000		4.09, 0.0001		1.16, 0.3649	
Number of Observations	99		66		42	

Table 4 reports the group estimates. Eastern region. The Green-Finance Index (GFI) coefficient is 0.2674 ($p = 0.012$) and significantly positive, while $\ln GI$ is significantly negative (-0.344 , $p < 0.01$). This pattern suggests a two-sided mechanism. On the one hand, green-finance flows in the East are large enough to stimulate green innovation, as confirmed by the positive national α_1 coefficient; on the other hand, a substantial share of funds is still channelled into relatively low-risk projects that do not immediately deliver abatement, so the direct effect of GFI on

emissions remains positive. The mature innovation ecosystem nonetheless translates part of the knowledge spill-overs into lower emissions, partially offsetting—but not overturning—the direct increase. Central region. Neither GFI nor $\ln GI$ is significant, indicating that both the green-finance market and the innovation ecosystem are still at an early stage of development, so their influence on carbon emissions is limited for the time being. Western region. The GFI coefficient is 0.3564 ($p = 0.025$) and significantly positive, whereas $\ln GI$ is insignificant. In this region, green-finance funds are largely directed towards infrastructure and resource-extraction projects; because the local innovation base is weaker, the indirect mitigation channel is absent. Consequently, green finance currently raises energy demand and emissions in the West.

Robustness Checks (Table 4-5) Confirm These Findings

Across all robustness specifications, $\ln GI$ retains its negative sign and remains highly significant at the 1 % level, confirming the stability of the innovation-mediated abatement channel. Replacing the core regressor with the noise-filtered index (w_clean_gfi) yields a negligible coefficient of 0.013 ($p = 0.858$); using a one-period-lagged GFI gives 0.081 ($p = 0.192$); and excluding Shanxi and Inner Mongolia leaves a coefficient of 0.077 ($p = 0.221$). In every specification, the indirect pathway $GFI \rightarrow \ln GI \rightarrow \ln CO_2$ remains significant and negative, underscoring the robustness of our main results.

Discussion and Conclusions

Drawing on provincial panel data for 30 Chinese regions from 2011-2021, this study assesses how green finance shapes carbon emissions and through what channel. The fixed-effects model shows that the composite Green-Finance Index (GFI) carries a positive but statistically insignificant coefficient with respect to per-capita CO_2 , indicating that existing green loans, bonds and related instruments remain largely volume-driven and have not yet been priced against abatement performance. By contrast, green technological innovation proves decisive: a 10 percent rise in green patents corresponds to roughly a 1.3 percent decline in per-capita emissions, underscoring the power of technology in decoupling growth from carbon output. Mediation tests reveal a standard positive chain—GFI significantly stimulates patenting, patents significantly lower emissions, and the resulting indirect effect (-0.055, bootstrap-verified) dominates the inconclusive direct term, showing that green finance currently reduces emissions only through the innovation pathway. Spatial patterns are uneven. In the more developed East, large financial inflows initially raise emissions, yet the region's mature innovation ecosystem transforms many of the new patents into measurable abatement, partially offsetting the rise. In the Centre, neither finance nor innovation is yet influential, reflecting an immature market and weak R&D base. In the resource-oriented West, green-finance funds are channelled mainly into infrastructure and extraction, innovation remains ineffective, and emissions increase in the short run. These relationships endure after replacing the finance index with a noise-filtered variant, introducing one-period lags, omitting high-emission provinces and applying two-way fixed effects with Driscoll–Kraay errors, confirming robustness. Policy should therefore push green finance from volume to performance by tying every yuan of credit or bond proceeds to a verifiable quantity of avoided CO_2 , integrate life-cycle carbon metrics into loan screening, price instruments with emission-linked discounts or surcharges, and embed abatement clauses in products such as patent-pledge lending, green ABS and REITs. Regional strategies must diverge: The East can refine ESG disclosure and establish transition-bond

norms; the Centre needs a dedicated green-finance hub and patent interest subsidies to ignite innovation; the West should pair ecological-compensation funds with low-carbon infrastructure bonds to steer capital toward renewables and ecosystem restoration. Enterprises can adopt internal carbon pricing and mandatory ESG reports so that financing costs track real-time performance, while investors reinforce discipline through active ownership and green-index funds. Limitations include the use of provincial aggregates, which obscure firm-level fund flows and verified emissions; residual endogeneity; and the absence of a distinction between end-of-pipe and substitution technologies. Future work can merge bank–firm credit files with audited emissions, exploit quasi-natural experiments such as tighter green-bond rules or carbon-market expansions, and extend the analysis to Belt-and-Road economies to test whether the finance–innovation–abatement nexus holds under different institutional settings. Within a framework that links funding to performance, rewards innovation and tailors policy to regional realities, green finance can become a genuine engine for achieving China’s dual-carbon goals.

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IMPLEMENTING A COMBINED COGNITIVE BEHAVIOURAL THERAPY AND BIOFEEDBACK COUNSELING PROTOCOL: A PILOT STUDY WITH JUVENILE CLIENTS IN A MALAYSIAN REHABILITATION INSTITUTION

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Abstract: *This pilot study was conducted in a Malaysian juvenile rehabilitation institution to address emotional dysregulation and behavioural difficulties commonly observed among adolescent residents with histories of trauma, impulsivity, and poor self-regulation. The main objective was to explore the implementation and effectiveness of a structured counselling protocol that integrates Cognitive Behavioural Therapy (CBT) with Heart Rate Variability (HRV) biofeedback. A qualitative case study design was employed, involving ten male adolescents aged 14 to 17 who participated in eight structured sessions delivered through a multistage process. The intervention began with rapport building and goal setting, followed by CBT-based techniques such as the ABC model, cognitive restructuring, visualization, and imagery rescripting. These were integrated with biofeedback training to help clients observe and regulate physiological responses in real time. Data were gathered through observation, session notes, client journals, and HRV recordings. Thematic analysis revealed key outcomes including enhanced emotional awareness, improved engagement, reduced impulsivity, and increased self-efficacy. Clients demonstrated an ability to link thoughts with emotional and physiological reactions, and gradually applied coping skills in real-life situations. The use of biofeedback significantly increased motivation and insight, particularly among participants who were initially resistant to traditional talk therapy. The combined approach also empowered clients to become more autonomous in managing emotional responses and behavioural challenges. Overall, the study supports the feasibility and clinical potential of integrating CBT and biofeedback in adolescent rehabilitation, offering a holistic method to promote sustainable emotional and behavioural transformation in high-risk youth populations.*

Keywords: *Cognitive Behavioural Therapy (CBT), Biofeedback, Heart Rate Variability (HRV); Juvenile, Counseling*

Introduction

Adolescents residing in juvenile rehabilitation institutions often present with complex emotional, cognitive, and behavioral issues (Shamala & Zain, 2023). Many of these young individuals come from environments marked by trauma, abuse, neglect, or delinquent peer influences, which contribute to emotional dysregulation, impulsivity, and problematic decision-making (Kermen, 2018). In Malaysia, juvenile rehabilitation centres such as Sekolah Tunas Bakti (STB) administered by the Department of Social Welfare serve as corrective institutions that provide structured routines and basic rehabilitation support. However, the psychosocial needs of these adolescents frequently go beyond discipline and structure, requiring targeted and evidence-based therapeutic interventions that promote emotional awareness and behavioral change (Luna et al., 2022; Tran et al., 2017). One such intervention with strong empirical support is Cognitive Behavioral Therapy (CBT). CBT focuses on identifying and modifying maladaptive thought patterns, which in turn influence emotions and

behaviors (Efsthathiou, 2021). It helps clients develop cognitive insight, coping skills, and healthier responses to stressors (Berking et al., 2008; Bomyea et al., 2020; Ekeblad et al., 2023). Among adolescent populations, CBT has demonstrated effectiveness in treating various issues such as anxiety, anger, depression, and conduct problems (Alavi et al., 2018; Butler et al., 2006; Hofmann et al., 2012). Nevertheless, CBT's reliance on verbal processing and cognitive reflection may limit its effectiveness for juvenile clients who struggle with emotional literacy or who are resistant to traditional talk therapy.

To enhance the therapeutic impact of CBT, researchers and practitioners have explored the integration of biofeedback-based approaches, one such method is Heart Rate Variability (HRV) biofeedback, which provides real-time feedback on physiological states and trains individuals to regulate their autonomic nervous system (Heiss et al., 2021). The EmWave device, developed by the HeartMath Institute, is an HRV biofeedback tool designed to help users achieve a state of "coherence," where the heart, mind, and emotions are in synchrony (Whited et al., 2014). Through guided breathing and visual feedback, users learn to self-regulate their physiological responses, thereby improving emotional control and reducing stress and anxiety (NCT05136586, 2021; Rose et al., 2021; Uzun & Yildirim, 2018). When used in combination, CBT and EmWave biofeedback offer a dual approach to counseling to targeting both cognitive distortions and physiological arousal. This integrative model may be particularly beneficial for adolescents in juvenile institutions, as it provides tangible, real-time experiences of self-regulation, alongside reflective and behavioral strategies (Rosaura Polak et al., 2015; Slutsker et al., 2010). Furthermore, biofeedback may increase motivation and engagement in therapy, especially for clients who benefit from visual or interactive elements.

Literature Review

Cognitive Behavioural Therapy (CBT) and Behavioural Change

Cognitive Behavioral Therapy (CBT) was introduced in the 1960s by Aaron T. Beck, who emphasized the influence of distorted thoughts on emotional responses and behavioral outcomes. As a form of psychotherapy grounded in both cognitive and behavioral theory, CBT promotes the idea that changes in thinking patterns can lead to significant improvements in emotions and behaviours (Collard, 2023). Originally developed to treat depression, CBT has since been adapted for a wide range of psychological and behavioral problems, making it one of the most researched and widely applied therapeutic modalities globally. In the context of adolescent behavioral problems, CBT has proven effective in helping individuals recognize and modify maladaptive thought patterns that drive impulsive, aggressive, or delinquent behaviors (Denecke et al., 2022; Nakao et al., 2021). This is especially relevant for youth in juvenile rehabilitation settings, where many exhibit poor emotional regulation, cognitive distortions, and limited coping strategies (Landenberger & Lipsey, 2005; Siemionow, 2020). CBT interventions aim to enhance self-awareness, improve decision-making skills, and promote behavioral accountability qualities often underdeveloped in institutionalized adolescents.

Multiple studies have supported the application of CBT with adolescent offenders. Lipsey, Landenberger, and Wilson (2007), in a comprehensive meta-analysis, concluded that CBT-based programs resulted in significant reductions in reoffending behaviors among juvenile delinquents. The most effective programs integrated structured cognitive interventions with behavioral practice and consistent reinforcement. Similarly, Wilson, Bouffard, and MacKenzie

(2005) highlighted that CBT was more effective than other treatment approaches when delivered with fidelity, particularly in institutional settings where behavior change is a primary goal. In the Southeast Asian context, though local research is less extensive, emerging case studies suggest that CBT-based interventions can positively influence emotion regulation, problem-solving, and interpersonal skills among at-risk Malaysian youth. A variety of core techniques are employed in CBT, each targeting specific cognitive and behavioral mechanisms. One key technique is cognitive restructuring, which teaches clients to identify and challenge irrational beliefs or automatic negative thoughts. For instance, a juvenile client may hold the belief “I’m a failure and nothing will change,” leading to learned helplessness and poor behavioral control. Through CBT, such thoughts are examined and reframed into more realistic alternatives, such as “I have made mistakes, but I can learn to do better.” This process helps reduce emotional reactivity and fosters a sense of self-efficacy.

Another commonly used strategy is behavioral activation, which involves encouraging clients to engage in positive, goal-directed activities that improve mood and reduce avoidance behaviors (Euteneuer et al., 2017; Huguet et al., 2016). This is particularly relevant for adolescents who exhibit low motivation or depressive symptoms. In addition, problem-solving training is often incorporated into CBT with juveniles, enabling them to analyze challenging situations, generate alternative solutions, and evaluate the consequences of different choices—skills that are essential for reducing recidivism and improving peer relationships (Amani et al., 2022; Ngo et al., 2020; Silverman et al., 2019). Other than that, CBT also emphasizes anger management and impulse control techniques, including helping clients recognize physiological signs of anger, identify triggers, and use relaxation strategies such as deep breathing or guided imagery to regulate their emotional responses (Lee & Ahmad, 2017). For adolescents with underdeveloped emotional vocabulary, these strategies are taught through simple language and experiential learning. Lastly, role-playing and social skills training allow clients to rehearse pro-social behaviors in a safe environment, which builds confidence and increases the likelihood of generalization in real-life situations. Despite its many strengths, CBT is not without limitations. In particular, it relies on the client’s ability to engage cognitively and reflectively in the therapeutic process. For some adolescents in juvenile institutions especially those with trauma histories, low attention spans, or learning difficulties traditional CBT may be challenging (Chipalo, 2021; Cohen et al., 2012). This highlights the need to integrate more interactive and somatic methods such as biofeedback to complement CBT and improve treatment responsiveness.

Biofeedback and Emotional Self-Regulation

Biofeedback is a psychophysiological intervention that enables individuals to gain awareness and control over physiological processes typically considered involuntary, such as heart rate, muscle tension, and skin conductance. One of the most commonly used forms is Heart Rate Variability (HRV) biofeedback, which involves training individuals to regulate their heart rhythms through focused breathing, attention regulation, and emotional self-awareness (Aritzeta et al., 2022; Moon-Ji & Wan-Ju, 2021). HRV refers to the variation in time intervals between heartbeats and serves as a reliable indicator of autonomic nervous system flexibility. Higher HRV is associated with greater emotional resilience and self-regulatory capacity, while low HRV is linked to stress, anxiety, and emotional deregulations (Umair et al., 2021; van der Zwan et al., 2019). Among juvenile clients in institutional settings, emotional regulation challenges are frequently observed and often expressed through impulsivity, aggression, and

behavioral defiance. Many of these adolescents have experienced trauma, disrupted attachment, and chronic stress, which can impair their physiological and emotional regulation systems. Biofeedback offers an experiential and body-based learning process that helps these youth become more aware of their internal states and provides strategies for shifting from a reactive to a more coherent physiological condition.

Research has shown promising results for HRV biofeedback in supporting emotional regulation among adolescents. For example, McCraty and Zayas (2014) found that adolescents who received HRV training exhibited reduced symptoms of anxiety, anger, and depression, as well as increased engagement in academic and social activities. Similarly, Zucker et al. (2009) reported that adolescents using HRV biofeedback demonstrated improved emotional control and reduced physiological stress responses. These findings suggest that biofeedback may serve as an effective tool to enhance emotional self-regulation, particularly for populations that struggle with traditional verbal-based therapies. In juvenile rehabilitation contexts, biofeedback is particularly beneficial due to its accessibility and nonverbal approach. Adolescents with low verbal proficiency or limited introspective abilities often find traditional talk therapy less engaging. In contrast, biofeedback provides real-time visual and auditory feedback that reflects changes in physiological state, which can be empowering and motivating. For example, a client may observe how focused breathing and positive imagery can lead to greater HRV coherence, reinforcing the connection between emotion, thought, and bodily regulation.

Biofeedback sessions are typically introduced through teaching clients simple breathing techniques, attention focusing, and emotional recall exercises. These sessions help them develop internal awareness of stress responses and cultivate skills to manage physiological arousal. Over time, clients learn to recognize the onset of emotional deregulation and apply self-regulation techniques in real-life scenarios. This somatic awareness creates an essential foundation for emotional intelligence and behavioral change. When integrated with cognitive-behavioral approaches, biofeedback enhances the effectiveness of cognitive strategies by reinforcing physiological self-regulation. For instance, once a client has developed the ability to lower physiological arousal through breathing and attention control, they are in a better state to apply CBT skills such as identifying cognitive distortions or engaging in problem-solving. The combination of top-down (cognitive) and bottom-up (physiological) strategies provides a holistic intervention that strengthens emotional resilience and supports sustained behavioral transformation among juvenile clients.

Methodology

This study adopted a qualitative case study approach to explore the implementation and effectiveness of a structured counselling protocol integrating Cognitive Behavioural Therapy (CBT) with heart rate variability (HRV) biofeedback among adolescents in a juvenile rehabilitation setting. The participants consisted of ten male adolescents aged 14 to 17 residing in a government juvenile institution. The intervention was designed and delivered over eight sessions using a structured protocol divided into clearly defined stages, allowing for a gradual and responsive therapeutic process.

Multistage Counseling Process Integrating Cognitive Behavioral Techniques and Biofeedback

The intervention was designed and implemented through a systematic, multistage process within the counseling framework. The approach began by establishing a strong therapeutic alliance, identifying key problems, and collaboratively setting goals that were realistic and measurable. Subsequently, cognitive behavioral techniques were integrated with heart rate variability (HRV) biofeedback to help clients become more aware of their thought patterns and physiological responses, allowing them to regulate their emotions more effectively. Techniques such as visualization, rescripting, and cognitive restructuring were applied to challenge irrational beliefs and reduce the impact of “hot thoughts.” To consolidate these skills, the intervention incorporated repeated practice and real-world application, supported by ongoing biofeedback to track progress and foster a sense of self-efficacy. Finally, in the closing phase, the process was designed to empower clients to become their own therapists, employing the strategies and techniques learned to maintain progress and cope with future stressors independently. This multistage approach underscores a comprehensive framework for strengthening self-regulatory capacities in a clinical context.

Preparation Stage I: Breaking the Ice

The initial stage focused on building rapport and creating a safe emotional environment for clients. Counselors engaged the adolescents through light-hearted conversation, storytelling, and informal dialogue to ease tension and reduce resistance. An informal screening process was conducted to understand the client’s emotional and behavioural challenges, using short interviews or simple questionnaires. This stage also included the introduction of the biofeedback tool, where clients were shown how heart rate variability reflects emotional states. Demonstrations were kept simple and relatable, using real-time feedback to help clients connect emotions like “stress” or “calm” to visible physiological reactions. This experiential approach laid the foundation for trust and openness.

Preparation Stage II: Clarifying Problems and Goals

Once rapport was established, the second preparatory phase focused on clarifying key personal challenges and setting therapeutic goals. Guided questioning was used to identify common issues such as impulsivity, anger, or low emotional control. Counselors collaborated with clients to set SMART goals—specific, measurable, achievable, relevant, and time-bound—that matched their developmental capacity. Clients were introduced to the cognitive approach of CBT using visual aids such as the CBT triangle and simple metaphors to explain how thoughts influence emotions and behaviors. HRV baseline data were collected to establish each client’s starting point in terms of physiological regulation.

Beginning Stage I: Identifying Specific Problems

At this stage, counselors helped clients analyze specific examples from their daily lives, such as peer conflicts or family stress, to uncover underlying thought patterns. The ABC Model (Activating Event, Belief, and Consequence) was applied to make connections between triggering events, beliefs, and emotional or behavioral responses. Socratic questioning and empathetic reflection were used to encourage critical thinking. During these discussions, biofeedback was used to monitor real-time HRV changes, helping clients become aware of their physiological responses to stressful thoughts and situations.

Beginning Stage II: Setting New Goals for Thinking and Behavior

Clients were guided to set clear goals for how they wanted to think, feel, and behave differently in future situations. Visualization exercises were introduced, allowing clients to mentally rehearse success in managing challenges. These visualizations were supported by HRV biofeedback, which helped reinforce calm states and physiological coherence while clients imagined positive outcomes. The integration of visual imagery and emotional awareness aimed to build confidence and emotional control simultaneously.

Middle Stage I: Challenging and Changing Inference

In this sub-stage, cognitive restructuring was introduced to help clients challenge irrational or unhelpful beliefs. Counselors guided clients in identifying common distortions such as overgeneralization or catastrophizing, and replacing them with more realistic alternatives. As clients worked through this cognitive shift, biofeedback exercises were used to support relaxation and calmness, reducing the emotional intensity of the restructuring process and promoting deeper learning.

Middle Stage II: Changing Hot Thoughts

This phase addressed emotionally charged "hot thoughts" that triggered impulsive or defensive reactions. Clients learned thought-stopping techniques and were taught how to interrupt automatic negative thinking patterns. Biofeedback played a key role in helping clients observe and regulate their physiological responses when confronting these reactive thoughts. Through repeated practice, clients began to develop a sense of control over their emotional responses.

Middle Stage III: Imagery Re-scripting

In this sub-stage, clients were guided through rescripting exercises to transform distressing or traumatic memories. Using visualization, they were encouraged to replace negative images with empowering, calming alternatives. The process was handled with sensitivity and reassurance, with biofeedback used to monitor HRV and maintain emotional safety throughout. This technique was particularly effective in reducing the emotional charge associated with past experiences.

Middle Stage IV: Working Through

This phase emphasized the application of new skills in real-life contexts. Clients were encouraged to use learned strategies—such as deep breathing, cognitive reframing, and behavioral rehearsal—when facing actual challenges. Counselors provided feedback and reinforcement, while HRV tracking was used before and after these real-life situations to assess clients' ability to self-regulate under pressure. Homework tasks were given to strengthen consistency and reinforce progress outside the session environment.

Ending Stage: Coaching the Client to Become Their Own Counselor

The final stage focused on consolidating gains and preparing clients for long-term self-regulation. Counselors reviewed each client's progress, highlighting their personal growth and resilience. Clients were introduced to relapse prevention strategies, including recognizing early warning signs and planning for high-risk situations. They were encouraged to continue using CBT tools and biofeedback independently. HRV tracking was discussed as a personal self-monitoring technique. Ultimately, the aim was to empower each adolescent to manage emotions and behavior with autonomy and confidence.

Counseling Skills Integrated Throughout the Intervention

Throughout the implementation of the structured counseling protocol, a range of core counseling skills were applied to support therapeutic goals and meet the developmental needs of juvenile clients. These skills played a vital role in building rapport, facilitating cognitive and emotional insight, managing resistance, and fostering behavioral change (Ezy Maulany et al., 2023). One of the foundational skills applied from the earliest stage was rapport-building (Mohamad et al., 2010). Counselors employed humor, active listening, and non-judgmental communication to create a safe, trusting environment. This was particularly crucial for adolescent clients, many of whom entered the sessions with low trust in adults and prior negative experiences with authority. Activities such as storytelling, casual dialogue, and ice-breakers helped ease resistance and enabled clients to feel heard and respected (Laird, 1983; Naparan, 2020).

As the sessions progressed, counsellors made extensive use of Socratic questioning to guide clients toward self-discovery and insight (Glaser & Kirschenbaum, 1980; Murdock & Connery, 2009). This technique involved asking open-ended, reflective questions to help clients explore their automatic thoughts, challenge negative beliefs, and develop alternative interpretations. The process encouraged critical thinking and enabled clients to take ownership of their thought patterns rather than simply receiving advice (Braun et al., 2015; Wharne, 2022). Exploratory and motivational interviewing skills were used to clarify clients' goals and to elicit their internal motivation for change. Counselors affirmed client strengths, used reflective listening to understand emotional undercurrents, and encouraged goal setting based on clients' own values. These techniques were essential during the preparation and early beginning stages of the intervention, as they helped to align clients' personal aspirations with the therapeutic direction. During the middle phases, more advanced skills were employed, including cognitive restructuring, visualization guidance, and emotion regulation coaching. Cognitive restructuring required counselors to support clients in identifying and reframing irrational thoughts, using real-life examples and supportive dialogue (Murdock & Connery, 2009). Visualization techniques were used to guide clients through imagery-based exercises, particularly during goal setting and rescripting sessions. These practices helped clients develop internal pictures of success and reduce emotional distress tied to negative memories. Emotion coaching involved teaching and modelling calming strategies such as deep breathing, grounding techniques, and mindfulness (Chan et al., 2024).

These were especially effective when combined with biofeedback training, allowing clients to monitor and self-regulate their physiological states in real-time. Counselors demonstrated emotional containment during distressing sessions and reinforced clients' efforts with positive affirmations. Behavioral coaching was emphasized in the latter stages of the intervention (Konopka et al., 2018). Counselors encouraged clients to apply learned skills in real-life

situations, provided feedback, and celebrated small victories. Role-playing was used to rehearse prosocial behavior, resolve conflicts, and prepare for emotionally triggering events. Counselors also helped clients reflect on their actions, reinforcing the use of adaptive coping strategies outside of therapy. Finally, empowerment techniques were used to foster long-term independence. As the sessions concluded, counselors guided clients in creating maintenance plans and recognizing early signs of emotional dysregulation. Clients were encouraged to take on the role of their own "internal counselor," drawing from the strategies and tools they had learned. Positive reinforcement and strengths-based language were used consistently to build self-efficacy and resilience.

In addition to the structured protocol content, the effectiveness of the counseling sessions was also supported by the consistent application of core counseling skills across all stages of the intervention. These skills were not applied randomly but were purposefully integrated based on the therapeutic goals of each phase. The counselor adapted communication style, engagement strategies, and intervention techniques in accordance with the client's emotional readiness and cognitive development. Table 1 below outlines the specific counseling skills used at each intervention stage, along with their intended functions and sample statements that reflect actual counselor-client interactions during sessions.

Table 1: Counseling Skills Applied by Intervention Stage, Function, and Sample Counselor Statements

Intervention Stage	Counseling Skill	Function
Preparation Stage I	Rapport-Building	To establish trust and reduce resistance in the early sessions.
	Active Listening	To validate feelings and show empathy.
	Non-Judgmental Communication	To create a safe and accepting space for self-expression.
Preparation Stage II (Clarifying Problems and Goals)	Exploratory Questioning	To help clients express concerns and define their challenges.
	Motivational Interviewing	To encourage commitment and build intrinsic motivation.
Beginning Stage I (Identifying Problems)	Socratic Questioning	To guide clients in identifying thought patterns and core beliefs.
	Psych education (CBT Triangle, ABC Model)	To explain the relationship between thoughts, feelings, and behaviors.
	Visualization Guidance	To help clients imagine successful scenarios and reinforce hope.
	Empowering Language	To build confidence and reinforce a growth mindset.
Middle Stage I (Cognitive Restructuring)	Cognitive Restructuring	To help clients challenge and reframe distorted thinking.
	Emotional Support	To provide reassurance during emotionally intense reflection.
	Thought-Stopping Techniques	To interrupt automatic negative thoughts and emotional reactivity.



Middle (Managing Thoughts)	Stage II	Hot	Emotion Regulation Coaching	To teach calming strategies such as deep breathing and grounding.
Middle (Imagery Rescripting)	Stage III		Trauma-Sensitive Guidance	To process distressing memories in a safe and supportive way.
			Positive Imagery Facilitation	To replace negative mental images with empowering alternatives.
Middle (Working Through)	Stage IV		Behavioral Coaching	To support application of new skills in real-life situations.
			Reinforcement and Feedback	To encourage progress and build self-efficacy.
Ending Stage (Relapse Prevention and Empowerment)			Self-Empowerment Skills	To help clients take ownership of their growth and emotional regulation.
			Maintenance Planning	To prepare clients for long-term independent use of skills.

Discussion

The Importance of Emotional Awareness and Engagement

Emotional awareness is a foundational element in the counseling process, particularly among adolescents in juvenile rehabilitation settings (Ibrahim et al., 2022; Ritkumrop et al., 2022). It refers to the ability to identify, understand, and express one's emotional states. For many juvenile clients, this capacity is often underdeveloped due to a history of trauma, neglect, or inconsistent caregiving environments (Luna et al., 2022). These young individuals may struggle to differentiate between emotional cues such as anger, fear, or sadness, which frequently results in impulsive behaviour, reactive aggression, or emotional shutdown. Therefore, fostering emotional awareness is not only a therapeutic goal but also a necessary precondition for deeper psychological work. In the context of this study, emotional awareness was prioritized during the early stages of the intervention protocol. The combination of CBT techniques and HRV biofeedback created opportunities for clients to explore their inner states in both cognitive and physiological dimensions. For instance, the use of the ABC model helped clients recognize the link between activating events, beliefs, and emotional consequences, while biofeedback provided tangible feedback about how their bodies reacted during emotional stress (Minen et al., 2019). This integration enabled clients to shift from vague statements such as "I feel bad" to more specific emotional insights like "I feel anxious when I think I'm being judged." This clarity laid the groundwork for targeted cognitive restructuring in later sessions.

Client engagement is closely linked to emotional awareness (Arbab Siyar et al., 2021). When clients begin to understand their emotional experiences, they are more likely to engage actively in the counseling process. In this study, initial resistance commonly observed in institutional settings gradually decreased as clients became more curious about their emotional reactions and gained a sense of control through biofeedback. The experiential nature of biofeedback in particular made therapy more interactive and less abstract, which enhanced motivation and trust in the process (van der Zwan et al., 2019). This is especially important in working with juvenile populations, who often exhibit resistance to traditional talk-based approaches. Furthermore, increased emotional awareness enabled clients to participate more meaningfully

in visualization, role-playing, and goal-setting activities (Frijda, 1993). Once clients could identify what they were feeling and why, they could begin to imagine alternative responses and internalize new behavioral choices. This readiness for change reflected not only cognitive insight but also emotional engagement both of which are essential for sustainable behavioral transformation. In short, the development of emotional awareness was both a therapeutic milestone and a catalyst for deeper engagement and progress throughout the intervention.

Strengthening Emotional Regulation and Cognitive Restructuring

Emotional regulation refers to an individual's ability to monitor, manage, and modify emotional responses in accordance with situational demands (Arbab Siyar et al., 2021). Among adolescents in juvenile rehabilitation, poor emotional regulation often manifests as impulsive aggression, verbal outbursts, or emotional withdrawal. These behaviours are typically driven by maladaptive thought patterns and unresolved emotional tension (Suganya et al., 2022). As such, a key objective of the intervention in this study was to enhance clients' ability to regulate their emotions, particularly through the combined use of cognitive behavioral strategies and biofeedback-based physiological awareness. The CBT component of the protocol provided a structured approach to identify and challenge cognitive distortions (Alavi et al., 2018). Techniques such as cognitive restructuring, the use of thought records, and the ABC model allowed clients to uncover irrational beliefs and examine their impact on emotional and behavioral outcomes (Suganya et al., 2022). For example, beliefs like "I can't control myself" or "Everyone is against me" were deconstructed in sessions through Socratic questioning and reframed into more adaptive alternatives. This shift from automatic negative thoughts to balanced thinking empowered clients to choose more constructive responses to stressors.

At the same time, biofeedback supported the emotional regulation process by helping clients become more aware of the physiological markers of distress, such as increased heart rate variability (Ratanasiripong et al., 2012). The real-time feedback provided during sessions gave clients an immediate, visible reflection of their internal state (Minen et al., 2019). They learned how certain thoughts triggered physiological arousal, and how conscious breathing and attention-shifting could restore calm. This dual approach not only increased insight but also provided clients with concrete tools to manage difficult emotions. The synergy between cognitive restructuring and physiological regulation was particularly evident in sessions involving anger management and hot thought interventions (Lehrer, 2018). Clients who previously reacted impulsively began using breathing techniques before responding to provocation, and several reported applying these skills during conflicts with peers or authority figures. Counselors also observed greater emotional stability and reduced escalation during role-play scenario, this behavioral shift suggests that clients were not only gaining intellectual understanding of their emotional triggers but also acquiring the capacity to regulate their internal states in real time. These findings are consistent with literature asserting that CBT is effective in reducing externalizing behaviors among adolescents (Lipsey et al., 2007), and that HRV biofeedback enhances emotion regulation (Zucker et al., 2009). The integration of these two methods created a comprehensive intervention that addressed both the cognitive and physiological dimensions of self-regulation. Ultimately, clients were able to internalize skills that supported not just momentary calm but also long-term behavioral transformation.

Bridging Cognitive and Physiological Self-Regulation

One of the most significant strengths of this intervention was its capacity to integrate both cognitive and physiological dimensions of self-regulation. Traditionally, cognitive behavioral therapy (CBT) emphasizes the restructuring of thought patterns to influence emotional and behavioral outcomes (Bilbrey et al., 2022). However, this top-down approach may not be sufficient for clients who are highly reactive at the physiological level or who have difficulty accessing cognitive reflection during emotional arousal. Conversely, biofeedback offers a bottom-up method by addressing the body's stress response directly through the autonomic nervous system. By combining these two approaches, the intervention created a more comprehensive and responsive therapeutic experience (Lehrer, 2018). Throughout the sessions, clients were able to develop an awareness of how their thoughts affected their emotions, and how those emotions, in turn, manifested physiologically. This awareness was made possible through real-time heart rate variability (HRV) feedback, which visually demonstrated the impact of stress-inducing thoughts (Webb-Murphy et al., 2010; Weise et al., 2008). For example, during cognitive restructuring activities, when clients recalled distressing memories or discussed triggering situations, biofeedback revealed increased physiological arousal. Counselors then guided clients through breathing techniques and grounding exercises, resulting in observable shifts toward physiological coherence. This real-time regulation experience enhanced clients' sense of control and reinforced the cognitive strategies taught. The integration of both self-regulation systems was particularly evident during imagery rescripting and role-play activities.

Clients were supported in revisiting emotionally charged experiences and constructing new internal narratives while maintaining a state of calm. The simultaneous use of visualization, thought replacement, and physiological self-soothing enabled clients to reprocess emotional material without becoming overwhelmed. This combined approach is supported by contemporary trauma-informed frameworks, which emphasize the need to engage both cognitive and somatic systems in order to create lasting change (Bilbrey et al., 2022; Jongsma et al., 2023; Webb-Murphy et al., 2010). Clients' verbal reflections also illustrated this integration. Several reported that they had begun to recognize internal warning signs of emotional escalation and could apply techniques such as controlled breathing and thought-stopping before reacting. These behaviors reflect a maturing of both emotional intelligence and physiological self-awareness, leading to more adaptive choices in daily life. By bridging cognitive restructuring with physiological regulation, the intervention addressed multiple levels of emotional processing. This dual engagement enhanced the sustainability of the behavioral changes observed, as clients were not only learning what to think but also how to feel and respond differently under pressure. In working with adolescent populations especially those with histories of trauma or deregulation this integrated method offers a powerful model for holistic change (Amani et al., 2022).

Conclusion

This study highlights the effectiveness of an integrated intervention combining Cognitive Behavioral Therapy (CBT) and Heart Rate Variability (HRV) biofeedback in fostering self-regulation among adolescents in juvenile rehabilitation. Emotional awareness emerged as a foundational element, enabling clients to identify, articulate, and make sense of their internal emotional experiences. By recognizing the link between thoughts, emotions, and physiological responses, clients were able to move from vague or reactive expressions to more precise emotional insights. This clarity served as a gateway to deeper therapeutic engagement,

increased trust in the process, and greater motivation to participate in counseling activities. The combined use of CBT and biofeedback significantly strengthened emotional regulation and cognitive restructuring. CBT techniques such as the ABC model and cognitive reframing helped challenge maladaptive beliefs, while biofeedback provided clients with real-time awareness of how stress and negative thoughts impacted their physiological state. This dual approach enabled clients not only to gain intellectual understanding but also to develop practical tools—such as controlled breathing and thought-stopping to manage emotional escalation in daily life. The observable improvements in anger management and social interactions demonstrated that clients were beginning to internalize these skills beyond the therapy setting. Importantly, the integration of cognitive and physiological self-regulation created a comprehensive therapeutic framework that addressed both top-down (cognitive) and bottom-up (somatic) processes. This bridging allowed clients to engage with emotionally charged content without becoming overwhelmed, facilitating deeper emotional processing and behavior change. Clients' self-reports and behavioral observations further validated the lasting impact of this approach. Ultimately, this intervention demonstrates that a holistic method—engaging both mind and body is crucial in supporting sustainable emotional and behavioral transformation among at-risk adolescents. The findings offer valuable implications for future counseling practices targeting trauma-exposed youth populations.

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CONSUMER ETHNOCENTRISM AND PRODUCT BIAS: A CONCEPTUAL FRAMEWORK INTEGRATING SOCIO- PSYCHOLOGICAL, DEMOGRAPHIC, AND DIGITAL MEDIA INFLUENCES

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Abstract: *In the age of globalization and digital connectivity, consumers are continuously exposed to both domestic and foreign products, making product evaluation increasingly complex and influenced by factors beyond price and quality. One notable behavioural pattern is product bias, where consumers favour or reject products based on their country of origin rather than objective attributes. This concept paper explores the influence of socio-psychological factors (such as national pride, cultural attachment, and perceived threats to local identity or economy), demographic variables (age, gender, education and income), and digital media influence (social media usage, influencer content) on product bias. Despite substantial research on consumer ethnocentrism, past studies have largely examined these variables in isolation, overlooking how their interaction influences biased consumption behaviour. To address this gap, the proposed conceptual framework is underpinned in Consumer Ethnocentrism Theory, which explains that consumers perceive purchasing domestic products as morally right and economically responsible, while viewing foreign goods as undesirable (Shimp & Sharma, 1987). As a supporting theory, Social Identity Theory suggests that individuals form part of their identity based on group membership, such as nationality, which influences their preferences and behaviours (Tajfel & Turner, 1986). Methodologically, future research is recommended to empirically test this framework using a quantitative, cross-sectional survey design, with data analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive and inferential statistical analyses, including regression, are suggested to test the relationships between variables. This study contributes theoretically by offering an integrated view of identity, social influence, and media exposure in shaping product bias, while also providing practical insights for marketers and policymakers aiming to understand and address culturally driven consumer behaviour. It concludes by emphasizing the importance of future cross-cultural and generational studies to explore the evolving impact of digital ecosystems and identity-based consumption in shaping global market dynamics.*

Keywords: Consumer Ethnocentrism, Product Bias, Socio-Psychological Factors, Demographic Variables, Digital Media Influence.



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Introduction

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In an increasingly interconnected global economy, consumers are frequently presented with choices between domestic and foreign products. While product quality, price, and brand reputation are important, purchasing decisions are often influenced by psychological and cultural perceptions. Cultural influences are among the broadest and deepest factors affecting consumer behavior. These include societal norms, values, and collective mental programming, which shape how consumers perceive and respond to products (Golchha & Nagariya, 2025). Psychological elements such as attitudes, beliefs, motivations, and emotions significantly impact consumer choices. These factors are intrinsic and form part of the psychosocial influences on purchasing behavior (Golchha & Nagariya, 2025). One such influence is consumer ethnocentrism, which refers to the belief that buying domestic products is a way to support the national economy, and that purchasing foreign goods is inappropriate or even harmful. Consumer ethnocentrism captures the belief that buying foreign-made goods is not only inappropriate but also morally wrong, as it is perceived to harm the domestic economy and cause job losses (Huang et al., 2020). This mindset can lead to product bias, where the perceived origin of a product becomes more important than its actual attributes or value.

Consumer ethnocentrism is shaped by various socio-psychological factors, such as national pride, cultural identity, and perceived economic threat. Consumer ethnocentrism, the preference for domestic products over foreign ones, is a significant factor influencing consumer behavior across various markets. This phenomenon is driven by socio-psychological factors such as national pride, perceived superiority, and familiarity with local products, particularly in emerging markets (Kinawy, 2025). In contrast, consumers in developed markets, who are more exposed to international brands, may exhibit a greater openness to foreign products, often influenced by psychological factors like self-expression and the symbolic value associated with these brands (Kinawy, 2025).

Understanding these nuances is crucial for businesses aiming to tailor their marketing strategies effectively. At the same time, demographic variables like age, education level, income, and geographic location may influence how individuals perceive and act upon these ethnocentric beliefs. For instance, research conducted in Slovakia and the Czech Republic found that age significantly impacts consumer ethnocentrism, although the direction and strength of this influence can vary by culture (Čvirik, 2021). The impact of income on ethnocentrism appears to be less consistent. In Zimbabwe, income was found to have an insignificant influence on consumer ethnocentrism (Muchandiona et al., 2021). For instance, older or less urbanized populations may exhibit higher levels of ethnocentrism compared to younger, more globally exposed individuals. In today's digital age, another important factor influencing consumer behavior is digital media. The widespread use of social media, online marketing, and digital influencers has transformed how consumers perceive products and make purchasing decisions.

In developing countries like India, digital platforms influence luxury brand purchases by connecting consumers to global reference groups, thereby affecting their brand choices and promoting openness to global brands (Jain & Schultz, 2019). Digital platforms can either reinforce ethnocentric attitudes by promoting national campaigns and local pride, or they can encourage openness to global brands through exposure to diverse consumer experiences.

Despite the importance of these factors, Existing studies have often examined socio-psychological (such as patriotism or cultural identity), demographic (such as age, income, education), and digital media factors independently in relation to consumer ethnocentrism (Budiarti et al., 2022; Kvasina et al., 2018; Egea & Frutos, 2021), without fully exploring how these dimensions interact to influence product bias. This indicates a clear research gap in understanding the combined or synergistic effects of these variables on consumer behaviour in a digitally connected marketplace. Therefore, this concept paper aims to propose an integrated conceptual framework that links these dimensions to provide a more holistic understanding of consumer behavior. The integration of these diverse factors into a comprehensive framework provides valuable insights for marketers to segment markets more effectively and develop targeted communication strategies that resonate with different consumer segments (Goel et al., 2025). Studying this topic is important because it can offer meaningful insights for businesses, marketers, and policy makers. A deeper understanding of these factors can help in designing effective marketing strategies, promoting local products, and addressing challenges in consumer perception within an increasingly competitive and globalized marketplace.

Problem Statement

Despite the growing interest in consumer behavior research, a key problem remains, current literature often treats socio-psychological, demographic, and digital media influences in isolation, resulting in fragmented insights that do not fully capture the complexity of modern purchasing behavior. In practice, these factors are deeply interrelated and collectively shape how consumers perceive and evaluate products, especially in relation to their national origin.

Consumer ethnocentrism, the preference for domestic products over foreign ones, significantly influences consumer behavior across various markets. This phenomenon is driven by socio-psychological factors such as national pride, perceived superiority, and familiarity with local products (Goel et al., 2025; Kinawy, 2025). Ethnocentric consumers tend to view foreign products as inferior or culturally inappropriate, which can lead to unfair rejection of high-quality international offerings, while overestimating the value of domestic alternatives. This behavior has direct implications for businesses trying to enter or grow in foreign markets. Understanding the underlying causes and effects of consumer ethnocentrism is crucial for businesses aiming to tailor their marketing strategies effectively in both emerging and developed markets.

Studies show that demographic factors like age, gender, income, and education can significantly influence levels of ethnocentrism. For example, older or less globally exposed populations often exhibit stronger bias toward domestic products. In contrast, younger generations, especially those active on social media may adopt a more global consumption mindset. Similarly, higher income and education levels can either amplify or mitigate these tendencies depending on the context (Čvirik, 2021; Inoni & Okorie, 2024). These demographic variables help segment the market, allowing businesses to develop targeted marketing strategies that resonate with specific consumer groups.

The growing influence of digital media adds further complexity, as consumers now navigate an environment saturated with culturally diverse messages, targeted ads, and real-time product reviews that may either reinforce or weaken ethnocentric attitudes. The advent of digital media and globalization has added new dimensions to consumer ethnocentrism. While digital media

can expose consumers to a broader range of foreign products, it can also reinforce ethnocentric attitudes by promoting nationalistic content (Kara et al., 2024). Moreover, globalization has led to a more complex consumer decision making process, where ethnocentrism interacts with other factors like brand image and perceived product value (Kara et al., 2024; Trivedi et al., 2024). Understanding these dynamics is essential for businesses to navigate the global market effectively.

However, few existing studies have attempted to combine these diverse elements into a single conceptual framework. Without such integration, marketers, global brands, and policymakers lack a clear roadmap for addressing product bias or crafting effective messaging strategies that resonate with different consumer segments. This study seeks to develop a conceptual model that captures the interplay of socio-psychological factors, demographic profiles, and digital media influences in shaping consumer ethnocentrism and product bias. By doing so, it aims to provide clearer insights into consumer decision making across cultural and national boundaries in an era of rapid globalization and digital influence. Businesses must consider these elements to develop effective marketing strategies that cater to ethnocentric consumers while also leveraging the opportunities presented by globalization and digital media. With that, they can better position their products in both domestic and international markets.

Research Objectives

This concept paper aims to explore how socio-psychological, demographic, and digital media factors influence consumer ethnocentrism and product bias in the global marketplace. The specific objectives are as follows:

1. To examine the influence of socio-psychological factors on consumer ethnocentrism and product bias.
2. To analyze the role of demographic variables in shaping levels of ethnocentric attitudes and product bias.
3. To investigate the impact of digital media influences on consumer ethnocentrism and product bias.
4. To propose an integrated conceptual framework that explains the relationship and interaction between socio-psychological, demographic, and digital media influences in shaping consumer ethnocentrism and product bias.

Literature Review

Consumer Ethnocentrism

Consumer ethnocentrism refers to the tendency of individuals to favor locally made products over foreign alternatives, shaped by national pride, cultural identity, and the belief that supporting domestic goods is morally and economically beneficial (Farah & Mehdi, 2021; Jurdi & Houjeir, 2020). These attitudes influence product evaluations and lead to product bias, especially when local products are perceived as more trustworthy (Vabø & Hansen, 2016; Huddleston et al., 2001). This study proposes a conceptual framework integrating three key drivers of consumer ethnocentrism: socio-psychological, demographic and digital media influences. These three dimensions collectively offer a comprehensive understanding of the drivers of consumer ethnocentrism and their impact on product bias in today's connected marketplace.

Socio-Psychological Factors

Socio-psychological factors significantly shape consumer behavior through the lens of consumer ethnocentrism, which reflects the belief that purchasing domestic products is morally right and economically beneficial, while foreign goods are viewed as undesirable (Budiarti et al., 2022; Kvasina et al., 2018). Rooted in cultural identity, national pride, group affiliation, and perceived economic threats, this mindset influences consumers to favor local products, often perceiving them as superior despite higher prices or limited innovation (Bryła, 2021; Hsu & Nien, 2008). Ethnocentric attitudes are influenced by demographics such as age, income, education, and patriotic sentiment, and are often stronger in collectivist cultures where loyalty to the nation is emphasized (Egea & Frutos, 2021; Jain & Jain, 2013). Driven by emotional attachment and a sense of civic duty, consumer ethnocentrism promotes product bias, shapes market preferences, and enhances local brand loyalty (Ibrahim Abdel-Aziz, 2024).

Demographic Factors

Consumer choices are influenced not only by price or product quality but also by demographic factors such as age, gender, education, income, and geographic context (Shili & Sohaib, 2025). Individuals with higher education levels often prefer branded or high-quality products, while those with lower income or education may opt for affordable or local alternatives (Král' et al., 2020; King et al., 2021). Income and marital status further shape preferences (Thapa, 2021; Chattaraj et al., 2018). These traits also impact consumer ethnocentrism, where loyalty to domestic products reflects national pride or economic concern (Eroglu et al., 2024). Older consumers generally show stronger ethnocentric attitudes, whereas younger individuals tend to favor global brands due to broader cultural exposure (Čvirik, 2021; Pentz et al., 2014; Chen et al., 2022). Gender and cognitive differences influence product engagement, particularly in high-value markets like luxury goods (Bigne et al., 2024; Arribas-Ibar et al., 2025). Recognizing these demographic patterns allows businesses to tailor strategies that align with consumer identity and preferences (Valášková et al., 2018; Král' et al., 2020).

Digital Media Influences

Digital media significantly influences consumer behavior, particularly in shaping product preferences tied to consumer ethnocentrism. Social media platforms and online channels help shape perceptions based on cultural identity and national pride, enabling businesses to align marketing with both local values and global trends (Zhang, 2016; Sharma, 2024). Digital influencers play a key role in this process, especially among younger consumers who trust their endorsements, with some promoting local products to reinforce national loyalty (Kanwar & Huang, 2022; Hapsari et al., 2024). Effective digital marketing involves optimizing content delivery to match consumer preferences, increasing engagement and reducing product bias (Zhang, 2023). While digital platforms broaden access to information, they can also reinforce existing preferences through algorithmic filtering, limiting exposure to foreign products and deepening ethnocentric attitudes (Alam et al., 2024; Gelovani et al., 2025; Marres, 2017).

Understanding consumer ethnocentrism requires a multidimensional approach that considers the socio-psychological, demographic and digital media influence shaping product preferences. These factors not only drive loyalty toward domestic goods but also contribute to selective perceptions of product quality and value. As digital media continues to shape consumer

exposure and engagement, the impact of influencers and algorithm-driven content becomes increasingly significant in reinforcing or reshaping ethnocentric attitudes. Recognizing these patterns allows marketers, policymakers, and businesses to respond more effectively to consumer expectations, balance national identity with global integration, and address product bias in a more informed and strategic manner.

The Propose Conceptual Framework

This concept paper is primarily underpinned by the Consumer Ethnocentrism Theory (Shimp & Sharma, 1987), which posits that consumers perceive the purchase of domestic products as both morally appropriate and economically beneficial, while viewing foreign goods as potentially harmful to the national economy. Such perceptions often result in product bias, where local products are favoured regardless of their comparative quality or price. Additionally, the study is supported by Social Identity Theory (Tajfel & Turner, 1986), which explains that individuals derive part of their self-concept from group memberships, including national identity. This affiliation encourages preference for in-group (domestic) products, reinforcing feelings of cultural loyalty and national pride. Although digital media is not directly derived from these traditional theories, it is conceptually integrated as a contemporary influence. Digital platforms, particularly social media, play a dual role in reinforcing ethnocentric attitudes through nationalistic content, while simultaneously exposing consumers to global alternatives that may dilute such tendencies. As such, digital media is positioned as a modern contextual factor that interacts with socio-psychological and demographic elements to influence product evaluation and consumer bias. The proposed conceptual framework suggests that consumer ethnocentrism is influenced by three main categories of factors:

- 1. Socio-Psychological Factors**

These include elements such as national pride, cultural attachment, and perceived threats to local identity or economy. These factors are theorized to directly increase consumer ethnocentrism and consequently product bias.

- 2. Demographic Factors**

Characteristics such as age, gender, income, and education are expected to moderate the relationship between socio-psychological factors and ethnocentrism. For instance, younger, more educated individuals may exhibit lower ethnocentrism compared to older or less-educated counterparts.

- 3. Digital Media Influences**

Exposure to digital content, including social media, influencer marketing, and global advertising, may weaken or reinforce ethnocentric tendencies.

The proposes that higher levels of consumer ethnocentrism led to stronger product bias, favoring domestic products and rejecting foreign alternatives regardless of their quality or value. Understanding this relationship can provide valuable insights for marketers, policymakers, and businesses aiming to position their products effectively in culturally sensitive or ethnocentric markets.

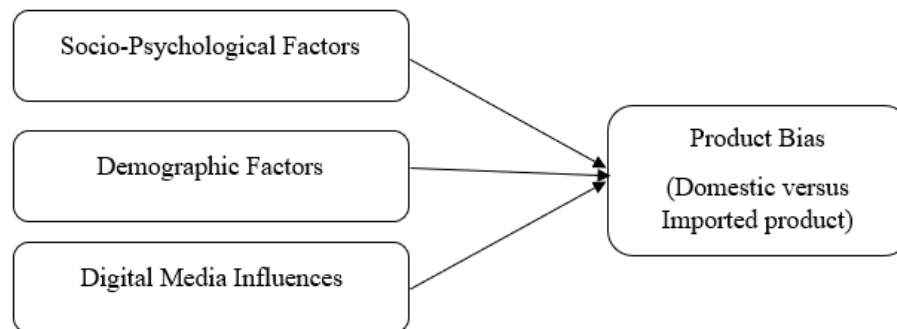


Figure 1: Proposed Conceptual Framework

Methodology

This study does not involve empirical data collection but proposes a conceptual framework to guide future research. To empirically validate the proposed framework, a quantitative research design is recommended, utilizing a cross-sectional survey approach to collect data from a diverse group of consumers across different demographic backgrounds. A stratified random sampling method is suggested to ensure balanced representation across variables such as age, gender, education level, and geographic location. An ideal sample size of 200–400 respondents would allow for meaningful statistical analysis and generalizability of findings.

Data would be collected through structured questionnaires distributed via online platforms like Google Forms, incorporating established and validated measurement scale such as the Consumer Ethnocentrism Scale (CETSCALE) for consumer ethnocentrism, along with adapted items for product bias, socio-psychological factors, digital media influence, and demographic data. The CETSCALE is a psychometric scale designed to measure the level of consumer ethnocentrism. It has been widely tested in various parts of the world to understand how consumers' ethnocentric tendencies influence their purchasing decisions (Bawa, 2004).

The collected data would be analyzed using Statistical Package for the Social Sciences (SPSS). The analysis would include descriptive statistics, reliability and validity testing, and inferential techniques such as multiple regression analysis to examine the direct and relationships among the variables within the conceptual framework. This approach enables the assessment of both main effects and interaction effects, providing empirical support for the theoretical propositions outlined in the model.

Discussion and Implications

The proposed conceptual framework offers a comprehensive lens to understand how consumer ethnocentrism and product bias are shaped by the interplay of socio-psychological factors, demographic factors, and digital media influences. It recognizes that consumer decision making is not purely rational but deeply influenced by cultural identity, national pride, and perceived economic threats. Factors that often drive loyalty to domestic products and scepticism toward foreign goods (Bryła, 2021; Farah & Mehdi, 2021). Demographic variables such as age, education level, income, and geographic location further contextualize these attitudes, highlighting generational and social divides in consumer perceptions (Kvasina, Crnjak Karanović, & Tucak, 2018).

Meanwhile, the growing dominance of digital media adds complexity, as consumers are increasingly exposed to global content, influencer marketing, and targeted advertisements that may challenge or reinforce their ethnocentric views (Gelovani et al., 2025; Hapsari et al., 2024). Social platforms can act as both agents of globalization and echo chambers of local cultural values, shaping ethnocentric depending on content exposure (Khare & Kautish, 2021). This framework contributes significantly to consumer ethnocentric theory by integrating these domains into a single model, allowing researchers to explore not just isolated variables, but how they function together in a systemic way. It extends existing models of consumer ethnocentrism such as CETSCALE (Sharma, Shimp, & Shin, 1995) and aligns with emerging interdisciplinary approaches in digital consumer behavior (Marres, 2017). Moreover, it opens new avenues for empirical research across different countries, cultures, and market conditions, offering the flexibility to adapt and test the model in various contexts (Ortega-Egea & García-de-Frutos, 2021).

The practical implications are equally important. For businesses and marketers, the model can guide the development of more nuanced branding and communication strategies that consider the cultural sensitivity of target markets. Domestic brands can strengthen their position by aligning their marketing with national values and identity (Čvirik, 2021), while international brands may benefit from tailoring their messages to address or bridge cultural and psychological barriers (Kanwar & Huang, 2022; Kara, Prasad, & Spillan, 2024). For policymakers, understanding the roots of consumer ethnocentrism can inform initiatives to support local industries, encourage fair competition, and educate the public about global trade (Goel, Giri, & Sharma, 2025). Lastly, for consumers, this model promotes greater awareness of the unconscious biases that shape purchasing decisions, encouraging more reflective and balanced consumer choices in an increasingly interconnected world.

Conclusion

It shows that ethnocentric tendencies shaped by a combination of socio-psychological influences, demographic factors, and the digital media influences. Consumers who exhibit strong national pride and a sense of moral obligation to support local products tend to reject foreign goods, often regardless of price or quality. Demographic variables such as age, income, education, and gender further influence these attitudes, revealing segment specific consumer behaviours. Nowadays digital environment, social media and influencers play a dual role which are reinforce ethnocentric sentiments by promoting national pride, and expose consumers to diverse global options, potentially weakening product bias. Understanding these dynamics is essential for marketers, policymakers, and local producers aiming to enhance the competitiveness of domestic brands. This is particularly relevant in developing countries where national identity and economic protectionism remain strong drivers of consumer behavior.

In future research explore consumer ethnocentrism differs across cultural and political contexts, especially by comparing collectivist and individualist societies. This can provide a broader understanding of national identity influences consumer behaviour globally. Additionally, there is a need for longitudinal studies to examine the long-term impact of digital media factors on ethnocentric attitudes, particularly as social media algorithms continue to shape the content users see. Research should also investigate the role of influencer credibility in reinforcing national loyalty, and digital figures affect trust and engagement with local brands. Another important area for future study is younger generations balance global exposure

with national loyalty, as their purchasing behaviours may redefine ethnocentric patterns in the coming years. Furthermore, the relationship between consumer ethnocentrism and sustainability initiatives warrants deeper investigation to determine whether preferences for local products are motivated by ethical and environmental concerns or purely by patriotic sentiment. Finally, future research should assess the effectiveness of government policies, marketing campaigns, and educational programs in shaping consumer ethnocentrism and influencing market dynamics.

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VALIDATING AN INSTRUCTIONAL COMPETENCY MODEL FOR ASSISTANT HEADTEACHERS: PRELIMINARY EVIDENCE FROM A PILOT STUDY USING CFA AND SEM

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Abstract: This study aimed to develop and validate an Instructional Competency Model tailored for Assistant Headteachers (GPK) in Malaysian primary schools, across both rural and urban school settings in Sabah, reflecting its diverse educational landscape. Grounded in the KOMPAS 2.0 framework, the model conceptualised instructional competency as a multidimensional construct comprising four latent domains: Curriculum-Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED). A pilot survey involving 100 GPK across various districts in Sabah was conducted. Data were analysed using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) to assess construct validity and model fit. The CFA results demonstrated excellent fit indices ($\chi^2/df = 0.446$, CFI = 1.000, RMSEA = 0.041), with standardised factor loadings ranging from 0.80 to 0.87. All constructs achieved strong composite reliability (CR > 0.81) and average variance extracted (AVE > 0.80). SEM analysis confirmed significant path coefficients from the main construct to its four dimensions, with Curriculum-Focused Instructional Leadership ($\beta = 0.87$) emerging as the strongest contributor. These results support the robustness, reliability, and contextual relevance of the model. The validated model holds significant theoretical and practical implications. It extends instructional leadership theory into middle leadership domains and offers a strategic framework for assessing, developing, and supporting GPK' instructional roles. This study advances scholarly discourse on distributed leadership and provides actionable insights for education policymakers, school administrators, and training providers.

Keywords: Instructional Competency, Assistant Headteachers, Confirmatory Factor Analysis, Structural Equation Modeling, KOMPAS 2.0

Introduction

In Malaysia's evolving education system, Assistant Headteachers (GPK) serve as key middle leaders who implement and supervise teaching and learning policies at both primary and secondary levels (Wahab & Mustapha, 2020). Besides handling administrative matters, GPK also support principals in ensuring instructional quality, particularly in contexts where school leaders face constraints. Their roles now include curriculum supervision, mentoring, and

teacher performance support (Mohamed et al., 2020). Research shows that effective GPK leadership positively influences teacher professionalism, classroom practices, and school outcomes (Hassan et al., 2023). GPK also foster teacher leadership by mentoring peers and supporting the development of professional learning communities in schools. These communities help drive consistent improvements in instructional methods and school culture. Through this dual instructional–administrative role, GPK act as enablers of both policy implementation and school transformation. Their contribution is essential to improving long-term educational quality.

The Malaysian Ministry of Education (MOE) has recognised the importance of middle leaders through strategic initiatives such as the Malaysia Education Blueprint 2013–2025 and the Strategic Plan 2024–2030. These documents highlight the need to enhance teacher competency and build instructional leadership capacity at all school levels (Adams et al., 2020). GPK are tasked with supporting career-based teacher development and coordinating professional training at the school level. This includes competency-based progression and targeted upskilling aligned with national education reform goals. However, studies have noted a lack of reliable tools to evaluate GPK’ instructional leadership competencies systematically (Beram et al., 2022; Samad et al., 2023). Most instruments available focus primarily on principals, leaving a gap in accurately capturing the influence of GPK as instructional leaders. This absence also affects the design of evidence-based development programmes tailored to their specific roles. As a result, the strategic alignment between classroom practices and national policy expectations remains inconsistent in many schools.

To address this gap, the present study introduces and validates an Instructional Competency construct designed specifically for GPK. The construct integrates four key domains adapted from the KOMPAS 2.0 framework: Curriculum-Focused Instruction (IBK), Research Culture (PP), Comprehensive Monitoring (PM), and Digital Ecosystem Culture (PED). These domains are aligned with evolving national frameworks such as the Standard Guru Malaysia (SGM 2.0), which also emphasise culturally responsive leadership and evidence-based professional growth (Mohd Razali et al., 2024). GPK play a vital role in curriculum implementation by coordinating academic standards and ensuring that classroom teaching meets national learning targets (Ambon et al., 2024). Through structured leadership practices, they help shape school culture, mentor teaching staff, and elevate the quality of student learning (Hui & Singh, 2020). Their instructional leadership is especially crucial in rural or underserved schools, where centralised oversight is often limited, and adaptive, context-sensitive leadership is most needed (Ambon et al., 2024).

To validate the proposed instructional competency model, this study employed Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) using data from 100 GPK in Sabah. Sabah was selected due to its diverse school contexts across Sabah, diverse challenges, and need for adaptive leadership. This study seeks to develop and validate a reliable instrument to measure the instructional competencies of GPK based on four KOMPAS 2.0 dimensions, and to examine the relationships between the construct and its core dimensions. This model aims to support performance evaluations, inform training design, and strengthen instructional leadership at the middle management level. The findings are expected to guide policy and practice in developing data-driven professional development for Assistant Headteachers in Malaysian schools.

Research Objectives

1. To validate the instructional competency model for Assistant Headteachers (GPK) based on the KOMPAS 2.0 framework using CFA and SEM.
2. To examine the relationships between instructional competency and its four dimensions (IBK, PP, PM, PED).

Research Hypotheses

H₀₁: The proposed instructional competency model does not demonstrate a good fit based on CFA and SEM analyses.

H₀₂: Each of the four instructional dimensions (IBK, PP, PM, PED) does not significantly predict the instructional competency of Assistant Headteachers.

Literature Review

Definition of Instructional Competency

Instructional competency refers to the ability of educational leaders, particularly Assistant Headteachers (GPK), to lead teaching and learning directly through teacher capacity building, effective curriculum implementation, and classroom data utilisation to enhance student achievement. It encompasses the skills to plan, supervise, and evaluate instructional strategies professionally, ethically, and in alignment with national education policies (Beram et al., 2022; Mukhtar & Razak, 2024).

Curriculum-Focused Instructional Leadership (IBK)

The dimension of Curriculum-Focused Instructional Leadership (IBK) highlights the competency of Assistant Headteachers (GPK) in managing the effective and holistic implementation of the national curriculum. GPK are expected to ensure that instructional planning aligns with curriculum goals and the diverse needs of students at the grassroots level. According to Mohamed et al. (2020), instructional leaders who emphasise curriculum alignment with teaching strategies have a significant impact on student achievement. Similarly, Kim & Ogawa (2023) found that middle leaders who consistently communicate curriculum vision help enhance teacher understanding of learning outcomes.

The strength of the IBK dimension also lies in the ability of GPK to adapt curriculum implementation to the contextual needs of the school. A study by Ismail et al. (2020) showed that failure to bridge the gap between policy and classroom practice often leads to ineffective teaching and learning. GPK must therefore be adept at tailoring content to students' abilities, available teaching resources, and the socio-cultural context of their schools. This adaptive leadership is especially relevant in Malaysia, where diverse school settings demand flexible instructional strategies (Yaacob & Ishak, 2023). Moreover, indigenous instructional leadership elements are increasingly prioritised to ensure that Western-origin frameworks are contextualised to the Malaysian education landscape (Samichan et al., 2021).

In addition to contextual alignment, the IBK domain supports instructional innovation and reflective teaching. GPK who guide teachers in applying differentiated strategies help ensure

the curriculum is accessible to all learners (Fanny et al., 2022). This role demands curriculum literacy, pedagogical awareness, and the ability to lead improvements in instructional design. The IBK domain thus represents a foundation for developing instructional competency among GPK, empowering them to bridge national reform goals with practical classroom realities.

Research Culture (PP)

This dimension reflects the responsibility of Assistant Headteachers (GPK) in cultivating a culture of reflective practice, professional inquiry, and data-driven instruction as core elements of instructional leadership. A research culture in schools is not merely an academic exercise but must be embedded in daily teaching and learning practices to enhance pedagogical quality and promote innovation (Mukhtar & Razak, 2024). Moreover, fostering such a culture requires deliberate leadership strategies that empower teachers to engage in collaborative inquiry and evidence-based improvement initiatives (Pilling, 2024). When GPK lead by modeling professional reflection and support for action research, they reinforce a sustainable culture of instructional innovation.

In the Malaysian context, the role of GPK in encouraging teacher engagement in research is increasingly recognised. For instance, Rahman et al. (2025) highlighted that fostering a school-based research culture enhances alignment between instructional practices and learning outcomes, particularly when classroom data is empirically used to inform teaching strategies. Likewise, Samad et al. (2023) found that GPK who support collaborative inquiry models such as action research and lesson study can build learning environments that are more responsive to student needs.

Critically, embedding a research culture requires GPK to take on dual roles as facilitators of inquiry and as intermediaries between policy and classroom practice. Beyond encouraging research among teachers, GPK must also translate research findings into actions that can elevate the overall quality of teaching in schools. This aligns with international perspectives that position research engagement as a catalyst for innovation and evidence-based leadership (Jude James et al., 2022).

When implemented strategically, a research culture serves as a catalyst for innovation, continuous professional growth, and instructional accountability. GPK are instrumental in institutionalising reflective practices and fostering collaborative inquiry among teachers to inform teaching decisions. These practices have been linked to improved pedagogical quality and sustainable school transformation (Choy et al., 2021). Furthermore, school leaders who actively promote reflection and inquiry help to build more resilient professional communities that are responsive to evolving educational demands (Dinham et al., 2020).

Holistic Monitoring (PM)

This dimension involves the ability of Assistant Headteachers (GPK) to systematically monitor and evaluate instructional implementation in a comprehensive and continuous manner. In modern instructional leadership, monitoring is no longer viewed as a compliance task, but as a mechanism for quality improvement grounded in reflection and evidence (Bush, 2024). GPK are expected to conduct regular classroom observations, deliver constructive feedback, and initiate pedagogical interventions to improve teaching effectiveness (Zhaffar & Rashed, 2022).

Effective school leader feedback has been shown to enhance teacher self-efficacy and instructional quality, particularly when based on clear performance criteria and supported by targeted follow-up actions (Nachbauer et al., 2022).

Effective monitoring also increases teacher motivation and ensures alignment between curriculum delivery and learning objectives (Yee et al., 2021). In Malaysia, collaborative and non-threatening monitoring approaches have proven more effective in promoting a culture of professional growth among teachers (Yaacob & Ishak, 2023). GPK who engage teachers in open dialogue during post-observation feedback sessions also help foster trust and professional ownership in instructional improvement.

Furthermore, comprehensive monitoring must include elements of reflection and systematic follow-up. GPK play the role of facilitators in helping teachers assess the strengths and weaknesses of their instruction using observation data, classroom evidence, and student performance. This aligns with the Ministry of Education's emphasis on standards-based evaluation and impact-focused monitoring (Raman et al., 2020).

In summary, this dimension requires GPK to demonstrate the ability to interpret instructional data critically and deliver constructive feedback within a professional environment. Monitoring should not only ensure compliance with educational policies but also act as a tool for continuous development that supports instructional excellence at the school level.

Digital Ecosystem Culture (PED)

This dimension underscores the capacity of Assistant Headteachers (GPK) to champion digital transformation in instructional leadership. Digital ecosystem culture is not limited to providing infrastructure or tools; it involves cultivating a mindset that embraces digital integration in pedagogy, assessment, and professional collaboration. According to (Abdullah et al., 2023), digital instructional leadership must promote critical awareness and ethical use of technology in teaching and learning. GPK play a key role in modelling digital competence, as evidenced by Hamid & Rahman (2025), who found that school leaders with high digital fluency influence teacher readiness to adopt digital pedagogies.

A thriving digital ecosystem also requires GPK to integrate ICT in instructional planning and delivery. Middle leaders who possess digital dexterity and leadership skills are better positioned to foster teacher acceptance of technology and align it with pedagogical needs (Naz & Rashid, 2021). Additionally, technology-enhanced learning environments are most effective when leadership focuses on instructional goals rather than simply infrastructure provision (AlAjmi, 2022). This implies that GPK must go beyond digital administration and actively lead in instructional design that leverages digital tools to meet learning outcomes, especially as leadership styles directly influence teacher motivation and ICT integration practices (M Mohd Siraj et al., 2023).

In addition, fostering a digital ecosystem means establishing systems for collaboration and data-sharing that support teacher learning. Digital platforms enable real-time communication and personalised feedback, enhancing instructional coherence. Kim & Ogawa (2023), emphasised the importance of leadership in sustaining digital learning communities. Meanwhile, Yasir et al. (2024) linked digital leadership practices with increased teacher

collaboration and innovation. This aligns with recent research by Shal et al. (2024), which highlights how virtual communities of practice empower teacher agency and distributed leadership through collaborative online engagement.

Ultimately, the PED dimension requires Assistant Headteachers to act as digital catalysts, ensuring that the integration of technology enhances not disrupts instructional practices. They are responsible for fostering a school culture where digital tools are used meaningfully to improve student learning, streamline instructional supervision, and build future-ready schools. Antonopoulou et al. (2025), further demonstrates that transformational digital leadership strongly predicts improvements in teachers' digital competencies and instructional coherence in primary education contexts.

Conceptual Framework

This study adapts the KOMPAS 2.0 Model (IAB, 2020) within the instructional leadership theory of Hallinger and Murphy (1985) to suit the roles of Assistant Headteachers (GPK) as middle leaders in Malaysian primary schools. Originally designed for principals, the model is tailored to reflect GPK's instructional responsibilities, aligning with evidence that distributed leadership enhances teacher autonomy and instructional innovation (Hsieh et al., 2024; Lin, 2022).

The framework conceptualises instructional competency as four interrelated dimensions: Curriculum-Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED). IBK covers curriculum alignment and pedagogical guidance; PP promotes reflective and evidence-based teaching; PM focuses on structured monitoring aligned with policies; and PED emphasises integrating digital tools into instruction.

This adapted framework forms the theoretical and operational basis for the measurement model tested using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) to validate the instructional competency construct among GPK.

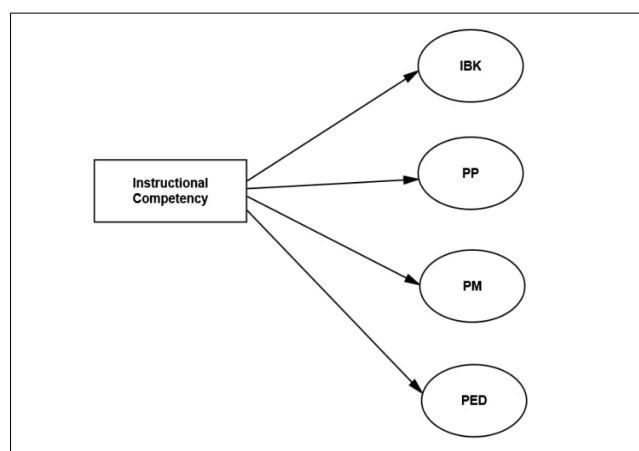


Figure 1: Proposed Instructional Competency Model for Assistant Headteachers (GPK)

Methodology

Research Design

This study adopted a non-experimental quantitative design using a cross-sectional survey approach. This design was selected as it allows for the collection of data from a representative sample at a single point in time, aligning with the study's objective to develop and validate the construct of instructional competency among Assistant Headteachers (GPK). It is also appropriate for examining relationships between variables without manipulation or intervention.

Research Site and Ethical Clearance

Formal ethical approval for this study was obtained from the Educational Research Application System (ERAS), the Ministry of Education Malaysia (MoE), and the Sabah State Education Department (JPN Sabah) prior to the commencement of data collection. Sabah was selected as the research site due to its unique educational context, which reflects rural diversity, resource limitations, and the pressing need for adaptive instructional leadership. This selection enhances the potential generalizability of the construct across Malaysia's diverse school settings.

Sampling and Respondents

A total of 100 Assistant Headteachers (GPK) were selected as respondents through purposive sampling across several districts in Sabah. Respondents were academic GPK currently serving in public primary schools under the jurisdiction of the Sabah State Education Department (JPN Sabah). This sample size met the minimum requirements for Confirmatory Factor Analysis (CFA) based on widely accepted respondent-to-item ratio guidelines. Descriptive data were gathered to provide contextual insights into the respondent profile.

Research Instrument

The research instrument was developed based on the four core dimensions of the KOMPAS 2.0 model, namely:

1. Curriculum-Focused Instructional Leadership (IBK)
2. Research Culture (PP)
3. Holistic Monitoring (PM)
4. Digital Ecosystem Culture (PED)

Each dimension was operationalised through multiple items rated on a five-point Likert scale, ranging from "1 = Strongly Disagree" to "5 = Strongly Agree." The initial draft of the questionnaire was reviewed by three subject matter experts in educational leadership and refined based on their feedback. The final version of the instrument was administered online via Google Forms, considering the geographical spread and accessibility constraints of schools in Sabah.

Data Analysis Techniques

Data were analysed using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) with the aid of AMOS software. These analyses aimed to evaluate the validity of the proposed measurement model, including internal consistency, convergent and discriminant validity, and model fit indices such as CFI, TLI, RMSEA, and Chi-Square/df. The application of CFA and SEM aligned with the study's goal of empirically validating the structure of the instructional competency construct and assessing the interrelationships among its dimensions.

Findings

Descriptive Statistics and Data Screening

A total of 100 valid responses were obtained from Assistant Headteachers (GPK) in several districts across Sabah. Preliminary screening indicated no missing data or outliers. Skewness and kurtosis values were within the acceptable range of ± 2 , indicating that the data met the assumption of normality for multivariate analysis.

Measurement Model Assessment (CFA)

Confirmatory Factor Analysis (CFA) was conducted to assess the validity of the measurement model consisting of four latent constructs: Curriculum-Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED). The initial model demonstrated excellent fit to the data based on the following indices:

Table 1: Fit Index for Measurement Model

Fit Index	Value
ChiSq/df	0.446
df	1
P-value	.078
GFI	.998
AGFI	.978
TLI	1.016
CFI	1.000
RMSEA	.041
NFI	.991

All items loaded significantly onto their respective constructs, with standardised factor loading ranging from 0.80 to 0.87.

Measurement Model Assessment through CFA

Figure 2 illustrates the structural model of Instructional Competency among Assistant Headteachers based on Confirmatory Factor Analysis (CFA). The model comprises a single overarching construct—Instructional Competency—represented by four primary dimensions: Curriculum-Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED). All pathways were statistically significant, with standardised factor loadings ranging from 0.80 to 0.87, indicating strong associations between the latent construct and its indicators.

The CFA results demonstrated an excellent fit to the data, with fit indices exceeding commonly recommended thresholds (Hair et al., 2019; Byrne, 2016): $\chi^2(1) = 0.446$, $p = .078$, $\chi^2/df = 0.446$, $GFI = .998$, $AGFI = .978$, $TLI = 1.016$, $CFI = 1.000$, $RMSEA = .041$ and $NFI = .991$. These values confirm the robustness and adequacy of the measurement model. These values suggest that the measurement model is highly acceptable and aligns with recommended thresholds proposed by Hair et al. (2019) and Byrne (2016).

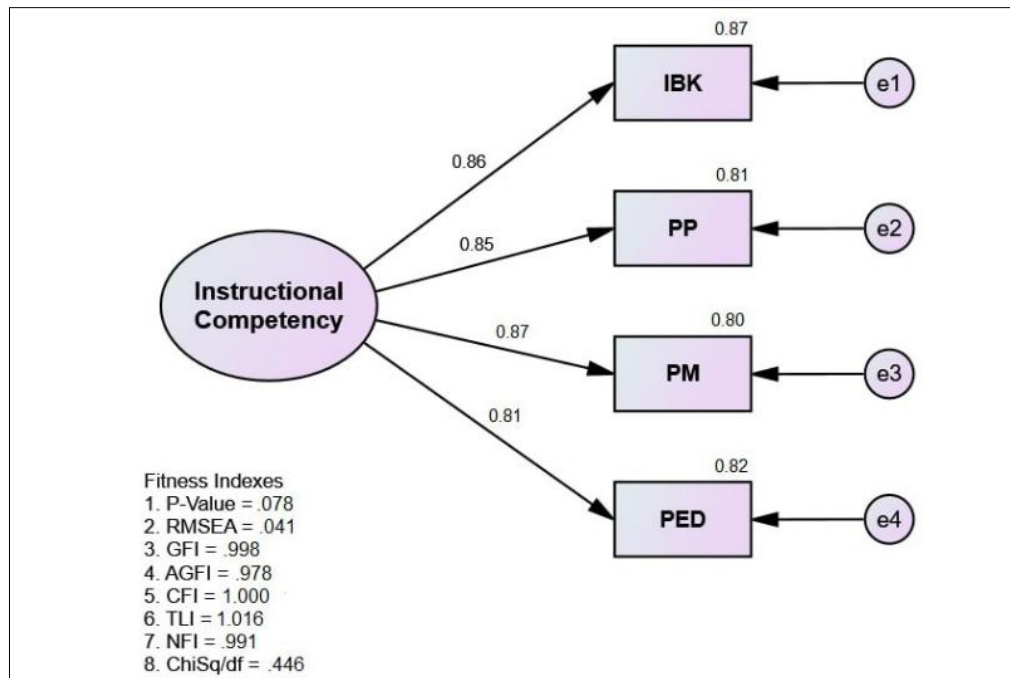


Figure 2. Confirmatory Factor Analysis (CFA) Model of Instructional Competency among Assistant Headteachers

Construct Reliability and Validity

The model demonstrated strong internal consistency and construct validity. Convergent validity was supported by factor loadings exceeding 0.6. Discriminant validity was deemed sufficient, as no excessively high correlations were detected between constructs. The table below shows the CR and AVE values for each construct, all of which were within acceptable thresholds:

Table 2: Composite Reliability (CR) and Average Variance Extracted (AVE) for Each Construct

Construct	Composite Reliability (CR)	Average Variance Extracted (AVE)	Status
IBK	0.86	0.87	Acceptable
PP	0.85	0.81	Acceptable
PM	0.87	0.80	Acceptable
PED	0.81	0.82	Acceptable

Structural Model (SEM)

The structural model examined the relationships between *Instructional Competency* and its four dimensions (IBK, PP, PM, PED). All paths were significant with strong coefficients ($\beta = 0.80\text{--}1.00$) and excellent fit indices, confirming model validity.

Table 3 presents the standardised path coefficients and interpretations, while Figure 3 illustrates the validated structural model, visually confirming the strength and direction of these relationships.

Table 3: Standardised Path Coefficients and Interpretations (SEM Results)

Path	Standardised Coefficient (β)	Interpretation
Instructional Competency → IBK	1.00	Reference path (fixed value)
Instructional Competency → PP	0.80	Strong relationship
Instructional Competency → PM	0.87	Very strong relationship
Instructional Competency → PED	0.83	Strong relationship

Assessment of the Structural Model

The structural model was examined to assess the relationships between the main construct, Instructional Competency, and its four dimensions: Curriculum-Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED). The results indicate that all four dimensions have significant and strong associations with the main construct, with standardised path coefficients ranging from 0.80 to 1.00. The model demonstrated excellent fit indices, confirming the robustness and validity of the proposed relationships.

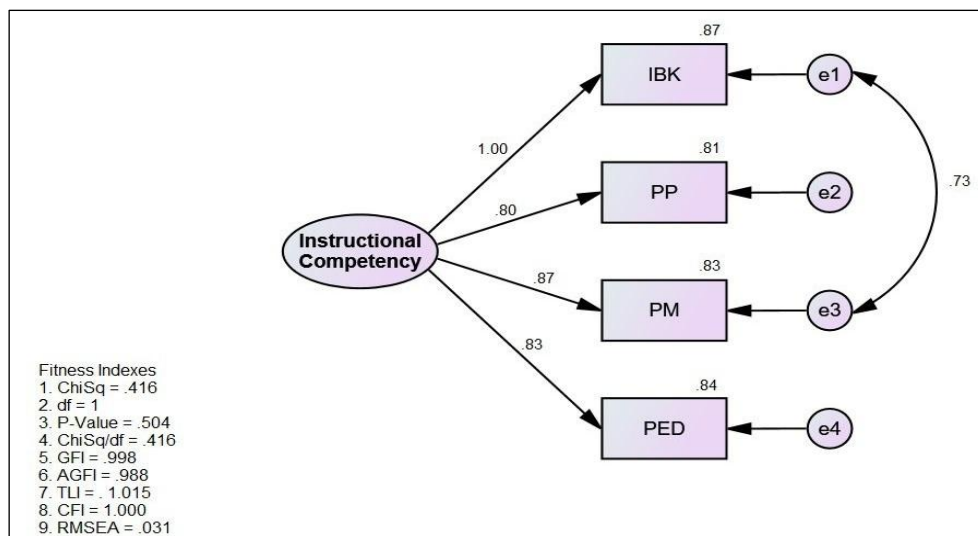


Figure 3. Structural Model of Instructional Competency among Assistant Headteachers

Summary of the Model

The findings confirm that the proposed model is valid and appropriate for measuring instructional competency among Assistant Headteachers in Sabah. The model demonstrated excellent fit, while the strong relationships between constructs, especially with PM and IBK, reflect the complex and multifaceted nature of instructional leadership at the middle management level. These results strengthen the structural integrity of the model and support its application in empirical evaluations and leadership development initiatives for GPK.

Discussion

The CFA results confirm the empirical validity of the proposed Instructional Competency Model for Assistant Headteachers (GPK) in the Malaysian primary school context. The model demonstrated excellent fit indices, with chi-square divided by degrees of freedom equal to 0.446, comparative fit index of 1.000, and root mean square error of approximation of 0.041. All four dimensions, namely Curriculum Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED), recorded strong standardised loadings ranging from 0.80 to 0.87. These findings indicate that the model is conceptually coherent and statistically robust, supporting its use in evaluating GPK' instructional competencies in diverse educational settings. Among the four dimensions, Curriculum-Focused Instructional Leadership (IBK) recorded the highest standardised path coefficient ($\beta = 0.87$), followed by Digital Ecosystem Culture (PED) ($\beta = 0.82$), Research Culture (PP) ($\beta = 0.81$), and Holistic Monitoring (PM) ($\beta = 0.80$). These findings suggest that Assistant Headteachers' instructional competency is most strongly influenced by their ability to align curriculum with instructional practices, integrate digital tools into pedagogy, foster a research-oriented school culture, and systematically monitor teaching and learning. All four dimensions play critical and complementary roles in shaping effective instructional leadership. This pattern reinforces the need for middle leadership that is data-driven, reflective, and innovative—especially within diverse school contexts across Sabahs. The results are consistent with previous studies by Zaini et al. (2024) and Kenayathulla et al. (2024), which emphasised the role of high-impact monitoring and digital integration in improving instructional quality.

Theoretically, this study contributes to the growing discourse on distributed instructional leadership by validating the relevance of the KOMPAS 2.0 framework for middle leadership roles, particularly among Assistant Headteachers. It extends the empirical foundation for understanding how instructional competencies manifest at non-principal levels of school management, a perspective often overlooked in educational leadership research. Practically, the validated model offers a reliable diagnostic tool for educational authorities to assess GPK' instructional leadership capacity across multiple dimensions. It can inform targeted professional development programmes, leadership appraisal systems, and policy interventions, especially for rural and semi-urban school contexts. The use of standardised metrics across the four dimensions also provides a consistent framework for measuring growth and impact over time.

Implications

This study presents several practical and theoretical implications for the development of instructional leadership among Assistant Headteachers (GPK). At the policy level, the validated model provides an evidence-based framework to support the formulation of competency standards and performance indicators for middle leadership in Malaysian schools.

The four core dimensions, which include Curriculum Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED), can be used as central elements in the design of structured professional development programmes suited to the specific challenges of diverse school environments in Sabah. From a theoretical perspective, the study affirms the relevance of the KOMPAS 2.0 framework beyond the role of school principals, emphasising its suitability for supporting shared leadership roles. This broadens the theoretical scope of instructional leadership by positioning GPK as essential contributors to curriculum implementation, pedagogical advancement, and digital transformation at the school level. The findings also provide a measurement model that can be replicated and adapted in future research to examine instructional leadership across various educational contexts and systems.

Conclusion

This study successfully developed and validated a robust and contextually relevant Instructional Competency Model for Assistant Headteachers (GPK) in Malaysian primary schools, particularly within the state of Sabah. Employing Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM), the model demonstrated strong construct reliability and validity across four critical dimensions: Curriculum-Focused Instructional Leadership (IBK), Research Culture (PP), Holistic Monitoring (PM), and Digital Ecosystem Culture (PED). The validated model reinforces the pivotal role of GPK in instructional leadership, extending their contribution beyond administrative duties to encompass data-informed decision-making, research-driven pedagogy, and digital transformation. These findings are especially relevant in geographically diverse school settings like Sabah where adaptive and distributed leadership is essential for improving instructional quality. Theoretically, this research contributes to the expansion of instructional leadership frameworks by validating the KOMPAS 2.0 model in middle leadership contexts. Practically, it provides an evidence-based tool for evaluating GPK' instructional capacity, informing leadership development programmes, and shaping policy interventions. Future studies may extend this work by testing the model longitudinally or across diverse educational contexts, contributing further to the discourse on instructional leadership effectiveness.

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ROHINGYA COMMUNITY IN KELANTAN: NATIONAL SECURITY CONCERNS AND LOCAL PERCEPTIONS

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Abstract: *The presence of the Rohingya ethnic community in local settlements, particularly in the eastern coastal states, has elicited a range of apprehensions among the local populace. Kampung Peringat, Melor and Kota Bharu are among the primary locations for the settlement of the Rohingya ethnic community in Kelantan. Initially consisting of just a few individuals, the Rohingya population has increased significantly, now numbering in the thousands as illegal immigrants in the region. This research uses a qualitative approach, employing data gathered from both primary and secondary sources. Data is collected through interviews and observations within relevant domains. Secondary data is drawn from empirical sources, including dissertations, academic journals, and online databases. This research encompasses three primary objectives: 1) to examine the implications of the influx of the Rohingya ethnic community in Kelantan; 2) to assess the management and security protocols in response to the arrival of Rohingya ethnic refugees in Kelantan; and 3) to evaluate the effectiveness of governmental policies aimed at managing and regulating the presence of the Rohingya ethnic community in Kelantan. The findings of this study indicate that 1) the presence of this community has given rise to a range of social, economic, and security challenges, such as increased competition in the job market, greater use of public facilities, and negative perceptions regarding national security; 2) the management and security measures necessitated by the influx of Rohingya refugees in Kelantan have not been effectively implemented; and 3) the current governmental strategies for managing Rohingya refugees are viewed as inadequate, with lax enforcement heightening the concerns of the local populace. This study advocates for the government to implement more effective actions in the management of Rohingya refugees, thus safeguarding the well-being and security of Malaysians.*

Keywords: *(Community, Kelantan, Illegal Immigrant, National Security, Rohingya)*

Introduction

The continuous persecution of Rohingya has forced thousands to escape to neighbouring countries in search of safety. Since Myanmar's independence in 1948, the number of Rohingya refugees has grown, particularly following military operations that persecuted the minority (Doctors Without Borders, 2019). This exodus occurred in 1978, 1990-1991, 2012-2013, 2015, and 2016, peaking in August 2017, as a result of genocide, war crimes, and crimes against humanity committed by the Myanmar military regime. As a result, nearly 80% of the Rohingya people now live in a diaspora, including Malaysia.

Several factors influence the selection of Malaysia as a transit country for Rohingya refugees and asylum seekers in the region. According to Andika (2019), there are three main factors that influence Rohingya refugees to choose Malaysia as their preferred destination. First, the factor

of Malaysia as an Islamic country. Second, they already have family members in Malaysia. Third, the factor of easily finding a job. Among other factors influencing them to migrate to Malaysia are having no other options, agents offering attractive smuggling offers and Malaysia's borders being easy to breach.

At the end of November 2024, approximately 111,410 Rohingya refugees and asylum seekers were registered with the UNHCR in Malaysia as of which accounts for 58% of the total refugee population in the country (UNHCR, 2025). Although a significant number of them possess UNHCR cards, this status only grants them international recognition as refugees, not national recognition. The 1951 Convention Relating to the Status of Refugees and the 1967 Protocol Relating to the Status of Refugees, which are the primary instruments in international refugee law, were not signed by Malaysia. In this regard, Malaysia is not legally obligated to acknowledge or provide refugees with specific rights, including access to health facilities, education, and employment. In contrast, Malaysia's immigration laws classify refugees as illegal immigrants (Hairunnisa, 2021).

Initially, the presence of the Rohingya in the region was defined by small clusters, comprising fewer than 10 individuals. The successful escape and subsequent establishment of a better life by a group of Rohingya ethnic individuals in their destination country served as a compelling example for other groups remaining in Myanmar (Nor Fazlina & Mohd Farid, 2024). The rise in the population of the Rohingya ethnic group can likewise be ascribed to the government's favourable disposition towards the refugees (Azharudin & Azlinariah, 2012). They were likewise allowed to navigate without the necessity of establishing residence in a designated settlement (Mohd Sophian, 2024 & Ruhisham, 2025). Within a short span of years, their population surged significantly in Malaysia, resulting in the establishment of colonies across diverse regions of the country, including the Klang Valley, Penang, Negeri Sembilan, Johor, Kuala Terengganu, and Kelantan.

In recent years, the increasing number of Rohingya ethnic communities in Kelantan has increasingly attracted the attention of the community and local authorities. The state, located on the East Coast of Peninsular Malaysia, has now become one of the focal locations for Rohingya refugees to reside informally. According to Mohd Khairul Hilmi (2025), among the Rohingya settlements in Kelantan are the Ketereh, Kok Lanas and Melor areas. Factors such as lower cost of living, existing community networks, and job opportunities in the informal sector have attracted the presence of these refugees. Their increasingly significant presence raises various questions about their legal status, social integration and impact on the local community. Therefore, this study aims to examine the acceptance and perception of residents in Kelantan towards Rohingya ethnic refugees on national security.

Methodology

This study uses qualitative methods. Qualitative methods are methods of collecting research data using various sources. Qualitative methods have the advantages and strengths of providing detailed and in-depth explanations of problems through reference to various research sources, such as interview processes and observations, where researchers must be present in the field to obtain data directly (Merriam, 2009). Two types of sources are focused on obtaining research information: primary data and secondary data. Interview methods were conducted to obtain primary data in this study.

Interview sessions with informants were conducted face-to-face and virtually. The face-to-face interview method has the advantage because it allows researchers to learn and experience the experiences of respondents described by them during the interview process, such as feelings (sad, angry, happy), actions, events, and gain new knowledge that may not be available through literature (Muthiah, 2008). Nonetheless, the face-to-face interview method presents drawbacks, as it necessitates considerable time and financial resources for execution, along with challenges in identifying appropriate and reliable informants appropriate to the area of focus. Virtual interviews were undertaken for informants unable to participate in person owing to time constraints or geographical distance, and used email or internet video conferencing. There were 11 informants interviewed in this study. Informants include residents, law enforcement, academics, non-governmental organisations (NGOs), and Rohingya refugees.

Secondary data is classified into two categories: printed and non-printed materials. The collection of printed secondary data is carried out through library research. This method plays a crucial role in aiding researchers in obtaining and enhancing the information necessary to support these studies. Secondary data of non-print materials, including electronic books, electronic magazines and journal articles, are obtained by exploring web operator sites such as Google Scholar. The Police Journal: Theory, Practice and Principles, Journal of International Relations and Strategic University of Malaya, Journal of International Studies, Universiti Utara Malaysia, and Zulfaqr Journal, Universiti Pertahanan Nasional Malaysia, are among the reference journals.

National Security Concept

The concept of "national security" originates from the 1648 Treaty of Westphalia, which established the principle of a sovereign state governed by a head of state, thus creating a new global framework for nation-states. In the current period of globalisation, numerous experts concur that security is a "contested concept", as it has been criticised for its restrictive definition and ethnocentric bias. Countless scholars, including Buzan, Lippmann, and Wolfers, have articulated the notion of security. Buzan adopts a comprehensive perspective on security, emphasising many levels and sectors (Stone, 2009). In his paper "New Patterns of Global Security in the Twenty-First Century", Buzan examines how the concept of security includes not only military elements but also environmental, social, political, and economic concerns (Buzan, 1991).

Buzan (1983) identifies five fundamental perspectives of security: military, political, economic, social, and environmental. These aspects are interrelated and do not function independently, forming a complex network of relationships. The five fundamentals are inherently interconnected. National security, within the framework of the international system, refers to the capacity of states and societies to preserve their functional independence and integrity. Buzan identifies military security as the initial fundamental perspective, emphasising the role of force and its potential impact on all state components. Military threats can vary in significance regarding security. Buzan identifies political security as the second fundamental perspective of security. Political security may manifest as ideological competition or assaults on the state. Such threats represent a persistent concern for a state, albeit being more complex and challenging to identify compared to military threats.

Political security refers to the mechanisms through which governmental institutions maintain the integrity of their nation under legal frameworks and constitutional provisions. Governments possessing a robust administrative framework are equipped to address security threats, whether domestic or external, by enforcing legal systems and implementing national security policies designed to uphold the legitimacy of political institutions and governance. Political security is understood as a threat aimed at exerting pressure on governmental authority or policies. This threat manifests through actions intended to overthrow the government, such as revolutions or the establishment of anti-government movements. These actions can undermine the country's political, administrative, and military capabilities, potentially leading to its collapse (Buzan et al., 1998). Governments characterised by political stability derive significant legitimacy from the populace, which is rooted in the active participation of citizens in selecting their leaders through a legitimate electoral process. When the government attains legitimacy from the populace, compliance with its laws and regulations is likely to follow. Buzan emphasised that political ideology differences persist within any nation, potentially threatening national security. Such ideological disparities may incite radical and fanatical sentiments among the populace, creating opportunities for exploitation by certain factions aiming to destabilise the current administrative system (Harrison, 2009).

Despite Buzan's challenges in defining the core concept of economic security, it is evident that economic security is intricately linked to military security, as financial limitations and constraints render military security reliant on economic security. Meanwhile, social security can be defined as a system of balance and identity prevalent in many countries worldwide. Social security, concerning culture and identity, is intrinsically connected to military and political security. According to Buzan, environmental security is particularly contentious compared to other security perspectives, as it appears unmanageable and poses a global threat with extensive repercussions. This study focuses on social security, economic security, and political security.

Findings

The results of this study discuss three main national security issues related to the Rohingya ethnic community in Kelantan, as follows:

Social Security

The presence of the Rohingya ethnic group in Kelantan is increasingly worrying the local community. The Rohingya community began settling in Kampung Melor Lama over a decade ago, with an initial population of no fewer than five individuals. All settlements in Kampung Melor Lama, Kampung Kubang Tin and Kampung Padang Kala have Rohingya settlement communities. Their numbers have increased significantly in a short time, with some claiming it has reached thousands (Syaherah, 2024a).

This sudden increase has led to the establishment of a large Rohingya community in the region, which has created a perception among the local population that their area is being "colonised" (Nur Firdaus, 2025). These concerns arise not only from the growing population but are also closely related to security issues. Furthermore, there are allegations that rice fields on the outskirts of villages have been turned into informal settlements, where some Rohingya residents engage in illegal activities such as gambling, cockfighting, and karaoke (Syaherah,

2024a). This situation disrupts public order and threatens the social harmony and cultural values of the local community.

Residents have observed that some Rohingya arrive in this country as married couples and remain for an extended period, establishing families and descendants in Malaysia. Indeed, some couples marry in the country, where it is claimed that the wedding ceremony is conducted by individuals acting as a *tok kadi*. In certain instances, they invite villagers to partake in feasts and employ locals for food preparation, signifying social engagement with the local population. When enquired about their immigration status into Malaysia, the majority indicated that they arrived legally by possessing a United Nations High Commissioner for Refugees (UNHCR) card (Ahmad Faris, 2025). Reports indicate that the Rohingya community is engaged in illegal activities and has confronted the local population, raising concerns regarding security and public order (Rushisham, 2025).

Crime statistics concerning the Rohingya ethnic community in Kelantan reveal a troubling increase (Ahmad Faris, 2025). In 2023, there were 56 arrests related to various criminal incidents involving the Rohingya, compared to 35 arrests in 2022. The highest number of recorded offences was housebreaking incidents under Section 457 of the Penal Code and cases of theft or embezzlement under Section 379 of the Penal Code, each comprising 11 instances. In the Kota Bharu district, 16 crime reports were recorded regarding this ethnic group, consisting of seven cases of theft and embezzlement, two cases of cable theft, and two violations of Section 4A(a) of the Open Gambling Houses Act 1953. In addition, one case of serious injury, one case of kidnapping and one case of murder. Crimes occurred mainly in the Melor and Ketereh areas (Syaherah, 2024b). Table 1 shows several media reports of crimes committed by the Rohingya in Kelantan.

Table 1: Media coverage of crimes committed by the Rohingya in Kelantan

Date	Media Agencies	News Headlines
February 19, 2025	New Straits Times	Rohingya imam charged with sexually abusing boy at Kelantan mosque.
September 23, 2024	Utusan Malaysia	Rape, murder, Rohingya sentenced to 24 years jail, four strokes of the rotan.
February 28, 2024	Berita Harian	Immigration Dept busts 'Ali Rohingya' human trafficking gang.
January 22, 2024	Harian Metro	Rohingya get married using their <i>tok kadi</i>
October 18, 2023	New Straits Times	Rohingya man was stabbed more than 40 times due to jealousy.

Source: Researcher

Apart from being involved in criminal cases, the Rohingya in Kelantan have also been detected committing various offences related to road laws. The Rohingya mostly constitute the majority of illegal immigrants who drive local vehicles without licences, particularly in Kota Bharu (Siti Rohana, 2023). Most of them have been detected using vehicles without a valid licence and without road tax and insurance, thus violating basic regulations under the Road Transport Act 1987. According to the Road Transport Department (RTD), driving licenses issued by the UNHCR are not recognised on a local level. This implies that, under the Road Transport Act 1987, these licenses are not valid for any vehicle in the country (Nicholas, 2020). UNHCR cardholders lack legal rights, status, and a foundation to make any demands of the local

government (UNHCR, 2020). The Royal Malaysian Police also issued a severe warning to the local populace, cautioning them not to permit any illegal immigrants to operate their vehicles. This is because they are responsible for any accidents or traffic violations that may occur while using the vehicle.

Another significant complaint from the local community regarding the Rohingya refugee community pertains to their perceived disregard for cleanliness, particularly in residential areas. Residents who live next to this community have expressed their discomfort with the level of cleanliness in the Rohingya living environment, which is found to be poorly maintained (Hudzaifah, 2025). This issue has also caused tension between the local community and the Rohingya ethnic group, as it is seen as a form of failure to adapt to the values of cleanliness that are part of the local community's culture (Nur Firdaus, 2025).

Economic Security

The Rohingya community in Kelantan engages in several informal economic activities to support their daily lives. Despite being classified as illegal immigrants and without legal documentation, they continue to pursue job opportunities in fields that do not necessitate formal qualifications or legal verification. Among the main activities they engage in are working as manual labourers on construction sites, collecting and selling scrap metal (Halim, 2024). However, because they are not subject to business licences or tax laws, their participation in this economic activity frequently leads to conflict when there is unfair competition with the local populace, particularly when they charge lower prices. The local community is concerned about this issue because they believe it threatens their work options and revenue sources (Siti Munirah, 2025).

Meanwhile, the Rohingya who have lived in Kelantan for seven years make a living by selling scrap metal. He uses a tricycle to do this informal work to support his family. He engages in this business secretly to avoid detection by the authorities, as his refugee status prevents him from working legally in the country. He claims that his daily salary of between RM40 and RM60 is enough to support his family (Syaherah, 2024a). According to Mustapha (2025), the Rohingya, who have historically earned their livelihood through scrap metal collection, have transitioned from using tricycles to lorries. They possess expertise in purchasing and selling scrap metal, encompassing the prices provided. Locals are employed as Rohingya lorry drivers, earning approximately RM100 daily.

In some areas, such as Kampung Melor Lama, there are also a few individuals in this community who run small businesses, such as opening stalls. There are Rohingya who have lived in Kelantan for over two decades, running small businesses such as opening stalls and are skilled in preparing local food such as *roti canai* (Ahmad Faris, 2025). Residents have expressed concern regarding the possibility that certain individuals may be conducting businesses unlawfully by utilising licenses that belong to local individuals, a practice referred to as the Ali Baba system. In this situation, individuals in the local community obtain business licences under their names, while the actual operations of these businesses are conducted solely by Rohingya individuals. This practice contravenes local authority regulations and prompts a critical examination of the transparency in business regulation, as well as the equity afforded to law-abiding local traders. This situation highlights the pressing necessity for enhanced enforcement and more defined policies concerning the participation of refugees in Malaysia's

informal economy, particularly in regions like Kelantan, where there has been a notable rise in the Rohingya community (Mohd Sophian, 2024).

Political Security

The influx of Rohingya refugees in Kelantan brings with it social and economic challenges, while also raising important questions regarding political security. Their growing presence has heightened concerns within local communities about the potential for demographic shifts that might threaten long-term political stability. Concerns emerge when the refugee community, even without citizenship status, is perceived as able to create significant community groups in terms of numbers and the spread of foreign cultures that may not align with national identity (Halim, 2024).

Rohingya refugees are alleged to have fake identity documents (MyKads) and have misused their UNHCR cards, raising doubts about the legitimacy of the country's administrative structure and border security. It is believed that Rohingya refugees have fraudulent identity documents such as MyKad, Malaysian passports and UNHCR cards. This raises major issues about the legality of the administrative structure of the country as well as the effectiveness of the measures that are in place to secure the borders. There are significant flaws in the control system at the country's entry points, particularly in high-risk border areas such as the Kelantan-Thailand border (Rushisham, 2025). The fact that some of these refugees were able to enter the country without going through the legal immigration screening process and that they obtained identity documents illegally is evidence of the fact that these flaws exist. These breaches at the land and sea borders have created an environment that is conducive to people smuggling activities that are orchestrated by transnational syndicates.

As a result, these breaches pose a threat to the security of the region and undermine the sovereignty of the nation. Furthermore, because there is no integrated biometric and tracking system amongst the agencies that are responsible for border security, it is impossible for refugees who are not formally recorded to be tracked and to travel freely within the country. In this context, the misuse of identity documents not only poses a challenge to public governance but also raises threats to national security, including the likelihood of elements of extremism or cross-border criminality invading the country (Halim, 2024).

Recommendation

This study recommends that the government take more effective action in managing Rohingya illegal immigrants to ensure the well-being and security of Malaysians. Several actions that may be implemented include:

Law Enforcement

The influx of Rohingya communities in Kelantan necessitates a stricter law enforcement strategy to guarantee that their management is conducted in a more organised and regulated manner. Rohingya who breach regulations should face suitable consequences, particularly concerning the possession of valid travel documents, unauthorised residence, and participation in criminal activities like smuggling, human trafficking, and the misuse of identification documents.

In order to comprehensively address this issue in Kelantan, it is necessary to improve the collaboration between enforcement agencies, including the Immigration Department of Malaysia, the Royal Malaysian Police, the National Security Council, and the Ministry of Home Affairs. Furthermore, it is crucial to collaborate with international agencies, including the United Nations High Commissioner for Refugees (UNHCR) and non-governmental organisations (NGOs), to ensure that actions against undocumented refugees are coordinated. Refugees who violate regulations must be subjected to legal action. Authorities can monitor refugees who engage in unlawful activities through the implementation of detection technology, including biometric systems and digital monitoring. The efficacy of field operations can be significantly enhanced by the urgent implementation of training and capacity-building programmes for enforcement personnel in Kelantan, particularly in areas designated as refugee settlements and at the borders.

It is also important for law enforcement to target residents who are participating in illegal immigration by renting out dwellings or giving work opportunities to illegal immigrants. In addition to violating immigration regulations, this practice has the potential to bring about social issues such as criminal activity, employment without proper authorisation, and economic inequities in the local community. Consequently, the government must take into consideration the possibility of imposing more severe punishments on individuals or employers who are involved in this activity. This would be in addition to the implementation of regular inspections and public awareness programmes regarding the implications of this activity from a legal and security standpoint. It is essential to take these measures to guarantee that the social sustainability and security of the state of Kelantan will continue to be preserved despite an influx of Rohingya refugees.

Tighten Border Controls

Enhanced border control in Kelantan is crucial for addressing the inflow of Rohingya, given the state's extensive land border with Thailand, particularly through the Tumpat, Pasir Mas, and Tanah Merah districts. The expansive border and frequent utilisation of unofficial entrance points have rendered this area susceptible to intrusions by refugees lacking legitimate documentation. Therefore, the government needs to increase the number of border control posts, enhance security patrols, and reinforce control infrastructure such as security barriers, watchtowers, and electronic monitoring systems. The increased presence of security troops in border hotspots can gradually diminish people smuggling and illegal immigration.

Besides physical reinforcement, the enhancement of innovative technologies in border management is also necessary. Radar monitoring devices, airborne drones, long-range surveillance cameras, and biometric scanners can detect suspicious movements in real time. This strategy enables enforcement authorities to operate more swiftly and effectively, hence diminishing dependence on labour-intensive manual patrols. The implementation of technology necessitates the establishment of a collaborative database across agencies, including the Immigration Department of Malaysia, the Royal Malaysia Police and the Malaysian National Security Council, to enhance the exchange of information regarding suspects or smuggling networks. This comprehensive strategy can not only improve Kelantan's border security but also establish a sustainable control mechanism for the long run.

Tighter border control also requires collaboration between Thailand and Malaysia through diplomatic and regional security mechanisms. To curb illicit cross-border activities, a stronger border control agreement and joint patrols are essential. Additionally, working with local authorities in southern Thailand to identify rat routes frequently used by human trafficking syndicates is crucial. Local communities serve as the first line of defence regarding vital information, and the government of Kelantan can play a key role locally by strengthening its involvement in the security community programme. When community members are concerned about potential threats to the border, authorities can detect and respond more swiftly.

Repatriation and Resettlement to a Third Country

The issue of repatriating Rohingya refugees to Myanmar presents a multifaceted and delicate challenge; however, it remains a crucial aspect to contemplate in the pursuit of a sustainable resolution to the ongoing refugee influx in Malaysia. Malaysia, while not a signatory to the 1951 Refugee Convention, nonetheless grapples with the complexities arising from the presence of unregistered Rohingya refugees lacking legal status. Malaysia is an independent nation that prioritises the national security of its citizens.

Furthermore, Malaysia could assist third countries and international organisations like Bangladesh in establishing temporary special settlements for Rohingya refugees, such as on Bhasan Char Island. The Bangladesh government has developed this island as a more organised and controlled area for refugee settlement, in contrast to the overcrowded refugee camps in Cox's Bazar. In spite of the criticism from numerous NGOs and the international community concerning the island's location and safety, it continues to be one of the most viable solutions to alleviate the demographic and socio-economic challenges encountered by nations such as Malaysia. Relocating refugees in Malaysia to designated areas through collaboration with UNHCR and the Bangladesh government would enable a more systematic approach to refugee management, grounded in humanitarian principles.

Conclusion

There are legitimate worries regarding the impact on national security caused by the influx of Rohingya ethnic communities in Kelantan. According to this research, the unchecked influx of Rohingya communities has threatened the political stability and independence of the nation, as well as impacted local social stability, boosted crime rates, and produced unfair economic competition. Failure to implement effective policies and weak law enforcement have revealed major gaps in the refugee management system, especially in terms of border control and monitoring of illegal immigrants.

Worryingly, people smuggling syndicates and the misuse of identity documents like phoney UNHCR cards and MyKads show that the national security system is vulnerable. This leaves the door open for transnational challenges, which could undermine the legitimacy of the government and the stability of the country's politics. Within this framework, the Rohingya refugee crisis has brought attention to the fact that national security encompasses not just military but also social, economic, and political security.

In this context, the Malaysian government needs to develop a more comprehensive and cohesive strategy, which should encompass enhancing law enforcement, fortifying border

controls, and streamlining the procedures for repatriation or resettlement to third countries through international collaboration. It is essential to implement these measures with careful consideration, ensuring that humanitarian principles are not overlooked while still aligning with national security.

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TEACHER PERFORMANCE EVALUATION SYSTEMS: A STRATEGIC DRIVER OF TEACHER PROFESSIONAL GROWTH AND SCHOOL IMPROVEMENT

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Abstract: *This paper explores the teacher performance evaluation system as a key mechanism for promoting teacher professional development and advancing school growth. In the context of global educational reform, teacher evaluation has shifted from a traditional supervisory tool to a strategic approach that supports teacher growth and school improvement. Using a conceptual research method, this study systematically reviews relevant domestic and international literature based on educational management theories, motivation theories, and continuous professional development models, summarizing their positive roles in enhancing teaching quality, motivating teachers, and informing policy development. The findings reveal that a scientific and reasonable evaluation system can optimize teacher resource allocation, strengthen teachers' professional awareness, and improve the overall management level of schools. To further deepen the analysis, this paper introduces three classical performance management theories—Management by Objectives (MBO), Expectancy Theory (Vroom), and Equity Theory (Adams)—to examine their practical value in guiding teacher evaluation practices. It also compares common evaluation methods in the field of education, such as the Key Performance Indicator (KPI) approach, 360-degree feedback, Behaviorally Anchored Rating Scales (BARS), and the MBO method. By analyzing real-world cases, the paper identifies existing problems in current evaluation systems, including unreasonable indicator design, disconnection between evaluation and incentives, lack of fairness, and weak feedback mechanisms. In response, it proposes practical optimization strategies, such as setting differentiated goals, building effective incentive systems, enhancing transparency, and strengthening feedback and data utilization, with the aim of better supporting teacher professional development and improving the overall quality of education.*

Keywords: *Teacher Performance Evaluation, Professional Development, Educational Management and Performance Management Theories*

Introduction

Teachers play a central role in the education process. Their performance not only affects students' learning but also influences the overall quality and reputation of schools. As educational reform continues, school leaders are paying more attention to how to evaluate teachers fairly and scientifically. A good performance system should help teachers grow and keep them motivated.

Problem Statement

However, many schools still use simple and rigid evaluation models that rely too much on numbers and ignore the value of the teaching process. Also, performance evaluations are often not connected to real incentives, which makes teachers less willing to take part.

Objective of this Study

To make performance evaluation more meaningful and helpful, we need to start with theory and also consider practical situations. This paper first introduces three important theories that help explain what a good evaluation system should include—such as clear goals, proper motivation, and fairness. Then, it looks at four common teacher evaluation methods used in schools, discussing their advantages, disadvantages, and suitable situations. In the final part, the paper gives suggestions for solving common problems, aiming to support education leaders in building better systems for teacher performance management.

Literature review

Management by Objectives (MBO)

Management by Objectives (MBO) was proposed by Peter Drucker and emphasizes the importance of employees and their supervisors collaboratively setting clear, measurable goals, which serve as the basis for performance evaluations. This theory focuses on employee involvement and goal alignment, making it particularly suitable for positions with high autonomy and organizations that are results-oriented.

Expectancy Theory (Vroom)

Expectancy Theory, proposed by Victor Vroom, posits that employees' efforts depend on their judgment of the value of expected outcomes and their understanding of the relationship between effort and performance. In performance evaluation, Expectancy Theory highlights the importance of aligning motivation mechanisms with evaluation outcomes, ensuring both fairness in the evaluation process and the effectiveness of motivational incentives.

Equity Theory (Adams)

Equity Theory, proposed by John Stacey Adams, focuses on employees' perceptions of fairness in the evaluation process and results. If employees believe their inputs (such as time, effort, and skills) do not match their rewards (such as pay, promotions, and recognition), it can lead to decreased work motivation. Therefore, performance evaluation systems should be transparent and reasonable, balancing both subjective and objective factors.

The application of these three theories in performance management has significant guiding significance. The Management by Objectives Theory (MBO) stimulates employees' sense of responsibility and execution ability by setting clear and measurable goals. The Expectation Theory (Vroom) improves the incentive effect of performance management by ensuring that incentive measures are consistent with employees' expectations. The Equity Theory (Adams) emphasizes the fairness of the evaluation process to prevent employees from losing their work

motivation due to unfairness. Combining these three theories can more comprehensively enhance the scientificity and fairness of the performance appraisal system.

In the education system, a scientific and reasonable performance appraisal system not only helps motivate teachers to improve the quality of teaching and scientific research, but also provides an important basis for education management. Here are a few common teacher performance evaluation methods and how they can be used in practice.

Key Performance Indicator (KPI) Approach

KPI is one of the most widely used performance evaluation tools in colleges and universities, emphasizing the quantitative assessment of achievements, such as the number of scientific research publications, teaching evaluation scores, and guiding students' competition results. The advantage of this method is that the data can be quantified, the management is operational, and it is especially suitable for linking with performance bonuses and title promotions, and has a strong incentive effect.

However, there are also significant limitations to the KPI approach. Because its core is result-oriented, it often ignores the hidden labor and educational value in the teaching process, which is easy to lead to the tendency of "emphasizing scientific research over teaching". In addition, long-term reliance on hard indicators may lead teachers to ignore the essence of education in pursuit of data, resulting in a tendency to achieve profitability.

Practical examples:

A university sets the KPIs in the annual performance evaluation of teachers as: "70% teaching score, 20% scientific research achievements, and 10% service work". This method is directly linked to the year-end performance bonus. Although it is helpful for quantitative management, it also causes dissatisfaction among some teachers, who believe that the pressure of scientific research is too great and the teaching investment is not recognized accordingly, which leads to a reflection on the rationality of weight distribution.

360-Degree Performance Feedback Method

The 360-degree feedback method comprehensively evaluates teachers from multiple perspectives such as students, parents, colleagues, and leaders, aiming to improve the comprehensiveness and multi-dimensionality of evaluation. This method is especially suitable for primary and secondary schools, which can promote home-school co-governance and enhance teachers' sensitivity to external feedback.

Its advantage lies in the wide range of evaluation angles, which can reflect the comprehensive quality and influence of teachers. However, there are obvious subjective problems in this method, especially the evaluation of students and parents is easily disturbed by non-performance factors such as emotion and relationship, which may affect the fairness and scientificity of the evaluation. In addition, the collection and analysis of multi-party data has a large workload, which has high requirements for the management system and personnel quality.

Therefore, 360-degree feedback is suitable for the comprehensive quality assessment of primary and secondary school teachers, especially in the context of building a positive interaction mechanism between teachers, parents and students.

Practical examples:

A middle school in Beijing implemented a 360-degree performance evaluation, in which feedback from students and parents accounted for 30% of the total evaluation. This has raised the awareness of home-school co-governance, but it has also exposed some problems, such as the lack of objectivity and emotional color of some students' evaluations, which leads to doubts about the authenticity of the results.

Behavioural Anchoring Rating (BARS)

BARS is an assessment method that concretizes a teacher's teaching behavior and sets a grading standard. It uses specific behaviors such as "frequency of classroom interaction" and "reasonableness of homework assignment" as the anchor point of scoring, which enhances the operability and guidance of the assessment. This method is especially suitable for teachers' teaching behavior improvement and classroom teaching observation.

The advantage is that the criteria are clear and the evaluation is concrete, which helps to improve teaching practice. At the same time, the design and implementation of BARS requires a high degree of professional support, including behavior classification, anchor setting, scoring level setting, etc., which require a lot of time and energy. In addition, BARS tends to focus on classroom performance, which is difficult to fully reflect the effectiveness of teachers' work in scientific research, teaching and research, and service.

Therefore, BARS is more suitable for targeted teaching scenarios such as teaching improvement projects, open class evaluations, and teacher professional development support.

Practical examples:

The evaluation items can include "frequency of classroom interaction", "quality of response to students' questions", "reasonableness of assignments", etc., and score through preset behavioral performance levels (such as excellent, good, medium, and poor), so as to achieve specific evaluation of teaching details.

Management by Objectives (MBO)

MBO emphasizes that teachers and administrators jointly set teaching and research goals at the beginning of the year, and form a closed loop of "consensus-implementation-feedback" through regular inspections and year-end evaluations. This approach focuses on both outcomes and process management, which can stimulate teachers' initiative and responsibility.

The advantage of an MBO is that the goals are targeted and negotiable, which makes it easy to combine the school's development goals with the individual's development plan. However, the effectiveness of its implementation is highly dependent on the communication ability and execution of managers, and if the goal setting is unreasonable, it may degenerate into formalism. At the same time, periodic review and process tracking also put forward higher requirements for the management mechanism.

Therefore, MBO is suitable for performance management of universities and research-oriented teachers, especially in an environment that encourages teachers to self-plan and self-evaluate.

Practical examples:

At the beginning of the academic year, university teachers and the academic affairs office or department heads jointly set annual goals including the number of class hours, research publication goals, teaching reform tasks, etc. At the end of the year, the assessment will be carried out according to the completion of the situation to achieve the organic combination of personalization and standardization.

Previous Studies

Teacher performance evaluation plays an important role in today's education reform. Its design and implementation not only directly affect teachers' professional growth but also impact students' learning outcomes and the overall quality of schools (Stronge, 2010). However, many schools still use relatively simple and rigid evaluation models. They rely too much on numbers and data while ignoring the complexity and value of the teaching process itself (Danielson, 2007). In addition, evaluation results are often not linked to real rewards for teachers, which causes teachers to lose motivation and a sense of identity in the evaluation system (OECD, 2019). Therefore, to build a scientific, effective, and motivating performance evaluation system, it is important to combine strong theoretical foundations with practical strategies.

A good teacher evaluation system should be based on three main principles: setting clear goals, using reasonable incentive mechanisms, and ensuring fairness.

First, the Goal Setting Theory proposed by Locke and Latham (2002) points out that specific and challenging goals can significantly improve individual performance. In education, this means teacher evaluations should guide teachers toward clear and measurable teaching objectives.

Second, regarding motivation, Firestone (2014) suggested that teachers' motivation can be divided into external and internal types. External motivation relies on financial rewards like performance bonuses but may also damage teamwork among teachers and even create "teaching to the test" problems. On the other hand, internal motivation focuses on the teacher's sense of purpose, self-efficacy, and professional autonomy, which offers a more lasting form of motivation.

Third, fairness is also crucial in building an evaluation system. According to Adams' (1965) Equity Theory, people tend to compare their efforts and rewards with those of others to decide if they are treated fairly. If teachers feel the evaluation results are unfair, their satisfaction may decrease, and they may respond negatively in their teaching work, ultimately harming the quality of education.

In terms of evaluation methods, Fogoroş (2016) mentioned that common approaches used in schools today include classroom observations, student evaluations, analysis of teaching outcomes, and peer evaluations. Each method has its strengths, but if not designed carefully, they can lead to inaccurate evaluation results.

In summary, a scientific and effective teacher performance evaluation system should fully integrate Goal Setting Theory, motivation mechanisms, and fairness principles. It should combine different evaluation methods and connect evaluation results to real incentives. Only by doing so can schools better support teachers' professional growth and continuously improve the quality of education.

Methodology

This article is a Conceptual Paper and adopts the following methods:

Literature review and comparative analysis, theoretical integration and model construction, case comparison method.

Finding

Although performance evaluation plays an important role in improving the quality of education and teacher development, there are still many problems in some educational institutions in the actual implementation process, which affects the fairness and effectiveness of performance evaluation. The following is a specific analysis of some typical problems:

The Indicator Setting is Unbalanced

In some universities, primary and secondary schools, performance evaluation indicators often focus on quantifiable results, such as "number of scientific research projects", "number of papers published", "number of student competition awards", etc. This kind of orientation of emphasizing quantity over quality ignores the emotional investment, classroom interaction and practical effect of education in the teaching process, and is easy to lead to the tendency of "emphasizing scientific research and ignoring teaching". Especially in colleges and universities, many teachers are forced to reduce classroom investment in order to meet the requirements of scientific research assessment, which weakens the educational function of teaching.

Ignoring the Individual Differences of Teachers

At present, some schools often adopt a unified scoring system when formulating performance evaluation standards, and lack the distinction between teachers' development stages and job responsibilities. For example, the evaluation of young teachers and senior teachers with the same scientific research and teaching standards fails to take into account the actual differences in their experience accumulation, scientific research resources and teaching ability. This "homogeneous evaluation" model not only affects the fairness of evaluation, but also may affect the enthusiasm and professional confidence of some teachers.

Disconnect Between Assessment and Incentive Mechanism

Effective performance appraisals should be linked to incentive mechanisms such as teachers' salaries, title promotions, and training opportunities. However, in practice, some schools only regard performance evaluation as a routine year-end process, and the evaluation results have little impact on the actual interests of teachers, resulting in low participation of teachers and

even the phenomenon of "going through the form". This kind of rupture between appraisal and incentive weakens the guiding and motivating function that performance appraisal should have.

Deviation in the Student Evaluation Data

In the student evaluation teacher mechanism widely used in primary and secondary schools and colleges and universities, the evaluation results are often disturbed by non-teaching factors such as teachers' "popularity index", scoring tightness, and subject attributes, and the subjectivity is strong. For example, some students are more inclined to give higher grades in order to have a more relaxed curriculum or less homework, rather than really evaluating the instructor based on the quality of the teaching. In this case, the representativeness and authenticity of student evaluation data are questioned, and it is difficult to use it as an important basis for teacher performance.

The Importance of Teacher Performance Evaluation in Teachers' Professional Growth and School Development

Teacher performance evaluation is not only a tool to measure teaching effectiveness but also a key mechanism for promoting teachers' professional growth and supporting the sustainable development of schools. A well-designed evaluation system can help teachers improve their teaching skills, boost their internal motivation, and guide professional development through goal setting, constructive feedback, and fair assessment. At the same time, it helps schools manage resources more effectively and strengthen organizational collaboration. In the context of ongoing education reforms, teacher evaluations are shifting from a simple results-based approach to a supportive, developmental, and motivational system. Based on this understanding, this section will analyze the positive impact of teacher performance evaluation on both teacher growth and school development, with real-life examples provided for illustration.

Promote the Professional Growth of Teachers Clarifying Professional Growth Paths

A scientific evaluation system helps teachers identify their strengths and weaknesses by setting clear and measurable teaching goals. This allows them to plan growth steps, such as improving classroom interaction and strengthening subject knowledge.

Providing Development Resources

Based on evaluation results, schools can arrange personalized training courses, teaching workshops, or research project opportunities to meet the diverse needs of teachers.

Encouraging Reflection and Improvement

Ongoing evaluation encourages teachers to reflect on their teaching practices, adjust strategies, and improve the quality of instruction.

Case: A certain city provided precise teaching diagnosis and one-on-one guidance for young teachers through performance data. Within two years, their average teaching ability assessment improved by 20%.

***Stimulating Teachers' Internal Motivation
Enhancing Sense of Achievement and Professional Identity***

A fair and transparent evaluation system helps teachers feel their efforts are recognized, strengthening their professional identity and long-term commitment to education.

Building Effective Incentive Mechanism

Linking evaluation outcomes to salary adjustments, promotion opportunities, and awards can effectively boost teachers' enthusiasm and innovation.

Case: A top high school launched an "Outstanding Teacher Growth Program," linking promotions to performance evaluations. As a result, teachers' motivation for promotion increased, and team stability improved.

***Promoting School Organizational Development
Optimizing Teacher Allocation and Position Management***

By analyzing performance data, schools can better allocate subject teachers and adjust positions, achieving efficient use of human resources.

Improving Overall Teaching Quality

The growth of individual teachers leads to improvements in the overall team, raising the school's teaching quality and reputation.

Buliding A Learning-Oriented School Culture

Performance evaluation encourages collaboration and experience-sharing among teachers, fostering a school culture focused on continuous improvement and collective growth.

Case: After a region implemented a "performance + training" linked mechanism, inter-school teacher collaboration increased by 42% year-on-year, and the area's overall teaching quality significantly improved.

***Suggestions for Optimizing Performance Appraisal System
Set Up Assessment Indicator Reasonably***

In view of the imbalance of assessment indicators just mentioned, performance appraisal should adhere to the principle of paying equal attention to "quality" and "quantity", and scientifically design evaluation dimensions. Based on the Management by Objectives Theory (MBO) theory, it advocates that employees and managers work together to set clear and measurable goals as a performance evaluation criterion. For example, colleges and universities can add teaching quality weights to the assessment of scientific research achievements, while

primary and secondary schools should highlight classroom teaching, student feedback, home-school communication, etc. For teachers with different experiences, personalized performance goals can be negotiated and formulated, such as young teachers can set "basic teaching skills improvement", and key teachers can set "subject research + teaching and research driven" goals, and evaluate performance according to the degree of completion at the end of the year.

Establish An Incentive Linkage Mechanism

In order to solve the problem of disconnection between assessment and incentive mechanism, an incentive linkage mechanism can be proposed based on Vroom's expectation theory. The results of performance appraisal can be linked to incentive elements such as salary adjustment, title promotion, and training opportunities to enhance the guidance and motivation of the system. Substantial rewards and development opportunities will be given to continuously outstanding teachers. For example, a middle school in Zhejiang linked the performance level with the number of teachers for further education, and those with excellent performance were given priority to participate in the training of municipal backbone teachers, and at the same time gave monthly performance rewards, which stimulated the motivation of teachers to actively participate in classroom reform and subject research.

Strengthen Institutional Transparency and Teacher Participation

Adams's theory of fairness emphasizes that individuals care about the perception of the contrast between their own efforts and rewards and those of others. If you perceive "unfairness", you may have negative emotions such as laziness and loss. Therefore, in the performance appraisal, it is necessary to ensure that the evaluation standards are open and the procedures are transparent, and introduce a differentiated evaluation mechanism, respect the characteristics of different positions and stages, and avoid "one size fits all". Improving the transparency of the performance system and encouraging teachers to participate in the design and revision of the system can enhance the sense of identity and implementation of the system. In addition, through regular briefings and publicity processes, the evaluation process is open and the results can be traced.

A university in Shenzhen introduced the mechanism of "hierarchical assessment + public appeal", which divided teachers into three categories: teaching, scientific research and comprehensive, and set assessment weights respectively, allowing teachers to raise objections to the results and review them, which effectively alleviated teachers' doubts about the fairness of the assessment.

Improve the Feedback Mechanism and Improve the Validity of the Evaluation Data

In view of the subjective problem of student evaluation, cross-verification of multiple data sources, including classroom observation, teaching logs, and peer evaluations, should be used to improve the objectivity and representativeness of the data. At the same time, students are trained in evaluation and guided to score objectively and fairly. At the same time, peer evaluation, mentoring, and personalized improvement plans are encouraged to help teachers continuously improve their professional ability.

Conclusion

A good performance evaluation system is very important for the development of high-quality education. Scientific evaluations are not only tools for human resource management but also key ways to help teachers grow, stay motivated, and improve teaching results. This paper explained three core theories—MBO, Expectancy Theory, and Equity Theory—showing that a good evaluation should look at what teachers do, how they do it, and whether the process is fair. By analyzing four practical methods (KPI, 360-degree feedback, BARS, and MBO), the paper also highlighted current problems, such as focusing too much on research, using one-size-fits-all standards, weak incentives, and unreliable student feedback.

Teacher performance evaluation has a direct and positive impact on both teachers' growth and school development. A well-designed evaluation system helps teachers clarify their professional goals, identify areas for improvement, and receive targeted support such as training and development opportunities. It also strengthens teachers' sense of achievement and motivation when linked to promotion, salary, and awards. For schools, performance evaluation improves the allocation of teaching resources, raises the overall quality of education, and builds a culture of collaboration and continuous improvement.

To improve evaluation systems, this paper gives four main suggestions: (1) set clear and reasonable goals based on teachers' roles and experience levels; (2) link performance results to rewards like promotion, salary, and training to increase motivation; (3) improve transparency and teacher involvement to make the system fair and acceptable; (4) collect feedback from different sources and focus more on ongoing performance, not just final results.

In short, performance evaluation should help teachers improve, not limit them. With a teacher-centered and student-focused approach, performance systems can support better teaching and a stronger education system.

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PERCEPTION OF PUBLIC TRANSPORT: A STUDY ON CUSTOMER SATISFACTION AMONG PUBLIC UNIVERSITY STUDENTS IN THE KLANG VALLEY USING RAPIDKL BUSES

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Abstract: Public transportation systems play a crucial role in sustainable urban development, yet ridership rates in Malaysia remain below optimal levels despite significant infrastructure investments. University students represent a key demographic for public transport utilization, but their satisfaction levels and usage patterns remain understudied in the Malaysian context. This study examines the perception of public transport services and customer satisfaction among National Defence University Malaysia (NDUM) students specifically regarding Rapid KL bus services, addressing critical gaps in understanding how service quality dimensions influence student satisfaction and subsequent usage patterns. A conceptual framework based on the adapted SERVQUAL model is proposed, focusing on six key dimensions: reliability and punctuality, tangible service environment, accessibility and convenience, safety and security, information and communication, and staff service quality. A quantitative research design is proposed to investigate relationships between perceived service quality and customer satisfaction. Reliability and accessibility are anticipated to emerge as primary determinants of student satisfaction, while safety concerns and service frequency are expected to significantly impact usage decisions. The study will contribute to the theoretical understanding of public transport customer satisfaction in a public university. The research provides practical recommendations for service improvement, including enhanced reliability, improved information systems, and targeted strategies to increase public transport adoption among young adults. Policy implications encompass institutional and governmental levels, supporting sustainable mobility practices and social equity objectives. This conceptual study offers a comprehensive framework for understanding public transport customer satisfaction among university students, providing valuable insights for transportation planners, policymakers, and service providers seeking to enhance public transport effectiveness in Malaysia.

Keywords: public transport, customer satisfaction, service quality, and university students

Introduction

Transportation systems constitute the fundamental infrastructure supporting modern urban societies, facilitating economic growth, social connectivity, and environmental sustainability. In developing nations such as Malaysia, the challenge of creating efficient and attractive public transportation networks becomes particularly complex due to rapid urbanization, increasing private vehicle ownership, and evolving mobility preferences among different demographic groups (Banister, 2008). The significance of public transport extends beyond mere mobility

provision, representing a critical component of sustainable development strategies aimed at reducing traffic congestion, air pollution, and urban sprawl (Litman, 2021). Malaysia has invested substantially in public transportation infrastructure over the past two decades, with comprehensive development of rail networks, bus rapid transit systems, and integrated transport hubs throughout major urban areas. The Klang Valley, encompassing Kuala Lumpur and surrounding metropolitan areas, serves as the primary testing ground for these initiatives, hosting various public transport modes including Light Rail Transit (LRT), Mass Rapid Transit (MRT), monorail systems, and extensive bus networks operated by Rapid KL (Land Public Transport Agency, 2023). Despite these investments, public transport ridership in Malaysia remains below optimal levels, with private vehicle usage continuing to dominate urban mobility patterns. The university student population represents a particularly important demographic for public transport systems due to several factors. Students typically face financial constraints that make public transport an economically attractive option compared to private vehicle ownership and maintenance costs (Zhou, 2012). University campuses often generate significant travel demand during peak hours, creating opportunities for efficient public transport utilization. Students represent future decision-makers and professionals whose early experiences with public transport can influence long-term mobility preferences and policy support (Whalen et al., 2013). National Defence University Malaysia (NDUM) presents an interesting case study for examining public transport perceptions among university students. Located in Sungai Besi, Kuala Lumpur, NDUM serves a diverse student population including local and international students, military personnel, and civilian students pursuing various academic programs. The university's unique location makes Rapid KL serves as the sole public transportation option for students commuting to and from the campus. This makes the university an appropriate context for examining student experiences with public bus services. Rapid KL, as the primary public bus operator in the Klang Valley, plays a crucial role in providing accessible transportation options for university students and the general public. The company operates over bus routes covering extensive areas of Kuala Lumpur and Selangor, serving millions of passengers annually (Prasarana Malaysia Berhad, 2023). However, public perception of Rapid KL services has been mixed, with frequent complaints regarding service reliability, vehicle conditions, and route coverage (Yee et al., 2024). The relationship between service quality and customer satisfaction in public transportation has been extensively studied in developed countries, but research focusing on developing nations, particularly in Southeast Asian contexts, remains limited (Eboli & Mazzulla, 2007). Understanding how university students perceive and evaluate public transport services provides important feedback for service improvement initiatives and policy development, contributing to broader sustainability goals and social inclusion objectives.

Literature Review

Service Quality and Customer Satisfaction in Public Transport

The conceptualization of service quality in public transportation has evolved significantly over the past three decades, drawing from broader service management literature while adapting to the unique characteristics of transport services. Early research focused primarily on operational efficiency measures such as on-time performance and cost-effectiveness, but recognition that passenger perceptions significantly influence ridership decisions has led to increased emphasis on customer-oriented quality measures (Hensher & Prioni, 2002). Parasuraman, Zeithaml, and Berry's (1988) seminal work introduced the SERVQUAL model, which has become one of the most widely applied frameworks for measuring customer perceptions of service quality. The

model's five dimensions—tangibility, reliability, responsiveness, assurance, and empathy—provide a comprehensive structure for evaluating service performance from customer perspectives. In public transportation contexts, tangibility encompasses physical appearance of vehicles and facilities, reliability refers to dependability of service delivery, responsiveness involves staff willingness to help passengers, assurance relates to employee knowledge and trustworthiness, and empathy concerns individualized attention provided to passengers. Application of SERVQUAL to public transportation has required various adaptations. Cavana et al. (2001) noted that public transport services differ from traditional service encounters due to involuntary service interactions, public good characteristics, and complex multi-stakeholder environments. These differences necessitate careful consideration when applying general service quality models to transportation contexts. Research by Tyrinopoulos and Antoniou (2008) demonstrated that the relative importance of different service quality dimensions varies significantly across transport service types and user groups. Their Athens public transport study found that reliability and frequency were most important for bus users, while comfort and cleanliness were more significant for metro users, highlighting the importance of context-specific research

University Students and Public Transport Behavior

University students represent a unique demographic with distinct transportation needs differentiating them from the general population. Financial constraints represent one of the most significant factors, as students typically have limited disposable income and are sensitive to transportation costs (Zhou, 2012). This economic reality often makes public transport an attractive option compared to private vehicle ownership, which involves substantial upfront costs and ongoing expenses. Temporal patterns of university life also influence student transportation behavior. Unlike traditional commuters following regular schedules, students often have irregular class schedules with varying start and end times throughout the week (Khattak et al., 2011). This irregularity can create challenges for public transport systems designed primarily to serve peak-hour commuting patterns. Social and cultural factors play important roles in shaping student transportation choices. Research by Limanond et al. (2011) found that peer influence and social norms significantly impact student transportation mode choice decisions. Students who perceive public transport use as socially acceptable are more likely to adopt these services, while those viewing public transport negatively due to social stigma may avoid these options even when economically rational. The relationship between student characteristics and public transport satisfaction has been explored in several studies. Age appears significant, with younger students generally showing higher tolerance for service inconveniences and greater willingness to use public transport (Miralles-Guasch & Domene, 2010). Gender differences have been documented, with female students often expressing greater concerns about safety and security, particularly during evening hours or in isolated areas (Loukaitou Sideris, 2014).

Malaysian Public Transport Context

Malaysia's public transport development has undergone significant transformation, driven by government initiatives aimed at reducing traffic congestion and promoting sustainable urban mobility. The National Land Public Transport Master Plan, launched in, established ambitious targets for public transport modal share, aiming to achieve 40% public transport usage in the Klang Valley by 2030 (Ministry of Transport Malaysia, 2012). Despite these investments,

public transport ridership remains below government targets. Cultural and social factors play important roles in Malaysian public transport usage patterns. Research by Borhan et al. (2019) identified several barriers to public transport adoption, including concerns about social status, comfort expectations, and safety perceptions. Many Malaysians associate private vehicle ownership with social success and view public transport as a lower-status option, creating psychological barriers extending beyond functional considerations. The multi-ethnic and multicultural nature of Malaysian society also influences public transport perceptions and usage patterns. Different ethnic groups may have varying expectations regarding service quality, comfort levels, and social interactions in public transport settings (Ismail et al., 2012). Understanding these cultural nuances is important for developing inclusive public transport services appealing to diverse user groups. Economic factors significantly influence public transport adoption in Malaysia. While public transport is generally more affordable than private vehicle ownership, relatively low fuel costs and vehicle financing availability reduce the economic advantage of public transport compared to many other countries (Norhisham et al., 2019). Additionally, government subsidies for fuel and vehicle purchases have historically favored private transport, creating policy inconsistencies that may undermine public transport promotion efforts.

Rapid KL Service Quality Research

Rapid KL has been the subject of numerous research studies examining service quality, customer satisfaction, and operational performance. Reliability emerges as one of the most significant concerns, with studies consistently documenting problems related to irregular service frequency, unpredictable arrival times, and route cancellations (Bakar et al., 2021). These reliability issues create uncertainty for passengers and may discourage regular usage, particularly among users with alternative transportation options. Vehicle condition and comfort represent another major area of concern. Studies have documented passenger complaints regarding air conditioning effectiveness, seat comfort, vehicle cleanliness, and overall maintenance standards (Ibrahim, 2003). These tangible service quality factors significantly influence passenger perceptions and satisfaction levels, particularly for longer journeys or during peak hours when vehicles may be crowded. Safety and security concerns have been prominent in Rapid KL research. Female passengers particularly have expressed concerns about personal safety during evening hours, at isolated bus stops, and on less frequently used routes (Yavuz & Welch, 2010). These safety perceptions may limit public transport usage among certain demographic groups and during specific time periods. Information provision and communication represent areas where Rapid KL has made significant improvements, including introduction of mobile applications, real-time arrival information, and digital payment systems (Rapid KL, 2023). However, research suggests that awareness and adoption of these technological improvements remain limited among certain user groups, particularly older passengers and those with limited digital literacy.

Theoretical Frameworks for Public Transport Customer Satisfaction

The theoretical foundation for understanding public transport customer satisfaction draws from multiple disciplines, including service marketing, transportation planning, and consumer behavior. The Expectation-Confirmation Theory, originally developed by Oliver (1980), provides a fundamental framework for understanding customer satisfaction formation. According to this theory, satisfaction results from comparison between pre-consumption

expectations and post-consumption perceptions of performance. The Theory of Planned Behavior, developed by Ajzen (1991), provides another important theoretical lens for understanding public transport usage decisions. This theory suggests that behavioral intentions are influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control. In public transport contexts, attitudes are shaped by service quality perceptions and satisfaction levels, while subjective norms reflect social influences and cultural factors. Recent research has attempted to integrate multiple theoretical perspectives to develop more comprehensive models of public transport customer satisfaction and usage behavior. Studies have combined the Theory of Planned Behavior with customer satisfaction theory and personal norm theory to examine word-of-mouth behavior among public transport users (Chen & Chao, 2011). These integrated models provide richer explanations of complex decision-making processes involved in public transport adoption and continued usage

Conceptual Model Development

The theoretical framework for this study integrates multiple established theories to provide comprehensive understanding of relationships between service quality perceptions, customer satisfaction, and behavioral outcomes among university students using Rapid KL bus services. The proposed conceptual model draws primarily from the SERVQUAL framework, Expectation-Confirmation Theory, and Theory of Planned Behavior, while incorporating contextual factors specific to the Malaysian public transport environment and university student population. The foundation of the theoretical framework rests on the premise that customer satisfaction with public transport services results from a complex evaluation process involving multiple service quality dimensions, individual characteristics, and contextual factors. This evaluation process involves cognitive and affective responses influenced by past experiences, social norms, and situational constraints (Fornell et al., 1996). The adapted SERVQUAL model serves as the primary structure for conceptualizing service quality in the public transport context. Recognizing the unique characteristics of bus services and specific needs of university students, the traditional five dimensions have been modified and expanded to better reflect public transport service delivery realities. The modified dimensions include: (1) Reliability and Punctuality, encompassing service frequency, on-time performance, and schedule adherence; (2) Tangible Service Environment, including vehicle condition, cleanliness, comfort, and facility quality; (3) Accessibility and Convenience, covering route coverage, stop locations, and ease of access; (4) Safety and Security, addressing both physical safety and personal security concerns; (5) Information and Communication, involving service information provision, digital services, and customer communication; and (6) Staff Service Quality, including driver behavior, courtesy, and helpfulness. Integration of Expectation-Confirmation Theory provides the mechanism for understanding how service quality perceptions translate into satisfaction outcomes. In public transport contexts, expectations are formed through various sources, including past experiences, word-of-mouth communications, marketing communications, and social comparisons (Spreng et al., 1996). The confirmation or disconfirmation of these expectations through actual service experiences leads to satisfaction or dissatisfaction outcomes, which subsequently influence future usage intentions and behaviors. The Theory of Planned Behavior contributes to the framework by explaining how satisfaction outcomes influence behavioral intentions and actual usage behaviors. According to this theory, behavioral intentions are determined by attitudes toward the behavior (influenced by satisfaction levels), subjective norms (social pressures and cultural factors), and perceived

behavioral control (availability of alternatives and situational constraints) (Fishbein & Ajzen, 2010).

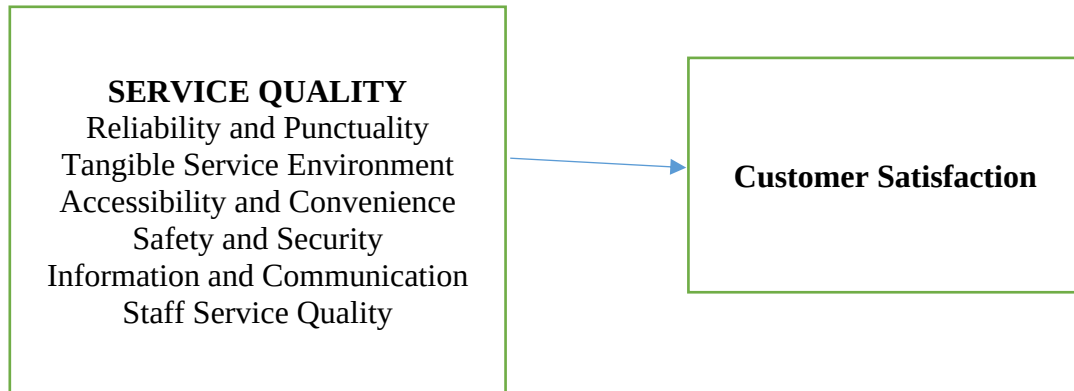


Figure 1: Proposed Conceptual Framework

Expected Findings and Theoretical Contributions

Based on the proposed theoretical framework and existing literature, several key findings are anticipated that will contribute to both theoretical understanding and practical knowledge in public transport customer satisfaction research. The study is expected to reveal significant relationships between the identified service quality dimensions and customer satisfaction among NDUM students, while uncovering unique patterns specific to the university student demographic and Malaysian cultural context. Reliability and Punctuality are anticipated to emerge as the strongest predictors of customer satisfaction, consistent with findings from international studies on public transport service quality (Van Lierop et al., 2018). University students, with their structured academic schedules and time-sensitive commitments, are expected to place particular emphasis on service dependability. The study anticipates revealing that students express significant frustration with irregular service frequency and unpredictable arrival times, which create uncertainty in journey planning and may result in tardiness for classes or other commitments. Safety and Security concerns are expected to be particularly prominent among female students and international students who may be less familiar with local conditions. The research anticipates finding significant gender differences in safety perceptions, with female students expressing greater concerns about personal security during evening hours and at isolated bus stops (Loukaitou-Sideris & Fink, 2009). These findings are expected to align with broader research on gender differences in public transport usage patterns and safety perceptions. The study is expected to contribute to theoretical development in several areas. First, the adaptation of the SERVQUAL model to the specific context of university students and Malaysian public transport services is anticipated to provide insights into the cultural and demographic specificity of service quality dimensions (Donthu & Yoo, 1998). The integration of multiple theoretical perspectives is expected to provide more comprehensive understanding of the satisfaction formation process and its relationship to behavioral outcomes.

Practical Implications for Service Improvement

The anticipated findings are expected to provide specific, actionable recommendations for Rapid KL and other public transport operators seeking to improve customer satisfaction among university students and similar demographic groups. Reliability Enhancement strategies are expected to be identified as the highest priority for service improvement, including investments in fleet management systems, real-time monitoring technologies, and operational procedures that can improve service punctuality and frequency consistency (Vuchic, 2005). Safety and Security Improvements are expected to be identified as critical for increasing ridership among female students and evening travelers. Anticipated recommendations include enhanced lighting at bus stops, installation of security cameras in vehicles and at stations, implementation of emergency communication systems, and deployment of security personnel during high-risk periods (Ceccato, 2013). Service Coverage Optimization recommendations are expected to focus on route planning that better serves the diverse travel needs of university students. This may include extending service hours to accommodate evening classes and social activities, providing express services during peak academic periods, and ensuring connectivity to key destinations such as shopping centers, employment hubs, and recreational facilities (Nielsen et al., 2006).

Policy Implications and Recommendations

The study's anticipated findings are expected to have important implications for transportation policy at both institutional and governmental levels. For universities, the research may recommend developing comprehensive transportation demand management strategies that integrate public transport promotion with campus planning and student services (Tolley, 1996). Institutional Policies that may be recommended include providing subsidized public transport passes for students, negotiating with transport operators for enhanced service to campus areas, implementing car-free campus initiatives that encourage public transport use, and integrating transportation considerations into student orientation and support programs (Balsas, 2003). Government Policy implications are expected to include recommendations for targeted public transport subsidies for students, integration of university transportation needs into regional transport planning, and development of regulatory frameworks that ensure adequate service quality standards for public transport operators (Pucher & Kurth, 1995). The research may also recommend policy initiatives that address broader barriers to public transport adoption in Malaysia, including fuel subsidy reforms that level the playing field between public and private transport, land use planning policies that support public transport accessibility, and public awareness campaigns that promote the social and environmental benefits of public transport use (Litman, 2021).

Social and Environmental Implications

The research is expected to contribute to broader discussions about sustainable transportation and social equity in urban mobility. By understanding the factors that influence public transport adoption among university students, the study may provide insights that support broader sustainability goals and social inclusion objectives (Banister, 2008). Environmental Benefits of increased public transport adoption among university students include reduced greenhouse gas emissions, decreased air pollution, and reduced pressure on urban infrastructure. The study may quantify these potential benefits and provide evidence for the environmental case for

public transport investment (Litman, 2021). Social Equity implications include ensuring that public transport services provide adequate access to educational, employment, and social opportunities for students from diverse socioeconomic backgrounds. The research may identify barriers that disproportionately affect certain student groups and recommend strategies for ensuring equitable access to quality public transport services (Martens, 2012).

Innovation and Technology Implications

The anticipated findings regarding information and communication services are expected to provide insights into the role of technology in enhancing public transport customer satisfaction. University students, as digital natives, may provide valuable feedback on the effectiveness of current technological solutions and preferences for future innovations (Prensky, 2001). Digital Service Development recommendations may include implementing mobile first service interfaces, integrating social media platforms for customer communication, developing gamification strategies that encourage public transport use, and exploring emerging technologies such as artificial intelligence for personalized service recommendations (Deterding et al., 2011). Smart City Integration implications may include recommendations for integrating public transport services with broader smart city initiatives, developing data sharing protocols that enable seamless multimodal journeys, and implementing Internet of Things technologies that enhance service monitoring and customer information provision (Batty et al., 2017).

Limitations and Future Research Directions

The study acknowledges several limitations that provide opportunities for future research. The cross-sectional design limits the ability to establish causal relationships between variables, suggesting the need for longitudinal studies that can track changes in satisfaction and usage patterns over time. The focus on a single university and single transport operator limits generalizability, suggesting the need for comparative studies across different contexts (Cook & Campbell, 1979). The reliance on self-reported data may introduce response bias and social desirability effects, suggesting opportunities for future research to employ objective measures of service quality and behavioral outcomes. This could include studies that combine customer survey data with operational data, GPS tracking, and other objective measures of service performance and usage patterns (Webb et al., 2000). Future research directions include expanding the study to multiple universities and transport operators, conducting longitudinal studies to track satisfaction changes over time, integrating objective service quality measures with subjective perceptions, and exploring the application of the framework to other demographic groups and cultural contexts. These extensions would enhance the generalizability and theoretical contributions of the research while providing broader practical insights for public transport improvement initiatives.

Conclusion

This conceptual study provides a comprehensive framework for understanding public transport customer satisfaction among university students in the Malaysian context, specifically focusing on National Defence University Malaysia students' perceptions of Rapid KL bus services. The research addresses significant gaps in the existing literature by examining a specific demographic group in a developing country context while focusing on bus services that have

received relatively less research attention compared to rail-based systems. The theoretical contributions of this study include the adaptation and extension of the SERVQUAL model to better reflect the specific characteristics of public bus services and the unique needs of university students. The comprehensive framework developed in this study provides a model for future research in public transport customer satisfaction, demonstrating the value of integrating multiple theoretical perspectives and methodological approaches to understand complex social phenomena. The findings and recommendations emerging from this research have the potential to contribute to improved public transport services, enhanced customer satisfaction, and more sustainable urban mobility patterns, ultimately supporting the broader goals of sustainable urban development and social equity in transportation access.

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A PRELIMINARY STUDIES: NEEDS FOR SMARTJAWI APPLICATION TO PRESCHOOL CHILDREN IN ISLAMIC EDUCATIONAL INSTITUTIONS

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Abstract: Lack of engaging and interactive educational resources becomes the primary barrier in Jawi learning for preschool students. Young children at the preschool stage learn better when their classes include visual elements and both hearing components and interesting learning activities. Various educational institutions still use traditional educational resources like textbooks and writing exercises even though these methods fail to keep students interested. This research studied teacher beliefs about Jawi education worth in Malaysian Muslim preschool institutions. The research examined ways to add technology which would enhance Jawi literacy engagement for children. The researchers performed qualitative semi-structured interviews among three Islamic preschool educators to evaluate their thoughts about digital tools needed in Jawi education. Educators acknowledge Jawi's crucial role in preserving Islamic and Malay history, as indicated by descriptive analytical findings; yet they face resource limitations, varying literacy levels among children, and a lack of appealing educational materials. Participants had a strong interest in digital learning solutions that offer user-friendly features, game-based methodologies, and comprehensive teaching strategies. The research demonstrates how Jawi Application can resolve these literacy obstacles while calling for more development of technological solutions for Jawi literacy improvement at Islamic preschools.

Keywords: Children; Islamic Preschool; Language; Literacy

Introduction

The education system in Malaysia used Jawi script historically for an essential transmission of knowledge since 2006 (Lubis et al., 2006). Jawi emerged as the writing system of Malay Sultanate times and its use facilitated both Islamic religious education and management and from an administrative and literary standpoint. The arrival of colonial governance caused major changes to the educational programs thus reducing Jawi's official standing in the classroom. Before colonization Jawi script functioned as the main writing method for the Malay

community according to Seock (1990). Jawi functioned as the main teaching language at madrasahs along with *pondoks* and mosques, so these facilities remained the primary education centers during this period. The mastery of Jawi script became an essential literacy skill for Malays because all religious texts about fiqh theology hadith and exegesis appeared in this script.

The teaching of Jawi education now occurs in preschools especially Islamic schools where young children receive supervision of this learning activity within Malaysia's educational system. The Islamic preschool Pusat Asuhan Tunas Islam (PASTI) shows proof of Jawi education integration through Islamic teachings to young students (Mashitoh, 2017). Jawi education in Islamic private preschools persists to maintain the script which functions as an essential key to learning Islamic principles and reading the holy book of Al-Quran (Ceriaazzarah, 2025).

Literature Review

Historical of Jawi Education in Malaysia

Changing educational practices in Malaya began when British colonial government took control in the nineteenth century. English and Rumi script became the main instructional tools in schools that operated under the colonial educational system (Lee et al., 2020; Tan, 2015). Malay-medium educational institutions persisted but the usage of Jawi script became less significant. Under this time Jawi experienced limited usage because religious educational institutions known as madrasahs became the main preservers of the traditional Islamic learning system.

The government of independent Malaya started creating a structured national education system after 1957. The Razak Report (Ministry of Education Malaysia, 1956) established the necessity for national education consistency yet made no reference to maintaining or spreading the use of Jawi script. The Jawi script continued to be present in primary-school curriculum but was mainly taught through Malay Language and Islamic Education classes. The Rumi script gained its position as the standard script of national education in 1983. The decline in Jawi education extended throughout the educational system after 1983 so that it was mainly found in Islamic Education classes. The limited exposure to Jawi script diminished because students not enrolled in religious studies courses thus contributed to the slow decline of literacy competency and overall usage.

The Malaysian government actively reinstated Jawi script into national education because they recognize its vital place as part of Malay cultural heritage. The Ministry of Education Malaysia brought Jawi script back to the primary school Malay Language curriculum during 2019 while implementing it across National Schools and National-Type Schools. The scheme intends to educate contemporary youth about Jawi script because it forms a core part of Malay cultural legacy. Many experts criticize the requirement to teach Jawi script in National-Type Chinese Schools and National-Type Tamil Schools. These institutions selected optional Jawi teaching as the replacement for mandatory learning for all students.

The educational status of Jawi script underwent major historical developments throughout Malaysian schools as this writing system moved from dominant presence in Islamic education into modern educational settings. The mandatory teaching of Jawi has become an important

educational goal in present-day Malaysia given its fundamental role in maintaining Malay cultural identity despite its decline caused by colonial interventions and educational reforms. Both governmental entities and Malaysian society must unite to protect and teach Jawi script since doing so helps preserve this linguistic and cultural heritage from disappearing.

The Introduction of Jawi Education in Malaysian Preschools

The structured knowledge and skills and values system of Jawi education serve as both a national educational core and an essential part of the Islamic Education subject in the Ministry of Education National Curriculum. Preschool functions as the first educational institution for formal instruction to introduce fundamental concepts which include Jawi literacy. Proficient Islamic Education educators instruct Jawi at this level where they directly determine which skills students learn to read and write the Jawi script. The effectiveness of Jawi script learning depends heavily on teaching approaches and motivating educational materials along with teaching methods that educators apply. Jawi literacy development closely corresponds to Islamic Education comprehension so students must receive early exposure to systematic instruction of Jawi script beginning in 2007 according to Man's study.

Maternal Jawi literacy represents both a core academic ability and a crucial factor for accomplishing excellent results in Islamic Education classes. According to Diah and Zin (2013) Jawi literacy creates a fundamental entry point to study subjects more deeply since students gain capability to handle religious texts along with Islamic classical literature as well as traditional sources of knowledge. The skills to read and write Jawi script form an essential base that determines how successfully students can understand Islamic teachings. Jawi literacy maintains its significance because numerous Islamic Education resources are presented in Jawi script (Ali & Abdullah, 2015). The writing of traditional Islamic texts such as Quranic exegeses, Hadith collections together with Islamic jurisprudence has relied upon Jawi script throughout history. A continuous link between history suggests that students need to master Jawi proficiency to access valuable contemporary and historical Islamic knowledge sources.

There are multiple important components which make up the Jawi curriculum for preschool children (refer to Figure 1) in the context of Jawi learning in preschool education. Students must learn to identify Jawi letters and create letters, link Jawi writing components together in addition to practicing Jawi reading and writing (Diah et al., 2011). Straightforward implementation steps must be established to facilitate early Jawi writing skill mastering among children. The author Ismail (2001) explains that Jawi serves as an essential school curriculum subject, yet children experience poor mastery due to restricted learning opportunities for Jawi. Ahmad (2008) observed that selected kids aged nine encounter specific difficulties when learning to write Jawi characters. Young students need better teaching techniques and longer lesson times and interactive teaching methods because they face difficulties learning Jawi literacy.

Table 1: The Component of Jawi Education in Malaysian Preschool Standard Curriculum for Children 4-5 Years Old

Source: Ministry of Education Malaysia (2017)

Focus	Content Standard	Learning Standard
P1 6.0 Jawi Learning	PI 6.1: Recognizes Jawi letters	PI 6.1.1: Pronounces the Jawi letters
	PI 6.2: Reads words containing two open syllables	PI 6.2.1: Segments Jawi letters that are combined with the vowel letter alif
	PI 6.3: Writes Jawi letters	PI 6.3.1: Coordinates eye-hand movement through sketching shapes, patterns, and lines from right to left

Numerous previous studies have indicated that children require extensive practice, and the process of learning to write Jawi should begin at the early stages of their education. Therefore, Jawi education for young children must incorporate appropriate and engaging methods and techniques to facilitate their recognition of Jawi letters and mastery of writing skills (Diah & Zin, 2013). Implementing effective teaching strategies at an early age is crucial in fostering Jawi literacy, ensuring that children develop a strong foundation in the script while maintaining their interest and enthusiasm in learning. To produce high-quality teaching aids that effectively enhance children's understanding and interest in Jawi script reading and writing, the researchers have focused on three key objectives:

1. To identify the challenges faced by educators in implementing Jawi learning activities.
2. To examine the teaching methods currently employed by educators in Jawi instruction.
3. To explore educators' perspectives on the significance of Jawi learning through the use of Jawi learning applications.

Method

Design

This exploratory study employed a qualitative design utilizing a semi-structured interview methodology to obtain a comprehensive grasp of preschool educators' viewpoints regarding teaching and learning inside Islamic Early Childhood Education Institutions. This design was selected as it enabled the researcher to acquire more nuanced and contextual data via direct engagement with the study participants.

Selection of Sample

The study sample consisted of three preschool educators who were purposively selected based on certain criteria, including their experience in the field of early childhood education and their willingness to share information in depth. The three educators taught in three private Islamic preschools, two of which were located in the state of Kelantan and the other in the state of Perak. The selection of locations was intended to obtain variations in educators' perspectives based on different educational environments and contexts.

Research Instrument

Researchers utilized the Interview Instrument: Needs Analysis to create the "SmartJawi Application: Interactive Learning Materials for Preschool Children Aged 5-6 Years". This instrument comprises three components as shown in Table 2 below:

Table 2: Items of Interview Instrument

No.	Item
1.	Identifying Jawi learning challenges
2.	Assessing current teaching methods
3.	Identifying the importance of Jawi Learning through the integration of Jawi Application

Data Collection

Data were gathered via semi-structured interviews, allowing the researcher to modify questions as conversation evolved. The interview questions aimed to investigate educators' experiences with the preschool curriculum, the problems encountered, and their perspectives on the employed teaching approaches. All interview sessions were recorded with the participants' consent and subsequently transcribed for analysis.

Data Analysis

The acquired data were examined utilizing descriptive analytical approaches. The interview transcripts were meticulously analysed to discern the principal topics that arose from the talks with research participants. The analytical procedure entailed categorizing the data pertinent to the study objectives, so allowing the researcher to discern patterns and linkages within the findings.

Findings

Identifying Jawi Learning Challenges

The interviewees revealed three primary challenges to teaching and learning Jawi in preschool as shown in Figure 2 below:

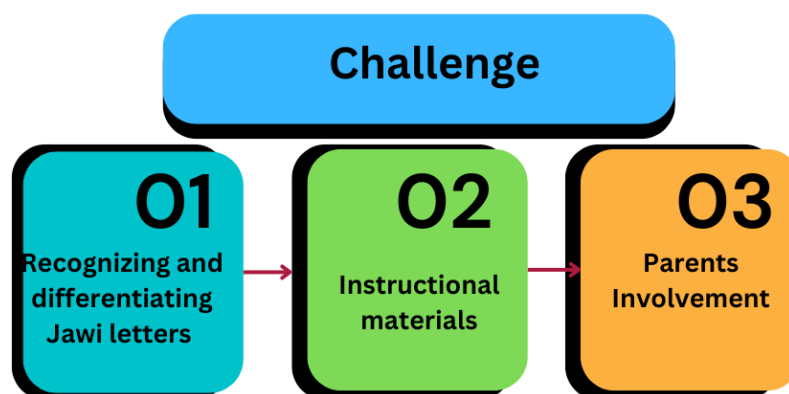


Figure 2: The Challenges in Jawi Education

Children found it challenging to distinguish between several Jawi letters that share similar shapes according to Participant 1 (ب (ba), ت (ta), ث (tsa), and ج (jim) and ح (ha), خ (kho)). Reading and writing errors occurred frequently because of this common misunderstanding. The traditional teaching materials including flashcards and textbooks continue to be used by schools per Participant 2 while children today more frequently demand interactive digital educational methods. The use of unengaging materials led children to lose their interest in Jawi studies. Participant 3 reported that parents did not provide adequate home assistance to their children for Jawi practice. The teaching of Jawi occurred exclusively within educational institutions since many Rumi parents allocated priority to Rumi reading and writing abilities. A joint effort between teachers and parents together with education establishments becomes vital to handle this problem and improve Jawi learning engagement and efficacy.

“One of the main challenges in teaching Jawi in preschool is the difficulty of children in recognizing and distinguishing Jawi letters that are almost similar in shape. For example, the letters ب (ba), ت (ta), ث (tsa) or ج (jim), ح (ha), خ (kho) often confuse them. Children are still in the early stages of recognizing letters, so when the shapes of letters look almost the same, they easily make mistakes in reading and writing.” – Participant 1

“I found that the lack of interactive and interesting teaching materials is a challenge in ensuring that children are interested in learning Jawi. Many of the materials available are traditional such as flashcards and textbooks, but children today are more inclined towards digital or interactive learning.” – Participant 2

“The big challenge I would like to highlight is the lack of parental support in helping children practice Jawi at home. Many parents emphasize reading and writing skills in Roman but pay less attention to Jawi. This causes children to only learn Jawi at school but not practice it at home.” – Participant 3

Assessing Current Teaching Methods

The analysis of the interview data indicates that educators employ several methods (refer to Figure 3) to instruct preschool children in Jawi, enhancing their comprehension and proficiency.

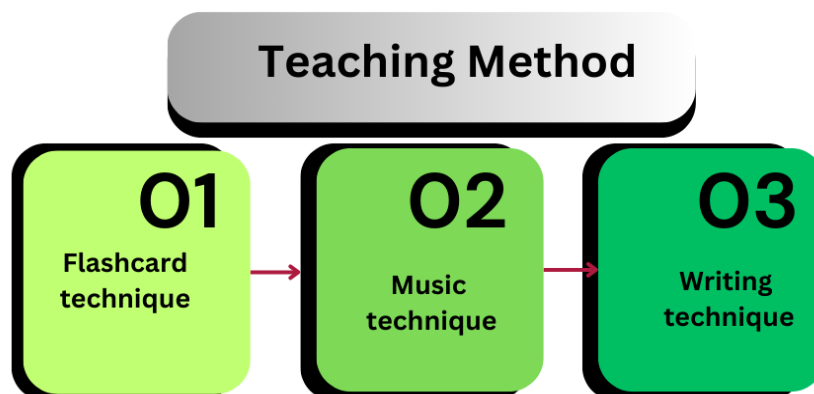


Figure 2: The Methods Utilised in Jawi Education

The flashcard method used by Participant 1 allowed the presentation of each Jawi letter with proper pronunciation to students before their responsive repetition. The introduced method successfully speeded up the students' ability to memorize letters and their recognition. The singing and song method was chosen by Participant 2 because its pleasant melody enables Jawi letter memorization in children. Musical learning techniques were more effective for preschool children thus making this approach both enjoyable and efficient for learning. Participant 3 executed the sequential writing approach that began with erroneous introductions followed by dot writing practice inside boxes and ending with syllable and phrase development. The system allowed learners to develop their Jawi writing skills by following a structured teaching approach. The tested approaches showed educational methods vary in effectiveness for engaging preschoolers with Jawi writing learning.

“I would like to share about the flashcard method that I use in teaching Jawi to preschoolers. This method is very effective because it helps children recognize and memorize Jawi letters faster. I will show one card at a time and say the letter clearly, then the children will repeat it.” – Participant 1

“I always use singing and song methods to teach Jawi. Preschoolers find it easier to remember something if it is presented in the form of an interesting song. For example, I have a special song to identify Jawi letters with an easy-to-memorize melody.” – Participant 2

“I use the step-by-step writing method in teaching Jawi. I will start by introducing the letter shapes separately, then the children will write them in boxes guided by dots. Once they are proficient, I will move on to practicing writing syllables and words.” – Participant 3

Identifying the Importance of Jawi Learning Through the Integration of Jawi Application

The implementation of Jawi applications in education is seen as an innovation that can enhance learning efficacy (refer to Figure 4).

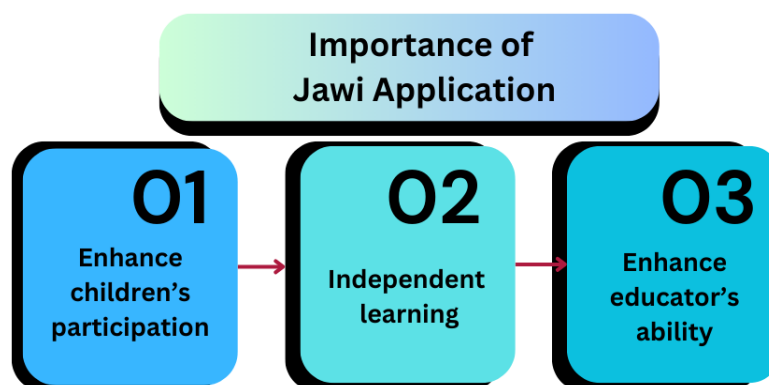


Figure 4: The Importance of Jawi Application

The research data shows Participant 1 stating that this educational platform increases student involvement in Jawi learning because its engaging game elements and colorful design elements. A modern educational preference exists for learners who demonstrate near-constant interest in technology applications for learning purposes. Participant 2 stated that Jawi

application creates a setting which allows children to self-study during after-school hours for reviewing lessons autonomously without relying entirely on their teacher. The independent study opportunity of Jawi through the application leads students to master it better. The Jawi application enables educators to conduct their lessons effectively and interactively through its functions for letter recognition and writing instruction and classroom game activities according to Participant 3. Teaching materials accessible through Jawi applications provide benefits to students who additionally help lecturers structure lessons to become more effective and engaging.

“I think that using Jawi applications can increase children's interest in learning Jawi. We know that children today are more inclined towards technology, so if we use applications that are interactive, colorful, and have game elements, they will be more interested in learning.” – Participant 1

“I also see that the Jawi application can help children study independently outside of school hours. With this application, they can review lessons at any time without being completely dependent on the educator.” – Participant 2

“I would like to emphasize that the use of Jawi applications can help educators deliver lessons more effectively and interactively. This application can be used as a teaching aid, for example in letter recognition activities, writing exercises, and interactive games.” – Participant 3

Discussion

Jawi education at the preschool level is crucial as it lays the foundation for early literacy among children and helps them recognize and master Jawi script from a young age. Effective Jawi instruction strengthens language comprehension, enhances reading and writing skills, and supports Islamic education. However, there are several key challenges in promoting Jawi learning among preschool children in Malaysian educational institutions. One of the primary challenges is that children struggle to identify and differentiate Jawi letters effectively (Mohamad & Baharudin, 2023). This difficulty arises due to the similarities in the shapes of certain Jawi letters, which differ only in the number or placement of dots. For instance, letters such as ب (ba), ت (ta), and ث (tha), or ج (jim), ح (ha), and خ (kha) are visually similar, leading to confusion among beginners. Young learners often find it challenging to recognize these letters, particularly when they are unfamiliar with the Jawi script, which differs significantly from the Romanized script. Additionally, Jawi letters change shape depending on their position in a word—whether at the beginning, middle, or end. For example, the letter ك (kaf) can appear as ك or ك, which may further confuse preschool learners who are newly introduced to the script. Unlike Roman letters, which maintain a consistent form, the variability in Jawi letter shapes poses a significant challenge for young children.

Another challenge is the lack of adequate teaching aids in preschool education. In the context of Jawi learning, there remains a shortage of engaging, interactive, and developmentally appropriate teaching materials. A key factor contributing to this issue is the limited development of digital learning applications for Jawi education (Sapri et al., 2020). Most educational applications currently focus on Malay language learning in Romanized script, leaving Jawi with insufficient attention in digital learning platforms. This lack of digital resources makes it difficult for students to access modern and enjoyable methods of learning

Jawi. Compared to Romanized script learning, which benefits from a variety of interactive and visually appealing applications, digital resources for Jawi remain scarce and lack innovation.

To ensure that preschool children can effectively improve their reading, writing, and spelling skills in Jawi, it is essential for educators and researchers to develop more interactive and engaging Jawi learning applications. Yaacob et al. (2016) advocate for the use of newly designed innovative applications as interactive learning platforms during teaching sessions. Such applications can facilitate Jawi learning, making it more memorable, efficient, and engaging while also providing a fresh and attractive approach to Islamic education.

Conclusion

Jawi learning promotion at preschools including Islamic preschools throughout Malaysia requires ongoing effort to protect this cultural heritage for future generations. Jawi script serves as both a writing tool and a fundamental aspect of Malay-Islamic culture that has maintained its function since centuries as a language for religious texts and official documentation and literary works. Jawi education development at the foundational level will help children acquire basic literacy competencies and simultaneously cultivate their cultural awareness and national preservation instincts. Effective Jawi education promotion requires future research to develop various teaching aids specifically for the national education system. This work requires studying the incorporation of technology in Jawi education because modern digital innovations help improve teaching methods and learning processes. Through the adoption of interactive learning tools featuring animations blended with audio pronunciation guides and gamified exercises the students will achieve better results in their letter recognition and spelling and writing skills through an interactive learning process.

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TRANSFORMING LEARNING VIA PEER FEEDBACK

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Abstract: *In order to enhance writing skills, students require immediate feedback either from instructors or peers. Thus, incorporating both teacher as well as peer feedback can improve students' writing and language acquisition. Incorporating peer feedback can also enhance collaboration among students to enhance their learning experiences. Peer feedback is especially effective in writing classes as it provides students with immediate feedback and creates collaborative opportunities. Students not only receive feedback, they also actively participate in providing feedback, which helps to develop their critical thinking skills. Some students find feedback from peers to be less threatening, more relevant and acceptable than receiving feedback from teachers and instructors. However, instructor feedback could also be invaluable to learners. This exploratory qualitative study investigated graduate students' attitudes and beliefs toward peer feedback and instructor feedback. The study was carried out in an assessment on critical review of an article. The study involved 19 graduate students from a public university in Malaysia. Data collection was conducted through structured interviews to gain insights into students' perceptions of the peer as well as instructor feedback processes for the critical review assessment. The findings revealed that the majority of the participants felt that peer as well as instructor feedback were both effective and helpful in improving their reviews. The participants also disclosed that they valued being able to take part in the peer feedback activity as it allowed them to exchange ideas with their classmates. Some also said that while giving comments and feedback to others, it also helped them improve and assess their own writing. Integrating peer feedback into writing classes can enhance writing skills and also encourage students to critically assess their own work while providing feedback to others. When structured effectively, peer feedback can foster a positive learning environment and promote the development of higher-order thinking skills.*

Keywords: *Peer Feedback, Instructor Feedback, Second Language Writing, Malaysia.*

Introduction

In order to enhance writing and argument development skills, feedback is essential for L2 learners. Within the sociocultural language learning framework, effective feedback in L2 writing builds upon collaborative learning and active interaction between peers as well as with instructors (Vygotsky, 1978). In a L2 writing class, it would be prudent to leverage on both peer and instructor feedback to enhance learning experiences. Peer feedback fosters interaction and negotiation of meaning among learners, while instructor feedback provides expert guidance within the zone of proximal development (Cheng & Zhang, 2024). Additionally, process-oriented writing pedagogy underlines the importance of feedback in the recursive

process of writing that involves drafting, revising, and refining (Graham, 2018). Feedback is essential to support and improve writing that is iterative as well as help develop thinking skills. In L2 writing, peers and instructors play complementary roles in supporting L2 writers. It is essential to examine and understand how L2 learners themselves view the roles of their peers and instructors in the feedback process. Thus, this study investigated graduate students' attitudes and beliefs toward peer feedback and instructor feedback in a writing activity.

Literature Review

Peer feedback is often integrated in L2 writing classes where students give and receive written or spoken comments on their writing. Nelson and Murphy (1993) state that peer feedback involves students providing feedback to each other on drafts either orally or in writing. This exercise enables students to improve their work while also developing skills to evaluate their own work (Nelson & Murphy, 1993). Peer feedback enhances writing skills by improving content, organization, and vocabulary similar to teacher feedback. It also empowers students to give feedback and trains them to be more critical in their own work (Patel, 2024). Increasingly, peer feedback has become a crucial element in second and foreign language classrooms, serving as an essential tool for enhancing students' writing and thinking skills. In language classrooms, peer feedback provides students with perspectives beyond those of their teachers, making it a valuable collaborative tool for improvement.

Peer feedback is particularly beneficial in writing classes as it provides students with immediate feedback and fosters collaboration to improve their writing skills. Feedback received from peers is often perceived as non-threatening, and students may find it more acceptable as it comes from their peers rather than instructors. This dynamic creates a supportive environment where students can engage in constructive dialogues and enhance their learning outcomes (Lerchenfeldt et al., 2023). The literature highlights several advantages of incorporating peer feedback, such as fostering individual responsibility, motivating students to deliver high-quality work, and aiding in the development of problem-solving skills (Kazemi et al., 2018; Motallebzadeh et al., 2020; Suryani et al., 2019). Moreover, peer assessment has been shown to increase accountability among team members, further contributing to the effectiveness of collaborative learning (Lerchenfeldt et al., 2023).

Although peer feedback has its advantages, challenges in integrating peer feedback in writing classes remain. Lam and Habil (2020) identify four main concerns, that include students' lack of confidence in providing feedback, the lack of constructive peer feedback given, distrust in their peers' ability to provide meaningful feedback, and hesitation to respond actively to feedback. Cultural factors further complicate the process. For example, students from high-context cultures often struggle with the directness of feedback provided in low-context cultures like the Netherlands, leading to discomfort and hesitation (Van Rompay-Bartels & Geessink, 2023).

In order to balance and mitigate the challenges of peer feedback, instructors and teachers remain an essential part in the L2 writing process, not only in providing feedback but also to

organise and mitigate peer feedback. Instructors play a critical role in facilitating effective peer feedback. Instructors need to design activities that promote meaningful engagement and equip students with tools such as structured rubrics and examples to guide constructive feedback (Suryani et al., 2019). Additionally, instructors must monitor the process to ensure comments are constructive and that students respond appropriately to feedback (Lam & Habil, 2020). Creating a supportive classroom environment and providing training on how to give and receive feedback effectively are essential for overcoming cultural and individual challenges (Van Rompay-Bartels & Geessink, 2023).

Balancing peer feedback with teacher feedback is crucial for maximizing its effectiveness. Afrasiabi and Khojasteh (2015) highlight that while peer feedback promotes autonomy, teacher feedback often results in more substantial textual changes. This balance is essential to provide comprehensive guidance and support to students. Peer feedback in writing offers numerous benefits, including improved writing skills, enhanced autonomy, exposure to diverse perspectives, and positive impacts of e-feedback. However, challenges such as the accuracy and reliability of feedback, logistical issues, and the integration with teacher feedback need to be addressed to maximize its effectiveness. Future research should continue to explore strategies to overcome these challenges and optimize peer feedback in writing instruction.

Methodology

The data for this study were collected via semi-structured interviews. The sample of the study consisted of 19 graduate students enrolled in a public university in Malaysia. All the 19 respondents were enrolled in a graduate level language education course. Before data was collected, the participants completed an assessment that required them to give written feedback to each other on their critical review assessment. They also received feedback from the instructor for the same assessment. After completing the assessment which required them to do a critical evaluation of an article, all the 19 were then interviewed individually. 18 of the students were female and there was only one male student in the study. All the students in the graduate class for the particular course agreed to participate in the research. The interview consisted of nine semi-structured questions related to participants feelings, thoughts and experiences related to their experiences receiving and giving peer feedback and the instructor feedback they received. The interview questions were designed by the researchers based on literature review. The interviews were conducted individually, within a week of completion of the activity. All the interviews were audio recorded and transcribed. The transcriptions were then shown to the participants for verifications and consistency in transcription. The interview data was then analysed in terms of themes surrounding the peer and instructor feedback processes.

Findings and Discussion

The analysis of the interview data showed that generally, all the participants had positive experiences in the peer feedback activity. As an example, Respondent 1 (R2) expressed the following, “I feel excited to see the feedback from my peer and I feel challenged to write feedback for my peers, where I need to do more deeper analysis”. R5 also stated that “I have never done a peer feedback activity in a classroom setting before. Based on the activity done, I feel comfortable and think that this activity could help me to answer the questions better”. Another participant, R14 added that “The activity is very helpful since I got to know the areas

to improve. I am glad that I'll still be able to repair my work before the final submission". The activity was used as a formative assessment cycle; thus, students could use the comments to improve their work before submitting.

When participants were asked about the usefulness of the peer feedback, almost all participants felt it was useful to their own assignment but some were critical of it as well. R1 stated that "Yes my peers comments were beneficial and helpful to me and I will consider the comments in my revision because I could know what are the important points which I have missed out, which aspect I should explain and elaborate more and also learn to follow the elements in the rubric". A similar sentiment is echoed by R10 "Yes, definitely. Now I know which part I need to focus and improve in my writing". However, R18 gave a critical view on peer feedback and assesses its effectiveness. R18 stated that "Some of the comments were beneficial and some are not. I think it is the matter of who we trust to comment our article review. If I get the person who I considered as good achievement, I will really look into the comments. It is more beneficial if the comments given are beneficial for my next writing". R8, emphasised the importance of peers providing the feedback, "Yes, it is much more beneficial and helpful for me because the one who corrected me are also learners and know exactly how I feel and discussing mistake with them are really helpful in order to redo any mistake that I have done".

Participants were also asked their views about getting feedback from both peers and instructors. Generally, almost all stated that both peers and instructor feedback were helpful in enhancing their writing. R1 stated that "I prefer to receive feedback from my peers and lecturer. Feedback given by my peers helped me to generate my thinking on how to write my review in a more better way and also identify the important points which I have missed out. Feedback from lecturer would be helpful for me to keep my task on track by focusing on the rubrics given". R7 stated that "Both from my peers and lecturer so that I will get better score or marks for my review as well as to get to know my strength and weaknesses of my review". R8 adds that "Both peers and lecturer because peers know and understand other learner problem and feedback from lecturer is must because lecturer is more knowledgeable in giving feedback".

Peer feedback can be incorporated in writing classes to improve writing skills as well as enable students to critically examine their own writing while providing feedback to other students. Peer feedback if incorporated in a structured manner may create a positive learning environment for students and develop higher order thinking skills. Peer feedback in writing offers numerous benefits, including improved writing skills, enhanced autonomy, exposure to diverse perspectives, and positive impacts of electronic feedback. However, instructors need to play an active role in designing and monitoring the peer feedback activity and process as well provide feedback as well. Incorporating peer feedback does not mean doing away with instructor feedback as many learners still expect feedback from their instructors. Instructor feedback is often perceived as authoritative and is highly valued by L2 learners for its accuracy and specificity (Kang & Han, 2015).

Conclusion and Recommendations

Peer feedback can be incorporated in writing classes to improve writing skills as well as enable students to critically examine their own writing while they provide feedback to their peers. Instructors can incorporate peer feedback in a structured manner to help foster collaboration skills and create a positive learning environment as well as develop writing skills. However,

the role of instructors and teachers in giving feedback remains pivotal as learners often value it for accuracy. Future research should continue to explore how peer feedback can be enhanced to a level that instructor feedback plays a lesser ‘expected’ role, i.e. where learners are trained to use detailed rubrics and provide accurate feedback. In the writing class, the ultimate goal should be to produce L2 writers who discover the iterative nature of writing and see writing as a process that needs to be actively improved.

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CHALLENGES AND STRATEGIES IN ENHANCING TAX COMPLIANCE AUDITING: A PHENOMENOLOGICAL STUDY OF TAX AUTHORITY AUDITORS

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Abstract: *Tax compliance auditing is essential to maintaining economic stability and promoting trust in tax systems. This study examines the challenges faced by tax authority auditors and identifies strategies to improve compliance practices. Using a qualitative phenomenological approach, data were collected through structured interviews with ten experienced auditors. The thematic analysis revealed three core themes: regulatory complexity, operational constraints and transparency issues. The results highlight the significant burden on auditors caused by rapidly evolving tax laws, high caseloads and inadequate cooperation from companies. Practical recommendations include ongoing training, simplified procedures and technological integration to improve audit efficiency. This study contributes to the growing discourse on tax compliance by providing actionable insights based on the experiences of selected tax auditors in Malaysia.*

Keywords: *Tax Compliance Auditing, Qualitative, Tax Authorities, Phenomenological Study*

Introduction

Auditing tax compliance is vital in order to uphold economic stability and ensuring the equitable collection of government revenue. It plays a crucial role in efficient tax administration by ensuring businesses adhere to regulations and contribute their fair share to national development. The tax authority enforces compliance with indirect taxes, such as Sales and Services Tax (SST), Goods and Services Tax (GST), and import duties. However, tax authority auditors face significant challenges, including frequent regulatory changes, resource limitations, and transparency issues. These obstacles hinder the effectiveness of tax compliance enforcement and highlight the need for strategic interventions.

Globally, tax authorities grapple with increasing regulatory complexity, operational constraints, and evolving economic environments. Frequent updates to tax laws create substantial knowledge gaps for auditors, necessitating ongoing training and adaptation (Lee & Tan, 2022; Wong & Abdullah, 2022). In Malaysia, these challenges are further exacerbated by understaffing and heavy workloads, which limit auditors' ability to conduct comprehensive assessments. Transparency issues, such as businesses withholding or altering critical information, compound these difficulties and obstruct effective enforcement.

Despite extensive research on taxpayer compliance behaviors, relatively little attention has been given to auditors' operational realities. Existing studies often emphasize determinants such as perceived fairness, procedural simplicity, and the deterrent effects of penalties on taxpayers, leaving a critical gap in understanding auditors' lived experiences (Johnson & Smith, 2023). This gap is particularly pronounced in Malaysia, where qualitative insights into

auditors' challenges and perspectives remain scarce. Addressing this gap is crucial for identifying systemic inefficiencies and improving enforcement strategies.

This research aims to address these issues by exploring the challenges tax authority auditors face, determinants influencing business compliance, and strategies for enhancing tax compliance enforcement. By focusing on auditors' experiences, the study provides a novel perspective that complements existing taxpayer-focused research and offers actionable recommendations to strengthen compliance practices.

To address these gaps, the study is guided by the following research questions:

1. What challenges do tax authority auditors face during tax compliance auditing?
2. What determinants influence business compliance, as perceived by auditors?
3. What strategies do auditors recommend for improving compliance auditing?

By addressing these questions, the study provides a nuanced understanding of tax compliance enforcement from the auditors' perspective, offering practical solutions to improve audit practices and foster a more effective and equitable tax system.

Literature Review

Tax compliance auditing is a cornerstone of effective tax administration, ensuring that businesses meet their tax obligations while contributing to government revenue. While significant research has explored taxpayer compliance behaviors, there is limited focus on the operational experiences of auditors, whose roles are crucial to enforcing compliance. This review synthesizes existing studies across three key areas: challenges in tax compliance auditing, obstacles affecting compliance, and strategies to improve auditing practices. Additionally, the section identifies research gaps, emphasizing the need for qualitative insights into auditors' lived experiences, particularly within the Malaysian context.

Challenges in Tax Compliance Auditing

Auditors face numerous challenges in enforcing compliance within a dynamic regulatory environment. Rapid and frequent updates to tax laws create significant knowledge gaps for auditors, requiring continuous upskilling. For example, Lee and Tan (2022) found that auditors often struggle to keep pace with changes, exacerbating the complexity of their tasks. Similarly, Chia and Wong (2022) highlighted the ambiguity of certain regulations, which increases the likelihood of inconsistent audit outcomes.

Operational constraints, including high caseloads and insufficient manpower, further impede auditing effectiveness. Wong and Abdullah (2022) reported that limited resources reduce auditors' ability to conduct in-depth investigations. Ng et al. (2023) emphasized that the lack of technological integration forces auditors to rely on manual processes, decreasing efficiency and increasing the risk of human error.

Transparency issues from businesses add another layer of difficulty. Companies withholding or manipulating information, as noted by Chia and Wong (2022), complicate compliance assessments. This non-cooperation not only delays audits but also undermines the overall effectiveness of compliance enforcement.

Obstacles Influencing Compliance

Compliance behavior is influenced by several key obstacles, including perceived risks, fairness, and procedural simplicity. Deterrence theory posits that the fear of penalties is a critical motivator for compliance (Lee & Tan, 2022). Johnson and Smith (2023) supported this claim, showing that stronger enforcement measures lead to higher compliance rates among businesses.

Perceived fairness also plays a vital role in fostering voluntary compliance. Wong and Abdullah (2022) found that companies are more likely to cooperate when audits are perceived as impartial and transparent. This aligns with the Slippery Slope Framework, which underscores the need for balancing trust and authority to build cooperative relationships between auditors and taxpayers.

Procedural complexity, however, remains a significant deterrent. Cumbersome processes and unclear guidelines can discourage compliance, even among willing taxpayers (Ng et al., 2023). Simplifying regulations and introducing user-friendly compliance systems are key to overcoming this obstacle and fostering a more cooperative environment.

Strategies for Enhancing Auditing Practices

To address the challenges in tax compliance auditing, several strategies have been proposed. Continuous training is crucial for equipping auditors with the skills necessary to adapt to changing regulations. Chia and Wong (2022) emphasized that targeted professional development programs significantly enhance auditors' capabilities.

The adoption of advanced technologies is another critical strategy. Digital tools such as automated risk assessments, predictive analytics, and AI-based solutions can streamline auditing processes, reduce manual errors, and improve overall efficiency (Ng et al., 2023). Tax authorities worldwide are increasingly leveraging these tools to modernize compliance enforcement.

Additionally, fostering collaboration through simplified and transparent procedures is essential. Johnson and Smith (2023) noted that clear guidelines and user-friendly compliance systems not only ease the process for businesses but also allow auditors to focus on high-risk cases. Promoting cooperation between auditors and businesses creates a more efficient and less adversarial compliance environment.

Research Gaps

Despite substantial advancements in understanding tax compliance dynamics, significant gaps remain. Existing research on tax compliance auditing often relies on quantitative approaches, offering limited insights into the operational realities and lived experiences of auditors. This gap is particularly evident within the Malaysian context, where enforcement complexities and challenges faced by tax authority auditors remain underexplored. By capturing the qualitative perspectives of auditors, this study provides a novel contribution, addressing an area critical to the development of effective tax enforcement strategies.

By addressing these gaps, this study provides a novel perspective on the challenges and strategies involved in tax compliance auditing, drawing on the lived experiences of tax authority auditors. The findings aim to contribute actionable recommendations to improve the efficiency and effectiveness of compliance enforcement.

Methodology

Research Design

This research utilized a phenomenological approach to investigate the experiences of auditors working at the tax authority. Phenomenology was chosen because it allows for a thorough exploration of participants' viewpoints, offering a comprehensive insight into the difficulties auditors encounter in tax compliance auditing and the tactics they utilize. This method is in line with Creswell and Poth's (2018) focus on retrieving real-life experiences for revealing valuable insights.

Participant Selection

Auditors with significant experience in tax compliance auditing were chosen as participants through purposive sampling, a method widely used in qualitative research to ensure the selection of participants who can provide rich and relevant insights (Creswell & Poth, 2018; Patton, 2022). Participants must have at least five years of experience auditing indirect taxes like Sales and Services Tax (SST), Goods and Services Tax (GST), and import duties to meet the selection criteria. This method made sure that the participants had the required skills to offer valuable and on-point perspectives. Ten auditors, coming from various roles and duties within the tax authority, were hired.

Data Collection

Structured interviews were utilized as the main approach for gathering data, providing a thorough examination of participants' experiences with room for conversational adaptability. Every interview ranged from 45 to 60 minutes in duration and took place in person to fit the participants' availability. The interview questions were created to meet the research goals of the study, centering on three main areas: challenges encountered during tax compliance auditing, obstacles influencing business compliance, and recommendations for enhancing auditing practices. In order to gather complete data, interviews were recorded and transcribed word for word, with additional field notes taken to document non-verbal signals and contextual information.

Data Analysis

The interview data was analyzed using thematic analysis, based on Braun and Clarke's (2021) six-phase framework. The process began with familiarization, where transcripts were read multiple times to immerse the researcher in the data. Initial codes were generated to capture significant ideas, which were then organized into preliminary themes. These themes were reviewed and refined for clarity and coherence, ensuring they accurately represented the data. Finally, the themes were defined and named, forming the basis of a narrative aligned with the research questions.

Ethical Considerations

The study was approved by the appropriate institutional review board to ensure ethical standards were followed. Participants were given information about the study's objective, the option to participate voluntarily, and their right to withdraw at any point. Participants were required to provide informed consent before taking part. Pseudonyms were given to participants for privacy reasons, and all data, such as audio recordings and transcripts, were stored securely to maintain confidentiality.

Analysis and Findings

The thematic analysis revealed three key themes that align with the study's research questions: challenges in tax compliance auditing, obstacles influencing business compliance, and strategies for enhancing compliance practices. Each theme is discussed below, supported by participant narratives.

Relevant theme 1: Challenges in Tax Compliance Auditing

The first theme highlights the primary challenges encountered by tax authority auditors in enforcing compliance. Participants consistently identified the complexity of tax regulations and operational constraints as significant barriers during audits. A common concern was the frequent updates to tax regulations. Participant 1 remarked, *"Staying updated on new regulations while managing ongoing cases is overwhelming. It's a constant learning curve."* Similarly, Participant 4 shared, *"Some of the laws are vague, and we spend significant time interpreting them to avoid making mistakes during audits."*

Operational constraints, such as high caseloads and limited resources, further compounded these difficulties. Participant 2 explained, *"The number of cases we handle is enormous, and this impacts the depth of our assessments. Sometimes, we have to prioritize larger cases at the expense of smaller ones."* Participant 5 added, *"We simply don't have enough manpower or time to handle all the cases thoroughly, which is frustrating."*

These findings underscore the systemic challenges faced by auditors, including regulatory ambiguity, resource shortages, and workload pressures, which collectively hinder the effectiveness of compliance enforcement.

Relevant theme 2: Obstacles Influencing Business Compliance

The second theme explores the determinants that influence business compliance from the auditors' perspectives. Participants emphasized the role of financial penalties, perceived fairness in audit processes, and the complexity of procedures. Participant 6 noted, *"Businesses are more likely to comply if they know the penalties for non-compliance are severe. Financial risks definitely play a big role."*

Perceived fairness also emerged as a critical determinant. Participant 4 stated, *"When businesses feel that the system is fair and transparent, they're more cooperative during audits."* However, procedural complexity was highlighted as a deterrent to compliance. Participant 8 observed, *"The forms and procedures are sometimes too complicated for businesses to understand, which leads to unintentional non-compliance."*

These determinants reflect a balance of enforcement and cooperation, where clear communication and fairness can promote voluntary compliance, while complex processes remain a barrier.

Relevant Theme 3: Strategies for Enhancing Compliance Practices

The final theme focuses on strategies suggested by tax authority auditors to improve compliance practices. Participants emphasized the need for continuous training, technological integration, and simplified procedures. Participant 7 stated, *“We need regular training sessions to stay updated on regulatory changes and improve our skills.”* Similarly, Participant 9 highlighted the importance of adopting digital tools, noting, *“Using technology would make our work much more efficient and reduce the chance of errors.”*

Simplified procedures were also a common suggestion. Participant 3 pointed out, *“Providing businesses with clearer guidelines and simpler forms would encourage compliance. Many businesses find the current processes too confusing.”* These strategies, proposed by tax authority auditors, align with global best practices and highlight the importance of combining enforcement with trust-building initiatives. By focusing on systemic improvements such as resource allocation and technological integration, and procedural enhancements like simplified compliance guidelines, these recommendations provide a comprehensive framework for strengthening tax compliance enforcement in Malaysia.

The findings reveal three interconnected themes: challenges in tax compliance auditing, determinants shaping business compliance, and strategies for enhancing compliance practices. Tax authority auditors identified significant barriers such as the complexity of tax laws, frequent regulatory changes, and operational constraints, which align with global challenges faced by tax authorities (OECD, 2023). Transparency issues among businesses, including withholding or manipulating information, further complicate compliance enforcement.

Determinants influencing compliance, as perceived by auditors, include the severity of penalties, fairness in audit procedures, and procedural simplicity. To address these issues, auditors suggested regular training to stay updated on evolving regulations, leveraging technology to streamline processes, and simplifying tax procedures to promote cooperation. These observations align with international recommendations, including the OECD's emphasis on modernizing tax systems through technology and fostering clearer communication (OECD, 2023). Collectively, these themes provide valuable insights into tax authority auditors' experiences and suggest practical steps to improve tax compliance enforcement.

Discussion

By addressing underexplored operational challenges faced by auditors, this study provides a unique perspective that complements existing taxpayer-focused research. This study's findings highlight critical challenges faced by tax authority auditors, determinants influencing business compliance, and strategies for improving compliance practices. The discussion interprets these findings in relation to existing literature and explores their practical implications for enhancing tax compliance auditing.

Complexity of Tax Regulations and Operational Constraints

The complexity of tax regulations and resource constraints faced by tax authority auditors reflect global challenges in tax compliance enforcement. Frequent changes to tax laws create significant knowledge gaps, requiring auditors to continuously update their skills. As Participant 1 noted, *“The frequent changes in regulations are overwhelming. We are constantly trying to keep up.”* This finding aligns with Lee and Tan’s (2022) observation that evolving tax environments impose substantial burdens on auditors.

Resource limitations, including understaffing and high caseloads, exacerbate these challenges. For example, Participant 3 remarked, *“The sheer volume of cases we handle means we cannot give each one the attention it needs.”* Similar findings by Wong and Abdullah (2022) emphasize how insufficient manpower hinders auditors' ability to conduct thorough assessments. Transparency issues, where businesses withhold or alter information, further obstruct enforcement efforts. Participant 5 stated, *“Sometimes, businesses are not transparent with their records, which makes audits even more difficult.”*

These results suggest that targeted interventions, such as capacity-building programs and increased resource allocation, are necessary to mitigate these challenges. Regular training programs can equip auditors with updated knowledge and skills, while policy revisions that streamline procedures and allocate resources more effectively can enhance audit efficiency.

Determinants Shaping Business Compliance

The study identifies financial risks, perceived fairness, and procedural simplicity as key determinants shaping business compliance. These findings support deterrence theory, which posits that the fear of penalties acts as a strong motivator for compliance (Johnson & Smith, 2023). Participant 6 highlighted, *“Businesses comply when they know the penalties are severe enough to outweigh the benefits of evasion.”*

Fairness and transparency in audit processes also emerged as critical factors influencing voluntary compliance. Participant 4 noted, *“When businesses perceive that audits are fair, they are more likely to cooperate.”* This observation aligns with the Slippery Slope Framework, which emphasizes the importance of balancing trust and authority to foster cooperative relationships between tax authorities and businesses (Wong & Abdullah, 2022). Conversely, procedural complexity remains a significant barrier to compliance. Participant 7 shared, *“The procedural complexity can be so high that even well-meaning businesses struggle to comply.”*

Simplifying procedures and ensuring clear communication between auditors and businesses are essential to addressing these barriers. These findings extend existing literature by highlighting how perceived fairness and procedural simplicity can complement deterrence strategies in promoting compliance.

Strategies for Enhancing Compliance Practices

The strategies proposed by tax authority auditors provide actionable insights for improving tax compliance enforcement. Regular training was a recurring recommendation, with Participant 8 emphasizing, *“Continuous training is vital for keeping up with regulatory changes and improving our skills.”* This aligns with Chia and Wong’s (2022) findings that targeted professional development programs significantly enhance auditors’ capabilities.

Technological integration is another critical strategy. Participant 9 remarked, *“Adopting automated tools can reduce manual errors and make audits more efficient.”* Advanced technologies, such as data analytics and predictive models, have been shown to streamline audit processes and improve efficiency (Ng et al., 2023). Simplifying compliance procedures was also frequently suggested. Participant 2 noted, *“Clearer guidelines and simpler forms would make compliance easier for businesses and reduce our workload.”* These strategies reflect a balanced approach, combining enforcement with support to foster a collaborative compliance environment.

Practical Implications

The findings provide actionable recommendations for policymakers and tax authorities. Investments in auditor training, resource allocation, and technology are critical to addressing the challenges identified in this study. For example, deploying automated tools can reduce auditors’ manual workload, allowing them to focus on high-risk cases. Simplifying compliance procedures and promoting transparency can encourage voluntary compliance, reducing the adversarial nature of tax audits.

These measures foster trust and collaboration between tax authorities and businesses. By addressing systemic inefficiencies and integrating fairness and clarity into tax compliance processes, these strategies enhance enforcement efficiency and promote a more equitable tax system.

Conclusion

This study explored the lived experiences of auditors at the tax authority to identify the challenges they face, determinants influencing business compliance, and strategies for enhancing compliance practices. The findings revealed three interconnected themes: the complexity of tax compliance auditing, determinants shaping compliance behavior, and actionable strategies for improving audit practices. Together, these themes provide valuable insights into the realities of tax compliance enforcement and offer practical recommendations for strengthening its effectiveness.

Challenges like frequent regulatory changes, resource constraints, and transparency issues underscore the need for structured support in tax auditing. Key determinants such as financial penalties, perceived fairness, and procedural simplicity significantly influence compliance behaviors. To address these challenges, auditors proposed strategies including continuous professional training, the integration of advanced technologies, and the simplification of compliance procedures. These findings underscore the importance of balancing enforcement with trust-building measures to foster cooperation between tax authorities and businesses.

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DEVELOPING A MODEL OF MULTI-CRITERIA DECISION MAKING FOR CUSTOMER UNCERTAINTY IN ONLINE PURCHASING (MCDM-UNOP)

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Abstract: *The growth of the internet market has attracted more customers to purchase products online. Despite its popularity, there is a significant issue concerning customer uncertainty when making decisions to purchase online. Therefore, this research aims to develop, validate, and prioritize a model of multi criteria decision making for customer uncertainty in online purchasing, known as the MCDM-UnOP model. This study used a mixed methods approach. The MCDM-UnOP model was developed based on the results of a comprehensive literature review and qualitative focus group interviews. A questionnaire was employed as the research instrument to collect quantitative data from internet users. A total of 348 usable questionnaires were collected and proceeded to the data analysis stage. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) using the split half method were conducted to validate the MCDM-UnOP model. The Analytical Hierarchy Process (AHP) technique was applied to prioritize the criteria associated with customer uncertainty in online purchasing. The validation process identified six key MCDM-UnOP criteria: security, shipping and delivery, privacy, product quality, financial risk, and psychological factors. These six criteria were measured using 34 sub criteria. The results of the AHP analysis indicated that security was the most important criterion, followed by privacy, shipping and delivery, product quality, and financial risk. The least important criterion was psychological factors. The findings provide valuable implications for decision makers in the online business industry to develop effective strategic marketing tools and to achieve a competitive advantage.*

Keywords: *Multi-Criteria Decision Making, Analytical Hierarchy Process, Uncertainty, Online Purchasing*

Introduction

The rapid advancement of technology has created new opportunities for businesses to market and sell their products and services through online platforms. According to Kandel (2025), conducting business transactions online has become the primary mode of commercial activity today. A survey conducted by the Malaysian Communications and Multimedia Commission (MCMC) (2022) reported a 4.5% increase in the percentage of online shoppers among Malaysian internet users between 2019 and 2022. In recent years, this upward trend has continued, driven by the expansion of Malaysia's digital economy, accelerated digital transformation efforts, and the widespread adoption of remote work and hybrid lifestyles.

Initiatives under the Malaysia Digital Economy Blueprint (MyDIGITAL) have also contributed to increased internet usage, with a significant portion of the population engaging in online activities, including shopping. Despite its growing popularity, a critical issue remains as customer uncertainty when making online purchase decisions (Handoyo, 2024, Durmus, Ulusu & Akgun, 2017; Bhukya & Singh, 2015). These feelings of uncertainty discourage many consumers from participating in online shopping.

Uncertainty has been recognized as the primary obstacle preventing customers from making online purchases (Schreier & Gierl, 2024; Yazdanifard et al., 2011; Van Os, 2010). Previous studies have revealed that online shopping is associated with high risks, including cybercrime, hacking incidents, and delivery issues (Kamarul Ariffin, Mohan & Goh, 2018; Fortes & Rita, 2016; Littler & Melanthiou, 2006). According to Krishnan et al. (2024), security is a key determinant of consumer trust in Malaysian e-commerce, alongside privacy and transparency, which also significantly influence trust and purchasing behavior. However, there is a lack of comprehensive studies that develop and validate the multiple criteria underlying customer uncertainty in online purchasing. Therefore, this research seeks to develop and validate a Multi-Criteria Decision-Making model for customer uncertainty in online purchasing (MCDM-UnOP). Additionally, the study aims to prioritize the criteria within the MCDM-UnOP model by ranking them according to customers' perceived importance scores. The findings could provide valuable guidelines for online sellers to better understand the key factors influencing customer uncertainty and to focus on improving service excellence.

Customer Uncertainty in Online Purchasing and Theory

Customer uncertainty is conceptualized as the inability of customers to correctly and consistently assess the transactional outcome in e-commerce due to the unavailability of complete and perfect information (Phamthi et al., 2024). Uncertainty has been widely recognized as a primary obstacle for customers when purchasing products online (Dabić et al. 2025; Yazdanifard, 2011). Online shopping involves significant risks such as cybercrime, hacking incidents, spam, lack of personal interaction, and information asymmetry (Kamarul Ariffin, Mohan, & Goh, 2018). These risks often lead to feelings of uncertainty among customers. Consequently, customers tend to feel more uncertain about purchasing products online than they do when buying the same products in physical stores (Ji & Lee, 2024). This uncertainty discourages customers from engaging in online transactions. In conclusion, understanding and managing the factors contributing to customer uncertainty has become a critical issue for online sellers. To explore the nature of these uncertain feelings in the context of online purchasing, two theories were reviewed: Uncertainty Reduction Theory (URT) and Information Processing Theory (IPT).

Uncertainty Reduction Theory (URT)

Uncertainty Reduction Theory (URT), originally developed by Berger and Calabrese (1975), serves as a conceptual framework for examining customers' behavior in online service usage (Hogg, 2007). URT posits that uncertainty naturally arises during initial interactions between individuals, and that people are motivated to reduce this uncertainty by predicting the other person's behavior and potential responses. In the context of online purchasing, customer uncertainty can stem from various sources, including the product itself, the purchasing process, and emotional factors (Hu et al., 2008). This uncertainty tends to increase when customers lack

prior experience or knowledge about a product or service. According to Brumfield (2008), uncertainty can be alleviated when consumers confirm their purchase decisions through peer reviews and product-related information shared by other customers.

Information Processing Theory (IPT)

According to Information Processing Theory (IPT), the customer decision-making process consists of three key stages: intelligence, design, and choice (Cook, 1993; Simon, 1955). In the intelligence stage, customers identify a problem and collect relevant information. During the design stage, they structure the problem, establish decision criteria, and explore alternative solutions. Finally, in the choice stage, customers evaluate the alternatives and select the one that best satisfies the established criteria, leading to a final purchasing decision. Previous research has introduced several techniques to interpret the multi-criteria aspects of customer decision-making, including network presentation models (Gao et al., 2012). However, more recent studies have found that the Analytical Hierarchy Process (AHP) is particularly effective for structuring decision-making criteria hierarchically and prioritizing them according to their relative importance (Abd Aziz et. al., 2024; Singh & Singh, 2017).

Methodology

Research Design

This research employed a mixed methods approach to develop, validate, and prioritize the MCDM- UnOP model. Figure 1 illustrates the step-by-step research process followed in this study. As shown in Figure 1, the research process is divided into two phases:

- Phase 1: Developing the MCDM-UnOP Criteria
An extensive literature review was conducted to identify the leading studies related to customer uncertainty in online purchasing. This helped establish the initial multi criteria for the MCDM-UnOP model. In the qualitative stage, three focus group interviews were conducted with internet users, including government employees, private sector employees, and higher education students to identify additional relevant criteria.
- Phase 2: Validating and Prioritizing the MCDM-UnOP Criteria
Quantitative data analysis techniques were employed to validate and prioritize the criteria in the MCDM-UnOP model. The model was validated through face validity, Exploratory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA) using the split-half method. Subsequently, the Analytic Hierarchy Process (AHP) technique was applied to prioritize the criteria related to customer uncertainty in online purchasing.

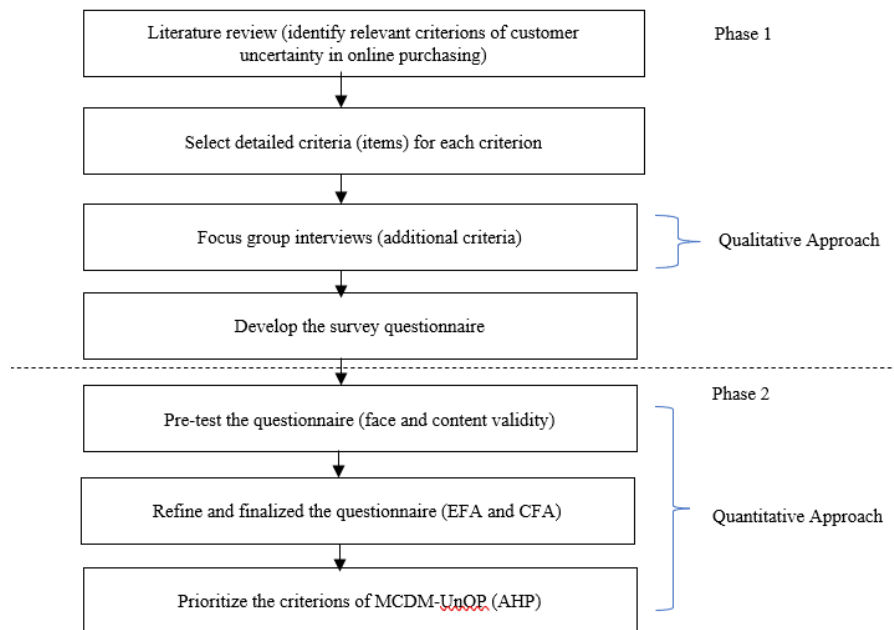


Figure 1: The Research Process

Population and Sampling Technique

The respondents of this research were internet users who engage in online activities. According to DataReportal (2025), approximately 34.9 million individuals in Malaysia were active internet users. Based on the recommendation by Krejcie and Morgan (1970), a sample size of 384 is required to represent a large research population. A cluster sampling technique was employed to select the respondents, as it is suitable for studies with large and geographically dispersed populations. The population was divided into four clusters based on the geographical zones of the internet users' locations: the South Zone, West Zone, North Zone, and East Zone. To improve the efficiency of data collection, enumerators were assigned to each zone to randomly distribute and collect the questionnaires.

Instrumentation

The criteria for customer uncertainty in online purchasing were derived from both the findings of literature reviews and focus group interviews. A structured questionnaire was used as the primary research instrument and consisted of three sections. Section A included five questions related to the respondents' demographic profiles, such as gender, age, level of education, monthly income, and frequency of internet usage. Section B comprised 39 items addressing various aspects of customer uncertainty in online purchasing. These items were measured using a 7-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Section C required respondents to prioritize the main criteria contributing to customer uncertainty in online purchasing. The content validity of the questionnaire was evaluated by a panel of experts with subject matter expertise in e-commerce and consumer behavior.

The data gathered were analysed by using the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) through split half method (Li & Cai, 2011). The EFA analysis was performed to explore the underlying factors by demonstrating the relationship between criterion (latent factors) and criteria (items). The CFA, on the other hand, was used to confirm whether the items actually underpin the factor for which they were theoretically designed (Hair et al., 2010, Byrne, 2016). In this research, the CFA was performed by using the structural equation modelling (SEM) procedure. Next, the Analytical Hierarchy Analysis (AHP) technique was performed to prioritize the importance of the main criterions of customer uncertainty in online purchasing (Saaty, 1980).

The multi-criteria decision making (MCDM) tool is helpful and effective in solving complex decision problems. Thus, this research utilized the AHP technique to prioritize the MCDM-UnOP criteria. The AHP technique is an approach for quantifying an idea, feeling, or emotion by assigning a number scale to prioritize decision alternatives that exist in a problem under consideration (Taha, 1997). The first principle is to structure the problem hierarchically into three levels. The levels include 1) determining the objective of the problem, 2) the criteria considered in determining the objective of the problem, and 3) alternatives that exist in the problem. The second principle of AHP is a pair-wise comparison relative to every element at every level except the first level by constructing a comparison matrix $n \times n$ (refer to figure 2) in which a is a value of ij priority K_i compared to K_j . The third principle is priority synthesis, involving the process of prioritizing ij every criterion in the problem. The priority is determined by the weighting value.

$$A = \begin{matrix} & \begin{matrix} K_1 & K_2 & K_3 & K_4 & \cdots & K_n \end{matrix} \\ \begin{matrix} K_1 \\ K_2 \\ K_3 \\ K_4 \\ \vdots \\ K_n \end{matrix} & \begin{bmatrix} 1 & a_{12} & a_{13} & a_{14} & \cdots & a_{1n} \\ \frac{1}{a_{12}} & 1 & a_{23} & a_{24} & \cdots & a_{2n} \\ \frac{1}{a_{13}} & \frac{1}{a_{23}} & 1 & \frac{1}{a_{34}} & \cdots & a_{3n} \\ \frac{1}{a_{14}} & \frac{1}{a_{24}} & & 1 & \cdots & a_{4n} \\ \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & \frac{1}{a_{3n}} & \frac{1}{a_{4n}} & \cdots & 1 \end{bmatrix} \end{matrix}$$

Figure 2: Pair Wise Comparison Matrix

Findings and Discussions

Initially, a total of 768 questionnaires were distributed to the respondents. Of these, 412 were returned, resulting in a response rate of 53.64%. However, 64 questionnaires were excluded due to incomplete responses. Therefore, a total of 348 completed questionnaires were retained for data analysis. Among the 348 respondents, 40.82% were male, and 59.20% were female. The majority of respondents (57.18%) were in the age range of 31 to 40 years old, and 44.82% reported a monthly salary between RM2,000 and RM3,999. Additionally, nearly all respondents (99%) reported using the internet on a daily basis.

The data were assessed for normality as a prerequisite for applying parametric techniques. The skewness and kurtosis values fell within the acceptable ranges of -2 to +2 and -7 to +7,

respectively, as recommended by Hair (2010) and Byrne (2016). These results indicate that the data were normally distributed. The Kaiser-Meyer-Olkin (KMO) measure yielded a value of 0.916, indicating that the sampling was adequate and that the criteria (factors) were appropriate for predicting the variability among the items. Table 1 presents the results of the Exploratory Factor Analysis (EFA) conducted to assess the criteria related to customer uncertainty in online purchasing. The analysis revealed a six-factor solution, explaining 65.71% of the total variance, with acceptable factor loadings (FL) greater than 0.5, as suggested by Hair et al. (2006). The six criteria identified in Table 1 are described as follows:

Table 1: EFA Results

Criteria	Criterion					
	(1) Security	(2) Shipping & Delivery	(3) Privacy	(4) Product Quality	(5) Financial Risk	(6) Psychological
1. Unsecure transaction and transmission	0.853					
2. Data intercepted by hackers	0.850					
3. Unauthorized access	0.839					
4. Denial of service	0.807					
5. Theft and Fraud	0.744					
6. Unsecured website	0.741					
7. Insufficient sellers' information	0.671					
8. Cyber crime	0.593					
9. Insecure payment system	0.555					
10. Unclear policies and terms	0.544					
11. Misdelivery		0.824				
12. Late delivery		0.724				
13. Long waiting time		0.720				
14. Loss of products		0.616				
15. Damaged products		0.601				
16. High shipping fee		0.589				
17. Delivery on weekends		0.548				
18. Difficulty in order cancellation		0.530				
19. Information used by unauthorized parties			0.811			
20. Information disclosure			0.802			
21. Information misused			0.751			
22. Against data protection laws and regulations			0.744			
23. Usage data without knowledge			0.614			
24. User's rights unprotected			0.526			
25. Unavailability of product				0.764		
26. Misleading of product Images				0.700		
27. Inaccurate product description				0.655		
28. Lack of touch and feel (touch-feel-try)				0.577		
29. Unworthy product				0.560		
30. Invalid product information				0.506		
31. Overspend					0.732	
32. Unaffordable to shop online					0.656	
33. Waste of money					0.655	
34. Stores offer better prices					0.623	
35. No price negotiation					0.512	
36. Family disapproval						0.611
37. Unrecognized by family/friends						0.602
38. Distrust online company						0.587
39. Discomfort						0.511
Eigenvalue	8.19	5.15	4.25	3.76	3.17	2.58
% of variance	20.21	13.45	11.82	10.21	3.12	3.11
% cumulative of variance						65.71

- **Criterion 1: Security**
Security is conceptualized as the protection of online purchasing assets from unauthorized access, alteration, use, or destruction, particularly of sensitive information such as credit card or bank account numbers and passwords, which may result in financial loss. This criterion is measured by ten uncertainty items, as presented in Table 1.
- **Criterion 2: Shipping and Delivery**
Shipping and delivery refer to the process of ensuring that the correct product is delivered at the right time, to the right place, in appropriate packaging, with

adequate quantity and quality, and at minimal cost. This criterion is measured by eight uncertainty items, as shown in Table 1.

- **Criterion 3: Privacy**
Privacy refers to an individual's ability to control and manage the conditions under which their personal data is collected and used. This criterion is measured by six uncertainty items, as detailed in Table 1.
- **Criterion 4: Product Quality**
Product quality is conceptualized as the customer's judgment of a product's superiority and overall excellence. This criterion is assessed through six uncertainty items, as outlined in Table 1.
- **Criterion 5: Financial Risk**
Financial risk is defined as the potential for monetary loss due to errors or failures in the online purchasing system. This criterion is measured by five uncertainty items, as indicated in Table 1.
- **Criterion 6: Psychological Risk**
Psychological risk refers to a customer's perception of social disapproval or regret arising from a poor purchasing decision. This criterion is assessed through four uncertainty items, as shown in Table 1.

Next, CFA was performed to confirm whether the criteria (items) are actually underlying the criterion (factors) for which they are theoretically designed. The results of the CFA-measurement model revealed that five criteria were deleted due to low factor loading ($FL < 0.50$). The deleted criteria were: unclear policy and terms, $FL: 0.491$ (Security Criterion); delivery on the weekend, $FL: 0.221$ (Shipping and Delivery Criterion); difficulty in order cancellation, $FL: 0.466$ (Shipping and Delivery Criterion), stores offering better prices, $FL: 0.410$ (Financial risk criterion); and no price negotiation, $FL: 0.481$ (Financial risk criterion). Figure 3 illustrates the re-specified CFA-measurement model. The results revealed that the factor loadings > 0.50 and the hypothesized model has an overall good fit ($\chi^2/df: 2.170$; p value: 0.000 ; $TLI: 0.912$, $CFI: 0.901$; $RMSEA: 0.09$). The CFI and TLI are both above 0.90 , indicating a good fit between the hypothesized model and the data structure.

From the CFA results, it can be concluded that the MCDM-UnOP model has achieved construct validity, which comprises six-criterion, namely security (9 criteria), delivery/shipping (6 criteria), privacy (6 criteria), product quality (6 criteria), financial risk (3 criteria), and psychological (4 criteria).

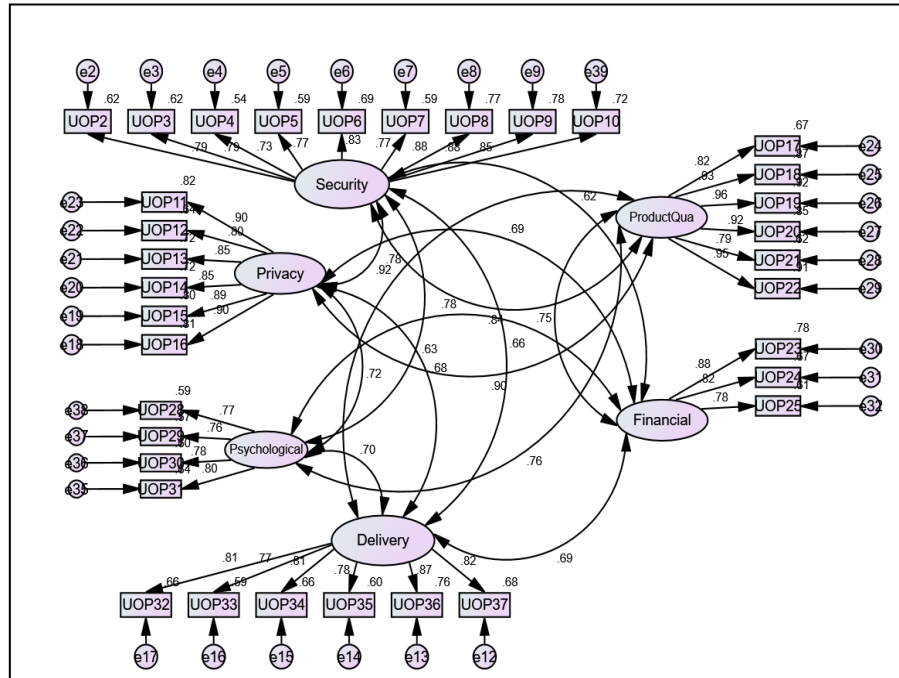


Figure 3: CFA Results (re-specified model)

Besides validating the MCDM-UnOP model, the aim of this research is to prioritize the criterions of customer uncertainty in online purchasing. Therefore, AHP analysis was performed to achieve this objective. Table 2 shows the results of prioritize the criterions of customer uncertainty in online purchasing, which is measured by the weighting score. The results revealed that the most important criterion of customer uncertainty in online purchasing was security (0.3569), followed by privacy (0.2272), shipping/delivery (0.1373), product quality (0.1365) and financial risk (0.0804). The most unimportant criterion of customer uncertainty in online purchasing was psychological (0.0630).

Table 2: AHP Results

Rank	Criterion	Weighted Score	Consistency Value
1 st	Security	0.3569	0.0139
2 nd	Privacy	0.2272	
3 rd	Delivery/Shipping	0.1373	
4 th	Product Quality	0.1365	
5 th	Financial Risk	0.0804	
6 th	Psychological	0.0630	

Conclusions

Managing customer uncertainty in online purchasing has become a critical issue for online sellers. Uncertain feelings discourage customers from participating in online transactions. Therefore, there is an urgent need to develop, validate, and prioritize a multi-criteria decision-making model of customer uncertainty in online purchasing, referred to as the MCDM-UnOP model. In this research, the development, validation, and prioritization of the MCDM-UnOP model were empirically tested using a mixed-methods approach. The findings identified and validated six customer uncertainty criteria in online purchasing: security, delivery and

shipping, privacy, product quality, financial risk, and psychological risk. These six criteria were measured by 34 specific items. In terms of priority, the results of the AHP analysis revealed that the most important criterion was security, followed by privacy, delivery and shipping, product quality, financial risk, and psychological risk. Theoretically, the MCDM-UnOP model developed in this study is novel and provides valuable insights into the fields of decision-making, management, and marketing. Practically, the research findings offer important implications for decision-makers in the online business industry, enabling them to develop strategic marketing tools by understanding the factors that contribute to customer hesitation in online purchasing. One limitation of this research is that the developed model still requires empirical evidence to establish the causal relationships with outcome variables, as highlighted in the literature.

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DOSAGE DEPENDENT PERFORMANCE OF NATURAL COAGULANTS FROM BANANA PEELS IN DOMESTIC WASTEWATER TREATMENT

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Abstract: *The increasing concern over the environmental and health risks associated with chemical coagulants in water treatment has prompted interest in natural alternatives. Banana peels, often discarded as food waste, offer potential as an eco-friendly and low-cost natural coagulant. This study aims to produce a natural coagulant from banana peels and determine the optimum dosage for effective removal of turbidity and total suspended solids (TSS) from domestic wastewater. The banana peels were collected, thoroughly washed, oven-dried at 90°C, ground into powder, and sieved to obtain a fine particulate coagulant. Three different dosages 1.0 g/L, 0.1 g/L, and 0.01 g/L were prepared and tested in 500 mL samples of domestic wastewater. Each sample underwent a jar test procedure involving rapid mixing at 180 rpm for 3 minutes, slow mixing at 10 rpm for 20 minutes, followed by 30 minutes settling period. Water quality parameters including turbidity and TSS were measured before and after treatment. The results revealed that the lowest dosage of 0.01 g/L achieved the highest removal efficiencies, 91.43% for turbidity, and 88.17% for TSS. Higher dosages resulted in lower performance, likely due to the overdosing effect that can destabilize floc formation. The findings confirm that banana peel-based coagulant is effective in improving water quality and that a minimal dosage yields the best results. This study demonstrates the potential of utilizing agricultural waste as a sustainable solution for domestic wastewater treatment and supports further research into optimizing natural coagulants for broader applications.*

Keywords: *Banana peel coagulant, Natural coagulant, Dosage optimization Domestic wastewater treatment, Turbidity removal*

Introduction

Clean water is a fundamental necessity for human health, sanitation, and environmental sustainability. Domestic wastewater, generated from household activities such as bathing, washing, and cooking, often contains a high concentration of suspended solids, organic matter, and dissolved impurities (Koul et al., 2022; Mitra & Verma, 2024). Effective treatment of this wastewater is essential before it can be safely discharged into the environment or reused. One of the most widely used methods in water treatment is coagulation, a process that aggregates fine particles into larger flocs for easier removal (Gaid, 2023; Undi & Bestha, 2023). Traditionally, chemical coagulants such as aluminium sulphate (alum), ferric chloride, and polyaluminium chloride have been used due to their effectiveness in turbidity and pollutant removal (Salem & AL-Musawi, 2021; Tahraoui et al., 2024). However, these chemical coagulants pose several health and environmental risks. Prolonged exposure to aluminium-

based compounds, for example, has been associated with potential neurological impacts and increased sludge production, which complicates disposal and increases treatment costs (Bettiol et al., 2023; Diver et al., 2023a).

In response to these concerns, natural coagulants derived from plant, animal, or microbial sources have gained attention as safer and more sustainable alternatives. These coagulants are typically biodegradable, non-toxic, and can be sourced from agricultural by-products. Among various natural sources, banana peels have emerged as a promising candidate due to their high content of active compounds such as polysaccharides and phenolics, which facilitate the coagulation process (Esther Jebarani Rayer et al., 2024; Zaidi et al., 2022). Banana peels are abundantly available, especially in food-producing areas, and represent an underutilized biomass with potential value in wastewater treatment applications (Jahin et al., 2024; Rofikoh et al., 2024).

This study focuses on utilizing banana peel powder as a natural coagulant for treating domestic wastewater. Specifically, it investigates the effect of different dosages on the removal efficiency of turbidity and total suspended solids (TSS). The objective of this paper is to determine the optimum dosage that yields the highest removal efficiency, promoting a low-cost and environmentally friendly approach to wastewater treatment.

Literature Review

The shift toward environmentally friendly water treatment technologies has led to growing interest in natural coagulants as alternatives to conventional chemical agents. Chemical coagulants such as alum and ferric chloride, although effective, often pose challenges including sludge management, residual toxicity, and high operational costs (Diver et al., 2023; Kaji et al., 2020). These limitations have prompted the exploration of safer, more sustainable materials, especially those derived from agricultural waste.

Among various natural sources, plant-based coagulants have shown considerable promise due to their availability, biodegradability, and low toxicity. Materials like moringa seeds, cactus mucilage, and banana peels have been studied for their coagulation potential. Banana peels, in particular, offer a unique advantage as they are abundantly produced as food waste and contain active compounds like polysaccharides, phenolics, and tannins that aid in destabilizing suspended particles in wastewater (Maurya & Davey, 2018).

Research has demonstrated the capability of banana peel powder to effectively reduce turbidity and suspended solids. Interestingly, optimal performance is often achieved at lower dosages. This is due to efficient charge neutralization and floc formation at minimal concentrations, whereas higher dosages may lead to particle restabilization, reducing overall removal efficiency (Azamzam et al., 2022; Mokhtar., Priyatharishini, & Kristanti, 2019). Therefore, identifying the correct dosage is essential to maximize treatment performance while minimizing material usage.

In addition to treating domestic wastewater, banana peel-based coagulants have been investigated for various other applications, including surface water clarification and the removal of specific contaminants such as heavy metals. Their broad applicability highlights the potential of banana peels as a versatile treatment agent, especially in rural or resource-limited

areas where advanced treatment facilities may not be feasible (Maurya et al., 2024; Zaidi et al., 2022).

Despite the positive findings, several factors still need to be optimized to ensure consistent results. Preparation methods, particle size, mixing intensity, and pH are some of the variables that can influence coagulation effectiveness (Naceradska et al., 2019; Okolo et al., 2021; Sun et al., 2019). While many studies focus on lab-scale testing, further work is required to validate performance under actual field conditions.

Material and Methods

Preparation of Natural Coagulant

Banana peels were collected from local vendors in Pagoh Jaya, primarily from food stalls selling fried bananas. The peels were thoroughly washed with tap water to remove surface contaminants and dirt. After washing, the banana peels were cut into smaller pieces and dried in an oven at 90°C for 2 hours. Once dried, the peels were ground into fine powder using a kitchen blender. The resulting powder was then sieved to obtain a uniform particle size, which was used as the natural coagulant in subsequent experiments

Jar Test Procedure

To evaluate the coagulation performance, a standard jar test was conducted. Three different dosages of banana peel powder 1.0 g/L, 0.1 g/L, and 0.01 g/L were weighed and added separately to 500 mL samples of raw domestic wastewater collected from drains in the Pagoh Jaya residential area. Each dosage was tested in triplicate to ensure consistency of results. The jar test procedure involved three phases. First, rapid mixing was conducted at 180 rpm for 3 minutes to ensure even distribution of the coagulant. This was followed by slow mixing at 10 rpm for 20 minutes to allow floc formation. Lastly, the samples were allowed to settle undisturbed for 30 minutes.

Parameter Analysis

To assess the effectiveness of the banana peel-based coagulant, three key water quality parameters were measured before and after treatment for turbidity and total suspended solids (TSS). The procedures for each test are described below:

Turbidity Test

Turbidity was measured using a digital turbidity meter. Prior to measurement, the sample container was rinsed with distilled water and carefully filled with the treated or untreated water sample, ensuring the liquid level did not exceed the indicator line. The container was then inserted into the turbidity meter with its alignment mark facing forward. After closing the lid, the “Start” button was pressed, and the reading was displayed in Nephelometric Turbidity Units (NTU). This test was used to determine the clarity of the water by evaluating the number of suspended particles remaining.

Total Suspended Solids (TSS) Test

The TSS was determined through a gravimetric method. A pre-weighed filter paper was placed in an oven at 100°C for 15 minutes to ensure dryness and then reweighed. Next, 100 mL of the water sample was filtered using the paper. The filter paper, now containing retained solids, was dried again in the oven at 105°C for 2 hours. After cooling, it was reweighed. The TSS value (in ppm) was calculated using the formula below:

$$\text{Total Suspended Solids } \left(\frac{\text{mg}}{\text{L}} \right) = \frac{\text{Weight (mg)}_{\text{final}} - \text{Weight (mg)}_{\text{initial}}}{\text{Sample Volume (L)}} \quad \text{Equation (1)}$$

Result And Discussion

Effect of Dosage on Turbidity Removal

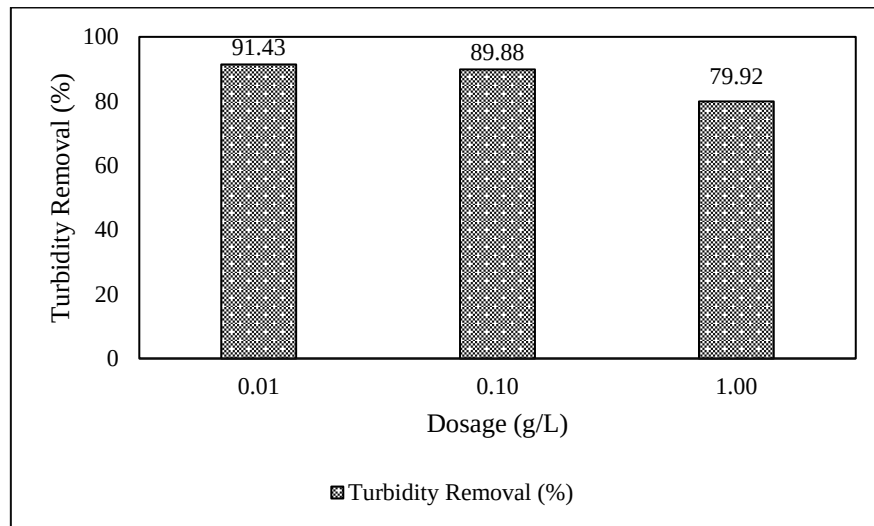


Figure 1: Effect of Dosage to the Turbidity Removal

The turbidity removal efficiency of the banana peel-based coagulant was assessed at three dosage levels: 0.01 g, 0.1 g, and 1.0 g. As shown in the data as Figure 1, the lowest dosage of 0.01 g achieved the highest turbidity removal at 91.43%, followed by 0.1 g (89.88%) and 1.0 g (79.92%). This outcome clearly indicates an inverse relationship between dosage and turbidity removal efficiency.

The superior performance of the lowest dosage can be explained by the principle of charge neutralization and floc formation. At lower concentrations, the active compounds in banana peels such as polysaccharides and phenolic groups effectively destabilize the colloidal particles in the wastewater, allowing efficient aggregation into flocs. However, as the dosage increases, the surplus of coagulant particles may lead to charge reversal or re-stabilization, thereby hindering the formation of stable flocs and reducing overall turbidity removal (Azamzam et al., 2022; Maurya & Daverey, 2018).

This finding is consistent with studies such as Mokhtar et al. (2019), who reported that banana peel powder achieved turbidity removal efficiency up to 88% at low dosages. Similarly, Azamzam et al. (2022) highlighted the effectiveness of banana-based coagulants for river water clarification, noting that low concentrations outperformed higher ones due to better floc

stability. Moreover, Hoonka et al. (2018) emphasized the importance of dosage control in natural coagulants, where overdosing often leads to diminished treatment performance due to particle restabilization.

In conclusion, the results reinforce that 0.01 g is the optimal dosage for turbidity reduction in domestic wastewater using banana peel coagulant. This not only ensures efficient treatment but also minimizes material usage, making it a cost-effective and sustainable alternative to chemical coagulants in community-level water treatment systems

TSS Removal

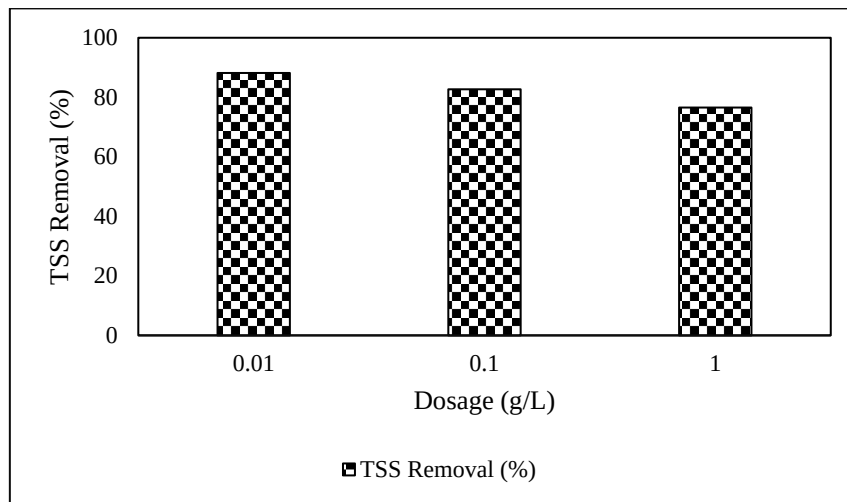


Figure 2: Effect of Dosage to the TSS Removal

The impact of varying coagulant dosages on total suspended solids (TSS) removal was evaluated using banana peel-based natural coagulant. The result in Figure 2 shows a trend similar to turbidity removal, where the lowest dosage of 0.01 g achieved the highest TSS removal efficiency at 88.17%, followed by 0.1 g at 82.69%, and 1.0 g at 76.56%. These findings confirm that lower dosages are more effective in aggregating and settling suspended particles in domestic wastewater.

This inverse trend can be explained by the principle of optimal particle destabilization. At a lower dosage, active biopolymers present in banana peels effectively neutralize the surface charges of suspended solids, facilitating floc formation. However, increasing the dosage beyond the optimal point likely causes floc breakage or particle restabilization, leading to a decline in removal efficiency. Excess coagulant may introduce competing particles or saturate binding sites, thereby reducing coagulation performance (Azamzam et al., 2022; Esther Jebarani Rayer et al., 2024).

The results align well with previous findings. For instance, Maurya & Daverey (2018) reported that banana peel coagulants achieved TSS removal up to 66.67%, particularly when used at lower concentrations. The superior performance in this study (88.17%) may be attributed to differences in peel processing method or the initial characteristics of the wastewater. Additionally, it was emphasized the role of natural polymer bridging in effective flocculation,

which works optimally only under a narrow dosage range (Ferasat et al., 2020; Lapointe & Barbeau, 2020).

In conclusion, the study demonstrates that a dosage of 0.01 g/L is most effective for TSS removal in domestic wastewater using banana peel coagulant. This supports its use in small-scale water treatment systems where material efficiency and sustainability are critical.

Conclusion

This study evaluated the effectiveness of banana peel-based natural coagulant in treating domestic wastewater, with a specific focus on optimizing dosage for the removal of turbidity, and total suspended solids (TSS). Three dosages 0.01 g/L, 0.1 g/L, and 1.0 g/L were tested using the standard jar test method under fixed mixing and settling conditions. The results demonstrated that 0.01 g/L is the optimal dosage, consistently achieving the highest removal efficiencies: 91.43% for turbidity, and 88.17% for TSS. Higher dosages led to reduced performance, likely due to floc destabilization and overdosing effects. The findings are in line with previous literature, which highlights that natural coagulants such as banana peels perform best within a narrow dosage range.

Overall, the results confirm the potential of banana peel powder as a low-cost, biodegradable, and sustainable coagulant for domestic wastewater treatment. Using the minimal effective dosage not only improves efficiency but also aligns with eco-friendly waste management and circular economy practices. This study contributes to the growing body of research promoting agricultural waste valorisation in environmental applications.

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EVALUATING ELEARNING USER INTERFACE DESIGN IN MALAYSIAN PRIVATE HIGHER LEARNING INSTITUTIONS: A COMPARATIVE STUDY ON ACADEMIC LECTURERS' EXPERIENCE

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Abstract: *Elearning systems are widely implemented to support teaching and learning activities in Malaysia. However, the full potential of eLearning remains underutilized due to poor usability and interface design. This study evaluates the user interface design (UID) of eLearning platforms in private higher learning institutions (HLIs) in Malaysia, with an emphasis on the academic lecturers' user experiences and perceptions. The paper adopts a two-phase mixed-methods approach, combining observation and survey questionnaires, guided by the ADDIE instructional design model and the Unified Theory of Acceptance and Use of Technology (UTAUT). In the observation phase, the user interface design (visual design, layout, navigation, and interactivity structure) of four private HLIs was examined through systematic observation. While in the second phase, survey questionnaires were distributed to 200 academic lecturers of private HLIs in Malaysia. The purpose of the survey was to assess platform usability across four key dimensions, which are course quality, technical system quality, interactivity, and visual design of eLearning platforms. The findings reveal several key usability issues, including inconsistent layouts, excessive text, poor navigation structures, and limited interactivity features. Difficulty in navigating content, lack of visual clarity, and insufficient support for effective teaching and learning tasks were reported by the academic lecturers. The findings from the survey further indicate that these deficiencies negatively impact academic lecturers' satisfaction and result in a lack of engagement with eLearning functionalities. The study concludes that UID plays a critical role in influencing the overall usability and effectiveness of eLearning systems of academic lecturers in private HLI. By identifying design-related challenges that hinder platform adoption and engagement, this study contributes to a deeper understanding of user experience issues in digital education environments, especially from the perspective of academic lecturers. These insights support national efforts aligned with Sustainable Development Goal 4 (SDG 4), which emphasizes inclusive and quality education through improved digital infrastructure in higher education.*

Keywords: *eLearning, User Interface Design, Private Higher Learning Institutions, Academic Lecturers, SDG 4*

Introduction

Higher education teaching and learning processes have been profoundly impacted by the Fourth Industrial Revolution's (IR 4.0) rapid digital development. In Malaysia, this shift aligns with the Ministry of Higher Education's (MOHE) goal for Education 4.0 which emphasizes the use of technology in order to enhance students' engagement and learning outcomes (Halili,

2019). As a result of this shift, eLearning platforms have emerged as key academic delivery methods, particularly at private higher learning institutions (HLIs), where digital adoption is urged to ensure institutional competitiveness and pedagogical flexibility (MIDA, 2021). Although eLearning systems are widely adopted in Malaysia, their effectiveness is determined not just by functionality, but also by the quality of the platform's user interface design (UID), which has a substantial impact on usability, engagement, and long-term adoption. UID refers to the visual aesthetics, as well as the layout structure, navigation, interactivity and overall usability of a digital platform (Gunasekera et al., 2019). Academic lecturers, who function as both content creators and facilitators in eLearning environments, rely on a good user interface to organize materials, manage student participation, and provide teaching and learning. Despite this, many platforms continue to experience usability challenges that discourage long-term participation and limit the system's functional usefulness (Abdul Rahman et al., 2024; Ahmad et al., 2022). Previously, numerous studies have investigated eLearning but mainly from the perspective of students and relatively, there are only a few studies that have given attention to how academic lecturers' experiences and their interaction with these platforms, including about UID (Miya & Govender, 2022; Elmunsyah et al., 2020). Thus, this gap is critical as academic lecturers play an important role in structuring content, setting the assessments, and guiding students' engagement. If interface design aspects like navigation menus, content arrangement, or interactive tools are not properly integrated, academic lecturers may struggle to use the system successfully, compromising both instructional quality and learner results (Miya & Govender, 2022).

Therefore, to address this issue, the study investigated user interface design of eLearning platforms in selected private HLIs in Malaysia and focuses on the experiences of academic lecturers. The study takes a two-phase mixed-methods approach: (1) observations of eLearning platform interfaces at four private HLIs and (2) a survey of 200 academic lecturers to measure their impressions across key usability parameters. The research is guided by two frameworks: the ADDIE instructional design model (Branch, 2009), which emphasizes the importance of systematic content design, and the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2003), which sheds light on technology adoption behavior. The results of both data collection phases point to a number of enduring problems with interface design. Uncertain navigation flows, inconsistent layouts, and inadequate use of contrast and typography were also noted. The poll results reflected these concerns, with academic lecturers expressing discontent with the platforms' technical performance, visual design, and engagement. Numerous users stated that difficulties with interface design deterred them from investigating more sophisticated platform functionalities, resulting in infrequent use beyond simple resource uploading. These results highlight the necessity of assessing UID in eLearning systems critically, not just as a technical element but also as a pedagogical facilitator.

The purpose of the study is to assess academic lecturers' experiences with eLearning UID in private HLIs in Malaysia. The study examines how current interface design elements affect academic lecturers' usability, engagement, and general satisfaction by examining survey and observational data. Through this assessment, the study provides information regarding specific design-related issues that affect academic lecturers' proficiency with eLearning systems. The Sustainable Development Goal 4 (SDG 4), which prioritizes fair access to high-quality education through enhanced digital learning settings, is one of the larger national education goals (United Nations, 2022). Thus, by highlighting real-world obstacles in digital learning infrastructure that could restrict access, quality, and instructional efficacy, the study

specifically supports SDG 4. In addition to negatively impacting user happiness, a poorly designed user interface runs the danger of escalating digital inequality by making it more challenging for educators, particularly those who are less tech-savvy in interacting with eLearning platforms in a meaningful way. In order to support national and international efforts to modernize and democratize higher education through technology, this study looks at the human-centered design challenges faced by academic lecturers. It addresses that gap by focusing on how academic staff in private HLIs perceive and interact with eLearning user interfaces, an area crucial to achieving long-term digital transformation and supporting the goals of Education 4.0. The findings can be used to create eLearning systems that are more inclusive, accessible, and effective and ultimately supporting national and global efforts to modernize and democratize higher education through technology (United Nations, 2022; Zancajo et al., 2021; Economic Planning Unit, 2021).

Literature Review

ELearning in Malaysian Higher Education

The driven of Malaysia's national initiatives such as Malaysian Education Blueprint 2015 – 2025 and MyDigital strategy have a significant impact towards the implementation of eLearning in Malaysia. Over the recent years, the use of digital technologies has grown rapidly especially in HLIs. These policies emphasize on the flexibility, technology-enhanced education that supports lifelong learning, industry-relevant skills, and greater access to quality education (Halili, 2019; EPU, 2021). In Malaysia, both public and private HLIs have responded on these initiatives by adopting a variety of eLearning platforms, either through proprietary learning management systems (LMS) or open-source solutions. Previously, the usage of eLearning was initially positioned as a tool for blended learning but the digital transformation accelerated due to COVID-19 pandemic as eLearning became a central tool across all education levels (Ahmad et al., 2022). Moreover, especially in private HLIs, eLearning has become a necessity tool for teaching and learning, course assessment and delivery, as well as grading system. Although, eLearning has become a core method tool after the pandemic, but the rapid shift revealed significant gaps in digital readiness, user engagement and infrastructure.

ELearning platforms are widely adopted in education sectors, especially in HLIs. But several studies have pointed out that the effectiveness of eLearning systems varies across institutions and user groups. Previous studies shows that while students often adapt quickly to digital platforms, many lecturers experience difficulties in navigating and using the available tools in eLearning platforms beyond the basic functions (Abdul Rahman et al., 2024; Elmunsyah et al., 2020). Some of the issues being raised include usability concerns, lack of training and unclear interface design. These aspects don't get much attention in institutional rollouts. In another study, Gunesekera et al. (2019) argue that the implementation of a successful eLearning platform requires more than access to technology but it also depends on system usability, user confidence, and effective instructional design. Thus, in Malaysia, the progress of eLearning mainstreaming has been notably positive, but there are still issues such as academic lecturer's experiences remains underexplored particularly in terms of UID and daily usage.

Academic Lecturer's Acceptance and Usage of eLearning

One of the criteria for a successful implementation of eLearning is the role of academic lecturers. Academic lecturers play a central role in the success of eLearning adoption in higher

education, as they are responsible for designing, organizing, and delivering teaching and learning experiences through digital platforms. However, previous studies have found that many lecturers continue to adopt eLearning platforms by only using the basic functions, that is often limited to uploading course materials or sharing announcements (Abdul Rahman et al., 2024; Ahmad et al., 2022). Although eLearning platforms offer advanced features such as interactive assessments, forums, and real-time feedback, these tools remain underutilized due to usability challenges and a lack of training. Miya & Govender (2022) highlighted that academic lecturers' acceptance of eLearning platforms is heavily influenced by the interaction with system interfaces, especially the perceived ease of navigation and design clarity. Although institutional infrastructure and supports are available, platforms that are difficult to use or lacking in intuitive structure may lead to frustration and disengagement of users. Similarly, in another study, Senevirathne and Manathunga (2021) highlight that academic lecturers often struggle with digital tools that are not designed with pedagogical workflows in mind, thus creating a mismatch between teaching needs and technological capabilities. Platforms that are difficult to use or lack an intuitive structure can lead to frustration and disengagement, even when institutional infrastructure and support are available.

Similarly, Senevirathne and Manathunga (2021) highlight that lecturers often struggle with digital tools that are not designed with pedagogical workflows in mind, creating a mismatch between teaching needs and technological capabilities. Moreover, previous research has shown that usability barriers remain a major factor in affecting academic lecturers' motivation and long-term engagement with eLearning (Abdul Rahman et al., 2024; Okocha & Odinko, 2021). These barriers include cluttered layouts, inconsistent content structures, and limited customization options. All of which hinder the effectiveness of teaching and learning practices. Furthermore, HLI's expectations alone are not enough to encourage full adoption, but rather, user experience and user satisfaction are equally critical in encouraging full engagement of eLearning usage. Recent literature emphasizes that academic lecturers' acceptance of eLearning goes beyond access or policy mandates. It is deeply related to the personal experiences with the eLearning platform's UID, ease of use, and alignment with teaching and learning tasks. Therefore, evaluating UID from an academic lecturer's perspective is essential in understanding how to improve eLearning adoption for long-term engagement in HLIs.

User Interface Design (UID) in eLearning Systems

UID plays a critical role in shaping the usability and effectiveness of eLearning platforms for the users, especially from the perspective of academic lecturers. Academic lecturers use eLearning systems particularly for teaching and learning purposes, such as a course delivery and assessment system. Although technological infrastructure and system functionality are the foundation of the platforms, the quality of UID significantly influences user satisfaction, engagement, and long-term adoption (Senevirathne & Manathunga, 2021; Miya & Govender, 2022). A well-designed interface facilitates easy navigation, lessens cognitive burden, and improves the user experience in general. In an eLearning platform, UID includes layout, design clarity, visual hierarchy, navigation structure, typography, interactivity, and the mechanism of feedback. In recent years, previous studies have shown that many eLearning platforms in HLIs are lacking in terms of user-centered design principles (Abdul Rahman et al., 2024). Academic lecturers report difficulties of usage due to cluttered dashboards, excessive textual content, unclear menu structures, and inconsistent visual cues. These issues hinder the academic lecturer's ability to deliver content effectively (Ahmad et al., 2022).

Moreover, there is a lack in terms of UID standardization across eLearning platforms that contributes to user's confusion and underutilization of features. Miya & Govender (2022) highlighted that many systems prioritize administrative and technical functions rather than pedagogical usability, hence making them less supportive of instructional workflows. In another study, Okocha and Odinko (2021) highlighted that users become less engaged and reluctant to explore more complex features, thus leads to lower engagement of users. Meanwhile, in the Malaysian higher education context, there are still very few studies being conducted that directly evaluate UID from the perspectives of academic lecturers. Thus, it creates a gap in having a better understanding of how UID influences teaching and engagement within the eLearning context. Therefore, the need to address this gap is crucial as UID is not merely an aesthetic component, but it is an essential factor that directly impacts the performance of teaching and the satisfaction of academic lecturers.

ADDIE Model and UTAUT as Theoretical Framework

This study adopts a dual-framework approach, which includes the ADDIE instructional design model and Unified Theory of Acceptance and Use of Technology (UTAUT). Both frameworks provide a guideline to evaluate academic lecturers' experiences with eLearning interface design in private HLIs. Both of the selected frameworks are widely used in educational technology research as they provide comprehensive perspectives on the design process (ADDIE model) and users' behaviour (UTAUT). ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) is a systematic instructional design framework that has been widely adopted in eLearning environments. The model supports structured development of learning experiences by ensuring alignment between goals, design strategies, and usability (University of Washington Bothell, n.d.). In this study, ADDIE is used to analyse the structure and presentation of UID elements, such as flow of navigation, visual hierarchy, and content layout within eLearning platforms in private HLIs.

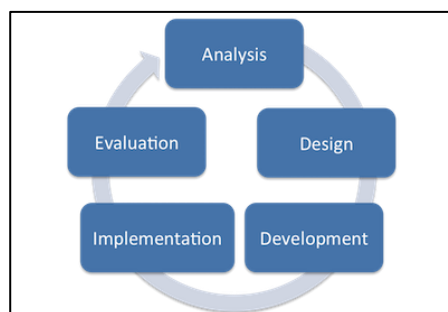


Figure 1: The Phases of ADDIE Model

Source: International Society for Educational Technology (ISFET)

Apart from the ADDIE model, the UTAUT model was also used as part of this study. The model was originally developed by Venkatesh et al. It remains relevant in modern research and has been widely applied in digital learning studies. Its usefulness in comprehending user intents in educational systems, particularly among academic staff, has been confirmed by recent literature (Miya & Govender, 2022; Okocha & Odinko, 2021). UTAUT model includes four core constructs, which are performance expectancy, effort expectancy, social influence, and facilitating conditions, which influence users' behavioural intention and actual use of technology. Thus, in this study, UTAUT is used to inform the analysis of survey data on

academic lecturers' perceived usability, satisfaction, and engagement with eLearning platforms.

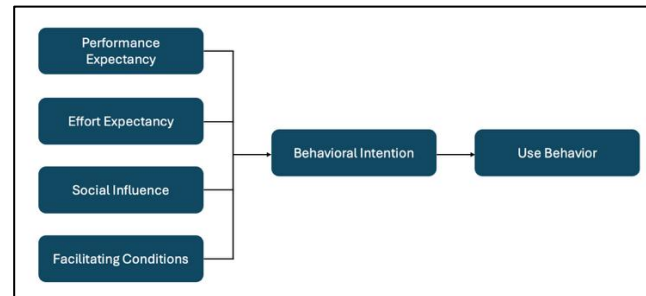


Figure 2: The UTAUT Model

Source: Unified Theory of Acceptance and Use of Technology: A Review (TheoryHub Book)

Therefore, by integrating ADDIE and UTAUT, the study bridges the design and academic lecturer's perspectives. ADDIE helps by evaluating whether the interface elements are instructionally sound, while UTAUT explains how those elements influence lecturers' adoption behavior. These models offer a holistic lens to assess how UID impacts eLearning usability in private HLIs.

Research Methodology

Research Design

This study employed a sequential mixed-methods design, integrating both quantitative and qualitative data collection, targeting academic lecturers from selected private HLIs by analysing and evaluating academic lecturers' experiences with UID in eLearning platforms. This approach enabled triangulation of findings, enhancing the validity of results by combining insights from direct observations and academic lecturers' perceptions towards eLearning usage. The study was conducted within the context of Malaysian private HLIs. In the qualitative phase, four private HLIs were selected as part of the observational analysis. The selected HLIs were chosen based on the active use of the institution's eLearning platforms and accessibility to conduct research. The eLearning platforms in these institutions varied in terms of platform types, design strategies, and digital levels, thus providing a broad view of UID practices across the higher education sectors. Moreover, in the quantitative phase, a total of 200 academic lecturers participated in the survey questionnaires. Furthermore, within each participating HLIs, random sampling approach was applied in selecting academic lecturers who are actively utilized eLearning platforms for course delivery. This approach ensured that selected participants had relevant and up-to-date experience with UID in actual teaching and learning practices.

Data Collection and Data Analysis

Data collected for this study were collected using two primary instruments, which are an observation checklist and a survey questionnaire. The observation checklist was developed based on the ADDIE instructional design model. The elements that were being focused on were visual layout, content structure, interactivity, navigation, and the platform's consistency. Observations were conducted within four selected private HLIs around the Klang Valley area

in Malaysia. The observation was conducted in order to evaluate the usability and instructional alignment of eLearning platforms from the perspective of academic lecturers.

The second primary instrument was a survey questionnaire. The survey questionnaire was designed using constructs from the UTAUT model, which was then distributed to five main key areas: course quality, technical system quality, interactivity quality, UID quality and visual design quality. A total of 31 items were included, and responses were measured by using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The survey questionnaire was distributed through Google Forms to 200 academic lecturers with experience in using eLearning platforms across private HLIs in Malaysia. Both instruments were selected to capture usability issues and users' perceptions, as well as to enable a comprehensive analysis of UID and users' experiences in eLearning usage.

The quantitative and qualitative findings were analysed and interpreted concurrently to provide a comprehensive understanding of UID issues in eLearning platforms of private HLIs in Malaysia. Data collected through observations were analysed using thematic analysis. Through the analysis, it identifies recurring UID patterns, usability challenges, and instructional design inconsistencies across the observed eLearning platforms. The observation data emphasized the flow of navigation, visual clarity, content organization, and system interactivity, which are all experienced by academic lecturers from the particular HLI. Through thematic analysis, it enabled the categorization of common usability challenges and effective interface features observed across four private HLIs. In addition, these themes were then synthesized to highlight design elements that either enhanced or hindered the teaching and learning practices of the academic lecturers.

Meanwhile, survey questionnaires were analysed using descriptive statistics. The analysis focused on identifying trends of academic lecturers' perceptions, including course quality, technical system quality, interactivity quality, UID quality and visual design quality. Moreover, measurements such as mean scores, frequency distributions, and standard deviations were used to present responses from participants. Reliability testing was conducted using Cronbach's Alpha, thus confirming the strong internal consistency across all constructs ($\alpha > 0.80$), thereby validating the instrument's suitability for examining academic lecturers' experiences and usage of eLearning platforms.

Findings and Discussion

Qualitative Findings: Observation

The qualitative analysis was conducted through observation on the eLearning platforms of four selected private HLIs in Malaysia. The four private HLIs were selected based on the institution's active integration of eLearning platforms, regional diversity, and accessibility for structured on-site observation. The selected institutions represented a cross-section of medium to large-scale private institutions. The observational analysis from these private HLIs revealed both strengths and areas requiring improvement in terms of UID and instructional support. Overall, the eLearning platforms effectively supported basic teaching tasks, including content delivery, uploading materials, submission of assignments, and providing announcements. However, the layout and navigation structures across the HLIs were inconsistent, with some systems displaying cluttered dashboards, redundant menu options, and poorly organized content sections. Apart from that, the visual hierarchy and aesthetics were also mixed, whereby

certain platforms employed clear typography, balanced colour schemes, and logical segmentation of content, while others were characterized by excessive text blocks, lack of contrast, and minimal use of visual cues, which reduced content readability and users' engagement. Furthermore, interactivity features such as discussion forums, real-time collaboration tools, and formative feedback mechanisms were often either underdeveloped or underutilized, which leads to limited opportunities for a more dynamic lecturer-student interaction.

Moreover, based on the observation from the four private HLIs, technical performance was another recurring issue with reports of slow loading times and occasional system lags during peak hours, which may have disrupted synchronous teaching and learning activities. In addition, analytics and evaluation tools were also limited, with most systems providing only basic tracking of student grades rather than offering deeper insights into learners' engagement or content interaction patterns. Overall, these findings show that while current eLearning platforms are functional and widely used, the UID often lacks the intuitive structure, visual consistency, and advanced interactivity that are required to fully support the digital pedagogy. Therefore, addressing these gaps through user-centered design improvements and enhanced technical features would significantly improve both teaching efficiency and academic lecturers' satisfaction.

Quantitative Findings: Survey Questionnaire

The survey questionnaires under quantitative analysis focused on five key constructs identified from the UTAUT model, and supported by relevant literature on eLearning usability and instructional design. The main key constructs are course quality, technical system quality, interactivity quality, visual design quality, and user interface design quality. Overall, respondents reported favourable perceptions across all areas, thus indicating that the current eLearning platforms generally support effective teaching and learning experiences for academic lecturers, but there is a need for improvements in enhancing the UI of eLearning platforms across HLIs in Malaysia.

Construct / Items	Mean	SD	Findings
User Interface Design Quality	4.3	0.5	Users find the interface user-friendly and well-structured. However, improvements in mobile responsiveness and layout clarity are needed.
Course Quality	4.2	0.6	Course design and flow are well supported, but some users suggest better tools for activity integration.
Visual Design Quality	4.1	0.6	Visuals are aesthetically pleasing, though some respondents noted issues with design contrast and cluttered layout.
Technical System Quality	4.0	0.7	System is stable and accessible. But improvements are needed in performance consistency during peak usage.
Interactivity Quality	3.8	0.8	Basic interactivity is present. However, there is a need for more real-time tools and collaborative features.

Table 1: Summary Table for Quantitative Findings

Based on all items, the highest-rated item was UID quality ($M = 4.3$, $SD = 0.5$). The results indicated that academic lecturers found the layout, navigation, and overall structure of eLearning platforms to be user-friendly and intuitive, thus suggesting a strong alignment between design expectations and actual interaction between users and eLearning platforms.

Course quality items also received a high mean score ($M = 4.2$, $SD = 0.6$). The respondents are positively satisfied with how eLearning platforms support course delivery, content organization, and learning activities. The score for visual design quality was positive ($M = 4.1$, $SD = 0.6$), which suggests that design elements such as colour schemes, typography, and visual hierarchy contribute to ease of use, content readability, and user engagement.

Findings from technical system quality ($M = 4.0$, $SD = 0.7$) showed that most users found the eLearning platforms to be stable and functional, but some variability was noted across HLIs. The lowest scoring construct was interactivity quality ($M = 3.8$, $SD = 0.8$), which indicates that while basic interactivity tools exist, the eLearning platforms may be lacking or underutilized in more advanced features to support collaboration, engagement, and feedback.

Although the overall response from academic lecturers on eLearning platforms was positive, the findings also reveal there are critical areas that require further enhancement. While UID quality received the highest score, several respondents indicated that there are challenges related to the flow of navigation, layout consistency, and responsiveness across devices. This suggests that despite general satisfaction, usability issues continue to affect overall academic lecturers' experiences, especially for those who are less familiar with digital platforms. Apart from that, visual design quality showed variation of responses, whereby some academic lecturers noted that aesthetic inconsistencies, poor contrast, or cluttered layouts reduced ease of use and users' engagement. These insights highlight the need for a more user-centered approach to refine the UID to ensure that visual elements are not only functional but also pedagogically supportive. In terms of interactivity, the lower score reflects a broader concern about limited features for real-time engagement, peer collaboration, and formative feedback. This indicates that the platforms may fulfil basic instructional functions but fall short in terms of fostering a dynamic and interactive teaching and learning environment.

Therefore, while eLearning platforms in private HLIs in Malaysia are largely functional and well-received, there remains a need to systematically enhance user interface, visual design, and interactive features to align with modern digital pedagogy and improve the academic lecturer's experiences and expectations for long-term engagement.

Conclusions

This study examines the UID quality of eLearning platforms in selected private HLIs in Malaysia, focusing on academic lecturers' usage and experiences. The study was conducted through a mixed-method approach by combining observations across four private HLIs and survey data from 200 academic lecturers, providing a comprehensive evaluation of how design, usability, and system features influence teaching and learning effectiveness for academic lecturers.

The findings revealed that while academic lecturers generally held positive views toward UID, course structure, visual presentation, and technical stability, there are still several critical areas that warrant improvement. One of the main concerns is the interactivity quality due to the limited implementation of collaborative tools and real-time engagement features. Additionally, based on the results of observations, there are issues regarding navigation consistency, visual hierarchy, and analytics capability, thus pointing to the need for more user-centered design strategies for the enhancement of eLearning platforms.

These insights carry practical implications for higher education institutions, particularly under digital infrastructure and instructional design to improve the eLearning platforms' usability and interactivity for better engagement by academic lecturers. These improvements are not only for increasing teaching efficiency but also to enhance users' engagement and satisfaction. Moreover, the findings contribute to Sustainable Development Goal 4 (SDG4) by reinforcing the need for inclusive and high-quality digital education systems. Overall, this study underscores the importance of ongoing platform evaluation, particularly UID. Academic lecturers' feedback and UID improvements will ensure that eLearning platforms remain effective, accessible, and pedagogically aligned within Malaysian higher education.

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THE INFLUENCE OF TIKTOK ON CAREER ASPIRATIONS AMONG YOUTH IN MALAYSIA

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Abstract: *This study explores how TikTok is influencing the career aspirations of youth in Malaysia. Once seen primarily as a platform for compact entertainment, TikTok has become a space where stories of unconventional success such as becoming a content creator or influencer are highly visible and widely celebrated. As a result, many young Malaysians are reconsidering traditional career paths and instead turning their attention to digital entrepreneurship and online fame. The research uses a qualitative method to better understand how exposure to TikTok content shapes young people's views of success, work and personal achievement. Through in-depth interviews with 10 Participants, the study looks at what draws youth toward careers in content creation, what motivates these decisions and how TikTok may be shifting their long-term goals. The study also explores the emotional and social factors behind these changes, including the pursuit of independence, creative expression and the appeal of public recognition. The findings offer insight into how media platforms are shaping generational mindsets around work and identity. They also highlight a growing gap between traditional education and the realities of digital career pathways. This research aims to inform how parents, educators and policymakers can better support youth in making informed decisions about their future, while recognising the influence of fast-evolving digital trends.*

Keywords: *TikTok, Career Aspiration, Social Media Influence*

Introduction

TikTok has transformed the digital landscape for Malaysia's younger generation. With its short-form video format and algorithmically curated content, the platform offers an interactive space that is both entertaining and highly influential. This paper examines the influence of TikTok on career aspirations among youth in a society where social media plays a central role in shaping identity, ambition and decision-making. It also explores whether sustained exposure to TikTok can alter perceptions of conventional career paths and identifies the key factors that motivate young people to pursue influencer-based careers over tertiary education.

Previous studies indicate that young people, particularly during formative stages of identity development are highly susceptible to digital pressures. TikTok's participatory culture,

algorithm-driven virality and ease of content creation have made it a powerful medium for shaping lifestyles, ambitions and career goals. By blurring the lines between audience and creator, the platform makes the prospect of becoming a digital influencer appear attainable and socially rewarding. Scholars such as Boyd (2014) and Livingstone and Helsper (2007) have highlighted that youth often seek validation in online spaces with metrics such as likes, shares and viral reach serving as tangible indicators of social worth. On TikTok, this form of validation reinforces the belief that prosperity and influence can be achieved more rapidly than through traditional career routes.

This paper builds on existing scholarship by investigating the influence of social media trends on the real-world career decisions of Malaysian youth. It also emphasizes the importance of integrating digital career literacy into education systems to ensure young people approach emerging digital opportunities with critical awareness and realistic expectations. While TikTok presents new career possibilities, it also carries the risk of fostering unrealistic ambitions. This calls for proactive engagement from educators and policymakers to address the shifting relationship between media and career aspirations.

Literature Review

TikTok and Youth Career Aspirations

The rise of TikTok as a dominant social media platform has redefined how Malaysian youth envision career possibilities and measure success. Existing research consistently shows that digital platforms shape self-perceptions, aspirations and life trajectories (Latif & Mohamed, 2021). TikTok's unique combination of algorithmic recommendations, participatory features and a culture of constant engagement provides users with the opportunity to create content, gain visibility and build personal brands (Abidin, 2018). Traditional markers such as job security and academic credentials are giving way to aspirations centred on flexible schedules, creative freedom and online recognition (Boyd, 2014; Livingstone, 2008). While these shifts can be motivating, they may also lead to unrealistic expectations and the undervaluing of formal education. Goffman's theory of self-presentation (1959) helps explain how youth manage their online identities curating content to meet audience expectations and build perceived value. While this can foster confidence and opportunity, it may also result in stress and unhealthy comparisons.

Internet Fame and Emotional Pressures

Studies on internet fame suggest that ordinary individuals can achieve influence through consistent online participation (Marwick, 2015). On TikTok, the concept of microcelebrity is closely tied to perceived authenticity and frequent content production (Khamis, Ang, & Welling, 2017). Many young users view high engagement metrics such as likes, shares and comments as markers of achievement. The blurred boundary between content consumers and creators makes the idea of becoming a content creator appear both accessible and desirable (Duffy, 2017). While TikTok offers career inspiration, research highlights the emotional pressures associated with maintaining an online presence, including the need to constantly adapt to trends while remaining distinctive (Annisa, 2022). This reflects the hidden costs of pursuing digital influence as a career.

Uses and Gratification Theory (UGT)

The Uses and Gratifications Theory (Katz, Blumler, & Gurevitch, 1974; Sundar & Limperos, 2013) offers insight into the appeal of TikTok for young audiences. Users engage with the platform for entertainment, self-expression and social validation motivations that can directly influence career choices. In Malaysia, TikTok has evolved beyond a purely entertainment-focused platform. It is increasingly becoming a source of career inspiration that connects youth with real-life success stories of peers and influencers (Azlan, Alias, & Hasan, 2021).

Methodology

This qualitative study employed semi-structured interviews with 10 Malaysian TikTok users aged between 18 and 39. Purposive sampling was used to ensure relevance and depth in participant insights. Interviews focused on three core areas: career aspirations, TikTok consumption habits and perceived influence of creators and trends. Data were analysed using thematic analysis to identify recurring patterns, underlying motivations and shared perspectives. This approach allowed for understanding of how TikTok shapes the career-related thinking of both students and young working professionals.

Finding and Discussion

This section presents the results of the thematic analysis, integrating them with relevant literature to interpret the patterns observed. To provide context for the qualitative findings, the demographic characteristics of the study participants are first outlined in Table 1. This is followed by a summary of the key themes that emerged from the analysis in Table 2. The themes refer to recurring ideas and patterns identified across participants' narratives, offering insight into how TikTok influences career aspirations, perceptions of traditional career paths and definitions of professional success among Malaysian youth.

Table 1: Demographic Profile of Participants

Participant	Age	Occupation	Education Level
1	19	Student	Diploma (in progress)
2	22	Freelance Graphic Designer	Diploma
3	20	Undergraduate Student	Bachelor's Degree (in progress)
4	21	Undergraduate Student	Bachelor's Degree (in progress)
5	25	Freelance Editor	Bachelor's Degree
6	27	Marketing Executive	Bachelor's Degree
7	29	Medical Doctor	Bachelor's Degree
8	23	Content Creator	Bachelor's Degree
9	34	Human Resource Executive	Master's Degree
10	39	Senior Engineer	Bachelor's Degree

The participants ranged in age from 19 to 39 and represented a variety of professional and educational backgrounds, including students, freelancers and professionals in established careers. This diversity offered a balanced perspective on how TikTok influences both individuals still in education and those already participating in the labour market. Notably, several participants with stable employment admitted that TikTok exposure had prompted them to reconsider their career satisfaction and aspirations.

Table 2: Summary of Themes Emerging from Thematic Analysis

Research Objectives	Emerging Themes	Summary of Insights
RO1: To investigate how TikTok affects Malaysian youth's career goals	Aspirational influence of TikTok creators	Participants reported that observing successful TikTok creators reshaped their personal career ambitions, often motivating them to pursue similar online-based careers.
RO2: To determine whether exposure to TikTok reduces interest in conventional career paths	Devaluation of traditional professions	Several participants expressed reduced motivation to pursue conventional career paths, viewing them as rigid and less rewarding compared to careers in social media content creation.
RO3: To identify the primary drives behind young people's consideration of TikTok-influenced careers	Autonomy, visibility, financial potential	Participants were attracted to content creation due to the perceived creative freedom, visibility and the belief that it offered faster financial rewards than conventional employment.
RO4: To examine how young people define and view career success through TikTok	Redefined success: lifestyle and recognition	Career success was defined less by job stability or workplace status and more by lifestyle flexibility, online popularity and high engagement metrics.
RO5: To investigate strategies that can assist youth in career decisions	Media literacy and realistic guidance	Participants emphasized the need for educators and policymakers to provide guidance that would help youth manage social media pressures while balancing digital ambitions with practical career planning.

The thematic analysis revealed three interconnected themes aligned with the research objectives: (1) TikTok as an alternative source of career inspiration (RO1, RO3), (2) Declining interest in traditional career paths (RO2) and (3) Peer validation and the shaping of online identity (RO4, RO5).

TikTok as Career Inspiration

Participants consistently reported that exposure to successful TikTok creators reshaped their personal career ambitions. Many perceived content creations as a viable and attractive career, driven by the accessibility of the platform and the visibility of peer success stories. The appeal was closely tied to autonomy, the potential for rapid recognition and the belief in achieving financial independence faster than in conventional employment. These findings support prior research on the aspirational influence of microcelebrities and the participatory nature of TikTok, which lowers barriers to entry and blurs the line between creator and consumer.

Reduced Interest in Conventional Careers

Several participants expressed a diminished interest in pursuing traditional professions, viewing them as rigid, less rewarding and lacking creative freedom. Stable, formal employment was often contrasted unfavourably with the perceived flexibility and lifestyle benefits of content creation. This sentiment was reported even among participants in secure, well-paid roles, suggesting that TikTok's influence extends beyond students to professionals already engaged in the labour market.

Peer Validation and Online Identity

Success on TikTok was largely defined through metrics such as likes, shares and engagement rates, which served as measures of validation. Participants associated career success less with educational qualifications or occupational status and more with lifestyle flexibility, online popularity and audience recognition. This redefinition aligns with Goffman's theory of self-presentation, where identity is constructed and maintained through repeated online performance. However, participants also acknowledged that such careers are precarious, heavily dependent on algorithmic visibility and sustained audience interest.

Implications

While TikTok offers opportunities for self-expression and alternative income, its influence may foster unrealistic expectations, especially regarding career stability. The findings underline the necessity for critical media literacy initiatives and informed career guidance, enabling youth to balance digital ambitions with realistic planning and an appreciation of traditional career pathways.

Conclusion

In conclusion, TikTok has a massive impact on the careers that young people want to pursue because it redefines success, visibility and financial independence. This change in attitude toward traditional careers to content creation is a more fundamental change in values and aspirations. Educators, policymakers, and families need to comprehend this phenomenon and be able to react with practical guidance and digital literacy interventions that will enable youth to make the right choices.

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ENHANCING EMPLOYABILITY SKILLS AMONG AGRICULTURE UNDERGRADUATES: A DESCRIPTIVE STUDY ON UB02002 ENGLISH FOR EMPLOYMENT COURSE

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Abstract: *Agriculture graduates often face challenges in transitioning from academic life to professional employment due to insufficient exposure to job market practices and expectations. This descriptive study utilises purposive sampling in exploring the experiences of 8 agriculture undergraduates enrolled in the UB02002 course (English for Employment) at a Malaysian public university. The 14-week course included four key assessments aimed at developing job application and communication skills to simulate authentic job-seeking scenarios through résumé and cover letter writing, mock interviews, a project-based HR interview and, individual reflections. Findings highlight improvements in students' ability to articulate qualifications, communicate professionally, collaborate in team settings and critically reflect on their learning experiences. This course significantly enhanced students' skills acquisition, self-awareness, self-confidence, understanding of industry expectations, and readiness for employment. This study recommends further integration of real-world assessments into academic programmes, particularly for students from non-English disciplines such as agriculture.*

Keywords: *English for Employment, employability skills, workplace readiness, agriculture undergraduates*

Introduction

In today's competitive job market, employability skills have emerged as a critical component for securing and sustaining employment, particularly among university graduates. The term employability skills refers to the skills, knowledge, attitudes, and other abilities that are necessary for a graduate to secure and keep a first entry job into the labour force (Yorke & Knight, 2006). Agricultural education is evolving to meet the demands of a modern workforce that values not only technical skills but also communication, adaptability, and professional preparedness. In recent years, there has been increasing pressure on higher education institutions to equip graduates not only with academic knowledge but also with practical employability skills. For agriculture students in particular, whose academic training is often technical and field-based, transitioning effectively into the workforce requires strong communications skills, particularly English. Despite possessing strong technical knowledge, many agriculture graduates face difficulty with job seeking strategies and struggle with industry expectations due to limited exposure.

Recognising these challenges, the UB02002 English for Employment course was introduced at a Malaysian public university as part of a language support initiative for MUET Band 4 and above undergraduates. It is a 14-week course focused on developing students' employability through real-world assessments. When designing a curriculum that aligns with employer

expectations the challenges in developing countries are often comparable to those in developed nations. For instance, research on how business graduates in China improve their employability suggests that such efforts should involve active collaboration between students, educators and employer. Moreover, the success of the curriculum in this regard relies on how well it incorporates employer demands alongside input from both instructors and students (Guo & Van Der Heijden, 2008).

This study provides a descriptive account of how this course was implemented, the course aimed to simulate job-seeking processes, including résumé writing, mock job interviews, and workplace collaboration. It examines their experience across 4 assessments and evaluates the effectiveness of the course in improving their job readiness.

Methodology

A qualitative descriptive approach was used to examine the learning outcomes of the UB02002 Course. The sample comprises 8 agriculture students in their second year of study who enrolled in the English for Employment course. They were purposively selected from a single public university in Sabah, representing a mix of genders (6 female, 2 male). All participants have MUET scores of Band 4 or higher, indicating advanced English proficiency. All of them have completed all 4 course assessments in 14 weeks and have consented to the use of their course materials and feedback for academic research purposes.

Data sources included students' submitted résumés and cover letters, video recordings of meetings and project-based HR interview, group project reports and individual reflections. The analysis focused on identifying recurring themes related to skills development trajectories, course impact, and students' perceptions of their employability readiness.

Course Implementation and Assessment Design

Résumé and Cover Letter

The first task required students to identify a relevant job advertisement, then craft a customised résumé and cover letter. This assessment emphasised the importance of targeted skills and professional presentation.

Students were guided to search for job advertisements relevant to their field of study and draft tailored résumés and cover letters. Most selected roles in agricultural technology, estate/farm/plantation management, R&D and agribusiness, which reflected their academic background.

Mock Job Interview

The second assignment simulated a real job interview environment, conducted individually according to the job positions they applied for in Assessment 1. Mock interview served as a practical platform to bridge theoretical understanding and real-world expectations. Each student was evaluated based on their verbal responses, body language, preparation and professionalism.

Project-based Learning – HR Interview and Report

This project-based assessment required students to conduct an interview with a real Human Resource (HR) professional. It consisted of three components: planning meeting to draft out the questions, interview session, and group report. Each student was responsible for two or more open-ended questions. Each group compiled their insights into a formal report, including visual evidence and a recommendation section. The assignment bridged academic learning with real-world industry perspectives.

Individual Project Reflection

Students submitted reflective essays at the end of the semester to critically analyse their roles in the project in terms of team dynamics, challenges faced, and future career implications. The reflections served as a powerful tool for self-evaluation and allowed learners to critically assess their development.

Findings

Skills Acquisition

All 8 students demonstrated improvements in technical writing, particularly in formatting and customising their résumés and cover letters. Students were initially unfamiliar with formatting conventions and struggled with articulating achievements. However, through instructor feedback, drafts improved significantly by the final submission. Students learned how to relate their academic background and work experience to specific job requirements. Phrases such as “Throughout my studies, I have developed skills in plant care, including watering, trimming, and ensuring overall plant health.” illustrated the alignment of classroom learning with (agriculture) industry needs.

The first assessment developed students’ ability to analyse job descriptions, understanding job specifications, reflect on their strengths, and present them accordingly in a résumé by highlighting relevant academic and extracurricular achievements. It increased students’ awareness of the importance of self-personality and taught them how to present their credentials in a marketable format. Most students began with limited understanding of résumé formatting and cover letter. Through iterative drafts and instructor feedback students developed more professional and focused documents.

Mock interviews also improved verbal communication and body language. Most students reported feeling nervous but gained exposure through practice and feedback. Initially, many relied on memorised responses, but post-interview reflections showed improved spontaneity and relevance in answers after rehearsal and peer feedback. Interview etiquette such as body language, tone, and attire, was emphasised students began to understand the professional nuances in real interviews. Students also learned to do research about the employer, anticipated common questions, and practiced responses.

Meanwhile, in the HR interview, students developed professional communication skills while organising and conducting interviews, which improved their interpersonal confidence. Through group meetings and agenda preparation, students practised formal documents (e.g., meeting notice, meeting minutes and formal emails and leadership.

(Refer to excerpts 1 – 4 in Appendix A for students' reflections)

Increased Self-Awareness

The individual reflections showed that students gained a clearer understanding of their strengths and weaknesses. Several acknowledged the need to improve soft skills and teamwork. The reflections also reviewed growth in problem-solving under pressure, and time management, especially when navigating scheduling conflicts and communication breakdowns.

(Refer to excerpts 5 – 8 in Appendix A for students' reflections)

Improved Confidence

The structured preparation for mock interviews, including anticipating questions and dressing professionally, helped students feel more competent. Students reported increased confidence in responding to common interview questions, particularly regarding strengths and achievements. They were instructed to dress formally and bring printed application documents. Initially, anxiety and inexperience affected their performance. However, after practice, they feel more confident and their skills such as verbal communication, non-verbal cues (eye contact, posture, tone), professional demeanour and time management have developed. Students gained clarity on their career paths and felt more confident about job-seeking after graduation.

(Refer to excerpts 9 – 11 in Appendix A for students' reflections)

Industry Insights

The group project with HR professionals was identified as the most impactful part of the course. Students learned about employer expectations, emerging industry skills, and the importance of adaptability. Questions posed included:

- a) What do you personally look at first when reviewing a résumé?
- b) What skills do you value most when hiring a fresh graduate?
- c) How can horticulture students better market themselves during job applications in companies that aren't directly in landscaping?
- d) Tell us about a time when you had two equally qualified candidates. What factors influenced your final decision?
- e) What advice would you give to fresh graduates to help them succeed in their first job?

HR professionals emphasised soft skills such as adaptability, communication, and teamwork, reinforcing lessons from earlier assessments. This is supported by a study conducted by Succi & Canovi (2019), where they mentioned that soft skills can enhance graduate employability. Conducting this professional interview was a meaningful and enriching experience for all the students because their communication, teamwork, and critical thinking skills throughout the process were enhanced. The authentic engagement with industry professionals provided valuable insights into the skills and qualifications HR professionals prioritise, understand the

key aspects of the recruitment process and helped students understand current employer expectations in different industries, especially for fresh graduates entering the job market.

(Refer to excerpts 12 – 16 in Appendix A for students' reflections)

Discussion

The course design aligns well with current trends in higher education emphasizing experiential and reflective learning. Each assessment builds upon the previous one, allowing students to progressively develop and refine their professional identity. The résumé and cover letter task encouraged students to understand job requirements deeply. The mock interview simulated real-life pressure situations and built poise. The group project promoted collaboration and exposure to employer perspectives. Finally, the reflective component ensured that students internalized the entire process.

Despite the small sample size, the results highlight the course's value in preparing students for the workplace. Importantly, agriculture students – who often assume practical fieldwork is sufficient - were shown the value of professional presentation and articulation of skills.

The English for Employment course effectively combined practical, reflective, and interactive learning to enhance the employability of agriculture students. Key strengths of course included:

- Progressive task structure from résumé writing to real-world industry interview
- Emphasis on professional English communication: all formal documents, verbal and written communication (refer to Appendix B), including the interview with HR professionals should be in English language
- Opportunities for self-evaluation and peer collaboration

Conclusion

The English for Employment course provided a well-rounded, practical framework for enhancing employability skills among agriculture undergraduates at a public university. Through a combination of résumé writing, interview simulation, industry engagement, and personal reflection, students developed critical skills required for career readiness. It also contributed significantly to students' growth in employability and personal confidence.

This descriptive study confirms that English language courses, when designed with real-world applications in mind, can go beyond grammar and vocabulary to foster professional identity, self-efficacy, and industry relevance. It equips agriculture students with essential career communication and job market skills. On the other hand, also provided a safe yet realistic platform to engage in professional development activities.

Recommendations

Based on the outcomes of this study, the following recommendations are proposed:

- a) Increase industry collaboration: More partnership with companies or industry professionals can provide more direct feedback to students, deepen students' exposure to hiring trends and professional expectations.



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- b) Digital literacy integration: Future iterations of the course can include LinkedIn profile development alongside with résumé and email writing modules to enhance digital job-seeking skills.
- c) Institutional adoption of project-based language modules: Incorporating similar employment-focused English modules.
- d) Ongoing reflection: Include short reflective exercises after each assessment to reinforce learning.

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Appendix A

E1: The discussion on résumé design, internship performance, and common interview mistakes made me realise the importance of presenting myself with professionalism and confidence. – S1

E2: I also learned how to improve my résumé based on real-world advice, making myself more marketable in the job market. – S5

E3: I also learned to avoid common interview mistakes like poor communication, lack of preparation, and not knowing enough about the company. – S7

E4: I was proud of my role as the group secretary, where I learned how to take meeting minutes, prepare notices, and manage meetings. -S1

E5: I learned that the value of self-awareness and understanding my own capabilities and areas for improvement is essential for continuous personal and professional growth. – S2

E6: This experience taught me the importance of having contingency plans and staying calm under pressure even when facing setbacks. It also reminded me that leadership sometimes requires making tough decisions and finding solutions when things don't go as planned. – S3

E7: In the future, I want to focus on building my soft skills, especially in areas like teamwork and self-confidence. I also plan to take more opportunities to practice speaking in front of others, whether in presentations or interviews. – S6

E8: I now see how important it is to ask for help when needed, communicate clearly, and support one another as a team. This project not only helped me improve academically, but also helped shape the mindset and soft skills I'll carry with me into any future career path. – S7

E9: I now feel more prepared and motivated to continue developing these skills as I move forward in my academic and career journey. – S1

E10: This project gave me the opportunity to sharpen my technical skills in using Microsoft Teams effectively. I gained confidence in handling digital tools in a professional context and also on how to contribute more efficiently to a team setting. – S5

E11: This project has encouraged me to continue learning, step out of my comfort zone, and be more confident as I move forward in my career path. – S6

E12: This experience has given me a deeper understanding of what employers expect from fresh graduates and the importance of combining academic knowledge with strong interpersonal and professional skills. – S1

E13: I realized that employers value not just qualifications, but also soft skills like initiative, adaptability, teamwork, and strong values. – S7



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E14: From writing emails to professionals, to thinking critically about hiring decisions and workplace expectations, I gained insight into what the world beyond the classroom will expect from me.

E15: The interview gave us useful knowledge about what the industry expects from future workers. Furthermore, we learned that being professional, well-prepared, and having good soft skills are just as important as practical skills. The session helped us understand the role of HR better and made us feel more confident to enter the job market.” – G1

E16: Each member played an active role in planning, coordinating, and executing the tasks required for the interview. This project also strengthened our collaboration and project management abilities. More importantly, it deepened our understanding of industry expectations and helped us build the confidence needed to approach future career opportunities. – G2

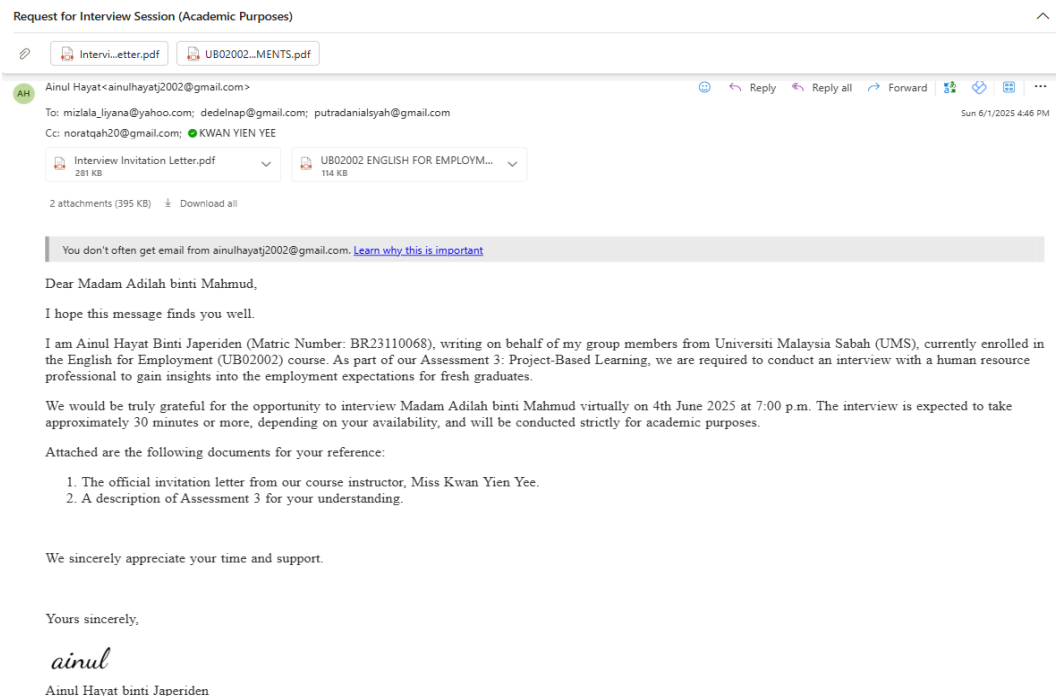


Figure 4: Formal email sent by the group secretary to invite one of the chosen HR professionals to be interviewed

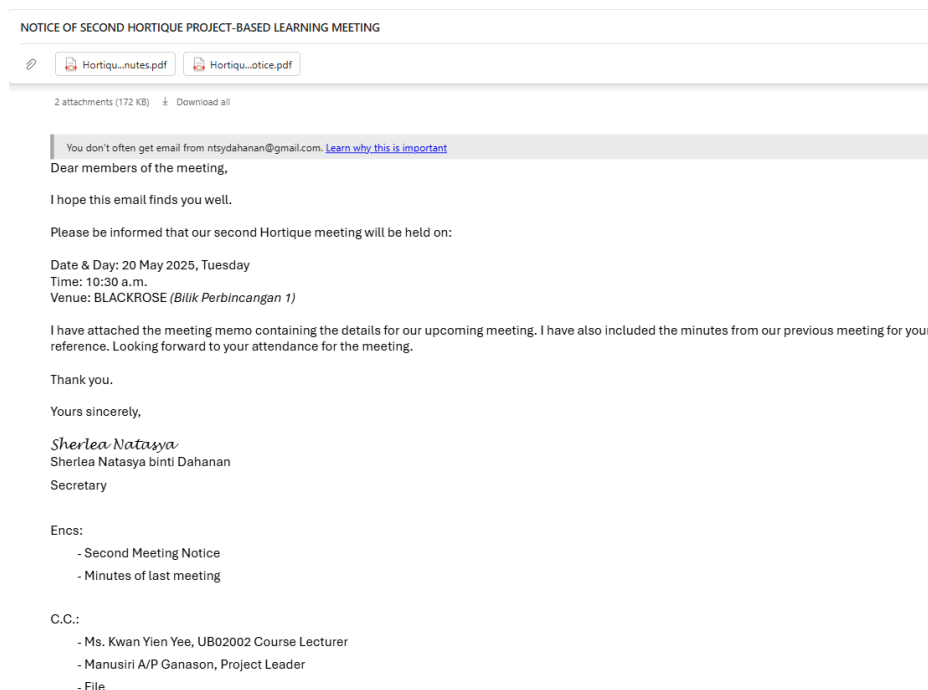


Figure 5: Formal email (in English) calling for the second meeting

**MINUTES OF SECOND HORTIQUE PROJECT-BASED LEARNING MEETING HELD ON 20 MAY
2025 AT 10:30 AM**

Present: Manusiri a/p Ganason (MG) - Project Leader
: Sherlea Natasya binti Dahanan (SN) - Secretary
: Mohd Izam bin Dollah@Abdullah (MI) - Technical Officer
: Soneeta Joyce Lansim (SJ) - Liaison Officer

1.0 Welcoming and Opening Remarks

MG welcomed all members to the meeting and outlined the purpose of the discussion.

2.0 Apologies

SN reported that no apologies were received.

3.0 Minutes of Previous Meeting

SN reviewed the minutes of the previous meeting and confirmed that all information was accurately recorded.

4.0 Matters Arising

No matters were raised.

5.0 Updates on Contacted HR Personnel

SJ, as the designated Liaison Officer, reported that no responses have been received from the HR personnel she contacted.

6.0 Finalisation of Interviewee Selection

SN proposed contacting Ms. Winnie Osiang from Pandewan Palm Oil Mill. MG informed the group that she has initiated communication with Ms. Siti Rahmani from IOI Plantation Services and recommended her as a potential interviewee. MG and SN will follow up with their respective candidates via email.

Action by

SN & MG

Figure 6: One of the minutes of meeting prepared by the students

THE IMPACT OF ENTREPRENEURIAL SPIRIT ON FIRM PERFORMANCE: A PILOT STUDY ON MEDIATING EFFECTS USING SPSS ANALYSIS

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Abstract: *The research investigates the interplay between entrepreneurial spirit, dynamic marketing capabilities, and firm performance. Before initiating large - scale data collection, a pilot study was carried out to assess the questionnaire's reliability and validity. Online questionnaires were disseminated to the owners and managers of small and medium - sized manufacturing enterprises, and ultimately, 64 valid samples were obtained. The collected data was analyzed by means of descriptive, correlation, regression, and mediation effect analyses using SPSS20 software. The main discovery indicates that dynamic marketing capabilities act as a mediator in the relationship between entrepreneurial spirit and firm performance. This research offers a preliminary foundation for comprehending these relationships, serves as groundwork for large-scale studies, and enriches relevant theories to offer guidance for corporate decision - making and operations.*

Keywords: *Entrepreneurial spirit; Firm performance; Dynamic marketing capabilities; Pilot study*

Introduction

In today's business environment, where globalization and digital change are intertwined, the market landscape is changing rapidly and the competitive landscape is becoming more and more intense (Darmasetiawan et al., 2023). The performance of a firm determines its ability to be robust, maintain its existence and achieve sustainable growth in an environment of uncertainty (Park, 2023). Among the many complex factors affecting firm performance, entrepreneurial spirit and dynamic marketing capabilities have come to the forefront and are widely recognized by academics and businesses as two key drivers (Mostafiz et al., 2022; Santos-Vijande et al., 2022).

Entrepreneurial spirit, characterized by innovative thinking, risk-taking, keen market insights and perseverance, is the source of endogenous power for enterprise development (Chang & Yang, 2024). Innovative entrepreneurs dare to break away from traditional thinking and actively explore new technologies, products and business models to open up new development paths for their enterprises; risk-taking entrepreneurs are able to make decisive decisions and

boldly invest resources in the market where opportunities are fleeting, and lead their enterprises to venture into new fields, so as to seize the first opportunity in the market(Suder et al., 2024).

Dynamic marketing capability is the key to maintain the competitiveness of enterprises in the rapidly changing market environment (Mostafiz et al., 2022). It requires enterprises to be able to quickly perceive market dynamics, accurately capture the changing trends of consumer demand, and timely adjust marketing strategies and resource allocation to efficiently meet customer demand. With strong dynamic marketing capabilities, enterprises can flexibly respond to market fluctuations, stand out from fierce competition, and increase market share and brand influence (Supriyanto et al., 2024).

Although the importance of entrepreneurial spirit and dynamic marketing ability to firm performance has been widely recognized, unfortunately, the specific mechanism of action between the three has not yet been fully revealed. This not only limits academics' in-depth understanding of the inherent laws of enterprise development, but also makes enterprises lack clear theoretical guidance in practice, making it difficult for them to accurately implement strategies to fully utilize the advantages of entrepreneurial spirit and dynamic marketing capabilities to achieve effective performance improvement (Zhang et al., 2020).

Based on this, this pilot study expects to try to initially unveil how entrepreneurial spirit affects firm performance through dynamic marketing capabilities by deeply mining and carefully analysing a large amount of actual data, and applying scientific and rigorous research methods, such as correlation analysis, regression analysis, and mediation effect test. By identifying the key paths and influencing factors and laying a solid foundation and clarifying direction for more in-depth and comprehensive research.

Theoretical Foundation and Research Hypotheses

Entrepreneurial Spirit and Firm Performance

Entrepreneurial spirit is a rich and complex concept that encompasses a number of key aspects such as innovation, risk - taking and contract spirit. Innovation spirit, as a crucial element of entrepreneurial spirit, enables enterprises to break into new markets, introduce novel products, and strengthen their competitive edge, thereby driving performance improvement; the spirit of risk - taking encourages entrepreneurs to seize market opportunities and promote enterprise development; the spirit of contract guarantees stable operation of enterprises and lays the foundation for performance improvement. These elements are intertwined and synergistic, and together they influence the trajectory and performance of the enterprise.

The spirit of innovation, as one of the core elements of entrepreneurial spirit, is like a powerful engine for the development of enterprises. In the ever-changing market environment, entrepreneurs with the spirit of innovation always maintain a keen insight into new technologies and trends and actively engage in the journey of exploring new markets (Chang & Yang, 2024). They dare to break through the constraints of traditional thinking, boldly try to transform new ideas into practical action, and meet the increasingly diversified and personalized needs of consumers by providing unique new products (Santos-Vijande et al., 2022).

Profit comes from uncertainty (Dimand, 2021). Risk-taking is an integral part of the entrepreneurial spirit, giving entrepreneurs the courage and boldness to make decisive decisions to response uncertainty (Landers, 2021). In a business world where market opportunities are fleeting, risk- taking motivates entrepreneurs to break the mold and take on challenges (Santos-Vijande et al., 2022). When opportunities arise in emerging markets or industry changes, risk-taking entrepreneurs are able to quickly capitalize on these potential opportunities and decisively invest resources in new business areas or projects (Cui & Song, 2022).

Contractual spirit is the cornerstone of sound development of enterprises, which runs through all aspects of their operations (Qi & Meng, 2020). Contract spirit requires enterprises to uphold the principle of honesty and trustworthiness in their dealings with suppliers, partners, customers and other stakeholders, and to strictly fulfill contractual agreements and business (Xia, 2022). In supply chain management, enterprises rely on the spirit of contract to establish long-term and stable cooperative relationships with suppliers to ensure the stable supply of raw materials and quality assurance, and to avoid interruptions in supply or quality problems affecting production and sales (Wang, 2022). In dealing with customers, adherence to the spirit of contract can enhance customer satisfaction and loyalty, and bring sustained orders and revenues to the enterprise (Liu, 2021).

Based on the positive impact of innovation, risk-taking and contractual spirit on firm performance demonstrated in the process of business development, the hypothesis is shown:

H1: Entrepreneurial spirit has a positive impact on firm performance.

Entrepreneurial Spirit and Dynamic Marketing Capabilities

There is a strong and complex link between entrepreneurial spirit and dynamic marketing capabilities in the development process of firms (Yay & Yay, 2022). Innovation and risk-taking in entrepreneurial spirit are strong driving forces that play a vital role in the enhancement of a firm's dynamic marketing capabilities (Mostafiz et al., 2024; Santos-Vijande et al., 2022).

The spirit of innovation makes entrepreneurs brave to break through the confines of traditional marketing thinking and actively explore new marketing models and strategies (Fang et al., 2022). In the booming digital economy, the market environment is changing day by day, and consumers' behaviors and needs are also changing. Innovative entrepreneurs are able to capture these trends and take the lead in integrating emerging technologies into their marketing activities (Hou, 2021).

Risk-taking gives entrepreneurs the courage to try new things in the face of uncertainty (Dimand, 2021). In a highly competitive market, new marketing models and strategies often come with a certain amount of risk, however, entrepreneurs with a sense of risk-taking will not be deterred by fear of risk (Dimand, 2021). They dare to take the lead in investing resources and trying new marketing channels, such as social media marketing and live streaming (Li, 2021).

In the highly competitive market environment, the spirit of contract makes entrepreneurs focus more on the long-term development and social value of enterprises rather than short-term

benefits, thereby promoting entrepreneurs to actively explore market changes, gain insight into market demand to capture business opportunities, and evolve business concepts from business opportunities, on the basis of which entrepreneurs integrate resources according to market demand to achieve optimal allocation of resources. Create more customer value (Wang & Chen, 2021).

In summary, entrepreneurs' innovation, risk-taking spirit and contractual spirit promote enterprises to explore new marketing models and strategies from multiple dimensions, which in turn significantly enhance their dynamic marketing capabilities. Based on this, the below is the hypothesis:

H2: Entrepreneurial spirit positively affects dynamic marketing capability.

Dynamic Marketing Capabilities and Firm Performance

Dynamic marketing capabilities, as a key element for firms to maintain competitiveness in complex and changing market environments, encompass the dimensions of market sensing, supply collaboration, and customer response capabilities (Day, 1994; Kusyana et al., 2025). These capabilities are interrelated and synergistic, and together they have a profound impact on firm performance (Fang & Zou, 2009; Helfat & Peteraf, 2003; Hoque et al., 2021a).

Market sensing capability is a crucial means for enterprises to gain insight into market dynamics (Li, ming, 2021; Mitreğa, 2019; Nikbin et al., 2022). In the digital era, market information travels extremely fast and consumer needs change rapidly. With advanced data analysis technology and market research tools, enterprises are able to collect and analyse massive amounts of market data in real time and accurately capture subtle changes in market trends (Kankam-Kwarteng et al., 2021).

Supply collaboration capability is a strong guarantee for an enterprise to respond efficiently to market demand (Correia et al., 2022). It involves the collaboration between various departments within the enterprise, as well as between the enterprise and its suppliers and partners. In the increasingly complex supply chain, enterprises need to establish close strategic alliances with upstream and downstream partners to achieve information sharing, resource integration and process optimization (Li et al., 2023).

Customer response capability is directly related to customer satisfaction and loyalty to the brand (Day & Van den Bulte, 2002). In a customer-centric market environment, the ability of a company to quickly and accurately meet individual customer needs is critical (Moradi et al., 2021). Enterprises can provide personalized product solutions and high-quality after-sales service by establishing a comprehensive customer relationship management system to keep abreast of customers' feedback and needs (Martin et al., 2020).

To summarize, market sensing capability, supply collaboration capability and customer response capability together contribute to the development of firm performance from the aspects of market insight, resource integration and customer service, respectively. Based on this, the hypothesis is proposed:

H3: Dynamic marketing capability has a significant positive influence on firm performance.

The Mediating Role of Dynamic Marketing Capabilities

In the complex ecology of business operations, there is an inextricable link between entrepreneurial spirit, dynamic marketing capabilities and firm performance. Given the positive effect of entrepreneurial spirit on dynamic marketing capabilities and the facilitating effect of dynamic marketing capabilities on firm performance described earlier (Sari et al., 2024), it is reasonable to hypothesize that entrepreneurial spirit does not act directly on firm performance, but rather indirectly affects firm performance through the key bridge of enhancing dynamic marketing capabilities (Kusyana et al., 2025).

From the theoretical level, the entrepreneur's spirit of innovation prompts enterprises to continuously explore new marketing concepts and methods, and the spirit of risk-taking helps enterprises to dare to try emerging marketing channels and strategies, all of which provide intrinsic motivation for the improvement of dynamic marketing capabilities. With keen market insights, entrepreneurs identify potential market opportunities, which in turn drives enterprises to continuously optimize their market sensing and quickly and accurately capture changes in consumer demand (Mostafiz et al., 2024; Santos-Vijande et al., 2022). This precise grasp of market dynamics enables enterprises to adjust their supply strategies in a timely manner, strengthen synergistic cooperation with suppliers, and to make sure that the products or services can efficiently satisfy market demand. At the same time, the entrepreneur's emphasis on customer value has prompted companies to improve customer responsiveness and provide customers with better service experience. And the enhancement of these dynamic marketing capabilities ultimately translates into the growth of firm performance, such as the expansion of market share, the enhancement of brand awareness, and the increase of profits (Hoque et al., 2021b).

From the perspective of empirical research, many researchers have explored this in depth in recent years. For example, Chen et al. (2021) found that entrepreneurial spirit significantly affects dynamic marketing capability and dynamic marketing capability plays a partly mediating role between entrepreneurial and firm performance by researching SMEs in several industries and analyzing them with structural equation modeling. This suggests that entrepreneurial has a strong relationship with firm performance directly on the one hand, and at same time, it indirectly promotes the improvement of firm performance by enhancing dynamic marketing capability. Li et al.'s (2022) study further confirms that, in the context of accelerated digital transformation, innovative entrepreneurs are more inclined to make use of digital technology to enhance the dynamic marketing capability of their firms such as carrying out precision marketing and personalized services, thereby enhancing the firm's performance in the marketplace. and thus enhance the competitiveness of enterprises in the market and realize performance growth. To summarize, based on theoretical derivation as well as empirical research, the hypothesis is proposed:

H4: Dynamic marketing capabilities play a mediating role in the relationship of entrepreneurial spirit and firm performance.

Method

Sample Selection and Data Collection

This research selected SMEs of China as the sampling objects, and there were several reasons for this choice. The manufacturing industry is the bedrock of China's real economy, playing an essential and irreplaceable role in the national economic structure. Research on this industry can offer valuable insights for its high-quality development. Additionally, SMEs, which are abundant in the manufacturing sector, have distinct approaches when facing intense market competition, limited resource distribution, and marketing-related decision-making (Wang, 2024). Investigating the relationships among entrepreneurial spirit, dynamic marketing capabilities, and firm performance in these enterprises can yield more generalizable research findings. These results can then provide SMEs with targeted strategies and theoretical guidance.

Since the research focuses on the top management of SMEs, the actual research process revealed that the questionnaire response rate from this group was relatively low (Borgholthaus et al., 2025). Therefore, conducting a pilot study became highly essential. Prior to the large-scale research, a pilot study serves to preliminarily assess the scientific nature of the research method, the accuracy of the measurement tool, and the practical applicability of relevant concepts. Failing to conduct a pilot study may lead to a waste of significant human and material resources, and it could severely undermine the quality and progress of the entire research project (Bell et al., 2022).

During the data collection phase, 89 SMEs were selected via the purposive sampling method. The questionnaires were distributed through China's "Wen Juan Xing" online questionnaire-based research platform. Prior to distribution, in-depth communication was carried out with the senior management of the sampled companies. We elaborated on the research objectives, the guidelines for completing the questionnaires, and assured them of data confidentiality and other crucial aspects. The questionnaires were designed to measure entrepreneurial spirit and marketing-related aspects, drawing on classical theories and research findings in relevant fields.

Variable - Scale Specifications for Core Constructs

Entrepreneurial Spirit

Entrepreneurial spirit consists of 24 items, innovative spirit (7 items), risk-taking spirit (7 items), and contract spirit (10 items) as three dimensions were used to measure the entrepreneurial spirit of the organization. Both Innovative Spirit and Risk-Taking Spirit were drawn from the well-established scales developed by Covin and Slevin (1989), and Contract Spirit was drawn from the scales developed by Carroll (1991), Lu (2015), and You (2018).

Dynamic Marketing Capabilities

Dynamic marketing capability consists of 22 items designed to measure a firm's dynamic marketing capability, which is measured using three dimensions: market sensing capability (7 items), supply collaboration capability (8 items), and customer response capability (7 items). The measurements of these dimensions were taken from Li (2015).

Firm Performance

Firm performance measured in two dimensions: long-term performance (4 items) and short-term performance (4 items). Among them, short-term performance is measured by financial indicators such as sales growth rate, profit growth rate, return on assets, return on investment, etc.; long-term performance is measured by competitive advantage indicators such as speed of response to the market, efficiency of internal operations, customer's evaluation of the value of the products and services, and the speed of innovation (Fang & Zou, 2009). Measurement indicators mainly refer to the research of Peng&Luo (2000); Sarkaretal (2001); Xie Hongming, Liu Changyong, Chen Chunhui (2006); Zeng Ping et al. (2009); Fang&zou, (2009) and other researchers.

Data Analysis

Descriptive Statistical Analysis

The collected data underwent summary statistical analysis using SPSS20.0 software, and the outcomes are shown in Table 1.

Table 1: Descriptive Statistics of Each Variable

V	Min	Max	M	SD
Entrepreneurial spirit (ES)	2.90	5.00	4.2019	0.67335
Dynamic marketing capability (DMC)	2.68	5.00	4.2105	0.64840
Short-term performance (SP)	2.00	5.00	4.0430	0.81352
Long-term performance (LP)	1.25	5.00	4.0742	0.87137

Based on the results of Table 1, it shows that the sample firms present specific characteristics in terms of entrepreneurial spirit, dynamic marketing capabilities, long-term performance and short-term performance.

The mean value of entrepreneurial is 4.2019, suggesting that the sample firms have certain entrepreneurial qualities. However, there is still room for enhancement in some subdimensions. Li et al. (2022) conducted research on firms in emerging economies in their study titled “Entrepreneurial orientation and firm performance in emerging economies: The mediating role of innovation capabilities” published in the Journal of Business Research. They found that the mean value of entrepreneurial spirit for these firms ranged from 4.0 to 4.3 on a 7-point scale, which is comparable to the findings of this study. Conversely, Zhao and Wang (2023) explored platform-based enterprises in their article “New connotation and cultivation path of entrepreneurial spirit in the era of digital economy-a multi-case study based on platform-based enterprises” in Management World. They discovered that due to the highly innovative and open digital economy environment, these enterprises had a higher mean value of entrepreneurial spirit, reaching 4.5. This shows that different industries and economic environments significantly influence the cultivation and manifestation of entrepreneurial spirit.

Regarding dynamic marketing capability, its mean value in this study is 4.2105. Zhang and Liu (2021) proposed in their article “Dynamic Marketing Capability and Firm Performance in the Digital Era: The Moderating Role of Digital Transformation” in the Journal of Marketing Theory and Practice that a dynamic capability mean value greater than 4.0 is necessary for

enterprises to be competitive, and this study's results align with this view. Nevertheless, Chen and Li (2024) reported a higher mean value of 4.6 for the dynamic capability of Internet enterprises in their study “Construction and Evolution of Dynamic Marketing Capability of Internet Enterprises in the Perspective of Digital Ecosystems-Taking ByteDance as an Example” in the Journal of Marketing Science. This indicates that the traditional industry enterprises in this study's sample may have limitations in leveraging digital marketing tools and analysing market data, resulting in difficulties in accurately discerning market trends and innovating marketing approaches. Therefore, there is a need to enhance their dynamic marketing capabilities.

For firm performance, the mean values of short-term and long-term performance are 4.0430 and 4.0742 respectively. Gao and Wu (2022) suggested in the Journal of Business Research, in their study “The impact of dynamic capabilities on firm performance: The mediating role of strategic flexibility”, that dynamic capabilities can result in a performance mean of 4.3 through rational coordination of long-term and short-term goals. Although this is consistent with the results of this study, the overall performance level in this study is relatively low. This could be benefit for the small sample size in this research, or it may be due to insufficient flexibility in the organizational structure and poor information flow between departments, which make it challenging to rapidly integrate resources and respond to market changes. As a result, it is difficult to fully convert dynamic capabilities into actual competitive advantages.

The relatively small standard deviation of each variable indicates that the measurement items for each variable do not vary greatly, suggesting that firms' performance is relatively balanced across different aspects. Liu and Sun (2021) pointed out in their paper “Digital Transformation, Strategic Flexibility, and Firm Performance - An Empirical Study Based on Listed Companies in China's Manufacturing Sector” in Business Economics and Management that a small standard deviation might imply that enterprises lack differentiation advantages in the market and are prone to engage in homogeneous competition. In the current competitive market, enterprises should conduct in-depth market research to precisely identify their target customer groups, explore their unmet needs, and simultaneously increase investment in research and development to drive product or service innovation and upgrading, thereby enhancing their market competitiveness.

Correlation Analysis

Subsequently, the Pearson correlation coefficient among the variables was computed, and the findings are presented in Table 2.

Table 2: Correlation Analysis of the Variables

Variable	ES	DMC	SP	LP
ES	1			
DMC	0.799** (0.000)	1		
SP	0.597** (0.000)	0.744** (0.000)	1	
LP	0.672** (0.000)	0.731** (0.000)	0.869** (0.000)	1

****.** Significantly correlated at the 0.01 level (bilaterally)

The correlation analysis results in Table 2 reveal the relationships among the variables as follows:

Relationship between ES and other variables: the correlation coefficient between ES and DMC stands at 0.799, with a significantly correlation at the 0.01 level. This implies that a stronger entrepreneurial spirit is associated with a potentially stronger dynamic marketing capability for the firm. Additionally, ES is significantly and positively correlated with the SP and LP of firms, with correlation coefficients of 0.597 and 0.672 respectively. This indicates that entrepreneurial spirit has a positive influence on both the SP and LP of firms.

Relationship between DMC and FP: The correlation coefficients of DMC with firms' SP and LP are 0.744 and 0.731 respectively, and both are significantly correlated at the 0.01 level. This suggests that better-developed dynamic marketing capabilities are likely to lead to better short-term and long-term performance for firms.

Relationship between SP and LP: The correlation coefficient between SP and LP of enterprises is 0.869, significantly correlated at the 0.01 level. This shows a obvious positive correlation between short-term and long-term performance, meaning that an enterprise with good SP is likely to also have good LP.

Regression Analysis

Variable Description and Correlation

In the descriptive statistics and correlation analysis in table1 and table2, SP and LP were analyzed separately. It was discovered that both SP and LP were significantly correlated with ES and DMC. Moreover, a strong positive correlation (with a correlation coefficient of 0.869) existed between short-term and long-term performance. This outcome indicates that short-term and long-term performance are highly consistent in reflecting business results.

Consequently, to explore more comprehensively the causal relationships among entrepreneurial spirit, dynamic marketing capability, and overall firm performance, in the subsequent regression analysis, short-term performance and long-term performance were integrated into a single comprehensive firm performance (FP) variable. By doing so, the potential multicollinearity issue that could occur when considering SP and LP separately can be avoided, and the relationships between variables can be examined from an overall perspective.

As indicated in Table1and Table2, the mean value of entrepreneurial spirit (ES) is 4.2019, with a SD of 0.67335. dynamic marketing capability (DMC)' mean value is 4.2105, and its SD is 0.64840. The mean value of short-term performance (SP) is 4.0430, with a SD of 0.81352, while the mean value of long-term performance (LP)'s mean value is 4.0742, and its SD is 0.87137. These data demonstrate that entrepreneurial spirit has an obvious positive correlation with dynamic marketing ability, short-term performance, and long-term performance. Additionally, dynamic marketing ability is also significantly and positively related to short-term performance and long-term performance.

Regression Model Analysis

The regression analysis was carried out using the Process macro program in SPSS, and the regression results are presented in Table 3.

Table 3: Regression Analysis of the Variables in the Mediation Model

Variable	Model 1		Model2		Model3	
	β	t	β	t	β	t
ES	0.7694	10.4627	0.7954	6.8743	0.1615	0.9771
DMC					0.8239	4.8006
R ²	0.6384		0.433		0.588	
F	109.4678		42.257		43.553	

Regarding the regression analysis of entrepreneurial spirit on dynamic marketing capability (corresponding to Model 1), dynamic marketing capability (denoted as DMC) was set as the dependent variable, and entrepreneurial spirit was used as the independent variable. The resulting regression equation is $DMC = 0.9775 + 0.7694 \times ES + \varepsilon$, where $\beta_1 = 0.7694$, $t = 10.4627$, and $p < 0.05$. By referring to Model 1 in Table 3, one can clearly observe the correlation coefficients and t-values of the regression of ES on DMC. This indicates that entrepreneurial spirit has a significant positive impact on dynamic marketing capability, thus supporting hypothesis H2. This finding not only corresponds to the strong positive correlation between the two variables in the previous correlation analysis but also aligns with the research results of Nguyen, H. T. N., Han, J. W., & Pham, H. C. (2024).

For the regression analysis of entrepreneurial spirit on firm performance (corresponding to Model 2), a linear regression was conducted. Firm performance (combining long-term and short-term performance, denoted as FP) was set as the dependent variable, and entrepreneurial spirit (ES) was the independent variable. The regression equation is $FP = 0.7165 + 0.7954 \times ES + \varepsilon$, with $\beta_3 = 0.7954$, $t = 6.8743$, and $p < 0.05$. The regression coefficients and t-values of ES can be directly obtained from Model 2 in Table 3, which shows that entrepreneurial spirit has a significant positive effect on firm performance, thereby supporting hypothesis H1. When combined with the previous correlation analysis, this further validates the positive relationship between entrepreneurial spirit and firm performance. This result is also consistent with the research findings of Ahmad, N., & Kausar, A. (2023) and Huang, Y., & Wang, X. (2022).

In the regression analysis of dynamic marketing ability on firm performance (corresponding to Model 3), firm performance was set as the dependent variable, and dynamic marketing capability was the independent variable. The regression equation is $FP = -0.0889 + 0.8239 \times DMC + \varepsilon$, where $\beta_5 = 0.8239$, $t = 4.8006$, and $p < 0.05$. From Model 3 in Table 3, one can see the coefficients and the significance of DMC on the FP regression. This indicates that dynamic marketing capability has a significant positive impact on firm performance, supporting hypothesis H3. This is consistent with the positive relationship between dynamic marketing capability and firm performance found in the correlation analysis. The result also concurs with the research results of Stefia et al. (2024), Zohoorian et al. (2022), and Kwon (2021), further confirming and enriching the understanding of the relationship between the two.

A test of the mediating role of dynamic marketing capabilities

To further explore whether dynamic marketing capabilities mediate the relationship between entrepreneurial spirit and firm performance, the stepwise regression method proposed by Baron and Kenny (1986) was employed for the test. The results are shown in Table 4.

Table 4: Analysis of Mediating Effects of Expected Dynamic Marketing Capabilities

Effect type	E	SE	Bootstrap95%CI		Proportion of Total Effect
			UL	LL	
Total effect	0.658	0.096	0.466	0.849	100%
Direct effect	0.134	0.137	-0.140	0.407	20.3%
Indirect effect	0.524	0.201	0.199	0.987	79.7%

The stepwise regression involves three steps. First, firm performance was regressed on entrepreneurial spirit (Model 1). Second, dynamic marketing capabilities were regressed on entrepreneurial spirit (Model 2). Finally, firm performance was regressed on both entrepreneurial spirit and dynamic marketing capabilities (Model 3).

Model 1: $FP = 0.7165 + 0.7954 \times ES + \varepsilon$

Model 2: $DMC = 0.9775 + 0.7694 \times ES + \varepsilon$

Model 3: $FP = -0.0889 + 0.1615 \times ES + 0.8239 \times DMC + \varepsilon$

The results indicate that in Model 1, the coefficient of entrepreneurial spirit on firm performance is significant ($\beta_7 = 0.7954$, $p < 0.05$). In Model 2, the coefficient of entrepreneurial spirit on dynamic marketing capabilities is significant ($\beta_9 = 0.7694$, $p < 0.05$). In Model 3, the coefficient of dynamic marketing capabilities on firm performance is significant ($\beta_{12} = 0.8239$, $p < 0.05$), while the coefficient of entrepreneurial spirit on firm performance ($\beta_{11} = 0.1615$) decreases compared to Model 1 and becomes insignificant ($p = 0.3324$). Considering the data of total, direct, and indirect effects in Table 4, it can be inferred that dynamic marketing capabilities play a fully mediating role between entrepreneurial spirit and firm performance, thus supporting hypothesis H4. The direct effect accounts for 20.3% of the total effect, and the indirect effect accounts for 79.7%, highlighting the crucial mediating role of dynamic marketing capabilities.

Discussion and Conclusion

Discussion of Findings

This pilot research is designed to comprehensively discover the intricate relationships between entrepreneurial spirit, dynamic marketing capabilities, and firm performance, with a particular focus on small and medium-sized manufacturing enterprises. Understanding these relationships is crucial for uncovering the internal driving forces behind business development. Through data collection and analysis, the relevant hypotheses were examined, and the following conclusions were drawn:

During the descriptive statistics and correlation analysis phase, a significant correlation was identified between the short-term performance (SP) and long-term performance (LP) of firms, as well as entrepreneurial spirit (ES) and dynamic marketing capability (DMC). Notably, the correlation coefficient between short-term and long-term performance reached 0.869.

For the regression analysis, the Process macro program in SPSS was utilized. The results indicated that entrepreneurial spirit has a significant positive influence on firm performance. The regression equation $FP = 0.7165 + 0.7954 \times ES + \varepsilon$, with $\beta_1 = 0.7954$, $t = 6.8743$, and $p < 0.05$, validates hypothesis H1. This finding aligns with the positive relationship observed in the

correlation analysis. It is interesting to note that Suder (2024), in a study involving 150 small printing firms, also found that entrepreneurial spirit positively impacted firm performance in both crisis and non-crisis situations, similar with the results of this study (Suder et al., 2024).

Entrepreneurial spirit also exerts a direct effect on dynamic marketing capability. The regression equation is $DMC = 0.9775 + 0.7694 \times ES + \epsilon$, where $\beta_3 = 0.7694$, $t = 10.4627$, and $p < 0.05$, suggests that an increase in entrepreneurial spirit can effectively enhance firms' dynamic marketing capabilities, thus supporting hypothesis H2. Kusyana et al (2025), in their research on 235 SMEs in the Bali fashion industry through questionnaires, arrived at similar conclusions, further demonstrating the role of entrepreneurial spirit in promoting dynamic marketing capabilities (Kusyana et al., 2025).

Furthermore, dynamic marketing capability has a significant impact on firm performance. The regression equation $FP = -0.0889 + 0.8239 \times DMC + \epsilon$, with $\beta_5 = 0.8239$, $t = 4.8006$, and $p < 0.05$, supports hypothesis H3. This result reaffirms the findings of the correlation analysis. The outcomes are in line with those of Zehir & Vural (2024), who conducted a questionnaire survey among 619 managers from various industries.

Finally, by applying the stepwise regression method to test the mediating role of dynamic marketing capabilities, it was discovered that dynamic marketing capabilities mediate the relationship between entrepreneurial spirit and firm performance. Hypothesis H4 was supported, and this finding was also verified by Kusyana et al (2025), further validating the reliability of this study's results.

Research Contributions

Theoretical Contributions

This research offers initial empirical evidence for exploring the relationships among entrepreneurial spirit, dynamic marketing capabilities, and firm performance. It significantly enriches the theoretical framework in relevant academic areas. In contrast to prior research that did not consider these three elements within a unified research framework, this study delves deep into the direct and indirect influence mechanisms of entrepreneurial spirit on firm performance. By applying rigorous descriptive statistics, correlation analysis, and regression analysis, it discovers that entrepreneurial spirit has a direct positive impact on firm performance and also has an indirect one through the mediating role of dynamic marketing capabilities. This fills a void in existing theories regarding the relationships among these three factors and refines the theoretical framework of firm performance influencing factors. Moreover, the findings of this study are consistent with relevant literature like Suder (2024) and Kusyana et al (2025), enhancing the generalizability and reliability of research results in this field.

Practical Contributions

The outcomes of this research hold great practical significance for the development of SMEs. Firstly, it emphasizes the urgency and importance of nurturing entrepreneurial spirit within SMEs. Business managers can directly boost firm performance by fostering entrepreneurial characteristics such as innovation and risk-taking. Simultaneously, leveraging entrepreneurial spirit to enhance dynamic marketing capabilities, including improving market sensing, supply collaboration, and customer responsiveness, can indirectly drive firm performance growth.

This offers clear guidance for business managers to make strategic decisions, create an environment conducive to entrepreneurial spirit development, and increase investment in enhancing dynamic marketing capabilities. Additionally, the research results can serve as a reference for industry associations and government departments. They can use these findings to formulate more targeted policies, guiding enterprises to enhance their competitiveness and promoting the healthy development of the entire industry.

Research- method-related Contributions

The results of this pilot study serve as a solid foundation for future large-scale research. Through this study, the feasibility of the research methodology has been confirmed, and potential issues and solutions during the research process have been identified, such as sample selection limitations and data collection difficulties. This provides valuable experience and a reference for future studies when expanding the sample scope to include enterprises from different industries and regions. It also enables subsequent research to explore the relationships among the three factors more comprehensively and deeply, contributing to the improvement of relevant theoretical and practical systems.

Research Limitations and Prospects

This pilot study has certain limitations. The relatively small sample size might not comprehensively represent all firms, which could lead to restricted generalizability of the research findings. Since the data collection mainly depends on questionnaires, there is a possibility of subjective bias from the respondents. For future research, it would be advisable to increase the sample size to include enterprises from diverse industries, with different scales and located in various regions. Meanwhile, a range of data collection methods, like interviews and secondary data collection, can be employed to enhance the reliability and generalizability of the study.

Moreover, conducting more in-depth investigations into the underlying mechanisms of the relationships among entrepreneurial spirit, dynamic marketing capabilities, and firm performance is crucial. This can involve exploring other potential mediating factors, such as strategic flexibility, market orientation, corporate culture, and organizational learning capabilities, as well as moderating variables, including the level of market competition, business environment, and environmental uncertainty. Such efforts will contribute to a more comprehensive understanding of this intricate relationship network.

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ESG RATING DIVERGENCE AND DEBT FINANCING COSTS: EMPIRICAL EVIDENCE FROM CHINESE LISTED COMPANIES

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Abstract: *ESG (environment, social responsibility and corporate governance) has become an important issue in corporate financial decision-making. Although ESG ratings are currently widely used to measure corporate ESG performance, due to differences in assessment methods and information sources adopted by different rating agencies, there are significant differences between corporate ESG rating results, which in turn affect their economic consequences. This paper uses Chinese A-share listed companies from 2016 to 2023 as a sample to systematically test whether ESG rating divergence will have a significant impact on corporate debt financing costs and explore its internal mechanism. The empirical results show that the greater the ESG rating divergence, the higher the corporate debt financing cost. Furthermore, this paper uses the Hong Kong Stock Exchange's strengthening of ESG information disclosure regulatory guidelines in 2019 as an exogenous shock to identify the impact mechanism of ESG rating divergence and verify the moderating role of corporate information disclosure standardization. The results show that in the context of more standardized ESG information disclosure, the negative impact of rating divergence on debt costs is significantly weakened, indicating that information quality has a certain mitigation mechanism. From the perspective of the "supply side of rating information", this study reveals the potential market consequences of ESG rating divergence and provides policy references for promoting the unification of the rating system and improving the transparency of information disclosure.*

Keywords: *ESG Rating Differences; Debt Financing Costs; ESG Information Disclosure; Exogenous Shocks; Moderating Effect*

Introduction

ESG (Environmental, Social, and Governance) was proposed by the United Nations Environment Programme in 2004 as an important standard for measuring corporate social responsibility. In recent years, ESG has gradually become a key indicator for assessing corporate sustainable development, attracting significant attention from both investors and academia. With rising demand for ESG ratings, numerous domestic and international agencies have launched ESG rating services. However, due to differences in information sources, rating models, and weighting methods, rating divergence has become increasingly prominent (Billio et al., 2021). In China, notable discrepancies also exist among ESG ratings provided by agencies such as Huazheng, Wind, and SynTao Green Finance for A-share listed companies. ESG rating divergence not only reduces comparability but may also lead to implementation biases. However, existing literature mainly focuses on the causes of divergence, with relatively limited research on its economic consequences—particularly its impact on the cost of debt. Given that China's financial system is dominated by debt financing and corporate capital structures are heavily influenced by the cost of capital, examining the effect of ESG rating divergence on the cost of debt carries significant practical importance. Theoretically, strong ESG performance can alleviate information asymmetry, reduce moral and regulatory risks, and

ultimately lower the cost of debt (Ghouma et al., 2018; El Ghouli et al., 2011). However, if corporate information disclosure lacks standardization, ratings rely more heavily on private information, making rating divergence among agencies more likely. When divergence is high, even if the average ESG rating is favorable, the market may perceive discrepancies in the firm's actual performance, leading to higher risk premiums. Using a sample of A-share listed companies from 2016 to 2023, this study collects ESG ratings from multiple agencies and corresponding financial data. Controlling for average ESG rating, number of rating agencies, firm characteristics, and fixed effects, we find that rating divergence significantly increases firms' cost of debt. To address potential endogeneity, we use the 2019 regulatory enhancement by the Hong Kong Stock Exchange regarding ESG disclosure as an exogenous shock for instrumental variable identification, and the results remain robust. Furthermore, by introducing "agency pair-year" fixed effects, we verify that the impact primarily stems from firms' disclosure quality rather than differences among rating agencies. Mechanism tests reveal that if a firm adopts third-party assurance or aligns with GRI standards, the effect of rating divergence on debt cost is significantly reduced, indicating that divergence partially reflects market concerns over disclosure quality. Further analysis also finds that although rating divergence raises the cost of debt, it simultaneously increases the cost of equity financing, prompting firms to shift toward more debt financing, as evidenced by rising leverage ratios. This paper contributes to the literature in two main ways: First, it investigates the impact of ESG rating divergence on corporate debt financing costs, filling a gap in existing research. Second, it introduces rating divergence as a novel explanatory variable for debt capital costs, thereby enriching the body of related literature.

Literature Review

Related studies can be broadly categorized into three areas: (1) traditional corporate finance research on ESG performance and financing costs; (2) research on ESG rating divergence; and (3) literature on determinants of corporate financing costs. First, a substantial body of literature suggests that strong ESG performance helps reduce corporate financing costs. Firms with outstanding performance in governance, environmental responsibility, and social responsibility are more likely to receive capital support (Ghouma et al., 2018; El Ghouli et al., 2011). Amiraslani et al. (2022) point out that firms with superior ESG performance enjoy lower credit spreads and longer maturities, especially in times of crisis. Ng and Rezaee (2012) and Dhaliwal et al. (2011) further emphasize the positive role of ESG disclosure in mitigating information asymmetry and reducing the cost of equity financing. However, most existing studies rely on ESG scores from a single rating agency or use simple averages across multiple agencies, overlooking the existence of rating divergence. ESG rating divergence reflects market disagreement over the credibility of ESG scores, potentially increasing risk premiums and influencing financing costs. The second stream of research focuses on the sources and economic consequences of ESG rating divergence. Berg et al. (2022) identify differences in indicator coverage, data sources, and weighting schemes as key drivers of divergence. Christensen et al. (2022) and Jørgensen and Ellingsen (2021) find that corporate disclosure behavior itself can have a dual effect on the level of divergence. Gibson Brandon et al. (2021) and Avramov et al. (2022) show that rating divergence increases equity risk premiums, suggesting that the market demands compensation for rating uncertainty, thereby weakening the investment value of ESG ratings (Serafeim and Yoon, 2022). Nevertheless, existing research has yet to examine the impact of ESG rating divergence on the cost of debt financing, which is precisely the research gap this paper aims to address. Given the dominant role of debt

financing in the capital structure of Chinese firms, investigating whether rating divergence increases financing costs is of significant importance. The third category of literature focuses on traditional determinants of financing costs, such as capital structure, governance mechanisms, and industry characteristics (Li, 2019). However, as ESG is increasingly integrated into corporate evaluation systems, traditional factors alone can no longer fully explain differences in financing costs, highlighting the need to supplement analysis from the perspectives of sustainability and information transparency. In summary, this paper contributes to the literature by incorporating ESG rating divergence into the analysis of corporate debt costs, thereby expanding the research scope of ESG divergence and enriching the understanding of financing cost determinants.

Research Methodology

This section builds on the institutional background to conduct theoretical analysis and propose testable hypotheses.

Institutional Background: Sources of ESG Rating Divergence

The causes of ESG rating divergence mainly fall into two categories. First, differences in private information: In addition to relying on publicly disclosed information from firms, ESG rating agencies also collect private information for their assessments. Since public information tends to be relatively consistent, divergence is more likely to stem from differences in agencies' capabilities and methods of gathering private information (Larcker et al., 2022). Second, differences in information analysis: Rating agencies adopt different models, indicator systems, and weighting schemes, which result in varying analytical outcomes even when using the same information.

Theoretical Analysis and Hypothesis Development

According to information production theory, the less public information a firm discloses, the more rating agencies must rely on private information (Chen and Lu, 2017), and differences in private information exacerbate rating divergence (Easley and O'Hara, 2004). Therefore, *ceteris paribus*, greater rating divergence reflects lower transparency in corporate information disclosure. The market interprets this as an "ESG performance risk," suggesting a possible deviation between a firm's true ESG performance and its average rating. Based on this, debt capital providers demand higher risk compensation in response to information uncertainty, thereby increasing the firm's cost of debt capital. Accordingly, the first hypothesis is proposed:

H1: Firms with greater ESG rating divergence have higher costs of debt capital.

Furthermore, when a firm's ESG disclosure is more transparent and standardized, rating agencies rely more heavily on public information, reducing the influence of differences in private information. In this case, rating divergence is more likely to reflect differences in rating models rather than distorted information. Therefore, the impact of rating divergence on financing costs should diminish. This leads to the second hypothesis:

H2: For firms with more standardized ESG disclosure, the impact of rating divergence on the cost of debt capital is weaker.

Data Sources

Due to data availability, this study collects annual ESG ratings for A-share listed companies from Wind Database, covering ratings by Huazheng, Wind, China Alliance of Social Value Investment, SynTao Green Finance, Minglan, and FTSE Russell from 2016 to 2023. These rating data are matched with annual financial data of listed companies to construct a firm-year panel dataset. Financial data are sourced from Wind and CSMAR databases. Following common practice in the literature (Ghouma et al., 2018), all financial industry firms and companies under ST (Special Treatment) status are excluded due to their special characteristics. The study retains only observations with available ESG ratings.

Research Methodology and Variable Construction
Based on the above theoretical analysis and existing literature, this study constructs the following model to examine the impact of ESG rating divergence on the cost of corporate debt capital:

$$Cost\_of\_Debt_{i,t} = \beta_0 + \beta_1 ESG\_Dis_{i,t} + \beta_2 ESG\_Ave_{i,t} + \beta_3 Agenc\_Num_{i,t} + \beta_4 Asset_{i,t} + \beta_5 EM_{i,t} + \beta_6 QR_{i,t} + \beta_7 ROA_{i,t} + \beta_8 SOE_{i,t} + FEs + \varepsilon_{i,t} \quad (1)$$

Subscripts *iii* and *ttt* denote firm and year, respectively.

Key Variables

The dependent variable is the cost of debt capital, defined as the ratio of a firm's annual financial expenses to its total debt, multiplied by 100%. Among the independent variables, the main variable of interest is ESG rating divergence.

Four agencies—Huazheng, SynTao Green Finance, the China Alliance of Social Value Investment, and Wind—use a 10-level ESG rating scale. These are coded from 0 (lowest) to 9 (highest). Minglan offers a 27-level rating; the lowest level is assigned a score of 0, the next lowest as 1, and so forth, up to 26 for the highest level. This score is then scaled to a 0–9 range by multiplying by 9/26. FTSE Russell provides a continuous score between 0 and 3.6; similarly, its score is scaled to the 0–9 range by multiplying by 9/3.6. These adjustments ensure comparability across different rating systems.

ESG rating divergence (*ESG_Dis*) is defined as the standard deviation of ESG scores assigned by different agencies to firm *iii* in year *ttt*. If a firm receives a rating from only one agency in a given year, the divergence is set to zero. To account for the time lag between rating publication and its potential effect on financing costs, the divergence measure is computed as the average of the values at the end of the previous year and the current year. The same averaging approach is applied to the ESG rating mean and the number of rating agencies; details are omitted for brevity.

Control Variables

To isolate the effect of rating divergence from the level of ESG performance itself, we control for the average ESG rating (ESG_Ave) of firm *iii* in year *ttt*, calculated as the mean of the adjusted scores from all available rating agencies. We also control for the number of rating agencies (Agency_Num) that rated the firm, which captures the level of market attention to the firm's ESG performance. This variable can affect information asymmetry and financing costs and is positively correlated with ESG rating divergence, so it is included as a control.

To further control for other factors influencing the cost of debt capital, we include a set of financial characteristics: total assets (Asset), equity multiplier (EM), quick ratio (QR), return on assets (ROA), and ownership type (SOE, equal to 1 for state-owned enterprises, 0 otherwise).

In addition, firm fixed effects and year fixed effects are included to control for unobservable firm-specific characteristics and time trends in the cost of debt capital, respectively.

Other Variables

Moreover, to analyze the mechanisms through which ESG rating divergence affects the cost of debt capital, this paper introduces proxy variables for the standardization level of corporate ESG disclosure, sourced from the CSMAR database. These include whether the firm uses third-party assurance (CER) and whether it follows GRI standards (GRI). These variables are incorporated into the model for further testing.

Variable definitions are summarized in Table 1.

Variable	Variable Definition	Calculation method
Cost_of_Debt (%)	Cost of debt	$100 \times \text{Finance Costs} / \text{Total Liabilities}$
ESG_Dis	ESG ratings divergence	The standard deviation of all ESG ratings of the company in that year
ESG_Ave	ESG rating average	The arithmetic mean of all ESG ratings of the company in that year
ESG_Dis_Pair	Disagreement on ESG ratings (rank by degree of disagreement)	Based on the average standard deviation of all companies under the same rating portfolio in the same year, a rating disagreement ranking variable is constructed
ESG_Dis_Industry	ESG rating divergence (industry average)	The average of the first and second-level industries with ESG rating disagreement
Asset	Total assets (yuan)	Total assets, natural logarithm
EM	Equity Multiplier	Total assets / shareholders' equity
QR	Quick Ratio	(Current assets - inventory) / Current liabilities
ROA	Return on Assets	Net profit / total assets
SOE	State-owned enterprise dummy variable	If it is a state-owned enterprise, assign a value of 1, otherwise 0
Agency_Num	Number of ESG rating agencies	The number of institutions involved in the ESG rating of the enterprise

CER_Proxy	Whether to publish ESG report in the report (instead of CER) year, assign a value of 1, otherwise 0
GRI_Proxy	ESG Disclosure Scorepoints, the higher the score, the more comprehensive the disclosure (alternative to GRI)
ESG_Dis_After	Disagreement ranking variable (ex post construction) Rank companies by ESG rating differences, used as a robustness alternative indicator
ESG_Dis_{t-1}	Rating disagreement in the previous year Standard deviation of ESG ratings in the previous year, used for lagged variable analysis (such as robustness or endogenous control)
Disclosure	Information disclosure variable (mechanism) Includes CER_Proxy, GRI_Proxy, to measure the quality and standardization of ESG information

Empirical Results and Analysis

Based on the preceding theoretical analysis, this study employs appropriate econometric models to examine the impact of ESG rating divergence on corporate cost of debt capital and analyzes the results accordingly. First, Equation (1) is used for the main empirical test, and an instrumental variable (IV) approach is applied to address potential endogeneity issues. Subsequently, a series of robustness checks are conducted, followed by mechanism analysis. The model is then augmented by controlling for inter-agency differences in ESG ratings and incorporating variables related to the standardization of ESG disclosure to test whether disclosure quality serves as a mechanism through which ESG rating divergence affects debt costs.

Next, heterogeneity analysis is carried out. Finally, to assess the impact of ESG rating divergence on corporate financing policies, the study examines changes in firms' leverage ratios.

Benchmark Regression and Instrumental Variables

This paper first uses a fixed effect model to examine the impact of ESG rating differences on corporate debt capital costs. Table 4-1 reports the results of the baseline regression and instrumental variable regression.

Table 4-1 Baseline Regression and Instrumental Variable Regression

Variable	(1) Benchmark regression	(2) Control variables	(3) Instrumental Variables (IV-2SLS)
ESG_Dis	0.263*** (3.50)	0.266*** (3.83)	0.302*** (3.42)
ESG_Ave		-0.044 (-0.71)	-0.042 (-0.67)
Agency_Num		-0.294*** (-5.08)	-0.306*** (-5.22)
Ln(Asset)		0.499	0.468

		(1.51)	(1.32)
EM		-0.000	-0.000
		(-0.30)	(-0.55)
QR		-0.604***	-0.601***
		(-4.10)	(-4.06)
ROA		-0.018***	-0.017***
		(-4.14)	(-3.63)
SOE		-0.072	-0.058
		(-0.69)	(-0.55)
Company fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Sample number	16848	16848	16680
R ²	0.509	0.556	0.794
Dependent variable mean	0.805	0.805	0.096

Note: The values in brackets are t values. *, **, and *** indicate significance at 1%, 5%, and 10% levels, respectively.

Results Interpretation: As shown in Table 4-1, the coefficient of ESG rating divergence (ESG_Dis) is positive and significant across all three models, indicating that higher rating divergence is associated with higher corporate debt financing costs. After including control variables, the coefficient is 0.266, suggesting that a one-unit increase in ESG_Dis leads to a 26.6 basis point increase in the cost of debt. When using the lagged value of ESG_Dis as an instrumental variable in a two-stage least squares regression, the results remain significant, confirming the robustness of the findings. This evidence supports Hypothesis H1.

Mechanism Analysis: Moderating Effect of ESG Disclosure Quality

If ESG rating divergence reflects poor ESG disclosure practices, then firms with more standardized disclosures should experience a weaker negative effect. To test this mechanism, the study introduces two proxy variables: CER (whether the firm publishes an ESG report) and GRI (completeness of ESG disclosure). Interaction terms are constructed to assess the moderating effect, and the results are presented in Table 4-2.

Table 4-2 The Impact of Information Disclosure Regulation ESG Rating Differences on Debt Financing Costs

Variable	(1) Third-party certification (CER)	(2) GRI Information Disclosure (GRI)
ESG_Dis	0.304***	0.319***
	(3.44)	(3.55)
CER × ESG_Dis	-0.533***	
	(-4.46)	
CER_Proxy	0.367*	
	(1.93)	
GRI × ESG_Dis		-0.327***
		(-3.83)
GRI_Proxy		0.255*

		(1.67)
Control variables	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Sample number	16680	16680
R ²	0.096	0.096

Note: CER_Proxy indicates whether the firm publishes an ESG report; GRI_Proxy refers to the completeness score of ESG disclosure. t-values are reported in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

Results Interpretation: Table 4-2 shows that when firms publish ESG reports or maintain higher disclosure quality (i.e., through third-party assurance or adoption of GRI standards), the impact of ESG rating divergence on the cost of debt financing is significantly reduced. The coefficients of the interaction terms are all negative and statistically significant at the 1% level, supporting Hypothesis H2. This indicates that standardized ESG disclosure can mitigate market concerns over uncertainty caused by rating divergence, thereby lowering financing costs.

Robustness Checks: Alternative Measures and Standardization

To further verify the reliability of the core findings, a series of robustness checks are conducted. These include using the range (max–min) of ESG ratings as an alternative measure of divergence, standardizing the ESG_Dis variable, adjusting for industry means, and replacing the dependent variable. The results are presented in Table 4-3, which demonstrates the robustness of the relationship between ESG rating divergence and the cost of debt financing.

Table 4-3 Robustness Test of ESG Rating Differences and Debt Financing Costs

Robustness test method	(1) Extreme Difference Index	(2) Difference Standardization	(3) Industry mean adjustment	(4) Replace the dependent variable
ESG_Dis alternative	0.158***	0.935***	0.190***	0.312***
	(2.87)	(2.62)	(3.32)	(3.47)
Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Number of samples	16680	16680	16680	15186
R ²	0.096	0.096	0.096	0.020

Note: (1) The ESG rating range (max–min) is used as a substitute for the standard deviation; (2) a standardized ratio of ESG_Dis to ESG_Ave is used; (3) ESG_Dis is divided by the industry average; (4) the cost of debt is replaced with an alternative measure: interest expense divided by total liabilities. t-values are reported in parentheses. *** indicates significance at the 1% level.

Results Interpretation: As shown in Table 4-3, the coefficient of ESG rating divergence remains significantly positive across various alternative measures and standardization methods, indicating that the main conclusion is robust. This suggests that the positive impact of ESG rating divergence on corporate debt financing costs is not driven by specific variable definitions or model specifications, but rather reflects a broadly applicable economic effect.

Conclusion and Recommendations

Research Conclusion

Based on data from A-share listed companies in China from 2016 to 2023, this study systematically investigates the impact of ESG rating divergence on corporate debt financing costs. The reliability of the findings is enhanced through the use of instrumental variable methods, mechanism analysis, and various robustness checks. The main findings are as follows:

ESG rating divergence significantly increases corporate debt financing costs. Baseline regression results show that, after controlling for firm characteristics, average ESG ratings, and the number of rating agencies, ESG divergence significantly raises the cost of debt capital, with the effect being statistically significant at the 1% level.

Instrumental variable estimation confirms the robustness of the causal relationship. Using the lagged value of ESG divergence as an instrumental variable in a two-stage least squares regression (2SLS), the results remain significant, addressing endogeneity concerns and further confirming that ESG divergence indeed imposes a higher debt cost burden on firms.

Standardized information disclosure mitigates the effect through a mechanism channel. Mechanism tests reveal that when firms adopt third-party assurance or align their disclosures with GRI standards, the negative impact of ESG rating divergence on financing costs is significantly reduced. This suggests that the market's primary concern lies in the uncertainty caused by poor disclosure practices.

Robustness checks support the broad applicability of the core conclusion. Whether using the ESG rating range, standardized divergence measures, industry-adjusted divergence, or alternative definitions of debt cost, the positive relationship between ESG divergence and financing costs remains consistently robust.

In summary, ESG rating divergence not only undermines the effectiveness of ESG ratings as a decision-making tool but also substantively affects firms' financing environments. Its impact is closely tied to corporate ESG disclosure practices.

Policy Recommendations

Based on the above findings, this paper proposes the following three policy recommendations:

Promote standardization of ESG rating frameworks. Regulatory bodies should take the lead in formulating or guiding rating agencies toward greater alignment in their rating indicators, weighting schemes, and data definitions. This would reduce

divergence stemming from methodological inconsistencies and enhance the comparability and effectiveness of ESG ratings.

Strengthen guidance on standardized ESG disclosure by firms. Regulators should further refine the ESG Information Disclosure Guidelines, encourage firms to adopt internationally recognized standards (e.g., GRI), and implement third-party assurance mechanisms. These efforts would improve market confidence in disclosure quality and fundamentally reduce rating divergence.

Enhance investor awareness and interpretation of rating divergence. Against the backdrop of rapidly growing ESG investment, institutional investors should be trained to recognize the sources of divergence across different agencies and make holistic assessments of ESG performance by considering both rating outcomes and disclosure quality, thereby reducing the risk of misinterpretation.

Research Limitations and Future Outlook

While this study provides systematic empirical evidence, several limitations remain:

The data is limited to domestic rating agencies, lacking a comparative perspective with international ESG ratings. ESG disclosure standardization is measured through proxy variables; future studies could adopt textual analysis or delve into the content of disclosures for more precise assessments. The paper does not examine the heterogeneous effects of ESG divergence on SMEs or on different types of debt instruments (e.g., green bonds, bank loans).

Future research could expand along the dimensions of cross-country comparisons, disclosure quality through textual analysis, and actual credit spreads of green financial instruments, thereby deepening the understanding of the market mechanisms through which ESG rating divergence exerts its influence.

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LEVEL OF SAFETY AWARENESS AND COMPLIANCE AMONGST CONSTRUCTION WORKERS IN SEMATAN, SARAWAK

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Abstract: *Despite the ongoing development of Malaysia's construction industry, safety compliance remains a critical concern. This study investigates the level of safety awareness and compliance among construction workers in Sematan, Sarawak. Using a cross-sectional, quantitative approach, data were collected from 100 respondents across various roles, including site managers, engineers and labourers. Results indicate moderate safety awareness but low compliance in certain areas, particularly in PPE usage and hazard communication. Key barriers include poor training, weak enforcement and casual attitudes toward safety procedures. The study recommends structured training, stronger site supervision and a proactive safety culture to reduce risks and improve compliance. These findings provide useful insight for policymakers, contractors and safety educators aiming to improve workplace safety standards in similar developing regions.*

Keywords: *occupational safety, construction industry, safety awareness, compliance, Malaysia*

Introduction

The construction industry is a significant contributor to Malaysia's economic growth, yet it consistently records one of the highest rates of occupational fatalities. According to the Department of Occupational Safety and Health (DOSH), the sector reported a fatality rate of 6.90 occurrences per 100,000 employees in 2021, highlighting a critical need for improved safety management (The Star, 2021). Accidents lead not only to project delays and financial costs but, more importantly, to human tragedy.

A primary factor contributing to the high accident rate is the non-compliance with established safety guidelines (Windapo, 2011). While the Occupational Safety and Health Management System (OHSMS) provides a framework for identifying and controlling risks, its effectiveness hinges on the awareness and adherence of the workforce. It is understood that OSHMS compliance in Malaysia is still at a nascent stage, but the specific level of workers' knowledge and awareness of these practices has not been sufficiently identified.

This research addresses this gap by focusing on construction workers in Sematan, Sarawak, a region undergoing rapid development. The study aims to achieve the following objectives:

1. To determine the factors that impact construction workers' knowledge of health and safety.
2. To identify the degree of awareness and its influence on the application of and compliance with OSH management systems.

3. To measure the overall level of safety knowledge and compliance among construction employees in the specified region.

By gauging the current state of safety awareness, this report seeks to provide actionable insights for the construction industry to foster a stronger safety culture, prevent casualties and improve adherence to safety legislation.

Literature Review

The high incidence of accidents in the Malaysian construction sector is a well-documented problem. Between 2005 and 2008, numerous serious incidents underscored the urgent need for reform in site safety procedures (Dayang & Gloria, 2011; Abdul Rahim et al., 2008). Effective safety programs are recognized not only for saving lives but also for reducing costs and boosting productivity (Ahmad, 2008).

Non-Compliance with Safety Practices

Non-compliance with safety guidelines is a principal cause of construction site accidents (Windapo, 2011). This can stem from negative attitudes towards safety measures, which are often influenced by management commitment and the perceived effectiveness of safety provisions (Zin & Ismail, 2012; Ratnasingam et al., 2010). Factors contributing to non-compliance are multifaceted, including the perception of safety costs as unnecessary expenses, workplace pressure to prioritize speed over safety and even a lack of enforcement by regulatory bodies (Windapo, 2013; Ugwu et al., 2020; Umeokafor et al., 2014b).

Cost Implications of Non-Compliance

The consequences of non-compliance manifest as both direct and indirect costs.

Direct Costs:

These are the immediate, insured costs associated with an accident, such as medical treatment, worker's compensation and liability insurance premiums (Smallwood & Haupt, 2006). These costs can also include property damage and fines.

Indirect Costs:

Often hidden and exceeding direct costs, these include lost productivity, equipment and site cleanup, costs associated with project delays and the administrative burden of accident investigation (Pillay & Haupt, 2008; Othman, 2012). Studies show the ratio of indirect to direct costs can be significant, ranging from 1.19:1 for temporary disability to 1.94:1 for permanent disability (Azman et al., 2019).

Existing Research and Gaps

Previous studies have explored various facets of construction safety. One study confirmed that while construction professionals are generally aware of the consequences of non-compliance, there are significant variances in awareness levels across different professional roles (e.g., engineers vs. site supervisors), particularly concerning liability and delay-related costs. Another investigation into Safety, Health and Environment (SHE) protection highlighted the

importance of organizational commitment and communication, noting that workers are often aware of hazards but may fail to use Personal Protective Equipment (PPE) without consistent enforcement (KA Shamsuddin et al., 2015). A study on PPE use in Johor, Malaysia, found high awareness but low compliance, particularly for hand, eyes and respiratory protection, pointing to a critical gap between knowing and doing (Bruno et al., 2020). This research builds on these findings by focusing specifically on the awareness and compliance levels in the developing region of Sematan to provide localized data.

Methodology

This study employed a quantitative, cross-sectional research design to assess the level of safety awareness and compliance. A structured questionnaire was the primary instrument for data collection.

Sampling and Respondents

Purposive random sampling was used to select 100 respondents from the construction sector in the Sematan area. The sample included personnel from various hierarchical levels, including directors, engineers, safety and health officers, site supervisors, and general labourers, primarily from Class A, B and C contractors.

Data Collection Instrument

The questionnaire was divided into two main parts:

Part 1: Demographics:

Collected background information on respondents, including age, gender, race and years of work experience.

Part 2: Workplace Safety and Health Knowledge:

Contained 30 questions designed to measure awareness and compliance. Questions were adapted from previous research and structured around seven key parameters: OSH Policy, Standard Operating Procedures, Equipment Handling, Training, Safety and Health Committee, Commitment and Attitude and Working Environment Awareness. A 5-point Likert scale was used for responses (1 – Strongly Disagree to 5 – Strongly Agree).

Data Analysis

The collected data was coded and analysed using the Statistical Package for the Social Sciences (SPSS) Version 25. The primary analytical methods included:

Frequency Analysis:

To describe the demographic profile of the respondents.

Descriptive Statistics:

To summarize the responses for each question.

Mean Score Index (MSI):

To determine the central tendency for each variable and rank its importance. The formula used was: $MSI = \frac{\sum fx}{N}$ where f is the frequency of responses, x is the score for each rating and N is the total number of responses.

Pearson's Product-Moment Correlation:

To examine the relationship between different variables, such as the relationship between safety training and safety compliance.

The margin of error was set at a 95% confidence interval to ensure the reliability of the findings.

Data Analysis and Results

The analysis was conducted on data from 100 respondents as shown in Table 1. The majority of respondents were in the 30-39 age group and all were male.

Respondent Demographics

Table 1: Distribution of Respondents by Job Role		
Job Role	Number of Respondents	Percentage
Construction Managers	7	7%
Equipment Operators	13	13%
Electricians	20	20%
Carpenters	27	27%
Construction Labourers	33	33%
Total	100	100%

Frequency Analysis Highlights

The responses to key survey statements revealed significant trends in safety perception and practice as illustrated in the following charts.

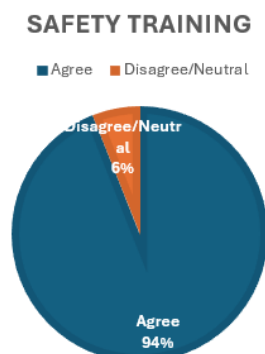


Figure 1: Is Safety Training Provided?

Safety Training:

As shown in Figure 1, a strong majority (94 respondents) agreed or strongly agreed that safety training is provided when starting a job or using new techniques. This indicates a foundational awareness of the importance of initial training.

MANAGEMENT-EMPLOYEE COMMUNICATION

■ Agree ■ Neutral ■ Disagree

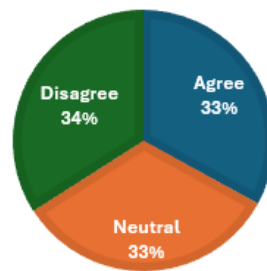


Figure 2: Does Regular Safety Communication Occur?

Management-Employee Communication:

According to Figure 2, the responses were evenly split, with approximately 33 respondents agreeing, 33 remaining neutral and 34 disagreeing that regular communication on safety occurs. This suggests significant inconsistency in safety communication channels.

HAZARD IDENTIFICATION SYSTEMS

■ Agree ■ Neutral ■ Disagree

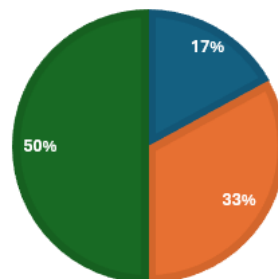


Figure 3: Are Hazard Identification Systems in Place?

Hazard Identification Systems:

Figure 3 shows that half of the respondents (50) disagreed that appropriate systems are in place to identify and prevent workplace dangers, pointing to a perceived weakness in proactive hazard management.

SAFETY COMMITTEE EFFECTIVENESS

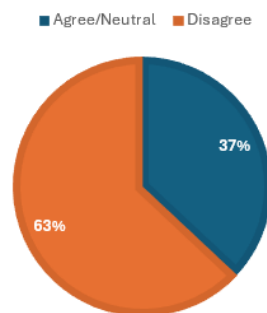


Figure 4: Is the Safety Committee Effective?

Safety Committee Effectiveness:

A large portion of respondents (approximately 63) disagreed that there is an active and effective health and safety committee, indicating a lack of visible and impactful safety leadership on site (Figure 4).

Key Findings

The analysis revealed three core themes:

Current Safety Practices:

While workers were aware of basic safety requirements like using PPE (helmets, boots, vests) and observing safety signs, actual compliance was inconsistent. Site managers confirmed that workers sometimes disregard safety advice due to obstinacy or a focus on completing tasks quickly. This points to a gap between awareness and behaviour.

Difficulties in Implementation:

Several barriers to consistent safety practice were identified:

Lack of Deep Understanding:

Many workers, particularly newer ones, possess only a fundamental knowledge of safety and are not proficient with more advanced safety protocols or equipment.

Insufficient Safety Education:

Formal training was reported as lacking, with most learning occurring through informal, on-the-job experience.

Attitude and Behaviour:

A careless attitude was cited as a major issue. Workers acknowledged the risks of not wearing PPE but still chose to do so, prioritizing task completion over personal safety.

Crucial Factors for Enhancement:

Respondents identified several key areas for improving safety practices:

Improved Communication:

Using both verbal and non-verbal methods, including making the Malay language a requirement for all workers to ensure signs and directives are understood.

Attentive Supervision and Monitoring:

Regular and consistent site monitoring was seen as essential to enforce compliance.

Fostering a Positive Safety Culture:

Creating a supportive environment where safety is the norm. The use of rewards for compliance and penalties for violations was seen as a practical way to reinforce desired behaviours.

Findings and Discussion

This study aimed to determine the level of safety awareness and compliance among construction workers in Sematan. The findings indicate that while a general awareness of safety principles exists, it does not consistently translate into compliant behaviour. This "awareness-behaviour gap" is a critical issue that undermines the effectiveness of OSH management systems.

The inconsistency in safety communication and the perceived ineffectiveness of safety committees suggest a weakness in organizational commitment. As established in the literature, management's role is crucial in shaping employee attitudes and behaviours toward safety (Zin & Ismail, 2012). When communication is sporadic and safety leadership is not visible, workers are less likely to prioritize safety protocols, even if they are aware of them.

The difficulties encountered, such as a lack of in-depth training and a prevalent "careless attitude," are significant barriers. The reliance on informal, on-the-job learning is insufficient for complex and high-risk environments. This reinforces the need for structured, ongoing training programs that go beyond basic induction. The issue of attitude highlights the importance of moving beyond mere compliance to fostering a genuine safety culture, where safety is an intrinsic value for every worker, not just a rule to be followed.

The recommendations from the respondent's better communication, consistent supervision, and a system of rewards and penalties align with established best practices for safety management. These elements are foundational to building a robust safety culture where every individual feels a sense of responsibility. Management must lead this charge by clearly defining responsibilities, investing in professional development, and actively involving employees in the safety program.

Recommendations

Based on the findings, the following recommendations are proposed:

Strengthen Management Commitment:

Management must demonstrate a visible and unwavering commitment to safety. This includes establishing a fully functional and active safety and health committee, ensuring regular safety audits and leading by example.

Implement Continuous Training:

Move beyond one-off inductions to a system of continuous and role-specific safety training. This should include practical, hands-on sessions on hazard identification, risk assessment, and the correct use of all necessary PPE.

Enhance Communication and Supervision:

Implement daily or weekly safety briefings like toolbox talks to keep safety at the forefront of workers' minds. Ensure supervisors are trained to effectively monitor compliance and provide constructive feedback. Standardizing communication in a common language (e.g., Malay) is essential.

Foster Employee Involvement:

Create formal channels for workers to report safety concerns without fear of reprisal. Involve them in developing safety procedures and initiatives.

Introduce an Incentive Program:

Implement a system that rewards safe work practices and penalizes non-compliance. This can help reinforce the message that safety is a top priority and a shared responsibility.

Conclusion

The level of safety awareness among construction workers in Sematan is moderate, but the level of compliance is worryingly inconsistent. A significant gap exists between knowing the rules and following them. This is primarily driven by inconsistent management communication, insufficient training, and attitudinal issues. To improve safety performance and reduce accidents, construction companies must move beyond basic compliance and actively cultivate a robust safety culture through demonstrated leadership, continuous education, and the active involvement of all employees.

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WHAT LEADS TO ONLINE FINANCIAL FRAUD VICTIMIZATION AMONG CONSUMERS?: AN EMPIRICAL ANALYSIS

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Abstract: *Along with the growing use of contemporary technologies, which has helped people in today's society with their daily lives. Nevertheless, it has led to an increase in online fraud instances that cost consumers and service providers around the world significantly. Fraud is a deceptive act committed by a person with the intention to gain an unfair advantage or violate the rights of an individual. The national scam response centre (NSRC) reported Malaysians have become victims and losses totalling RM1.34 billion were recorded from 33,234 cases involving various online scams in 2023. The loss involved six modus operandi, with investment scams recording the most losses at RM437 million, followed by e-commerce (RM383 million), telecommunications (RM334 million), e-finance (RM104 million), love scams (RM41 million), and non-existent loans (RM39 million). Shockingly, these financial scams tied to cybercrime are on the rise in Malaysia, with police records showing 35,368 reported cases in 2024, equivalent to a 2.53% increase compared to the previous year. These scams led to total losses of RM1.58 billion. In the first quarter of 2025 alone, the Royal Malaysia Police (PDRM) documented 12,110 online scam cases, which included fake e-commerce deals, bogus loan offers, and fraudulent investment platforms. The financial impact from these cases amounted to RM573.7 million (The Vibes, 2025; FOMCA, 2025). Thus, the study aims to investigate the underlying reasons of these issues happened among consumers in Malaysia. The study employed a quantitative survey among 267 consumers across Malaysia by utilizing a seven-point Likert scale questionnaire. Furthermore, using SPSS software, the analysis reveals that for main factors, i.e., Poor Knowledge, Low Self Control, Financial Pressure, as well as Bad Routine Activity, are known as major significant reasons for this severe social issue. The findings of this study may be very useful for the authorities to apply relevant policy improvements for the societal well-being.*

Keywords: *Consumers, Online Financial Fraud, SPSS analysis*

Introduction

Stated in the PwC's Global Economic Crime and Fraud Survey - Malaysia Report (2020), asset theft (16%), corrupt practices (18%), customer fraud (20%), and cybercrime (16%) rank as Malaysian organizations' top four most disruptive or significant fraud incidences. Asset theft has reduced by 6% since 2018, however Malaysia's top four disruptive crimes still make up 70% of the total economic crimes. Various fraud categories had been uncovered in previous studies from a variety of angles like fraud might be internal, when it is perpetrated by employees or managers, or external, where it is committed by a client or other third parties. Not just that, fraud can also be categorized according to its type as well. (Fazli Aghghaleh et

al., 2016). As effective fraud-prevention and detection systems reduce the likelihood of fraud, organizations should implement robust controls, analytics, and reporting mechanisms to detect and deter fraudulent behaviour. In addition, public and employee awareness campaigns, including clear reporting channels and education on common scams, are essential because everyone (not just organizations) must be alert to behaviours and signals that enable fraud (McKinsey, 2022).

The goal of the study is to determine the elements that influence financial fraud victimization in Malaysian society by examining individuals' opinions towards various variables.

In this modernized era, technology has evolved rapidly in the world and Malaysia was not left behind. According to Digital 2023 Global Overview Report, until now there are 96.8% (Digital 2023 Global Overview Report, 2023) from total population in Malaysia (34.14 million) are connected online on the internet. It is a huge number that show Malaysian people are well informed about IT.

However, financial fraud is on the rise and has cost individuals, businesses, and the country millions of Ringgit Malaysia. This undermines trust in the financial system, disrupts economic stability, and has adverse implications for society. According to Kirennesh Nair writing in The Star (1 October 2022), Malaysia recorded 12,092 online fraud cases from January to July 2022, amounting to RM 414.8 million in losses. Similarly, Focus Malaysia reported losses of approximately RM 415 million during the first seven months of 2022. The issues are becoming so worse that Bank Negara Malaysia, BNM had to step in to issue the solution for all the banks in Malaysia to migrate away from using SMS as their OTP into online based authentication in order to improve the security. This case seems like the evolution of technology, especially in online shopping and social media, has also put the fraudsters to be more advanced in scamming people. For example, many Malaysian banks use SMS one-time passwords, often known as OTPS, for online financial services. To conduct online banking transactions, users must enter authentication OTP numbers acquired by SMS into a browser or a mobile application. Fraudsters, on the other hand, have been able to manage these codes from some consumers' devices. It all begins when a user unintentionally installs harmful software or clicks on links that lead to malware installation. Such users are sometimes tempted to click such links by the promise of a reward or other perks.

Literature Review

The rise in online financial fraud instances has compelled responsible organizations such as Bank Negara Malaysia (BNM) and police department cybersecurity sections to work harder in order to strengthen security and raise awareness among individuals to be more cautious when exchanging information. If these situations are not addressed by all parties, more individuals will become victims, affecting Malaysia's economic might. Fraudsters can intercept sensitive information, such as banking credentials and credit card data, using malware. It also enables criminals to intercept communications delivered to the device, such as OTPs for online transactions. Fraudsters may remove the SMS from the device after collecting the OTPS, leading victims to believe they did not receive any SMS. Fraudsters can get access to consumers' bank accounts using this approach. This can lead to financial frauds, which typically occur without the victims' knowledge.

Online Financial Fraud

The United States Department of Justice (2020) defines fraudulent activity as intentionally misleading people by promising non-existent products, services, or financial benefits that were never intended to be provided or were misrepresented. So, the deception of others in order to obtain funds or property through deceitful, and unlawful financial dealings or schemes is called as financial fraud. According to Shang et al. (2023), most financial fraud occurs and begins on the internet, and this fraud occurs utilising network communication technologies such as phishing (Team B, 2021; Mdpi, 2023) activities, advance fee scams, love scams, loan scams and investment scams. In Malaysia, according to The Star news, Datuk Seri Dr Awang Adek Hussin, executive chairman of the Securities Commission Malaysia (SC), stated in 2023 that between 2020 and 2022, the overall amounts of fraud-related complaints increased by 100%, about losses in total hitting RM10 millions. There are factors that influence the occurrence of financial fraud, and among them are poor knowledge (Williams, 2019), low self-control (Kadoya, 2021), financial pressure (DBS, 2022), and bad routine activity (Kadoya, 2021).

Poor Knowledge

According to the Cambridge Dictionary, knowledge is defined as a comprehension or awareness about a topic gained through learning or experience, whether known by one person or by a group of people. While illiteracy, ignorance, and lack of awareness are synonyms for poor knowledge. Engels et al. (2019) claim in their study that there is a strong link between literacy, specifically financial literacy (Engels et al., 2019; Mdpi, 2023), and financial fraud. Their findings conclude that older people are more likely to be victims of financial scams than younger people, owing to their larger property and the possibility of cognitive decline related to getting older. Because older people are slower to adapt to changing awareness than younger people, they are more inclined to become victims. (Engels et al., 2019) & (Ueno, 2021). In addition, poor knowledge or ignorance can result in impulsive choices, overlooked possibilities, and even damage to themselves or others as well such as engaging in financial fraud (Williams, 2019). On top of that, victims of financial scams do not usually report these occurrences because the victims are either unconscious of the fraud when it happens, have no idea where to file it, or choose not to report it completely (DeLiema, 2022). Hence, the hypothesize is:

H1: Poor knowledge will be more likely to become a victim of financial fraud

Low Self Control

As stated in Kendra Cherry's article (2022), self-control is defined as a capacity to control and alter how you react in order prevent unintentional attitudes, improve desired behaviour, and accomplish objectives over the long run. When it is associated with a low of self-control, however, it has negative consequences and interferes with the well-being of individuals and those around them. Kadoya (2021) discovered that persons who lack self-control have a greater probability to be those targeted of financial fraud. This viewpoint is supported by previous studies, specifically Reisig and Patt's (2008) findings demonstrating that people with low self-control are impulsive and frequently indulge in seeking risks actions. However, Reisig and Patt's findings (2008) discovered that while low self-control has no impact on whether

individuals are being targeted, it considerably raises the possibility of fraud victimization. In short, the hypothesize is:

H2: Low self-control will be more likely to become a victim of financial fraud

Financial Pressure

Financial pressure arises when someone is in a circumstance that is unable to earn enough income to fulfil their financial commitments. It is typically caused by costly expenses, or profits that is susceptible to economic crises. Those may experience financial difficulties as a result of poor financial management, excessive spending, a heavy debt pressure, or the loss of jobs. (Hayes, 2021). In their study, Bar Lev E et al. (2022) stated that someone who is financially impacted or experiencing financial distress is more likely to become a target or fraud victim due to the fact that they desperately want immediate and high return on their money, so they invest or borrow money irrationally. In an article written by Afiq (2021) in Kosmo news, as much as RM62,397,559.45 in losses recorded by the Polis Diraja Malaysia (PDRM) due to financial fraud syndicates such as financial loans. This occurred as a consequence of the COVID-19 pandemic, which caused an economic recession and financial hardship for many people, including job losses and a damaging impact on the business world. In summary, the hypothesize is:

H3: Financial pressure will be more likely to become a victim of financial fraud

Bad Routine Activity

Routine Activity Theory (Cohen & Felson, 1979; Reyns, 2017; Hutchings & Hayes, 2009), as defined by Gregory Paul C. (2023), is a theory of criminology that clarifies the way trends in individual daily behaviours generate possibilities for crimes to occur. Furthermore, Bradford W. Reyns (2017) wrote in his book, *The Theory of Routine Activities*, that once motivated offenders meet a suitable target, that is a person who is lacking in capable guidance, then they will act to attempt an opportunity on the person they are targeting. While bad routine activities refer to routine activities that will have a negative effect on oneself, and among the activities that will reveal a person to be a target of scammers are those who frequently show their lifestyle in social media and download anything from unknown websites, and until their privacy is open and easily accessible to fraudsters. (Madiha et al., 2015). In a nutshell, the hypothesis is:

H4: Bad routine activity will be more likely to become a victim of financial fraud

The Research Framework

The study employed four independent variables to predict the dependent variable, which is the causes of financial fraud victimisation among consumers (Victims of Financial Fraud).

Independent Variables (x)

Dependent Variable (y)

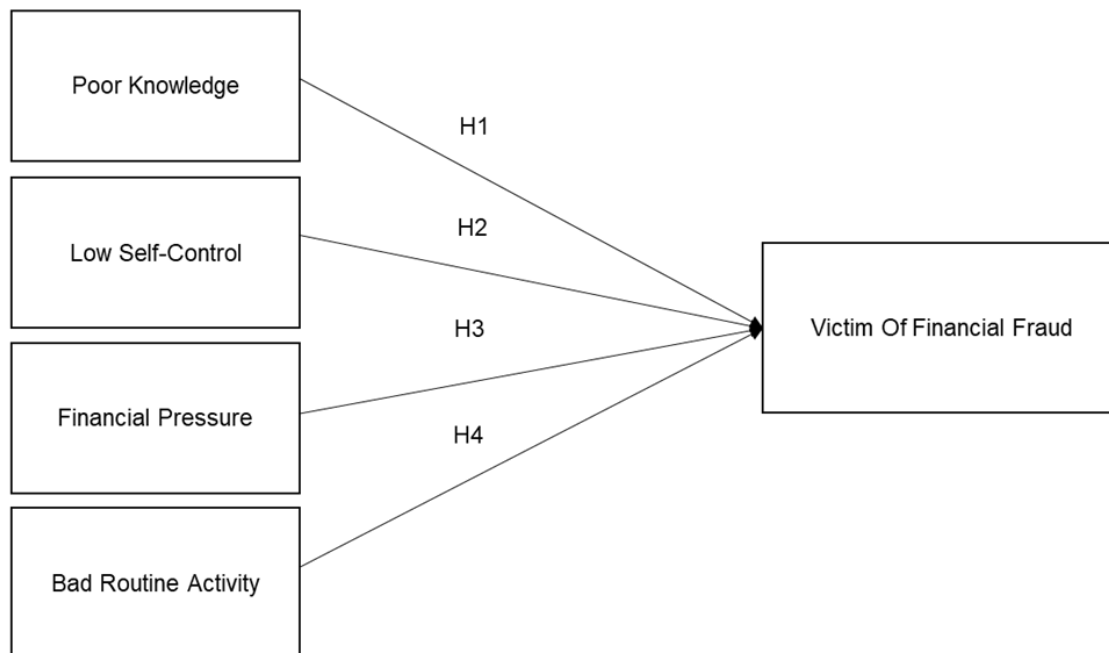


Figure 1: The Research Framework

Source: This Study.

The Research Methodology

Throughout the process of completing this research, two ways in where the information were gathered, primary data and secondary data. For primary data, distributed questionnaires is used to people and the result was analyzed using SPSS software. While for secondary data, past journals and websites were used to get the information and knowledge from past researchers and authorized websites to write the report.

1. Primary Data

For primary data, the data collected through questionnaires was analyzed using SPSS software. Distribution of the questionnaire was done using google form as it is easier for respondents to answer the question without using a pen to answer the questionnaire. The total respondents involved was 267.

2. Secondary Data

For secondary data, past journals and authorised websites were used to get the information.

Questionnaire Design

The questionnaire consists of three main sections, the first being the demographic question which includes eight items, namely gender, age, ethnicity, marital status, living area, education, job title and income. While the second section is an independent variable that includes Poor Knowledge, Low Self-Control, Financial Pressure, Bad Routine Activities, and each variable is provided with three question items. Then the last section is the dependent variable related to online financial fraud victims, and there are four question items were constructed. Both sections

of the independent and dependent variables will use a 7-point Likert scale to choose where 1: strongly disagree, 2: disagree, 3: somewhat disagree, 4: neutral, 5: somewhat agree, 6: agree, 7: totally agree. In addition, the data collection method applied the simple random sampling, which is valid for collecting information in a more time-saving, simple, and straightforward manner. This is due to the fact that the data obtained, the choice for each respondent is chosen randomly, naturally, and unbiasedly. (Simkus, 2023).

Data Collection Method

The study employs quantitative and qualitative approach to dig into the topic selected. The main instrument used is survey questionnaire that provided to get responses from the respondents regarding the issues. It consists of three sections which in Section A, asking demographic profile of the respondents, Section B covers the questions of dependent variable of the topic asking about their opinion about the victims of financial fraud. Lastly, Section C addresses the independent variables which are the risk factors of the topic studied using seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire is spread through social media sources and networking like WhatsApp and Telegram as well as Instagram. A total of 267 respondents gained after the distribution period ended. Aside that, the study also used secondary data that was collected from prior discussion of the issue like journals, research papers and websites.

Data Analysis Technique

All data gathered were analyzed using quantitative as well as qualitative methods. To be clearer, this section illustrates the outcomes of respondents' research into poll statistics. Certainly, all of the data received from the 267 respondents were analyzed using the SPSS project. The two main branches of statistical methods which are descriptive and inferential analysis were used in this research to derive meaningful insight.

In brief, descriptive analysis describes the fundamental characteristics of various forms of data in research. A few major types of descriptive analysis methods include measures of frequency, central tendency and dispersion or variation, such as mean and standard deviation. Besides, inferential analysis is applied to generate conclusion about the larger population based on sample data. Among the techniques used like hypothesis testing and regression analysis to test relationships, make predictions, or assess the significance of findings.

Moreover, Cronbach's alpha is used to measure the scale of reliability in order to determine how closely related a set of items is as a group of questionnaires. According to the website StatisticsHowTo.com, Cronbach's Alpha > 0.7 are considered acceptable and valid to perform. Meanwhile, a hypothesis test is performed to determine whether a hypothesis regarding a population parameter is true. Commonly, if the p-value is less than .05 ($P \leq 0.05$), a researcher may reject the null hypothesis and come to the conclusion that there is sufficient evidence to support the alternative hypothesis. In contrast, if the p-value is greater than .05, it indicates that the null hypothesis is unable to be rejected, and the conclusion that there is insufficient evidence to support the alternative hypothesis.

Overall, there are eight items of quantitative data analysis consisting of frequency analysis, descriptive analysis, Cronbach's Alpha, Convergent & Discriminant Validity Test, Factor Analysis, Multiple Regression Analysis and Pearson Correlation Analysis.

The Findings

The results from a Multiple Regression analysis produced significant results that support the hypothesis.

Multiple Regression Analysis

The results from the Multiple Regression Analysis are generated in three major parts, i.e., Model Summary, ANOVA, and Coefficients.

The Model Summary

Table 1: The Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872 ^a	.760	.756	.43291

a. Predictors: (Constant), Routine_Activity, Poor_Knowledge, Financial_Pressure, Low_Self_Control

Source: This Study.

Table 1 show that R square is 0.760 for regression of Online Fraud Victimization of 0.872. Besides, 76% of Online Fraud Victimization was affected by 4 factors which are, Bad Routine Activity, Poor Knowledge, Financial Pressure and Low Self-Control

Anova

Table 2: ANOVA

Anova^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	155.282	4	38.820	207.145	.000 ^b
	Residual	49.101	262	.187		
	Total	204.382	266			

a. Dependent Variable: Financial_Fraud_Victimization

b. Predictors: (Constant), Routine_Activity, Poor_Knowledge, Financial_Pressure, Low_Self_Control

Source: This Study.

As shown in ANOVA, Table 2, F= 207.145; p value = 0.000, therefore, wellness for the model is affirmed. In analyzing the factors of fraud victimisation, all four factors have worked well.

Table 3: Coefficients

Coefficients^a								
		Unstandardized		Standardized		95.0% Confidence		
		Coefficients		Coefficients		Interval for B		
		Std.						
Model	B	Error	Beta	t	Sig.	Lower Bound	Upper Bound	
1 (Constant)	.205	.207		.990	.323	-.203	.612	
Poor_Knowledge	.556	.050	.541	11.014	.000	.457	.656	
Low_Self_Control	.083	.044	.090	1.898	.050	-.003	.169	
Financial_Pressure	.179	.046	.185	3.928	.000	.089	.269	
Bad_Routine_Activity	.159	.033	.182	4.788	.000	.093	.224	

a. Dependent Variable: Financial_Fraud_Victimization

Source: This Study.

Table 3 describes the coefficient results that significantly correlate with the dependent variable, Online Fraud Victimization. A valid p value is the one that was lower than 0.05. In this case, all four factors were significantly correlated with the dependent variable of Online Fraud Victimization as their respective p-values are less than 0.05, which indicates these factors are very significantly correlated with the dependent variable.

Discussions of the Results

Poor knowledge

Hypothesis 1

The result from MLR suggests that people with Poor Knowledge will be more likely to become a victim of financial fraud since the p-value (0.00) was less than 0.05, thus the significance level is established. This means that the finding was in line with the research from Lee et. al., (1997), where poor knowledge has an impact on victims of financial fraud.

People with Poor knowledge are highly exposed to financial fraud. This happened when fraudsters, frequently assuming a fictitious identity or projecting an unfounded air of reliability, persuade, mislead, or encourage individuals to freely interact with the fraudster. This leads to people with poor knowledge easily being a victim of fraud and may easily lose their money in the blink of an eye. There are many cases that happen around us, one of the most popular cases is the Macau scam (Malay Mail, 2021; SC Malaysia, 2024). This Macau scam (Malay Mail, 2021; SC Malaysia, 2024) targeted many victims deceived by scammers because they are alleged to have debts with the National Bank or the Inland Revenue Board in large amounts. For instance, a technician in Nilai lost RM470,000 to a scammer posing as an IRB representative, claiming tax arrears totalling RM17,600.76 (The Malay Mail, 2021). This causes them to panic and immediately transfer the money to the scammer without researching first. In another report written by Holkar & Lees (2020) said that It might be more difficult to recognise and avoid scams when a person is experiencing common mental health issues, such as increased impulsivity and poor decision-making. These give an impact to their health

because they just suffer huge losses due to not checking in advance whether the information heard is authentic or not.

Low Self-Control

Hypothesis 2

Since the MLR's p-value for Low Self-Control is 0.05, therefore the significant level is proven. This suggests that low self-control has a negative impact on victim of financial fraud. These findings are consistent with Holtfreter et al. (2008), who identify low self-control as a key risk factor for both offline and online financial fraud, and with Dutch survey results showing that individuals with low self-control face substantially higher victimization risk even independent of their risky behaviors. In developing country contexts, Bar Lev et al. (2022) further highlight how psychological traits such as naivety, impulsivity, or misplaced trust, linked to low self-control, contribute to financial fraud victimization.

Financial Pressure

Hypothesis 3

The result from MLR suggests that financial pressure is positively influenced the risk factor of financial fraud victimization, since the p-value (0.00) was less than 0.05. The analysis done proposed that financial pressure impacted the risk factor of financial fraud victimization. The finding is in line with the research paper by Walter, A. et. al., (2020) where financial state could cause fraud victimization.

financial pressure. Based on the website that discusses "what is financial pressure" explains that any circumstance where tension over money is present results in financial pressure might cause people to feel pressure about their finances. This can cause you to struggle with the expenses that are increasing with the high inflation rate every day which makes the living cost increase which makes the salary earned not enough to cover the expense. Hidthiir (2025) informs that some Malaysians have turned to borrowing and other methods of subsistence as a result of their finances getting worse as a result of the growing cost of living and the depressing economic situation. Scammers easily target people who are in financial trouble because they are looking for a quick way out with a high return. This financial pressure affects the relationship among the family members where wellbeing which can quarrel with family members due to financial concerns that lead to family problems that cause divorce. This will bring a high rate of divorce. Financial stress may lead to irritability and rage, a decrease in sex drive, and a weakening of even the strongest relationships if it is left unchecked (Robinson, 2020). The most frequent point of contention between partners is frequently stated to be money.

Bad Routine Activity

Hypothesis 4

The result from MLR shows that bad routine activity is positively influenced the risk factor of financial fraud victimization as the p-value (0.00) was less than 0.05. It proves that the risk factor of financial fraud victimization is affected by bad routine activity. This is in accordance

with prior studies by Reisig, M. et al. (2008), that routine activities provide little information about fraud victimization and targeting.

bad routine activity. According to Hutchings et al. (2009) mentioned that it was discovered that regular computer use and online banking usage were risk factors for phishing (Team B, 2021; Mdpi, 2023) attacks. Excessive sharing of personal information on social media will be easy for scammers to leak because scammers can easily access our personal data based on the information they obtain. According to the New Straits Times newspaper report written by the BOTS team stated that the data obtained from Kaspersky. Kaspersky stated that a total of 195,032 payment system-related phishing (Team B, 2021; Mdpi, 2023) operations were discovered in Malaysia in the first two quarters of 2022 by Kaspersky, with 108,755 of them occurring in the first quarter and 86,277 in the second. This happens because of the pandemic habits where people need to limit movement and contact to avoid the spread of the virus. At that time, people did a lot of online transactions that accidentally led to other websites that led to phishing (Team B, 2021; Mdpi, 2023). This demonstrates that during the epidemic, phishing (Team B, 2021; Mdpi, 2023) assaults against businesses increased significantly according to the same news. If left unchecked it can lead to national problems where data within the country can be easily accessed by ruthless hackers.

Recommendations

Two major area of suggestion are proposed which include improvement by the industry as well as for the policy maker.

Suggestion for Improvement in the Market by the Industry

First suggestion that industry can improve in market is by encouraging the implementation of forensic accounting. In his article, Adam Hayes (2022) explained that forensic accounting is an integration of accounting and investigatory methods used to identify financial fraud. Therefore, it is critical to use fraud prevention and detection strategies to reduce this loss as well as every business needs to have an approach in place because minimizing scams is considerably simpler than rebounding damage after the fact. In addition, this system can assist the organization in determining where the stolen assets disappeared and the best way to recover it. In short, forensic accounting assistance can help to avoid these kinds of circumstances and discover fraudulent transactions in finance.

Next is to improve the quality and organization of internal control. Internal controls, according to Will Kenton (2023), are the systems, regulations, and processes put in place by an organization to safeguard the accuracy of financial and accounting data, foster accountability, and dodge fraudulent activity. Precisely, the internal control function provides benefits such as regulation compliance, accuracy in the documentation of transactions, asset protection, and assisting in the achievement of the company's goals. As a result, a strategic internal control strategy is critical and must be laser-focused in order to be well-organized and effective in implementation. A company is advised not to do all work that overlaps without further supervision. In fact, efficient organizations will segment their processes into three arrangements: separating responsibilities based on categories and importance, monitoring access to ensure that planned procedures are followed, and finally conducting an evaluation in each management.

Suggestion for Policy Improvements

One of the ways people can prevent themselves from getting caught by scammers is by installing antivirus protection tools on electronic devices such as computers, smartphones, tablets and so on. A well-known antivirus program is Kaspersky. According to Remani Tadong (2017), states that the antivirus software Kaspersky Internet Security Antivirus was created by Kaspersky Lab. It works to shield users against viruses and is primarily made for MacOS and Microsoft Windows-based systems. He continued by mentioning how the Kaspersky Security Network Service enables customers of Kaspersky Lab security products from all over the world to speed up the process of identifying malware and reducing the time it takes to offer protection against security hazards that are aimed at their machines. According to the New Straits Times, a post by the BOTS team states that Kaspersky's Anti-Phishing system detects anonymous data based on the triggering of deterministic components. Users are advised to be vigilant against cyber threats by protecting personal data strictly so that irresponsible people do not misuse personal information.

Next, the government should consider making improvements to the policy by establishing a hotline to report fraud. Fraud prevention and detection is critical to inform all parties at every level that there is a hotline available for victims or someone who wants to get information about this awareness. A vital aspect of the hotline is the ability to report without fear, and the authorities should take decisive action on such reports so that they have a fair justification in the case of a lawsuit. Additionally, in order to produce efficient and effective results, there ought to be a formal procedure to consistently investigate and resolve issues.

Conclusion

The findings of this study showed that risk factors of financial fraud victimization among Malaysians, which are Poor Knowledge, Low Self-Control, Financial Pressure, and Bad Routine Activity, were capable of increasing the rate of financial fraud victims. Hence, these finding would provide input for the relevant authorities to further look into these matters in order to curb online financial fraud for the society.

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CORPUS-BASED INSIGHTS INTO AUTHORIAL REFERENCES IN INDONESIAN RESEARCH ARTICLES

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Abstract: *The focus of this study is on how Indonesian authors construct authorial references in Indonesian research articles (IRAs). This paper looks at how Indonesian scholars in social and humanities sciences (SHSRAs) and nature and health sciences (NHSRAs) use first-person and third-person pronouns in 490 articles. The study is structured in a mixed-methods research design, with two analytical stages. The quantitative study centred on assessing the frequency of first- and third-person pronouns with AntConc 3.5.8 (Macintosh OS X, 2019) authored by Anthony. For the qualitative phase, Hyland's taxonomy was applied to interpret the usage patterns. The findings indicate that both SHSRAs and NHSRAs did not contain either the pronoun aku ('I') or the term tim penulis ('the authoring team'). The data reveals that Indonesian authors are more inclined to use peneliti ('the researcher') for single-authored papers, whereas kita ('we') for multi-authored works. Both disciplines are showing a preference for authorial reference that is more impersonal or inclusive, rather than overtly personal expressions.*

Keywords: *academic writing; authorial reference; Corpus-based insights; Indonesian Research articles (IRAs); linguistic devices*

Introduction

Research articles (Ras) is regarded as an objective academic writing since the authors should be neutral in representing their point of view. Hyland argues that in academic writing is considered as substantially objective reporting of an autonomous fact (Hyland, 2001). RAs is believed as a manifestation of communication between the authors and the readers scientifically. According to Ivanič (1998) writing is not just transferring the content but also a portrait of the writer's self-attribution in the text (Ivanič, 1998) or personal attribution and he also argues that many academic writers interact with the readers through their academic writing, at the same time, they also construct their identity (Işık-Taş, 2018).

An authorial reference as an authorial identity plays an important role in a text. The authorial identity as a linguistic device is the use of first person pronouns and their corresponding determiners in the text (Hardjanto, 2022; Hyland, 2002a, 2002b) which is earlier called as self-mention (Firdaus et al., 2021; Hyland, 2001; Walková, 2018). The authorial identity (Elander et al., 2010; Flowerdew & Wang, 2015; G. He et al., 2020; Hyland, 2002a, 2002b; Işık-Taş, 2018) also named as authorial presence (Ivanič, 1998; Li, 2021), authorial reference (Bašić & Veselica-Majhut, 2016; Hardjanto, 2022) or self-reference (Basthomi et al., 2015). The choice of self-reference or impersonality in academic writing has a significant role in projecting authors' identity (Basthomi et al., 2015) as a writer's identity that embodied in text (F. He, 2020). In English academic writing, the author self-reference is usually realized linguistically by the first-person (I, me, my, mine, we, us, our, ours, myself, and ourselves), the third-person

pronouns (she, he, it, her, hers, his, him, himself, herself, itself, they, them, their, theirs, and themselves) (Huddleston & Pullum, 2002) such phrases the author(s), the writer(s), and the researcher(s) as the authorial references (Hardjanto, 2022; Hyland, 2001).

First-person pronouns are capable of being expressed in both singular and plural forms in the Indonesian language, which is similar to English. The English pronoun 'I' can be used to describe either *saya* or *aku*, which are (Sujatna et al., 2024) both singular first-person pronouns. Although they both use the word 'I', they are slightly different in terms of formality and usage context. The pronoun *saya* is more formally used in formal or polite conversations, but *aku* is more casually used when discussing casual situations or among close friends and family.

The plural form of the first-person pronoun in Indonesian is characterized by the use of *kami* and *kita*, which are both translations of 'we' in English. There is a significant difference between these two. The pronoun *kami* is a singular pronoun that exclusively applies to the speaker(s) and excludes the listener(s). In contrast, *kita* is a pronoun that is inclusive, referring to both the speakers and the listeners in the group being referred to. The importance and uniqueness of this distinction in Indonesian is that it explains whether or not the person being spoken to is considered a part of the group.

In Indonesian, it is possible to express academic or authorial self-references using terms like *penulis* 'the writer' or *peneliti* 'the researcher'. These are forms that are specific to a single writer or researcher. In Indonesian, when referring to a group, typically uses phrases like *tim penulis* 'the team of writers' or *tim peneliti* 'the research team' to indicate the plural form, just as English uses terms like 'the authors' or 'the researchers'.

In terms of authorial reference functioning in discourse, the writers to apply the Hyland's taxonomy covering four functions as (explaining what was done, structuring the discourse, showing a result, making a claim) (Hyland, 2002b). One of the four functions, "explaining what was done", it is commonly employed to articulate the actions taken by the researcher(s)/author(s)/writer(s). To describe the direct steps taken by the researcher(s)/author(s)/writer(s) in the method section, such as: *First, I examined the steps of data collection*. The second type of the four functions is structuring the discourse. The purpose of "structuring the discourse" is to direct the reader through the text by arranging the structure or argument. By signalling the text's structure, directing the reader's attention, and supporting the flow of the argument, it contributes to the flow of the argument. It demonstrates the connection between the components of the text, such as: *Now we turn to discuss the theoretical framework*. The next function is "showing a result". The researcher(s)/author(s)/writer(s) are able to present their research findings by using this function. The outcome of analysis or research is typically indicated by this, for example: *We discovered that students tend to choose a project instead of an examination*. The final function utilized in this study is the one of 'making a claim'. The purpose of this function is to present the writer's position, interpretation, argument, or evaluation. The writer can use authorial reference in an assertive way to take a stance, argue a position, or interpret results. It signifies ownership and authorial voice, for instance: *The researchers believed this collaborative method is more effective than others*.

In this paper, the writers try to explore the first and third-person pronouns (*aku*, *saya*, *kami*, *kita*) and other pronouns (*penulis*, *peneliti*, *tim peneliti*, *tim penulis*) as it represented authorial reference in Indonesian Research Articles (IRAs). This paper investigates the frequency and the self-mention discourse functions of the first-person and third-person pronouns in both

singular and plural forms and in 490 articles which were written by Indonesian authors in IRAs in the year 2011-2020. The IRAs was taken from the group of social & humanities sciences research articles (SHSRAs) and the nature & health sciences research articles (NHSRAs) academic journals. This paper also describes the four discourse functions of the pronouns as authorial reference which was categorized by Hyland (2002).

Method

To provide a more understanding of the research topic mix-methods research design consisting of two analysis stages are implemented (Creswell & Creswell, 2018). In the first stage, the corpora collected are analyzed related to the frequency of the first-person pronouns through AntConc 3.5.8 (Macintosh OS X) 2019 which was developed by Anthony to represent the quantitative analysis. Secondly, to characterize the qualitative stage, the writers implement Hyland's taxonomy (explaining what was done, structuring the discourse, showing a result, making a claim) (Hyland, 2002b).

As mentioned earlier, this research applied corpus as the data. The corpus could be stored digitally, and it is a bunch of text which were searchable easily (Jones & Waller, 2015). The corpora (2,120,431 words) were collected from 490 texts of IRAs in ten years (2011-2020) as described in Table 1. While the IRAs were obtained from 271 texts of SHSRAs and 219 texts of NHSRAs as described in Table 2. The Table 2 described 55% of the sources is SHSRAs and other 45% is NHSRAs fields.

Table 1. Corpora Distribution

Year	Texts	Words
2011	58	210,128
2012	55	211,691
2013	47	211,209
2014	47	213,407
2015	45	210,348
2016	45	217,546
2017	49	211,192
2018	47	212,630
2019	50	211,867
2020	47	210,413
Total	490	2,120,431

Table 2. Fields of Indonesian Research Articles (IRAs)

Field	Articles
Social and Humanities Sciences (SHSRAs)	271
Nature and Health Sciences (NHSRAs)	219
Total	490

Result and Discussion

Based on the data collected, the writers describe that there are two major personal pronouns used as the authorship in IRAs. From the two types of personal pronouns as both singular and

plural; the singular could be the first-person (*saya, aku*) and the third-person (*peneliti, penulis*) while the plural as the first-person (*kami, kita*) and the third-person (*tim peneliti, tim penulis*) as described in Table 3.

Frequency of pronouns in SHSRAs and NHSRAs

From the data collected in SHSRAs, it was reported that the pronouns (both singular and plural forms) as many as 2701 data. The words of the singular pronouns (55.2%) is more ordinary to be used than the plural ones (44.8%) or 10.4% slightly higher singular than plural form, as illustrated in Table 3.

Table 3. Pronouns in Social and Humanities Sciences Research Articles (SHSRAs)

Forms	Pronouns		Frequency	Percentage (%)	
	First-Person	Third-Person		Subtotal	Total
Singular	<i>saya</i>		412	27.6	15.3
	<i>aku</i>		-	-	-
		<i>peneliti</i>	708	47.5	26.2
		<i>penulis</i>	372	24.9	13.8
Subtotal			1492	100	55.2
Plural	<i>kami</i>		297	24.6	11.0
	<i>kita</i>		704	58.2	26.1
		<i>tim peneliti</i>	208	17.2	7.7
		<i>tim penulis</i>	-	-	-
Subtotal			1209	100	44.8
Total			2701		100

From the subtotal of singular pronouns (1492 data), it was described that third-person (1309 data) is more commonly used than the first-person pronouns (412 data). It means that the Indonesian writers are more common to apply the words *peneliti* and *penulis* as the third-person compared to the words *saya* as the first-person pronoun form in their research articles. While the usage of *peneliti* (708) is more popular than *penulis* (372) and it is only the word *saya* (412) found in data while the word *aku* as singular pronouns was not found in SHSRAs.

For the plural form, it was reported that the first-person (1001 data) is more familiar than the third-person pronouns (208 data) in SHSRAs. It was outlined in Table 3 that the word *kita* (704 data) is more common applied than *kami* (297 data) as the first-person plural forms while *tim peneliti* (208 data) as a plural form of the third-person pronoun and no data recorded of *tim penulis* in SHSRAs.

The illustration of the pronouns used by in the Indonesian writers in SHSRAs are described in the following examples. Part A is the usage of singular first-person forms in SHSRAs while the third-person forms were described in part B.

A. The usage of singular first-person pronoun forms in SHSRAs

*IFRS tidak berpengaruh terhadap cara saya menganalisis sekuritas. Informasi
maupun warga binaan lainnya. Saya mengidentifikasi dimensi privilese ini*

The corpora containing the word *saya* ‘I’ found in SHSRAs describes that the writer of the article is an individual. The writer denotes the word *saya* to express his/ her self-mention directly as the author of the article. From the data collected the writers did not find the usage of *aku* in SHSRAs as the singular first-person pronoun form.

data yang dilakukan oleh **peneliti** *adalah dengan melakukan pemilihan*
lainnya yang dapat digunakan oleh **peneliti** *adalah media lain seperti: media*

karena itu, dalam bagian berikutnya **penulis** *akan menganalisis dinamika*
mudah oleh mereka. Dalam keyakinan **penulis** *, banyak di antara mahasiswa akan*

The data above describes that the words *peneliti* and *penulis* are found in SHSRAs. The word *peneliti* in English means ‘a researcher’. It was reported that from all the pronouns (both singular and plural) found in the data, the usage of the word *peneliti* is the dominant. It was stated that as the highest number found 708 times the word *peneliti* applied in SHSRAs by the Indonesian authors while the word *penulis* is 372 times.

B. The usage of plural first-person forms in SHSRAs

keterbatasan anggaran di kementerian **kami** *juga menjadi kendala untuk kami bias*
Surat edaran ini saya buat setelah **kami** *melakukan kajian bahwa praktik*

Walaupun dasar epistemologi sering **kita** *abaikan, tetapi hal ini sebenarnya sangat*
atas, hal yang paling penting bagi **kita** *adalah bagaimana kita sebagai*

The words *kami* and *kita* in Indonesian language refer to ‘we’ in English. There is a different meaning between *kami* and *kita*; *kami* does not include the speaker while *kita* does.

telah dilakukan sebelumnya oleh **tim peneliti** *. Alur penelitian diawali dengan survey*
seminar yang diadakan oleh **tim peneliti** *bekerjasama dengan (IAP) dan*

Besides finding the singular pronoun forms, the writers also discovered the plural pronoun forms, *kami* and *kita* as the plural first-person pronoun forms and *tim peneliti* as the third-person pronoun forms in SHSRAs. Among the four plural pronoun forms, it was informed that *kita* as the dominant (704 data), *kami* (297 data), and *tim peneliti* (208 data). In addition, the following is the description of the usage of pronouns (both first-person and third-person) in Nature and Health Sciences Research Articles (NHSRAs) in Table 5.

Table 5. Pronouns in Nature and Health Sciences Research Articles (NHSRAs)

Forms	Pronouns		Frequency	Percentage (%)	
	First-Person	Third-Person		Subtotal	Total
Singular	<i>saya</i>		-	-	-
	<i>aku</i>		-	-	-
		<i>peneliti</i>	173	81.6	53.9
		<i>penulis</i>	39	18.4	12.1
Subtotal			212	100	64.2
Plural	<i>kami</i>		35	29.7	10.6
	<i>kita</i>		74	62.7	22.4

	<i>tim peneliti</i>	9	7.6	2.7
	<i>tim penulis</i>	-	-	-
Subtotal		118	100	35.8
	Total	330		100

The usage of pronoun form (both first-person and third-person) in NHSRAs is lesser number than in SHSRAs. It was reported, in SHSRAs totally found 2902 data while in NHSRAs is 330 data altogether.

Table 5 depicts that the pronouns *aku* and *saya* could not be found in the NHSRAs as the first-person pronoun while the words *kami* and *kita* were existed. The words *peneliti* and *penulis* as singular and *tim peneliti* as plural third-person pronouns were discovered while the phrase *tim penulis* was not found in NHSRAs. In the singular forms, the word *peneliti* (81.6%) as the third-person and *kita* (62.7%) as the first-person of the plural form were commonly used in NHSRAs.

The followings are the examples of the word *peneliti* (173 data) and *penulis* (39 data) as the third-person in the singular form found in NHSRAs.

(kelompok II, III, IV, V). Selanjutnya **peneliti** akan menguji pada kelompok
Hal ini sejalan dengan hipotesis I **peneliti** bahwa terapi bermain merupakan

imun tubuh terhadap infeksi jamur, **penulis** akan membahas respon imun host
sumberdaya Ikan, Jatiluhur. **Penulis** berterima kasih kepada rekan-rekan

Furthermore, in NHSRAs, the authors usually utilized the plural pronouns *kita* (74 data) and *kami* (35 data) as the first-person pronoun. The followings are the plural first-person pronoun forms, *kita* and *kami* as the data found in NHSRAs.

akan menguatkan, **kita** sendiri kalau **kita** buat salah nanti hasilnya akan buruk
, sedang, dan panjang. Apabila **kita** cermati, maka tampak bahwa jam buka

, seperti darah, pus, sputum, dan urin. **Kami** mendeteksi isolat MRSA secara
ekstraksi gagal dengan luaran perinatal **kami** menggunakan analisis bivariat Chi

Table 5 describes that the phrase *tim penulis* was not found in NHSRAs. It was reported only 9 data found as *tim peneliti* as the plural third-person pronouns in NHSRAs. The following are the samples of *tim peneliti* as the plural third-person pronouns in NHSRAs.

dokter di seluruh dunia dan SKDI. **Tim peneliti** mengucapkan terima kasih kepada
antijamur. Ucapan Terima Kasih **Tim peneliti** mengucapkan terima kasih atas

In conclusion, Figure 1 tried to illustrate the usage of pronouns (*saya*, *aku*, *peneliti*, *penulis*, *kami*, *kita*, *tim peneliti* and *tim penulis*) in SHSRAs and NHSRAs.

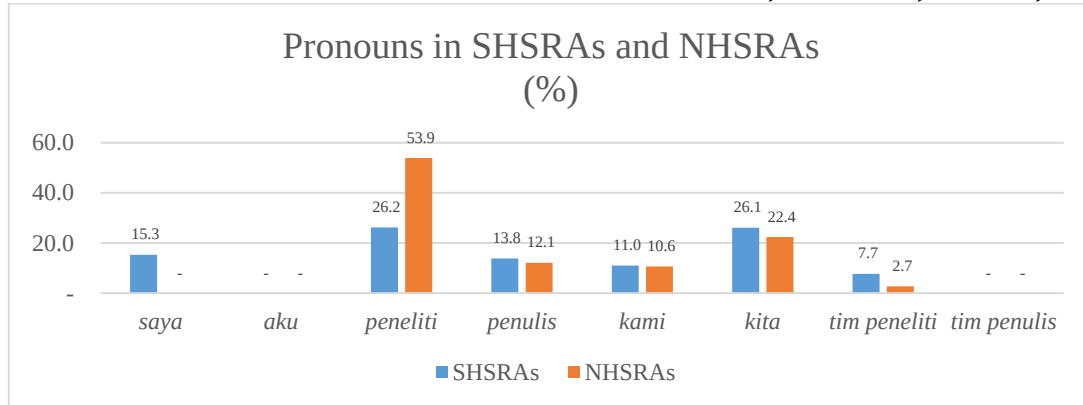


Figure 1. Pronouns in SHSRAs and NHSRAs

Figure 1 describes the usage of first-person and third-person in both singular and plural forms in SHSRAs and NHSRAs. It was drawn that the pronoun *aku* 'I' and *tim penulis* 'the authoring team' could not be found in SHSRAs. Based on the data, it shows that Indonesian authors predominantly employed the third-person pronoun *peneliti* 'the researcher' to express a single-author article and *kita* 'we' to refer to multiple authors. The choice made indicates a preference for a more formal and collective authorial stance in SHSRAs.

In NHSRAs, there was no presence of the pronouns *aku* and *tim penulis*. In addition, the unrecorded data showed that the formal first-person singular pronoun *saya* 'I' was not recorded. As with SHSRAs, Indonesian authors typically use *peneliti* when talking about a singular author and *kita* when talking about multiple authors. These patterns indicate that there is a shared tendency for both types of articles to refrain from explicitly personal references and instead use more impersonal or inclusive forms of self-mention.

Relating to the data found, the writers identified four discourse functions of the pronouns as authorial reference (Hyland, 2002b) was described in the following examples taken from our corpus.

a) explaining what was done

- (1) *Saya mengidentifikasi dimensi privilese ini dalam tiga lapisan sosial, yaitu atas, tengah, dan bawah.*
'I identified the dimensions of this privilege in three social layers, namely top, middle, and bottom.'
- (2) *Peneliti bersama observer melakukan analisis terhadap sesuatu yang telah dilakukan selama mengajar.*
'The researcher together with observers analyze something that has been done during teaching.'
- (3) *Berdasarkan hasil lapangan dan analisis data sekunder yang ada, penulis kemudian menyeleksi dan menentukan variabel yang berpengaruh terhadap kerentanan penduduk yang ada di Kecamatan Salam.*
'Based on field results and analysis of existing secondary data, the author then selected and determined the variables that affect the vulnerability of the population in Salam District.'

The first classification of the four rhetorical function is “explaining what was done” is illustrated in the examples (1) – (6). The six examples described both singular and plural forms in the first-person and third-person pronouns found in SHSRAs and NHSRAs. From the six pronouns expressed as the authorial self-mention discussed in this paper, it is only three pronouns (*saya*, *peneliti*, and *penulis* as singular forms) and three pronouns (*kami*, *kita*, and *tim peneliti* as plural forms). The data (1) – (3) explained that *saya* (1) *peneliti* (2), and *penulis* (3) are the authorial references as singular pronoun forms did the activity *mengidentifikasi* ‘to identify’ in (1), *melakukan analisis* ‘to analyse’ in (2), and (3) *menyeleksi dan menentukan variabel* in (3) to explain what the pronouns (*kami*, *kita*, and *tim peneliti*) have done.

- (4) **Kami** membaca dan menganalisis dokumen AMDAL dan menurut kami tidak beres.
‘We read and analyzed the AMDAL document and we think it's not right.’
- (5) Selanjutnya, apabila **kita** kaji segala kelebihan, kekurangan, serta keraguan dasar filosofi, epistemologi, ontologi dan formulasi aplikasi konstruktivisme, mengundang keraguan di dalam praksisnya, karena kita belum sempat berpikir secara komprehensif tentang hal tersebut.
‘Furthermore, when we examine all the advantages, disadvantages, and doubts about the basic philosophy, epistemology, ontology and application formulations of constructivism, it raises doubts in its practice, because we have not had time to think comprehensively about it.’
- (6) **Tim peneliti** menganalisis data sekunder dan primer menggunakan tahapan analisis data kualitatif.
‘The research team analysed secondary and primary data using qualitative data analysis stages.’

The other three data (4) – (6) are plural forms. The pronoun *kami* (4), *kita* (5), and *tim peneliti* (6) are plural forms as the authorial references do the activity *membaca dan menganalisis* ‘to read and to analyze’ in (4), *kaji* ‘examine’ in (5), and *menganalisis* ‘to analyze’ in (6) described the pronouns (*kami*, *kita*, and *tim peneliti*) have done.

b) structuring the discourse

- (7) Pada bagian pertama, **saya** akan membahas stratifikasi sosial di rutan.
‘In the first part, I will discuss social stratification in prisons.’
- (8) Beberapa masukan yang direkomendasikan untuk pengembangan penelitian berikutnya, yaitu: pertama, **peneliti** berikutnya dapat mencari faktor-faktor lain yang terkait dengan implementasi sistem pengukuran kinerja.
‘Some inputs are recommended for further research development, namely: first, the next researcher can look for other factors related to the implementation of a performance measurement system.’
- (9) Oleh karena itu, dalam bagian berikutnya **penulis** akan menganalisis dinamika di balik wacana reposisi keterlibatan masyarakat ke dalam pengarus-utamaan kebijakan-kebijakan pemerintah yang semakin besar dorongannya akhir-akhir ini.
‘Therefore, in the next section, the author will analyze the dynamics behind the discourse of repositioning community involvement into the mainstream of government policies, which has been increasingly encouraged recently.’

The second classification of the discourse functions is “structuring the discourse”. It is reported that the pronouns in data (7) - (9) are singular forms. The phrase *Pada bagian pertama, saya akan membahas...* in data (7) illustrates that the sentence is initiated by the phrase *Pada bagian pertama* to describe the first stage which was followed by *saya akan membahas* as a singular pronoun *saya* who did the action *akan membahas* ‘will discuss’. In data (8), the usage of the word ... *pertama* ‘the first’ and in data (9) is initiated by the words *dalam bagian berikutnya* ‘in the next section’ to indicate “structuring the discourse”.

- (10) *Selanjutnya kami mewawancarai Ibu Ela Romlah.*
‘Then we interviewed Mrs. Ela Romlah.’
- (11) *Pertama-tama kita harus menentukan posisi masing- masing reproduksi modal sosial Ahmad Hidayat Mus.*
‘First of all we have to determine the position of each reproduction of social capital Ahmad Hidayat Mus.’
- (12) *Sebagai langkah awal tim peneliti mencoba merancang suatu model...*
‘As an initial step, the researchers tried to design a model...’

The plural forms detailed in data (10) – (12) indicated “structuring the discourse”. The data (10) is started by the word *selanjutnya*, it means that the pronoun *kami* ‘we’ has discussed something before. Data (11) is commenced by the *Pertama-tama* ‘first of all’ while data (12) *Sebagai langkah awal* ‘As an initial step’ to denote the “structuring the discourse”.

c) showing a result

- (13) *Sedangkan proses kebijakan yang saya nilai paling krusial adalah tahapan implementasi kebijakan yaitu tahapan dimana sebuah tujuan kebijakan akan dilaksanakan dengan seluruh sumber daya dan potensi yang ada maka penulis memilih teori.*
‘Meanwhile, the policy process that I consider to be the most crucial is the stage of policy implementation, namely the stage where a policy goal will be implemented with all available resources and potential, so the authors choose theory.’
- (14) *Pada tahap pelaksanaan pembelajaran, saat mengajar di kelas kontrol peneliti tidak mengalami kesulitan karena siswa sudah terbiasa mendapatkan pembelajaran langsung (direct instruction) sebelumnya.*
‘At the learning implementation stage, when teaching in the control class the researcher had no difficulties because the students were used to getting direct instruction beforehand.’
- (15) *Berdasarkan hasil pengamatan penulis dapat dilihat dari banyaknya masyarakat yang membawa surat pengantar bebas biaya administrasi dari Kepala Lingkungan membuktikan bahwa masyarakat mempunyai motivasi yang tinggi dalam berpartisipasi terhadap pembangunan di Kelurahan Cabenge.*
‘Based on the author's observations, it can be seen from the large number of people who bring cover letters free of administrative fees from the Head of the Environment, proving that the community has high motivation in participating in development in Cabenge Village.’

Besides the two rhetorical functions discussed earlier, “showing a result” in IRAs are described in the following examples (13) – (18). The phrase *Sedangkan proses kebijakan yang saya nilai*

paling krusial adalah ‘Meanwhile, the policy process that I consider to be the most crucial is ‘ (13) was chosen by the pronoun *saya* to display “showing the result”. The data (14) and (15) the pronoun *peneliti* picked the phrase ... *peneliti tidak mengalami kesulitan karena siswa sudah terbiasa mendapatkan pembelajaran langsung (direct instruction) sebelumnya* ‘... the researcher had no difficulties because the students were used to getting direct instruction beforehand’ in (14) and the phrase *dapat dilihat dari banyaknya masyarakat yang membawa surat pengantar bebas biaya administrasi dari Kepala Lingkungan membuktikan bahwa masyarakat mempunyai motivasi yang tinggi dalam berpartisipasi terhadap pembangunan di Kelurahan Cabenge* ‘it can be seen from the large number of people who bring cover letters free of administrative fees from the Head of the Environment, proving that the community has high motivation in participating in development in Cabenge Village ‘ in (15) are also to describe “showing of the result” of the *peneliti* in (14) and *penulis* in (15) mentioned.

- (16) *Dinamika kemiskinan rumah tangga terbagi menjadi tiga, yaitu rumah tangga yang selalu miskin (miskin kronis), miskin sementara (transien) dan tidak pernah mengalami kemiskinan pada periode penelitian, di mana **kami** menemukan bahwa sekitar 4,78 persen penduduk di Indonesia mengalami kemiskinan kronis dan sebanyak 17,88 persen penduduk mengalami kemiskinan sementara (transien) pada periode tahun 2011-2013.*
‘The dynamics of household poverty is divided into three, namely households that are always poor (chronic poor), temporarily poor (transient) and have never experienced poverty during the study period, where we found that around 4.78 percent of the population in Indonesia experienced chronic poverty and 17.88 percent of the population experienced temporary (transient) poverty in the 2011-2013 period.’
- (17) *Di balik itu **kita** menemukan adanya semacam dislokasi politik (political dislocations), atau terlepasnya muatan-muatan substansi politik demokratis dari bekerjanya kelembagaan politik, atau political displacement terlemparnya aktor-aktor politik dari kelembagaan politik demokrasi.*
‘Behind this we find a kind of political dislocation, or the release of the contents of democratic political substance from the workings of political institutions, or political displacement when political actors are thrown out of democratic political institutions.’
- (18) *Dari hasil eksplorasi, **tim peneliti** dapat mengkonseptualisasikan model dan menjelaskan mekanisme kerja BUM Desa sebagai hybrid institutions dalam mengelola dan memanfaatkan sumber daya milik bersama untuk pemberdayaan masyarakat desa di Desa Pongkok.*
‘From the results of the exploration, the researchers were able to conceptualize the model and explain the working mechanism of BUM Desa as a hybrid institution in managing and utilizing shared resources for empowering rural communities in Pongkok Village.’

Data (16) – (18) showed the usage of plural pronoun forms *kami*, *kita*, and *tim peneliti*. The phrase *bahwa sekitar 4,78 persen penduduk di Indonesia mengalami kemiskinan kronis dan sebanyak 17,88 persen penduduk mengalami kemiskinan sementara (transien) pada periode tahun 2011-2013* is the result which was found by the plural pronoun *kami* in (16). It is similar to the phrase *adanya semacam dislokasi politik (political dislocations), atau terlepasnya muatan-muatan substansi politik demokratis dari bekerjanya kelembagaan politik, atau*

political displacement terlemparnya aktor-aktor politik dari kelembagaan politik demokrasi which was described by the plural pronoun *kita* in (17), and *model dan menjelaskan mekanisme kerja BUM Desa sebagai hybrid institutions dalam mengelola dan memanfaatkan sumber daya milik bersama untuk pemberdayaan masyarakat desa di Desa Ponggok* which was discovered by the plural pronoun *tim peneliti* in (18). The last three data mentioned are the examples of the “showing of the result” by using the pronouns *kami*, *kita*, and *tim peneliti*.

d) making a claim

- (19) *Bagi saya*, peningkatan kemampuan guru memang perlu, agar pendidikan bisa maju.
‘For me, improving the ability of teachers is indeed necessary, so that education can progress’.
- (20) Melalui studi kasus, **peneliti** berfokus pada eksplorasi secara mendalam terhadap sebuah kegiatan, aktivitas, maupun peristiwa yang terjadi terhadap individu-individu dalam kelompok tertentu.
‘Through case studies, the researcher focuses on in-depth exploration of an activity, activity, or event that occurs to individuals in a particular group.’
- (21) **Penulis** berpandangan bahwa jaringan sosial pesantren yang bernama Hamida menjadi sangat penting dalam dinamika politik elektoral di Tasikmalaya, terutama melalui jejaring yang dibangun oleh para kiai sehingga menjadi kekuatan politik yang signifikan bagi kandidat kepala daerah di Tasikmalaya.
‘The author views that the social network of a *pesantren* named Hamida is very important in the dynamics of electoral politics in Tasikmalaya, especially through networks built by kiai so that they become a significant political force for regional head candidates in Tasikmalaya.’

Data (19) – (21) described the singular *saya*, *peneliti*, dan *penulis* as the first-person pronouns. In data (19) the phrase *peningkatan kemampuan guru memang perlu, agar pendidikan bisa maju* described “making a claim” by the pronoun *saya*. The sentence (20) *Melalui studi kasus, peneliti berfokus pada eksplorasi secara mendalam terhadap sebuah kegiatan, aktivitas, maupun peristiwa yang terjadi terhadap individu-individu dalam kelompok tertentu* illustrates that the pronoun *peneliti* as a singular pronoun “making a claim” on *pada eksplorasi secara mendalam terhadap sebuah kegiatan, aktivitas, maupun peristiwa yang terjadi terhadap individu-individu dalam kelompok tertentu* through a verb *berfokus* ‘focuses’. Not only the singular first-person pronouns *saya* and *peneliti*, but also the pronoun *penulis* as described in data (21). In this data, the pronoun *penulis* “making a claim” in the sentence *bahwa jaringan sosial pesantren yang bernama Hamida menjadi sangat penting dalam dinamika politik elektoral di Tasikmalaya, terutama melalui jejaring yang dibangun oleh para kiai sehingga menjadi kekuatan politik yang signifikan bagi kandidat kepala daerah di Tasikmalaya* by using the verb *berpandangan* ‘views’.

- (22) **Kami** melihat ada dua hal yang menjadi kendala utama dalam hal ini, di samping adanya pengabaian mengenai sosialisasi dan penyebaran informasi yang sangat minim.
‘We see that there are two main obstacles in this regard, in addition to the neglect of socialization and the dissemination of information that is very minimal.’

- (23) Walaupun **kita** dapat mengasumsikan tentang keberadaan dunia di luar diri kita, tetapi kita tidak mempunyai akses langsung kepadanya.
'Although we can assume the existence of a world outside of us, we do not have direct access to it.'
- (24) Menanggapi hal tersebut, **tim peneliti** mengingatkan warga bahwa kegiatan koperasi itu murni urusan ekonomi, sementara kebutuhan dan permasalahan masyarakat desa ini tidak hanya sebatas urusan ekonomi.
'Responding to this, the research team reminded residents that cooperative activities are purely economic matters, while the needs and problems of the village community are not only limited to economic matters.'

Besides the three singular forms mentioned, *saya*, *peneliti*, and *penulis*, the plural forms of the third-person pronouns *kami*, *kita*, dan *tim peneliti* were also found as "making a claim" in the data. The pronoun *kami* in data (22) shows that the phrase *ada dua hal yang menjadi kendala utama dalam hal ini, di samping adanya pengabaian mengenai sosialisasi dan penyebaran informasi yang sangat minim* was selected by the pronoun *kami* 'we' by using the verb *melihat* 'see' as "making a claim". The phrase *tentang keberadaan dunia di luar diri kita, tetapi kita tidak mempunyai akses langsung kepadanya* as "making a claim" by using the pronoun *kita* as third-person (inclusive the reader) through the verb *dapat mengasumsikan* 'can assume' in (23). The clause *bahwa kegiatan koperasi itu murni urusan ekonomi, sementara kebutuhan dan permasalahan masyarakat desa ini tidak hanya sebatas urusan ekonomi* in (24) was also described as "making a claim" by applying the third-person pronoun *tim peneliti* and the verb and object *mengingatkan warga* 'reminded residents'.

Conclusion

Concerning the authorial references in IRAs, the writers focused on the group of social & humanities sciences research articles (SHSRAs) and the nature & health sciences research articles (NHSRAs). Firstly, the writers identified the frequency of the pronouns (both singular and plural forms) in IRAs covering SHSRAs and NHSRAs. Secondly, the writers also reported the usage of the four discourse functions of the pronouns as authorial reference refers to Hyland's taxonomy, covering explaining what was done, structuring the discourse, showing a result, making a claim.

It was outlined that both sources (SHSRAs and NHSRAs) used the word *peneliti* as the third-person pronoun is commonly applied. In SHSRAs, the singular form *aku* is no data found while in NHSRAs, is not only the singular form *aku* but also *saya* is no data recorded. The dominant usage of the plural forms found in the data is *kita* while the *tim penulis* was not found in both SHSRAs and NHSRAs.

In relation to the discourse functions of the pronouns as authorial reference refers to Hyland's taxonomy, it was reported that the explaining what was done, structuring the discourse, showing a result, making a claim were detected in both SHSRAs and NHSRAs.

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THE IMPACT OF HALAL TALENT DEVELOPMENT ON ENHANCED FOOD SECURITY IN MALAYSIA: A TRIPLE HELIX PERSPECTIVE

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Abstract: *In the context of a rapidly growing halal industry, the intersection of talent development and food security has become increasingly critical, particularly in Malaysia. This conceptual paper explores the role of halal talent development driven by collaboration among academia, industry, and government in enhancing national food security. Guided by the Triple Helix Model, this study integrates the contributions of academia in curriculum and research, the industry's role in providing practical exposure, and the government's support through policy and regulation. The primary objective of this study is to examine the effect of halal related curriculum and training programs on the food security in Malaysia. Secondly, it aims to evaluate industry-academia collaboration in talent development contributes to a sustainable food security in Malaysia. These objectives are critical to understanding structured partnerships can generate a competent halal workforce that supports a secure, traceable, and resilient food system. A qualitative research method is propose for this conceptual paper, incorporating content analysis of existing literature, policy documents, and industry reports. The conceptual framework is develop based on insights drawn from the Triple Helix Model, positioning talent as a strategic resource to achieve competitive and sustainable advantages in halal food systems. Although no empirical data, this paper offers a theoretically grounded model that highlights the interlinkages between structured halal talent development and food security outcomes. The anticipated result is a conceptual pathway demonstrating enhanced employability through education and industry engagement strengthens food security infrastructure.*

Keywords: *Halal Talent Development, Food Security, Triple Helix Model*

Introduction

Malaysia aims to position itself as a global halal hub, with a growing emphasis on food safety, traceability and supply chain integrity under the broader concept of food security. Despite regulatory frameworks like JAKIM's Malaysia Halal Certification, the halal food industry faces persistent challenges including manpower shortages, skill mismatches, and compliance failures especially among SMEs which compromise product authenticity and consumer trust (Hashim & Ismail, 2024). Recent studies highlight that workforce skill gaps are a critical barrier: reliance on foreign labor with limited understanding of halal standards leads to

operational inefficiencies and noncompliance in production and certification processes (Rahman & Hassan, 2023). Similarly, research shows that halal certification authorities struggle with limited trained human resources and weak career path systems, discouraging halal talent retention and undermining industry compliance (Hashim & Ismail, 2024).

At the same time, halal traceability systems such as block chain, internet of things (IoT), and traditional digital tracing tools are increasingly recognized as essential for verifying halal compliance throughout the supply chain. Their effective adoption depends not only on technology, but on a capable workforce trained to implement and manage these systems reliably (Ab, Halim & Yusof, 2023). Studies in Malaysian SMEs reveal that traceability systems perceived as useful and easy to adopt significantly improve halal integrity and food safety standards (Abd Rahman, et. al. 2022). This landscape underlines the strategic importance of halal talent development coordinated through the Triple Helix of academia, industry, and government. Academic institutions have begun integrating halal-focused curriculum aligned with industry needs under frameworks like the Malaysian Qualifications Framework (MQF), yet gaps remain between theoretical training and practical skills demanded by industry (Aziz, & Wahab, 2021). High-quality talent becomes a strategic resource enabling Malaysia's halal food system to be secure, transparent and sustainable.

Literature Review

Definition of Food Security

Food security means ensuring that all people, at all times, have access to enough safe, nutritious, and affordable food to live healthy and active lives (Food and Agriculture Organization [FAO], 2008). It is based on four important aspects: food availability (enough food must be produced), food access (people must be able to afford and reach food), and food utilization (food must be nutritious and safe), and food stability (food must be available consistently over time) (FAO, 2023).

Around the world, food security is becoming harder to maintain due to climate change, growing populations, unstable supply chains, and economic gaps. These global challenges also affect developing countries like Malaysia. In Malaysia, food security focuses on having enough food for its people, supported by local food production, stable prices, and access to safe and healthy food (Ministry of Agriculture and Food Security [MAFS], 2024).

Although Malaysia has good natural resources and a favorable climate, it still relies heavily on imported food like rice, beef, dairy, and vegetables (Department of Statistics Malaysia [DOSM], 2023). This dependency makes Malaysia vulnerable to changes in global prices and food supply, as seen during the COVID-19 pandemic.

Another major issue is food access and affordability, especially for lower income families, rural populations, and Indigenous groups. To address these challenges, Malaysia's National Agrofood Policy 2.0 (2021–2030) aims to strengthen food security through sustainable farming, new technologies, better food distribution, and increasing the country's self-sufficiency (MAFS, 2024). Government initiatives also focus on supporting local food production and reducing import dependence.

The third pillar, food utilization, highlights the importance of food quality and nutrition. Malaysia has improved its food safety and public nutrition systems, but still faces the “double burden of malnutrition” both undernutrition and obesity, especially in urban and rural poor communities (World Health Organization [WHO], 2022).

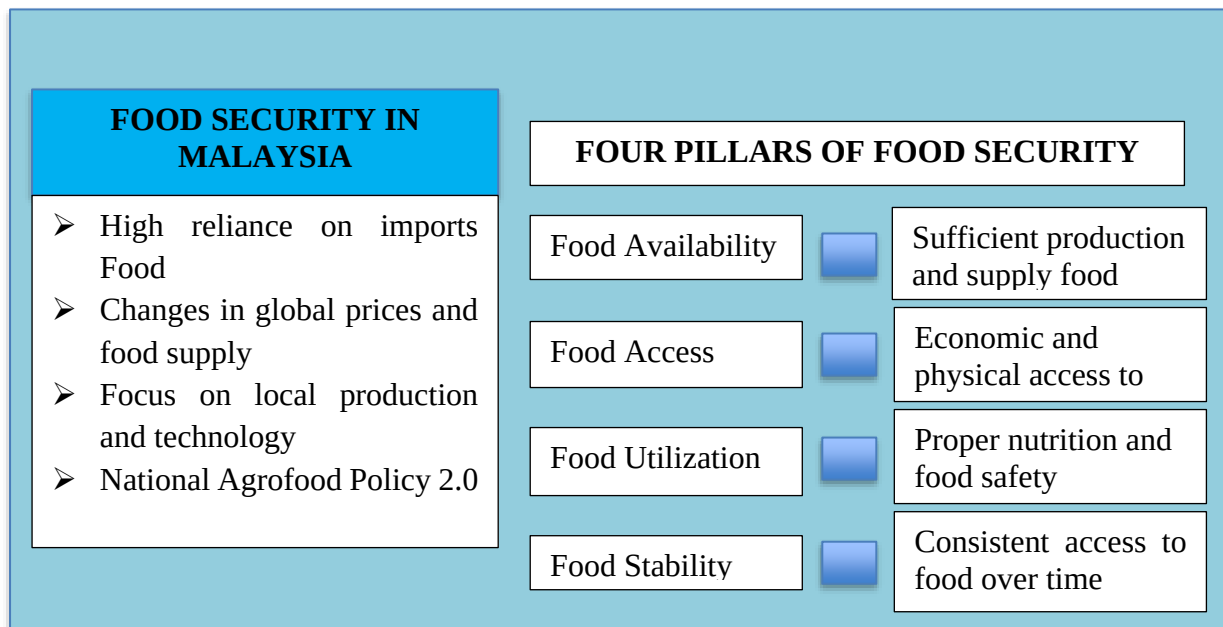


Figure 1: Summary of Food Security in Malaysia and Four Pillars

Source: Food and Agricultural Organization and Ministry of Agriculture and Food Security

Halal Talent Development

Halal talent refers to skilled individuals that are knowledgeable and competent in halal standards, certification, supply chain management, and Islamic food laws. In Malaysia, the development of halal talent is increasing seen as critical to enhancing national food security. As a global halal hub, Malaysia’s food system must comply with stringent halal requirements to ensure the safety, quality, and religious acceptability of food products. Competent halal professionals help maintain integrity across the halal supply chain from production to distribution thus reducing risks of contamination or non-compliance (Ab Talib et al., 2021).

Malaysia’s Halal Industry Master Plan 2030 underscores the pressing need to develop domestic halal workforce capacity, aiming for a 50% increase in professionals in halal-related fields by 2030. This talent development strategy mandates alignment between academia’s halal curriculum and industry-relevant competencies. A well-trained halal workforce also supports the growth of local halal food production, reducing dependency on imports and enhancing self-sufficiency both vital aspects of food security.

Furthermore, halal talent contributes to consumer confidence, international trade competitiveness, and regulatory enforcement (Zulfakar et al., 2019). Although systematic research explicitly linking halal talent development to food security outcomes in Malaysia remains limited, the logic is clear: a skilled halal workforce ensures compliance, traceability, and food safety key pillars of food security in halal systems. Zainol et al. (2018) analysed Malaysia’s seed industry and found that firms with strong intangible assets such as trained

workforce, robust policy, and brand credibility were more capable of achieving growth and contributing to food availability, stability, access, and utilization. These findings reinforce the notion that human capital is a strategic resource for achieving national food resilience.)

Triple Helix Mode

The Triple Helix framework collaboration among university, industry, and government has been increasingly applied as a pathway toward innovation-driven development. Ashikin and Zaharul (2024) conducted a case study in Malaysia revealing that while Triple Helix collaborations face structural and policy level challenges (such as misaligned incentives), the model remains effective in promoting coordinated innovation efforts. Earlier work by Zakaria and Nasruddin (2019) also demonstrated Malaysia's successes and barriers in university, industry, government research partnerships, identifying intermediary platforms facilitate knowledge transfer and innovation uptake. Although these studies focus on innovation broadly, the logic extends to food security: when universities research sustainable agro-tech, industries adopt it, and government sets supportive policy, the combined effect strengthens national food systems.

Table 1: Key Research Contributions Linking Talent Development and the Triple Helix Model to Food Security in Malaysia

Title	Focus Area	Contribution to Food Security	Source
Integrated Farming & Universities in Food Security	University-led training in integrated farming	Enhances availability, access, utilization, stability	Hameed Sultan et al. (2024)
Halal Supply Chain Innovation	Digital skills in halal food chains	Improves traceability and food safety	Belkhatir et al. (2020)
Social Capital in Food Security	Community-based knowledge & training	Strengthens all four pillars locally	Khazami et al. (2020)
Blockchain & AI in Halal Traceability	Technology adoption for food safety	Boosts transparency and halal assurance	Alourani & Khan (2024)
Seed Industry & Food Resilience	Triple Helix and seed industry growth	Supports value chain and productivity	Zainol & Chua (2021)
Rice Research for Self-Sufficiency	Public research institutions in rice innovation	Increases national food self-sufficiency	Mohamad Noor et al. (2021)

This study will adopt a quantitative research design using a structured questionnaire survey to examine the impact of halal talent development on food security in Malaysia, mediated by the Triple Helix collaboration (academia, industry, government). The target population includes professionals in halal food production SMEs, educators in halal-related programs, and government officers in agriculture or food safety. A stratified random sampling technique will be use to ensure representation across the three Triple Helix sectors. The survey instrument will be adapted from validated constructs in previous studies related to talent development, innovation ecosystems, and food security (e.g., Hameed Sultan et al., 2024; Khazami et al., 2020).

Data will be analyse using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test both direct and mediating effects among variables. This approach is suitable for testing complex relationships involving latent variables. Validity and reliability will be ensure through pilot testing and expert reviews. Although the data collection is yet to begin, anticipated limitations include response bias and access to participants across sectors. Nonetheless, the methodological rigor in sampling and instrument design aims to ensure the reliability and generalizability of the results.

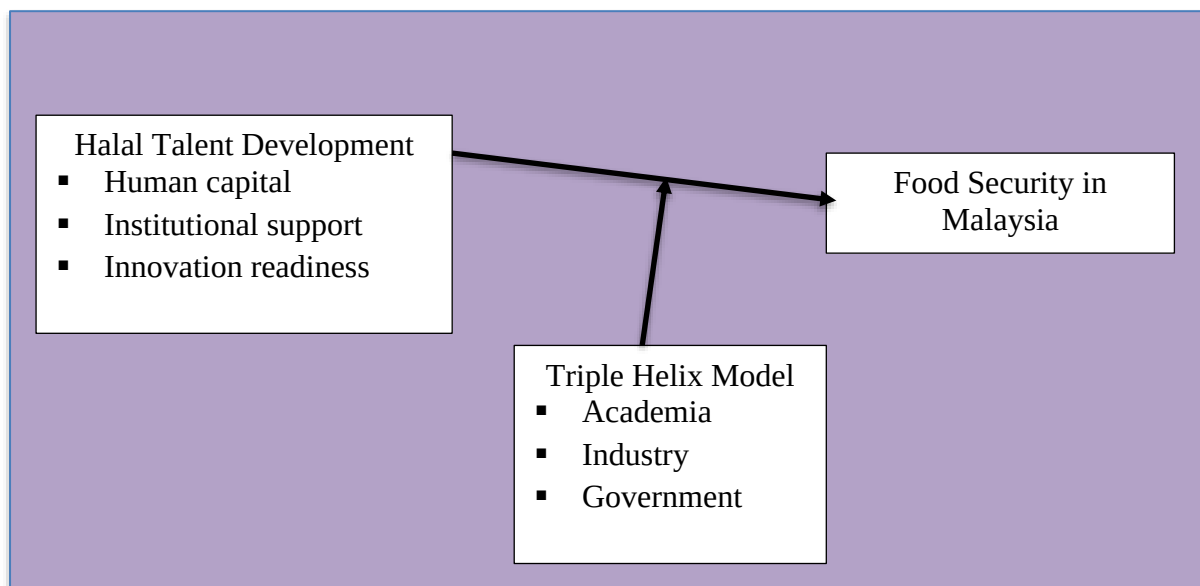


Figure 2: Theoretical framework The Impact of Halal Talent Development on Enhanced Food Security in Malaysia: A Triple Helix Perspective

Discussion

Based on existing literature and the proposed theoretical framework, it is anticipate that halal talent development will have a significant positive effect on Malaysia's food security pillars particularly in terms of availability, access, and utilization. It is also expect that the mediating role of the Triple Helix collaboration will strengthen the relationship between talent development and food system resilience, aligning with previous research on innovation ecosystems and agri food security.

The discussion will focus on, academic curricula, and industrial up skilling can aligned to support halal food supply chains. Findings expected to highlight key areas for institutional improvement and investment, especially in the context of digitalization and cross sectoral coordination. Additionally, more focus to embedding digital and halal compliance competencies within tertiary education, especially in areas such as block chain traceability, AI for quality control, and Shariah compliant food technologies. These efforts would enhance Malaysia's global competitiveness and improve the reliability of its halal food system.

Conclusion

Halal talent development, it is recommend that academic institutions align their curricula with the evolving needs of the halal food industry. Continuous collaboration between universities, government agencies, and industry players should be joint through research, internship programs, and skill certification pathways. Future research should focus on empirically examining the specific impact of halal talent development on each pillar of food security within the Malaysian context. Future empirical research examining the long-term impact of Triple Helix collaboration such as graduate employability, food safety metrics, and innovation adoption in halal SMEs can provide actionable insights. Additionally, comparative studies across ASEAN countries could benchmark Malaysia's progress in developing a resilient halal food system.

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CONSUMER PAYMENT BEHAVIOUR IN DIGITAL PAYMENT: A SYSTEMATIC LITERATURE REVIEW

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Abstract: *Digital payment systems have grown quickly around the world as more people have smartphones where the internet is getting better by the service provider. This study aims to explore the consumer payment behaviour within the evolving landscape of digital payment system. It seeks to uncover key constructs, theoretical approaches, and publication patterns that define current research in fintech-driven consumer behaviour. The systematic literature review is applied by using the PRISMA guideline. Inclusion criteria focused on studies examining consumer payment behaviour using empirical data. Exclusion criteria filtered out irrelevant domains such as marketing, health tech, and blockchain. Journals were classified by quartiles, and theoretical frameworks including TAM and UTAUT were identified. This study shows that since 2021, there has been a big increase in research on how people use digital payments. Most of this research has been on general consumers, young people, and business groups. The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) were the two theories that were used the most by the previous researchers. Factors that affected decisions were how easy it seemed to use, trust, financial knowledge, and social pressure. Combining trust-based and innovation diffusion theories indicated that the model's resilience might be improved in promising ways. Thus, the potential future work should explore underrepresented groups such as educators and elderly users and assess regional disparities in digital payment. This SLR contributes a comprehensive map of consumer payment behaviour research in the fintech domain, highlighting theoretical advancements and population-specific insights. It offers valuable recommendations for scholars, practitioners, and policymakers seeking to enhance consumer payment behaviour through digital technologies*

Keywords: *Consumer behaviour, Digital payment, Mobile payment, Trust*

Introduction

Digital financial technology, or FinTech, has advanced so quickly that it has fundamentally changed how individuals manage their finances, make purchases, and perform transactions. The rising use of digital payment methods like contactless cards, mobile wallets, and Quick Response (QR) code payments in place of conventional cash-based systems is the clearest example of this change. In both developed and emerging countries, these changes are not just changing consumer preferences but also redefining the larger financial environment (Celestin, 2024). Due to that the decision-making procedures, inclinations, and behaviours involved in choosing payment options for goods and services are all included in consumer payment

behaviour. According to Teixeira, Kallas, and Dias (2024), they claim that this behaviour is influenced by behavioural, emotional, and cognitive elements. They are intricately linked to the consumer's views of convenience, value, and trust. These dynamics have changed as a result of the shift to digital payment methods, which frequently increase efficiency. But the issues raise in money management and excessive spending because cashless transactions are intangible (Gould, 2024).

Digital payment systems have grown quickly around the world as more people have smartphones where the internet is getting better by the service provider. Rui (2023) says that mobile payments and contactless technologies now offer levels of speed and convenience that have never been seen before. This is helping cashless societies grow in using for purchasing goods and services. People are more and more interested in digital transactions because they are so easy to use. These transactions have features like instant transfers, real-time updates, and connections to other financial services. With a quick adoption by the individuals, it means that cybersecurity needs to keep coming up with new ideas to stop fraud and build user trust (Hossain, Islam, Rahman, & Arif, 2024).

Moreover, FinTech innovations have changed the way payments are made around the world by offering flexible, user-friendly financial solutions. The COVID-19 pandemic sped up this disruption a lot between 2019 and 2024, forcing people to use digital alternatives while following physical distancing rules (Yuan, 2024). The rise of digital wallets, embedded finance, and real-time payments has changed how people of all ages spend money, but especially Generation Z, who prefer tech-based solutions instead of traditional systems. FinTech is said to have improved financial inclusion and given consumers more power around the world. However, it also raises concerns about data privacy and digital literacy (Celestin, 2024).

In Malaysia, the digital payment situation has grown a lot, which is in line with the country's efforts to promote a digital economy. The shift to digital transactions has been sped up by government programs like eTunai Rakyat, the Central Bank's Financial Sector Blueprint 2022–2026, and the growth of FinTech startups. Figure shows that the volume of financial transactions in Malaysia in 2024.

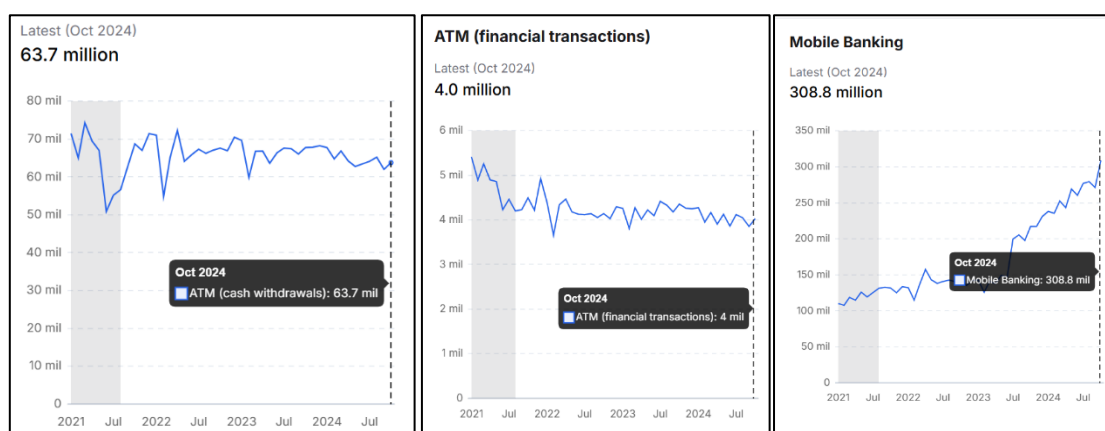


Figure 1: Volume of Financial Transactions in Malaysia (2024)

Source: Government of Malaysia, Bank Negara Malaysia Payment Statistics Dashboard

Referring to Figure 1, Bank Negara Malaysia (2024) says that as the country becomes more digitally advanced, its financial authorities will be better able to keep an eye on the economy. The national dashboard shows current trends in electronic payments based on Bank Negara Malaysia's monthly payment statistics. For example, there were 63.7 million ATM cash withdrawals, 4 million ATM financial transactions, and 308.8 million mobile banking transactions, showing that more people are choosing mobile-based financial solutions. Therefore, to gain a better understanding on how the different generations and profession groups use digital payment systems, it is imperative to look at consumer payment behaviour in the digital context, particularly among educators, who are still underrepresented in current studies.

Method

The systematic literature review used in this study to explore the existing literature comprehensively and methodically to answer the specific research questions. In order to ensure transparent and comprehensive reporting of systematic reviews, Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) method is used to provide a framework and a checklist for this study.

Review Method

First, we will collect relevant sources of information such as Scopus that discuss consumer behaviour and digital payment since 2015 – 2025. This selection is used to select studies that are relevant to the research topic. Inclusion criteria include studies that focus on consumer payment behaviour and digital payment using empirical data analysis. Whereas, exclusion criteria include literature that does not relevant or no fulfil standard methodological such as marketing, major clinical study, mobile health, NFC, pandemic, satisfaction, social media, sustainable development, digital health, digital divide, deep learning, customer satisfaction, cryptography, costs, cryptocurrency, cost, controlled study, continuance intention, competition, child, blockchain, bitcoin, artificial intelligence, adolescent, 5G mobile communication systems, telemedicine, and MI Leath. Table 1 shows the inclusion and exclusion criteria that considered in this study:

Table 1: Inclusions & Exclusion Criteria Consumer Payment Behaviour and Digital Payment

Payment	
Inclusions Criteria	- Keywords from abstract that related to: - Digital payment - Mobile payment - Consumer behaviour - Financial inclusion - Relevant articles from 2021 – 2025 - Articles wholly written in English
Exclusions Criteria	- Automatic remove 30 keywords from Scopus: - marketing, - major clinical study, - mobile health, - NFC, - pandemic, satisfaction, social media,

- sustainable development,
- digital health,
- digital divide,
- deep learning,
- customer satisfaction,
- cryptography,
- costs,
- cryptocurrency,
- cost,
- controlled study,
- continuance
- intention,
- competition,
- child,
- blockchain,
- bitcoin,
- artificial intelligence,
- adolescent,
- 5G mobile communication systems,
- telemedicine,
- MI Leath.

2. Articles year from 2016 – 2020

Research Questions

To guide the systematic literature review on consumer payment behaviour in digital payment, the following research questions have been formulated:

RQ1: Which journal is the most significant publication for consumer payment behaviour towards digital payment?

RQ2: What theory adoption approaches are used most often for consumer payment behaviour in digital payment?

RQ3: What are the factors or constructs that most influence consumer payment behaviour in digital payment?

RQ4: What recommendation factors are proposed for consumer payment behaviour in digital payment?

RQ5: What are the most respondents in consumer payment behaviour being discussed in publications?

Data Collection Process

This literature review investigated the methods, approaches, and trends that have been employed to enhance external construction research between 2015 and 2025. In accordance with the PRISMA guidelines, the specific outcomes for which aimed to collect data for this study. These results were predetermined in accordance with our research objectives and inquiries. In accordance with the PRISMA guidelines, we implemented specific methodologies to assess the potential for bias in the studies that were included. The internal validity and quality of each study were evaluated during this stage. Initially, we identified 529 publications that

satisfied the predetermined criteria from the SCOPUS website. These publications were subsequently narrowed down to 50 publications from Scopus-indexed journals. Electronic Commerce Research, International Journal of Bank Marketing, Journal of Theoretical and Applied Electronic Commerce Research, and Technological Forecasting and Social Change were among the journals that were classified as Q1, which is 52% of total journals. Furthermore, 28% of the journals were classified as Q2, and the Journal of Risk and Financial Management was the most prevalent. Lastly, 10% of the journals were classified as Q3, which included the International Journal of Electronic Finance, International Journal of Sustainable Development and Planning, International Review of Management and Marketing, Investment Management and Financial Innovations, and Latin American Journal of Central Banking. The following Figure 1 illustrates the distribution of quartiles of articles according to journals:

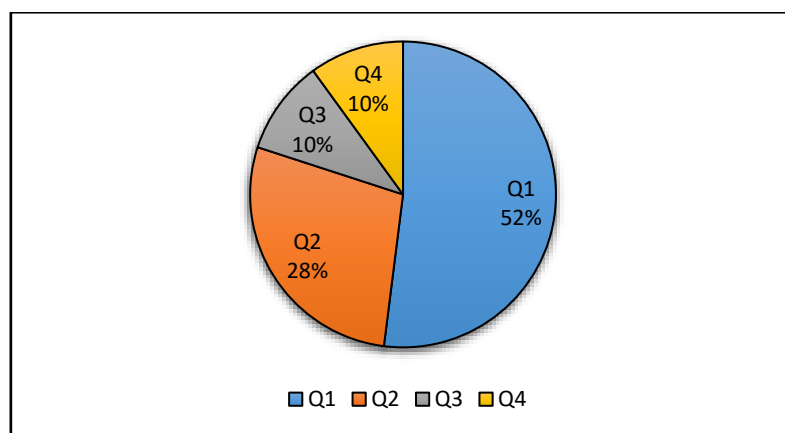


Figure 1: Distribution of Quartiles of Articles According to Journals

Analysis and Evaluation

With a particular focus on literature related to digital payments, consumer payment behaviour, and mobile payments, this section describes the critical analysis and evaluation of the research that were part of the systematic literature review. A thorough screening and evaluation procedure was conducted in accordance with the PRISMA methodology (Page et al., 2021) to guarantee that only studies that were in line with the goals of the research were kept for synthesis.

All potentially suitable papers were subjected to a thorough full-text examination in order to improve the review's validity and applicability. After a more thorough review, a number of studies that briefly seems pertinent based on their names and abstracts were eliminated during this phase. For example, articles like "Digital payment adoption in public transportation: Mediating role of mode choice segments in developing cities" were not included because they do not analyse consumer behaviour in contexts of digital or mobile payment usage, but rather promote online ticketing systems within transportation infrastructure. This kind of selective filtering enhances theme focus and coherence in accordance with best practices in systematic reviews (Boell & Cecez-Kecmanovic, 2015).

The evaluation of included studies was structured around the following criteria as presented in Table 2:

Table 2: Evaluation of Included Studies Criteria

Methodological Quality	Every study was evaluated according to its sample size, data collection strategies, analysis methodologies, and research style (qualitative, mixed-method, or quantitative). This strategy improves the findings' dependability and guarantees methodological transparency (Siddaway, Wood, & Hedges, 2025).
Theoretical Grounding	The review examined whether the conceptual framework employed supports the interpretation of consumer behavior in digital and mobile payments by applying well-known theories or models (such as the Theory of Planned Behavior and the Technology Acceptance Model (Fosso Wamba, Queiroz, & Trinchera, 2020).
Validity and Reliability of Findings	Results were evaluated for consistency and relevance to actual consumer behavior, as well as for presentation clarity and whether they were statistically or thematically validated.
Topical Relevance	The research' thematic alignment with this review's main subject was given particular consideration. To ensure thematic consistency, articles that examined institutional, infrastructure, or vendor-side concerns that had no direct bearing on the payment behavior of specific customers were excluded (Kitchenham et al., 2008).
Contribution to Research Objectives	Every article that was chosen was examined for its contribution to the knowledge of consumer trends, difficulties, and behavioral patterns in the use of digital and mobile payments. This stage is essential for locating research gaps, new themes, and conceptual overlaps in the entire body of existing literature.

Findings

The results of the analysis will be managed to provide an overview of consumer payment behaviour towards of using digital payment. The following is a flowchart of the PRISMA 2020 search method shown in Figure 2 below.

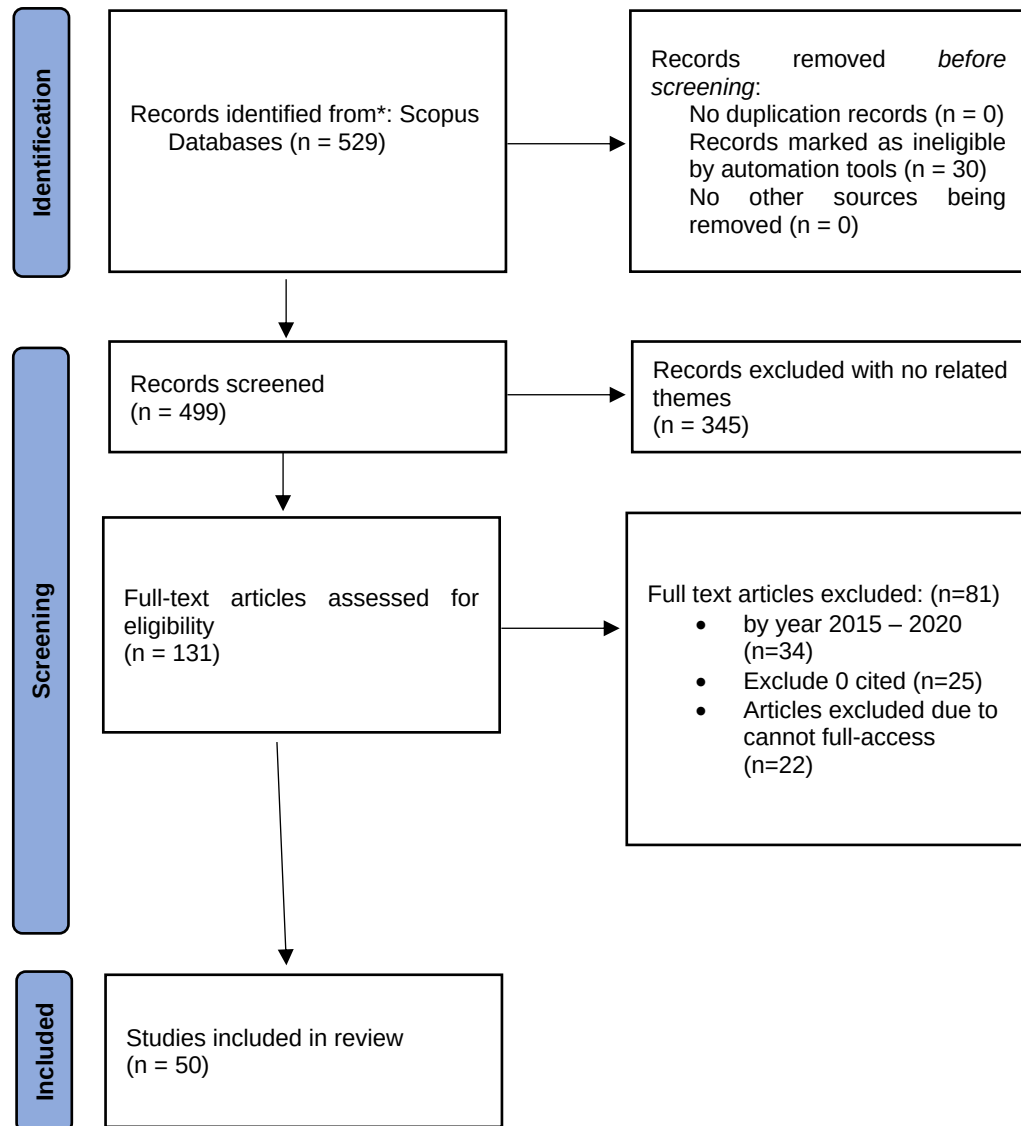


Figure 2: PRISMA Flowchart

Results and Discussion

RQ1: Significant Journal Publications

A summary of the distribution studies past progression is shown in Figure 3. This literature review takes consideration of 50 articles of primary research that look at how consumers behave when using digital payments. There are now more recent and relevant studies included because more studies have been published since 2021.

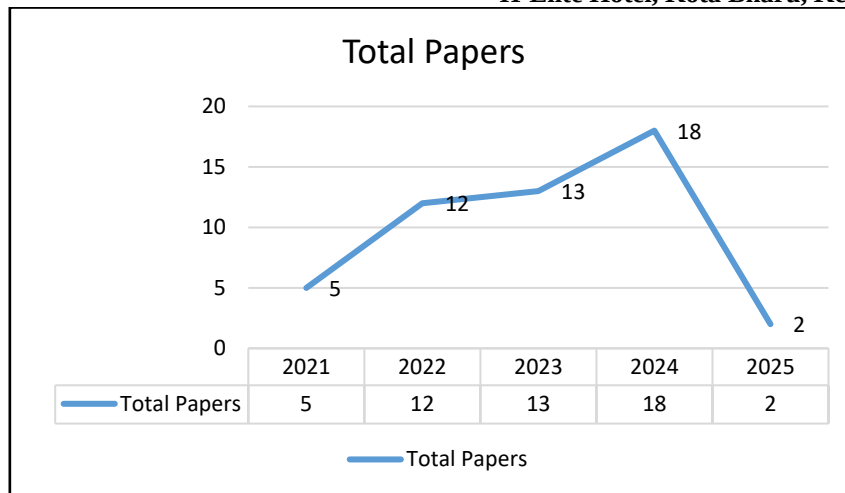


Figure 3: Publications by Year Among 50 Articles Identified

The analysis of the selected primary studies reveals the distribution of research publications pertaining to digital payment consumer behaviour across various academic disciplines. The selected five most journals that have more than one article published in the area of research. For more detailed informations are available in Table 3.

Table 3: Distribution Journals in Digital Payment Consumer Payment Behaviour

No.	Journal Name	Quartile	Amount	Source
1.	Electronic Commerce Research	Q1	2	(Agárdi & Alt, 2024), (Zhao, Li, & Yan, 2024)
2.	International Journal of Bank Marketing	Q1	2	(Shaikh, Alamoudi, Alharthi, & Glavee-Geo, 2023) (Rahman, Nguyen-Viet, Nguyen, & Kamran, 2024)
3.	Journal of Theoretical and Applied Electronic Commerce Research	Q1	2	(Wu, Lee, & Tian, 2021), (Thoumrungroje & Suprawan, 2024)
4.	Technological Forecasting and Social Change	Q1	2	(Shaikh, Glavee-Geo, Karjaluoto, & Hinson, 2023), (Jaiswal, Mohan, & Deshmukh, 2023)
5.	Journal of Risk and Financial Management	Q2	2	(Hasan et al., 2024), (Sebayang, Hakim, Bakhtiar, & Indrawan, 2024)

RQ2: Most Theory Adoption Approach

The most recent methods for figuring out customer behaviour in fintech adoption are listed in the figure. Figure 4 highlights two significant methodological approaches: the unified theory

of acceptance and application of technology (UTAUT) and the technology acceptance model (TAM). Numerous variables contribute to the popularity of these techniques. One of the most well-known theoretical frameworks, TAM, has been widely used in studies examining how financial goods and services are accepted and used. In order to understand the different elements that affect user behaviour, it offers an organized framework. Comparably, UTAUT has been quite popular in the sector, which has led to its extensive use in research on fintech adoption (Julianto et al., 2021; Nanggala, 2020; S. Singh et al., 2020). TAM is often utilized as a basis for creating and evaluating models and hypotheses, which makes it a prominent idea in the field of fintech acceptance research.

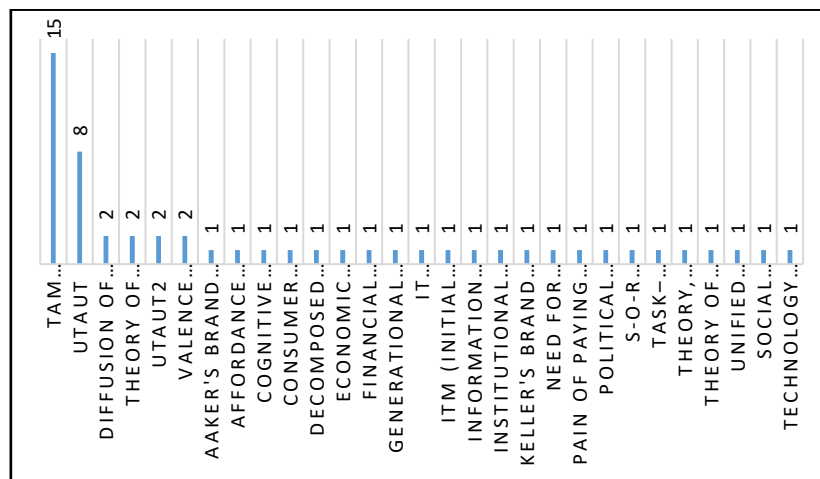


Figure 4: The Most Theory That Identified in 50 Articles

RQ3: Factors That Constructs That Most Influence Consumer Payment Behaviour in Digital Payment

A number of factors can affect how consumers behave while making digital payments. Through comprehension of these and more elements that impact consumer payment patterns toward digital payments, researchers can pinpoint payment patterns and digital payment usage. Table 4 displays a few of the most important elements that have been found in a few of papers about fintech user behaviour.

Table 4: Factors That Influenced by Consumer Payment Behaviour in Digital Payment

Factor	Description	Source(s)
Perceived Ease of Use	Degree to which using digital payment is free of effort	Chawla & Joshi (2020); Sharma & Sharma (2019)
Perceived Usefulness	Extent to which digital payments enhance transaction performance	Gupta & Arora (2021); Davis (1989)
Trust	Belief in the security, reliability, and integrity of the payment platform	Baabdullah et al. (2019); Prasad et al. (2019)
Security and Privacy	Consumer concern about data protection and transaction safety	Sharma & Sharma (2019); Singh & Rana (2020)

Social Influence	Impact of peers, family, or societal norms on payment choice	Baabdullah et al. (2019); Gupta & Arora (2021)
Compatibility	Fit between digital payment features and user lifestyle or habits	Sharma & Sharma (2019); Chawla & Joshi (2020)
Perceived Risk	Perceived potential loss from using digital payments	Liébana-Cabanillas et al. (2017); Singh & Rana (2020)
Convenience	Ease of access and speed of completing payments	Phonthanukitithaworn et al. (2016); Shin (2009)
Financial Literacy	Knowledge and ability to manage personal financial matters	Adisa et al. (2020); Ismail et al. (2022)
User Innovativeness	Willingness to try out new technologies	Agarwal & Prasad (1998); Oliveira et al. (2016)
Service Quality	Quality of service received from providers and platforms	Baabdullah et al. (2019); Liébana-Cabanillas et al. (2017)
Mobile Self-Efficacy	User's belief in their ability to use mobile technology	Baabdullah et al. (2019); Luarn & Lin (2005)
Technological Readiness	Preparedness to adopt and use new technologies	Parasuraman (2000); Chawla & Joshi (2020)
Perceived Enjoyment	Degree of pleasure associated with using the service	Lin et al. (2020); Venkatesh et al. (2012)
Perceived Value	Overall assessment of benefit versus cost in using digital payment	Chawla & Joshi (2020); Yang et al. (2012)

RQ4: Proposed Theory Improvement for Consumer Behaviour in Digital Payment

There are several ways in which existing theories of consumer payment behaviour in digital payment could be improved. Some possible improvements that have been identified in this article are shown in Table 5.

Table 5: Theory Improvements Identified Among 50 Selected Articles

Theory Improvement	Key Factors Introduced/Enhanced	Sources
Extended Technology Acceptance Model (TAM)	Perceived security, trust, lifestyle compatibility	Wijayanti & Nurcahyo (2022); Widyastuti et al. (2023)
Unified Theory of Acceptance and Use of Technology (UTAUT2)	Hedonic motivation, habit, price value	Waris et al. (2022); Wijaya et al. (2021)
Integration of TAM with Trust Theory	Trust, perceived risk, privacy concern	Dastan & Gürler (2021)

TAM with Innovation Compatibility, complexity, Chawla & Joshi (2020)
Diffusion Theory (IDT) observability
Theory of Planned Subjective norms, attitude, Gurung et al. (2021);
Behavior (TPB) with TAM perceived behavioral Hossain et al. (2020)
control

RQ5: The Most Respondents on Consumer Payment Behaviour Following by Categories

To identify key trends in consumer payment behaviour research within the fintech landscape, 50 journal articles were reviewed. Among of these 41 publications were successfully categorized into specific consumer groups, while the remaining 9 addressed fintech-related themes in a more general context without targeting any distinct consumer demographic. As illustrated in the pie chart below, the most frequently studied group was general consumers, followed by youth segments including Gen Y and Gen Z. Other categories included women, tourists, farmers, entrepreneurs, and residents—reflecting a wide but uneven distribution of academic focus.

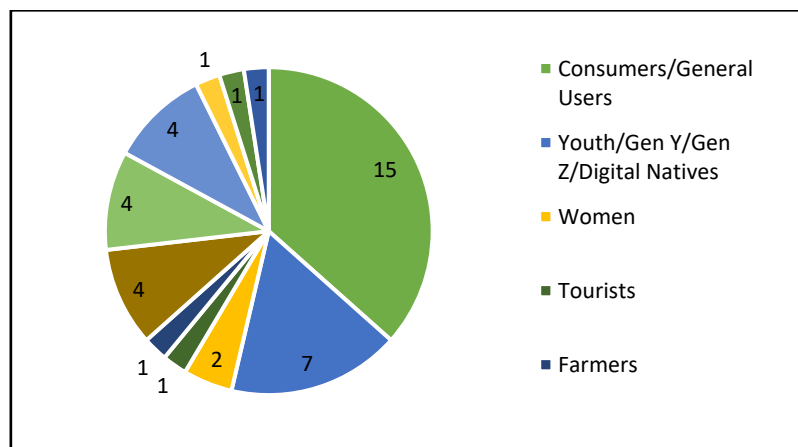


Figure 5: Trends in Consumer Payment Behavior Research Within the Fintech Landscape

Conclusion

Consumer purchases have seen a significant transformation with the rise of digital payment systems, which have brought about increased speed of internet network, convenience, and integration among financial services. After examining 50 peer-reviewed research, this systematic literature review found that general consumers and younger generations like Gen Y and Gen Z were the focus of most scholarly attention. The Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) are two theoretical frameworks that have had the biggest impact on how these groups behave.

Hence, the key influencing factors such as trust, perceived ease of use, social impact, and financial literacy provide vital insights into the complexities of digital payment adoption. Building on these findings, this review also acknowledges emerging theoretical enhancements, particularly the combination of TAM with the Theory of Planned Behaviour (TPB) as proposed by Gurung et al. (2021) and Hossain et al. (2020). This integrated approach introduces crucial behavioural constructs such as subjective norms, attitude, and perceived behavioural control,

which may serve as moderators or mediators in future empirical models. Further review need to explore by putting together themes, constructs, and methodological trends to give full picture of how digital financial tools are changing the way different customer groups pay for things. It gives a complex picture of current academic debate, which improves both theory progress and real-world uses in the digital finance ecosystem.

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ASSESSING THE IMPACT OF CHINA'S CARBON DIOXIDE EMISSIONS ON FINANCIAL STABILITY

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Abstract: *This study examines the impact of carbon dioxide (CO₂) emissions on financial stability in China, with a specific focus on the banking sector. Drawing on a panel dataset of Chinese commercial banks from 1990 to 2021, the analysis employs the bank-level Z-score as a proxy for insolvency risk. Financial indicators, including the Z-score, Return on Assets (ROA), and Return on Equity (ROE) are sourced from the World Bank's Global Financial Development Database, while data on CO₂ emissions and macroeconomic control variables are obtained from the World Development Indicators (WDI). The Generalized Method of Moments (GMM) estimator is utilised to address potential endogeneity and the dynamic nature of bank performance. Empirical results indicate that higher CO₂ emissions are significantly associated with lower Z-scores, reflecting heightened financial fragility within the banking system. Robustness checks, including comparative assessments with ROA and ROE, confirm that the Z-score is a more sensitive and reliable measure of climate-related financial risks. These findings underscore the urgent need to integrate environmental considerations into China's financial regulatory and supervisory frameworks. The study also highlights the importance of climate-resilient banking strategies that align with national development priorities and global sustainability objectives, particularly the United Nations Sustainable Development Goals (SDGs).*

Keywords: *Carbon dioxide emissions, financial stability, Z-score, China, climate risk*

Introduction

Climate change is increasingly acknowledged as a systemic risk to the global financial system. Environmental degradation, particularly through rising carbon dioxide (CO₂) emissions, poses serious challenges to economic resilience and financial sector stability. This issue is especially pertinent in the context of China, which is the world's largest emitter of CO₂ and home to one of the most systemically important banking sectors globally. As a critical pillar of national economic development, China's banking sector is highly vulnerable to climate-related disruptions that may impair asset quality, hinder credit allocation, and elevate the risk of loan defaults, especially in environmentally sensitive regions.

Despite China's dominant role in global CO₂ emissions, empirical research on the link between emissions and financial fragility remains limited. In particular, few studies have examined this relationship using bank-level Z-scores, a composite measure of insolvency risk that captures

profitability, capital adequacy, and earnings volatility. This research gap is significant, as it restricts our understanding of how environmental degradation translates into systemic banking risks.

This study addresses the gap by empirically assessing the direct impact of CO₂ emissions on the financial stability of Chinese banks. Specifically, it evaluates whether increasing national CO₂ emissions are associated with declining Z-scores over time. The study also compares the sensitivity of Z-scores to climate risk against traditional performance indicators such as Return on Assets (ROA) and Return on Equity (ROE). In doing so, it contributes to a more nuanced understanding of climate risk transmission and supports the formulation of climate-aligned financial regulations. This research directly advances several United Nations Sustainable Development Goals (SDGs), including SDG 13 (Climate Action), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation and Infrastructure).

Literature Review

The growing body of literature on climate-finance linkages underscores the importance of embedding environmental risks into financial supervision frameworks. Global institutions such as the Financial Stability Board (FSB, 2020) and the Network for Greening the Financial System (NGFS, 2021) have advocated for regulatory reforms that explicitly address climate-related threats to financial systems. Empirical research affirms that physical climate risks, including droughts, floods, and extreme weather events, adversely impact loan quality and elevate the probability of credit defaults, particularly in developing economies (Breitenfellner et. al, 2019; Wang & Zhang, 2019).

In the Chinese context, rising CO₂ emissions have been associated with heightened credit risk and financial fragility, particularly in regions with substantial environmental exposure (Zhou & Zhao, 2021; Liu, Xu, & Li, 2020). However, most existing studies concentrate on macroeconomic or firm-level outcomes, leaving a notable gap in the assessment of how CO₂ emissions affect bank-level financial stability indicators. Additionally, while China's financial system has experienced rapid expansion, it has not developed a parallel framework for managing climate risk, thereby increasing institutional exposure to both chronic and acute environmental shocks (Chen & Lin, 2022).

The Z-score has gained wide recognition as a composite measure of bank insolvency risk, incorporating elements such as profitability, capital adequacy, and earnings volatility (Laeven & Levine, 2009). Research indicates that the Z-score is responsive to both macroeconomic fluctuations and sector-specific shocks, including environmental stressors (Chen & Lin, 2022). Nevertheless, few empirical investigations have examined the direct relationship between national CO₂ emissions and bank-level Z-scores in China—a critical gap that this study seeks to address.

Methodology

This study utilises a balanced panel dataset comprising Chinese commercial banks over the period 1990 to 2021. The dependent variable is the Z-score, a widely accepted measure of bank insolvency risk, calculated as the ratio of the sum of return on assets (ROA) and equity-to-assets ratio to the standard deviation of ROA. The Z-score, along with other financial indicators

such as ROA and return on equity (ROE), is obtained from the Global Financial Development Database published by the World Bank.

The key independent variable is annual national carbon dioxide (CO₂) emissions, which serves as a proxy for long-term environmental degradation. Data on CO₂ emissions and relevant macroeconomic control variables that including gross domestic product (GDP) growth, inflation rate, and equity ratio are sourced from the World Development Indicators (WDI), also maintained by the World Bank.

To address methodological concerns such as endogeneity, unobserved heterogeneity, and autocorrelation, the analysis employs the System Generalized Method of Moments (System-GMM) estimator. This dynamic panel estimation technique is suitable for models with a lagged dependent variable and enables consistent parameter estimation in the presence of endogenous regressors. By incorporating bank-specific effects and allowing for the dynamic nature of financial performance, System-GMM enhances the reliability of the empirical results.

Control variables included in the model such as bank size, GDP growth, inflation, and equity ratio are selected based on their theoretical and empirical relevance to banking stability. Collectively, the model specification aims to isolate the direct impact of CO₂ emissions on the financial stability of banks in China, as measured by the Z-score.

Results

The results indicate a significant negative relationship between CO₂ emissions and Z-scores among Chinese banks. Higher CO₂ emissions are consistently associated with declining Z-scores, signalling an elevated probability of bank insolvency. This association remains robust across various model specifications and after accounting for key macroeconomic controls.

Comparative analysis with traditional metrics such as ROA and ROE confirms that the Z-score is more sensitive to environmental degradation. While ROA and ROE reflect profitability and shareholder return, they are less responsive to systemic risks posed by climate change. The Z-score, by contrast, offers a more comprehensive and dynamic assessment of a bank's resilience to environmental stressors.

Conclusion

This study provides robust empirical evidence that carbon dioxide emissions undermine the financial stability of banks in China. The consistent negative association between emissions and Z-scores underscores the need for financial regulators to incorporate environmental factors into macroprudential oversight. Regulatory bodies should embed climate risk in stress-testing exercises, capital adequacy frameworks, and financial disclosures.

At the institutional level, Chinese banks are urged to integrate climate-related indicators into credit risk models, lending strategies, and operational planning. As China advances towards its sustainability goals, the banking sector must evolve into a proactive agent of climate resilience. Future research could extend this analysis to include transition risks, sectoral vulnerabilities, and policy-induced shocks.

Co-Author Contribution

The authors declare no conflict of interest in the preparation of this article. Muzafar Shah Habibullah served as the principal supervisor and provided intellectual guidance in shaping the research design, methodological framework, and analytical strategy. Zulkornain Yusop, as the co-supervisor, contributed to refining the interpretation of findings and enhancing the theoretical and policy perspectives. Nurulashikin Romli conceptualised the study, conducted the literature review, performed the empirical analysis, and led the manuscript preparation and revision process.

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PRE-SERVICE TEACHERS' RESPONSES TO AUTISM REPRESENTATION THROUGH LITERATURE: A QUALITATIVE STUDY BASED ON "THE CURIOUS INCIDENT OF THE DOG IN THE NIGHT-TIME"

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Abstract: *This study investigates the personal reflections of Malaysian pre-service teachers after engaging with the novel *The Curious Incident of the Dog in the Night-Time* by Mark Haddon. The novel offers a unique narrative perspective presumed to be from an individual with Autism Spectrum Disorder (ASD). The objective of this research is to explore how literary exposure to autism influences pre-service teachers' understanding, empathy, and views on inclusive education. The study employed qualitative design with written reflections from five pre-service teachers as data sources. Thematic analysis revealed three main themes: increased awareness of autism traits, emotional engagement through literature, and reflections on readiness to teach in inclusive classrooms. Findings suggest that literary engagement fosters critical thinking and empathetic perspectives among teacher trainees. The study highlights literature's potential as a pedagogical tool in teacher education programs to better prepare future educators for inclusive classroom settings.*

Introduction

Context of Inclusive Education and ASD in Malaysia

The global educational landscape is undergoing a significant transformation, with an increasing emphasis on inclusive practices designed to accommodate the diverse learning profiles of all students. A critical component of this evolution involves effectively supporting students with Autism Spectrum Disorder (ASD), a neurodevelopmental condition characterized by variations in social communication, behaviour, and sensory perception. This global movement towards inclusion necessitates a paradigm shift in educational approaches, moving away from segregated models to integrated learning environments that cater to a spectrum of needs.

Malaysia has actively embraced this inclusive vision through progressive policies such as the Zero Reject Policy and the Malaysia Education Blueprint 2013–2025. These national initiatives underscore a strong commitment to ensuring that all learners, including those with autism, have access to quality education within mainstream settings. The successful implementation of such top-down policy mandates, however, hinges critically on the preparedness of educators. There is a recognized and persistent gap in the practical knowledge, empathy, and confidence of pre-service teachers regarding students with autism. Many future educators receive limited exposure to ASD beyond abstract definitions during their training, which can lead to misunderstandings, perpetuation of stereotypes, and hinder the effective integration and support of students with ASD in inclusive classrooms. This highlights a crucial disconnect

between policy aspirations and the practical realities faced by teachers, underscoring the need for more effective, ground-level training interventions.

Literature as a Pedagogical Tool for Teacher Preparation

In response to this pedagogical gap, literature, particularly novels that portray autistic traits, offers an innovative and humanistic tool to bridge the divide between theoretical knowledge and empathetic understanding. Mark Haddon's *The Curious Incident of the Dog in the Night-Time* stands out as a particularly valuable resource in this context. The novel is narrated by Christopher Boone, a character whose behaviours and thought processes align closely with characteristics often associated with ASD. This unique first-person perspective provides readers with an unparalleled window into a neurodivergent experience.

For teacher education, this novel holds significant value as it fosters open discussion, cultivates empathy, and encourages critical engagement with complex inclusive issues. Unlike traditional, didactic training methods, narrative-based learning offers an experiential dimension that is often missing. By immersing themselves in Christopher's world, pre-service teachers can develop a more profound and nuanced understanding of neurodiversity, moving beyond clinical definitions to grasp the lived experiences of individuals with autism.

Research Gap and Study Objectives

This study directly addresses a significant research gap concerning how specific literary engagements can profoundly transform pre-service teachers' empathy and pedagogical readiness, particularly within the Malaysian context. While the importance of inclusive education and teacher preparedness is widely acknowledged and studied, the unique contribution of narrative-based learning in fostering these qualities remains underexplored. This investigation seeks to provide empirical evidence for the efficacy of such an approach, especially when integrating specific theoretical lenses.

The research aims to achieve the following objectives:

- To explore how Malaysian pre-service teachers respond to the literary representation of autism in *The Curious Incident of the Dog in the Night-Time*.
- To identify emergent themes related to understanding, empathy, and pedagogical readiness in their personal reflections.
- To evaluate the extent to which engagement with such literary narratives can serve as a transformative pedagogical tool for fostering inclusive mindsets.

Literature Review and Theoretical Framework

This section provides a review of existing scholarship concerning the role of literature in cultivating empathy, the portrayal of disability in narratives, and the current state of autism awareness among pre-service teachers. It also details the theoretical foundations that underpin this research, offering a conceptual framework for understanding how literary engagement influences pre-service teachers' perceptions of autism and their readiness for inclusive education.

Literature's Role in Understanding Neurodiversity and Fostering Empathy

Literature serves as a powerful vehicle for fostering empathy and moral imagination within educational contexts. As Martha Nussbaum (1997) posited, literary narratives enable individuals to vicariously experience realities different from their own, a capacity crucial for cultivating inclusive pedagogical mindsets. This immersive engagement cultivates emotional intelligence and reflective thinking, both of which are vital attributes for teachers navigating the complexities of diverse classrooms. Research by Kidd and Castano (2013) further supports the notion that reading literary fiction can enhance empathetic abilities, suggesting a direct cognitive and emotional benefit.

Beyond general empathy, literature also plays a crucial role in illuminating human experiences that are often marginalized or misunderstood, particularly those involving disability and neurodiversity. The way disability is portrayed in literature significantly influences societal perceptions of difference. Baglieri and Shapiro (2012) noted that disability-themed literature can either reinforce harmful stereotypes or actively dismantle them, depending on the authenticity and nuance of its representation. In the context of autism, portrayals have historically ranged from romanticized savants to isolated, one-dimensional individuals, often lacking the necessary depth and nuance. Mark Haddon's.

The Curious Incident of the Dog in the Night-Time stands apart by offering a more sophisticated and nuanced perspective through Christopher Boone. The novel captures the neurodivergent experience without resorting to pathology or oversimplification, providing genuine insight into how an autistic individual navigates the world. Murray (2008) highlighted the novel's unique ability to provide a sophisticated understanding of how autistic individuals perceive and interact with their environment, making it an invaluable text for teacher training programs seeking to foster genuine understanding and empathy.

Pre-Service Teacher Preparedness for Inclusive Education and Autism Awareness

Adequate awareness and preparedness regarding autism among pre-service teachers are fundamental prerequisites for successful inclusive education. However, a consistent body of research indicates persistent gaps in their readiness and confidence to teach students with ASD. For instance, Abdullah, Salleh, and Jusoh (2022) found that while Malaysian pre-service teachers generally support the concept of inclusion, they frequently lack the practical tools and specific strategies required to effectively support students with ASD. Similarly, Low et al. (2018) reported that many pre-service teachers receive limited exposure to the practicalities of inclusive education beyond purely theoretical coursework. Integrating literary texts like The Curious Incident into teacher education curricula can serve as a powerful means to bridge this theoretical-practical gap. Such narratives offer realistic and emotionally resonant encounters with autistic characters, providing a deeper, more personal understanding than abstract definitions alone. This form of engagement can significantly reinforce empathy and stimulate critical pedagogical reflection, preparing future educators not just intellectually, but emotionally, for the demands of inclusive classrooms.

Theoretical Underpinnings of Literary Engagement

This study is underpinned by two complementary theoretical frameworks that together provide a robust lens for interpreting the impact of literary engagement: Reader-Response Theory and Theory of Mind.

Reader-Response Theory: Developed by Louise Rosenblatt (1978), Reader-Response Theory posits that literary meaning is not inherent solely within the text but is actively co-created through a dynamic interplay between the reader and the text. Readers bring their unique experiences, emotions, prior knowledge, and social contexts to the act of reading, and these elements profoundly shape their interpretation and understanding. In the context of teacher education, this theory is particularly relevant because pre-service teachers' emotional and personal engagement with texts about disabilities can significantly influence and reshape their pedagogical beliefs and approaches. Beach (1993) noted that literary responses inherently foster self-reflection and empathy, qualities that are indispensable for effective inclusive practice. This theoretical lens guides the analysis of participants' reflections, acknowledging the subjective nature of their experiences and how these experiences contribute to their evolving professional identities as future educators.

Theory of Mind (ToM): Originating from developmental psychology, Theory of Mind refers to the cognitive ability to attribute mental states—such as beliefs, intentions, desires, and emotions—to oneself and to others. This capacity is fundamental for developing empathy, understanding social cues, and navigating complex social interactions, making it vital for teachers who must understand and respond to the diverse internal worlds of their students. Autism Spectrum Disorder is often associated with differences in Theory of Mind, which can help explain some of the challenges individuals with ASD may face in social communication.

The Curious Incident of the Dog in the Night-Time provides a unique opportunity for readers to gain insight into a mind presumed to be on the autism spectrum. Engaging with Christopher Boone's narrative compels readers to actively exercise their own Theory of Mind, inferring his feelings, perceptions, and motivations, even when they differ significantly from neurotypical experiences. This process mirrors the empathetic reasoning and perspective-taking skills that teachers need to develop to effectively support neurodivergent students. Zunshine (2006) emphasized literature as a 'cognitive playground' for practicing Theory of Mind, highlighting its suitability as a tool for analysing literary engagement in teacher training.

Research Methodology

This chapter outlines the methodological approach adopted in the present study. Given the study's objective to explore the nuanced responses of pre-service teachers to the literary representation of autism, a qualitative design was deemed most appropriate. The research design, participant selection, data collection procedures, data analysis techniques, and ethical considerations that rigorously guided the study are discussed in detail.

Research Design

This study employed a qualitative descriptive design, which is highly suitable for exploring perspectives, attitudes, and experiences within their naturalistic settings. This approach, as described by Sandelowski (2000), provides in-depth, context-specific insights that are

grounded in participants’ subjective realities. This aligns precisely with the study’s aim to capture the rich and nuanced reflections from pre-service teachers after their engagement with a literary text, allowing for a deep understanding of their evolving perceptions and beliefs.

Participants and Sampling

The initial pool of participants comprised ten pre-service teachers enrolled in an undergraduate English education program at a Malaysian public university. These individuals were purposively selected due to their participation in a course that included the mandatory reading of *The Curious Incident of the Dog in the Night-Time*, and all had completed a written reflection assignment based on the novel. To align with the stated methodology in the abstract and ensure a focused analysis, five reflections were subsequently chosen through criterion sampling. These five reflections were selected specifically for their richness, the depth of their engagement with neurodiversity themes, and the critical thinking evident in their responses. The selected participants were aged between 21 and 24 years and represented diverse academic backgrounds within the English Education program. While they had received introductory exposure to special education through modules in educational psychology and inclusive education, none possessed extensive prior experience teaching students with autism. This variability in background, within an otherwise homogenous academic cohort, allowed for a broad range of insights and reflections while maintaining a consistent context for the study.

Table 1: Participant Demographics

Characteristic	Details
Age Range	21-24 years
Academic Program	Undergraduate English Education
Prior Education	Introductory modules in educational psychology and inclusive education
Prior Experience with ASD Students	None had extensive experience

Research Instrument

The primary research instrument utilized in this study was a written reflection prompt. This open-ended prompt was carefully designed to elicit comprehensive and authentic responses from the participants regarding their engagement with the novel’s main character, its overarching themes, and its portrayal of autism. The prompt specifically encouraged participants to discuss their emotional reactions to the text, their observations of Christopher Boone's traits, and to draw connections between their literary experience and their future roles as educators in inclusive classrooms. These reflections provided genuine insights into participants’ interpretive processes and their evolving beliefs concerning neurodiversity and inclusive pedagogy.

Data Collection Procedure

Data were collected from the coursework submissions of the pre-service teachers. A crucial ethical consideration was the timing of informed consent: students were explicitly informed that their reflections might be used for research purposes, but informed consent was obtained after the course had concluded and all grades were finalized. This measure was implemented to prevent any potential coercion or perceived influence on their academic performance. Once

consent was secured, the reflections were anonymized to ensure confidentiality and compiled for analysis. Each reflection ranged from 500 to 800 words, comprehensively addressing character analysis, thematic discussion, and personal responses, and was submitted digitally and stored securely.

Data Analysis

The collected reflections were analysed using thematic analysis, following the systematic six-phase process outlined by Braun and Clarke (2006). This rigorous approach ensured a thorough and transparent analysis.

Findings and Discussion

This chapter presents the detailed findings derived from the qualitative thematic analysis of the five selected written reflections. The analysis yielded three main themes, precisely aligning with the study's abstract, which illustrate how participants responded to the literary portrayal of autism in Mark Haddon's *The Curious Incident of the Dog in the Night-Time*. The discussion integrates insights from Reader-Response Theory and Theory of Mind to interpret the data, providing a comprehensive understanding of the observed transformations.

Table 2: Summary of Emergent Themes and Illustrative Quotes

Theme	Illustrative Quotes
1. Increased Awareness of Autism Traits	"I thought autistic individuals were all like the genius characters in movies. But Christopher is different. He struggles, he thinks differently, but he is also brilliant in his own way."
2. Emotional Engagement Through Literature	"I was able to understand why Christopher needed order and structure. He is not being difficult; he is trying to make sense of a confusing world."
3. Reflections on Readiness to Teach in Inclusive Classrooms	"Christopher reminded me that every child learns differently. As a teacher, I must be ready to adapt and not expect all students to fit into the same mould."

Theme 1: Increased Awareness of Autism Traits

A prominent theme emerging from the reflections was the participants' significant shift from stereotypical views to a more nuanced and accurate understanding of autism. Many pre-service teachers admitted to holding preconceived notions about autistic individuals, often derived from popular media portrayals that presented either extreme genius or profound social deficits. Christopher Boone's complex and authentic portrayal in the novel directly challenged and disrupted these oversimplified assumptions. One participant articulated this shift, stating, "I thought autistic individuals were all like the genius characters in movies. But Christopher is different. He struggles, he thinks differently, but he is also brilliant in his own way". This statement reflects a crucial movement beyond a singular, often misleading, archetype.

Theme 2: Emotional Engagement Through Literature

The most impactful and frequently articulated theme was the profound development of empathy toward individuals with autism. Participants consistently described how reading Christopher Boone's first-person narrative allowed them to vicariously enter his world, gaining a deep understanding of his routines, fears, sensory sensitivities, and unique cognitive peculiarities. One participant's reflection powerfully captured this empathetic connection: "I was able to understand why Christopher needed order and structure. He is not being difficult; he is trying to make sense of a confusing world". This statement highlights a shift from judgment to understanding, recognizing the underlying reasons for behaviours that might otherwise be misinterpreted.

This deep emotional engagement supports the Reader-Response perspective, which suggests that texts act as "mirrors and windows" (Bishop, 1990), humanizing autism beyond mere clinical definitions. The emotional bridges formed through identification with a fictional character proved to be more effective in fostering genuine empathetic understanding than purely theory-based modules alone, laying a crucial foundation for inclusive pedagogical practice.

Theme 3: Reflections on Readiness to Teach in Inclusive Classrooms

A significant and highly practical theme was the direct pedagogical insight gained by the pre-service teachers. Participants frequently reflected on their future roles as educators, highlighting the critical need for patience, the implementation of differentiated instruction, and the importance of building trust with neurodivergent students. One trainee's reflection underscored the necessity of adaptive teaching: "Christopher reminded me that every child learns differently. As a teacher, I must be ready to adapt and not expect all students to fit into the same mould". This statement illustrates a move towards a more flexible and individualized approach to education, acknowledging the diverse learning styles and needs present in any classroom.

Conclusion

This study meticulously examined how Malaysian pre-service teachers responded to the representation of autism in Mark Haddon's novel, *The Curious Incident of the Dog in the Night-Time*. Drawing upon the complementary lenses of Reader-Response Theory and Theory of Mind, the research unequivocally revealed that literary texts possess a powerful capacity to enhance empathy, challenge preconceived misconceptions, and foster inclusive pedagogical thinking among future educators.

Participants consistently demonstrated a notable increase in their emotional understanding and a heightened awareness of the unique needs and perspectives of neurodivergent learners. Their interpretations of Christopher Boone's experiences vividly illustrated how literature, when approached critically and reflectively, acts as a potent catalyst for professional growth and personal transformation. The three main themes identified—increased awareness of autism traits, emotional engagement through literature, and reflections on readiness to teach in inclusive classrooms—highlight the dynamic and interconnected interplay between narrative immersion and the formation of a teacher's professional identity.

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A SYSTEMATIC LITERATURE REVIEW ON THE IMPACTS OF ARTIFICIAL INTELLIGENCE ON TOURIST EXPERIENCES

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Abstract: *This systematic literature review critically assesses the multidimensional impact of Artificial Intelligence (AI) on tourist experiences, addressing the central question: "What are the effects of artificial intelligence on tourists' experiences?" A rigorous systematic literature review, conducted using PRISMA guidelines, utilized the Scopus database and a PICO-based search string. From an initial 246 articles, 24 relevant papers were synthesized through quality assessment and thematic analysis. Findings reveal AI's pervasive role in enhancing personalization, efficiency, and digital immersion across sentiment analysis, urban mobility, and personalized travel planning. However, this potential is significantly tempered by critical challenges, including data privacy, algorithmic bias, the persistent digital divide, and a notable lack of quantitative empirical support for AI's long-term effects on tourist satisfaction and authenticity. This review offers actionable insights for tourism professionals to strategically leverage AI and guides researchers toward crucial future directions, emphasizing robust ethical frameworks, addressing user-specific barriers, and conducting empirical studies on AI's enduring psychological and emotional impacts. The study's novelty lies in its holistic synthesis of AI's multifaceted impacts on the entire tourist experience, uniquely highlighting the critical tension between its transformative potential and the ethical, social, and empirical gaps that must be addressed for its responsible and equitable deployment in tourism.*

Keywords: *Artificial Intelligence (AI), Tourist Experience, Systematic Literature Review, Digital Tourism, Personalization*

Introduction

The advent of the Artificial Intelligence (AI) era has brought forth a disruptive wave of innovation in industries worldwide, with the tourism industry at the forefront of this transformation. Predictions suggest a strong growth for the AI in Tourism market, a value of 13.38 billion by 2030 with a compound annual growth rate (CAGR) of 28.7 % (MarketsandMarkets, 2024), stressing its strong impact on the delivery and consumption of tourism services (Buhalis & Tussyadiah, 2021).

The acceleration of AI use, ranging from complex personalized recommendation engines to highly responsive automated customer service systems (Hollebeek et al., 2021) goes beyond technological tools. It signifies a broader call for a redesign of the tourist experience, requiring a holistic comprehension of its impacts for both travelers and the industry stakeholders (Ferhataj & Memaj, 2024).

This study offers an in-depth contribution to the emerging and multi-faceted application of AI in tourism, which significantly reshapes the tourist travel experience. Key developments include AI-based sentiment analysis extracting detailed tourist perceptions from large internet data (Babu et al., 2024), smart mobility services for efficient routing and enriched urban exploration (Prakash, 2021), individualized travel planning through personalized itineraries using both profile-specific preference and current situation (Stamboli et al., 2025), and improved digital interfaces mediated by virtual assistants, chatbots and immersive virtual/augmented reality experiences (Partarakis & Zabulis, 2024). These innovations, collectively, portend a new age, one where AI exerts greater control over consumer behaviour, as well as the operational efficiency of all manner of companies (Davtyan, 2024), and the overall standard and availability of travel (Buhalis & Tussyadiah, 2021).

Despite the growing of AI adoption in the tourism industry, there is a substantial and intricate gap in understanding the combined direct and indirect effects of AI altogether on the holistic tourist experience (Andrianto et al, 2025). Much of the current research is centred on promoting the advantages of individual AI technologies in isolation (Mariani & Borghi, 2020), leaving behind a noticeable dearth of synthesized understanding regarding how these diverse facets of AI influence, interact, and cumulatively shape the locus of a tourist's entire travel experience, from initial latent to actual experience, meticulous pre-travelling information search, on-site decision making experience, and even to post-travel experience or feedback (Ma et al., 2025).

This fragmentation in current research makes it challenging for both academics to build robust theoretical frameworks and industry practitioners to strategically leverage AI for truly integrated and enhanced tourist experiences. Addressing this intricate gap is therefore crucial for both advancing academic discourse and practical industry application, as it will bridge theoretical knowledge with real-world outcomes, empowering tourism businesses to strategically deploy AI to meet and exceed evolving traveler expectation (Buhalis & Tussyadiah, 2021).

The aim of this systematic literature review is to consolidate the state-of-the-art and critically assess the multidimensional impact of AI on tourist experiences. By bridging the existing knowledge gaps and synthesizing insights from different areas of AI application, this study seeks to contribute to a comprehensive understanding of the impact of AI on distinct phases in the tourist journey. The findings will provide actionable guidance for professionals in the field to improve the quality-of-service provision and will help researchers identify future research directions in this fast growing and increasingly AI driven field. Specifically, the purpose of this review is to address the following research question: "What are the effects of artificial intelligence on tourists' experiences?"

Literature Review

Artificial Intelligence in Tourism

Artificial intelligence (AI) has been transforming numerous industries lately, and its integration into tourism led to a profound transformation in operational activities and the way consumers interact. AI, which refers to the simulation of human intelligence processes by machines, especially computer systems, includes machine learning, natural language processing, and computer vision, and is increasingly being implemented in the travel industry (Mishra et al.,

2024; Frenette, 2022). For example, sentiment analysis based on AI has shown a high-performance in obtaining detailed tourist perceptions on the basis of unstructured big data such as online reviews, with the possibility of accurately pinpointing satisfaction drivers (e.g., cleanliness, service quality) (Aggarwal & Gour, 2020).

Likewise, AI-based recommendation systems provide deeply personalized travel plans, based on users' preferences and spatial data, to travel and improve efficiency and relevance of planning (Li et al., 2024; Bettache & Dennouni, 2025). Generative AI tools, however, such as ChatGPT are also seen as suitable tools to enhance easy access by tourists since these tools support personalized engagement by offering pre-trip information, virtual and augmented reality experiences, and comparative insights that help tourists explore cultural elements before making reservations (Stergiou & Nella, 2024).

While these great examples show how AI can be used to enhance and personalize experiences, the use of large datasets to inform these decisions can also be a concern when it comes to data privacy and the ethical considerations of algorithmic bias (Shemshaki, 2024), which may be impacting and accidentally influencing tourists to come to certain places or preventing certain demographics from doing so (Putera et al., 2022). Hence, while the benefits of AI are significant, ethical implementation and inclusivity must be prioritized to ensure all travelers' needs and rights are considered.

Digital and Smart Tourism

The development of digital technologies has led to the concept of Digital and Smart Tourism, a concept that integrates the extensive use of Information and Communication Technologies (ICTs) to enrich the tourist experience, increase the efficiency of the resource use and encourage the sustainability of the activities in destinations. Digital tourism systems, leveraging AI, big data and the Internet of Things (IoT), have led to the development of connected and intelligent ecosystems that adapt in real time to the visitors' wishes (Vujko et al., 2025).

AI applications in smart city tourism for instance, improves the effectiveness, digital engagement, and sustainability by utilizing smarter mobility systems, promoting cultural routes, and utilizing better waste management (Öztürk & Aktan, 2024; Vujko et al., 2025). Digital technologies such as mobile applications, virtual tours and smart exhibits enhance the interactivity, personalisation and immersion greatly in the tourist experience (Vujko et al., 2025). Digital platforms enable user generated content (UGC) and thereby deliver real-time testimonials from actual clients, strongly affecting both destination image and traveler attitudes, with AI supporting to filter and summarize this huge amount of information (Marine-Roig, 2017).

The contribution from smart technologies however is managed, often, by a destination's ICT readiness that could create a digital divide where areas with less extensive investment in infrastructure might not be able to make the best of new trends (Sustacha et al., 2023). Furthermore, despite promising efficiency and ease-of-use, as digital tourists produce vast amounts of data, robust data-governance, security, and privacy arrangements are essential to continue securing the trust of the tourist and guarding against potential abuse.

Tourist Experience in the Age of AI

AI has dramatically transformed the travel experience, from pre-travel inspiration and destination planning to on-site activation and post-trip reflection. Today, tourists interact with AI in many situations such as personalized recommendations, real-time assistance via chatbots, and intelligent applications providing the real-time information and easy traffic (Vujko et al., 2025).

Access to AI-based insights from sentiment analysis enables destinations proactively address tourist dissatisfaction, leading to improved overall experiences (Aggarwal & Gour, 2020). In urban mobility, machine learning on user-generated data reveals the determinants of service satisfaction in, for example, Mobility as a Service (MaaS), pointing to levers for a more user-centered design (Aman & Smith-Colin, 2022). Moreover, new ways of discovering destinations are made possible by AI-based cultural experiences, such as intelligent waterborne autonomous vehicles for museums (Rong et al., 2020).

However, despite these developments, concerns about the security and privacy of personal data remain as a persistent factor diminishing the quality of tourism, illustrating a significant tension between convenience and trust (Sustacha et al., 2023). Additionally, while AI can provide customization of a depth that is never been possible, there is a continuing debate about whether it could rob the experience of the happy accident or the real human connection that travelers often seem to embrace. Hence, any AI evolution in tourism must strike a balance between technological progression and the preservation of real and valuable human experiences, while respecting privacy and offering the same opportunities to all types of travelers.

Methodology

Conducting Systematic Literature Review

A systematic literature review (SLR) is a structured methodological approach developed to answer specific research questions through the integrative findings of prior reliable research that offers transparency, clarity, comprehensiveness, and accessibility when exploring an issue (Thorpe et al., 2006). It is a comprehensive retrieval of studies of a particular condition on a topic that is then selected and evaluated and subjected to an analysis according to a method that relates to a subject of interest (Klasse et al., 1998). The resulting study utilized a comprehensive methodology, described in an extensive protocol and supported by a Technical Roadmap and Data Collection and Selection Flow Diagram following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The methodology comprised seven key steps: developing research questions, determining relevant keywords, identifying relevant databases, setting search restrictions (i.e., time ranges and languages), setting up a review strategy, and summarizing findings from selected documents, as well as reporting results within tables and narratives. The PRISMA 2020 flow chart provides a framework for reporting on the process for identifying studies and for including and excluding studies from the review in a transparent and reproducible manner (Amin et al., 2022).

Formulation of Research Questions

The research question guiding this systematic literature review was meticulously crafted using the PICO framework, a robust methodology included in the Research Questions Development Tool (RQDT). PICO is a powerful technique that assists authors in developing unique, focused, and relevant research questions, thereby streamlining the review process. As emphasized by Okoli (2015), the development of precise research questions is paramount to avoid the occurrence of unnecessary article searches and ensure the efficiency of the review.

The PICO framework comprises three essential components: Population (or Phenomenon of Interest), Interest (or Intervention/Exposure), and Context. The components of the current study, as applied to this framework, are defined as follows:

- P (Population/Phenomenon of Interest): Tourists' experiences
- I (Interest/Intervention): Artificial Intelligence (AI)
- Co (Context): The tourism sector

Based on these components, the overarching research question formulated for this systematic literature review is: "What are the effects of artificial intelligence on tourists' experiences?"

This precisely defined question serves as the foundation for the subsequent stages of the review, guiding the identification, screening, and analysis of relevant literature.

Table 1: PICO table

Population or Problem	Interest	Context
Tourists' experiences	Artificial Intelligence	The tourism sector

Identification and Screening Process

The Scopus database was selected as the primary source for the systematic literature search, given its comprehensive coverage of academic literature. In alignment with the research question, "What are the effects of artificial intelligence on tourists' experiences?", the key terms "Artificial Intelligence" and "Travel experience" were employed as core search concepts (refer to Table 2 for full search string details). A diversified set of keywords, including relevant synonyms, was generated to ensure a broad yet focused search, as detailed in the synonym search strategy presented in Table 3. This approach is critical, as highlighted by Kraus et al. (2020), who emphasize that while numerous articles can be identified through varied keywords, irrelevant search results can compromise the quality of a systematic literature review. Consequently, the search strategy was carefully constructed to narrow the scope to highly pertinent articles while still comprehensively addressing the research topic.

Utilizing the specified search string, an initial total of 246 articles were identified from the Scopus database. These articles were then subjected to a rigorous screening process based on several predefined criteria, as presented in Table 4. This selection process is essential, as Kitchenham and Charters (2007) note that reviewing a large volume of articles is often impractical, making the application of focused screening essential. The screening criteria applied included: Subject area (Social sciences, Business, Management and Accounting, Decision science), Document types (article), Language (English), Source type (Journal), and Publication stage (Final). Limiting the review to English-language articles was crucial to avoid any misunderstandings regarding the study's findings (Linares-Espinos et al., 2018), while focusing on final published articles ensured the quality of the review (Johnson and Hennessy,

2019). After applying these comprehensive screening criteria, the number of articles was reduced to 42.

An eligibility process was further initiated for each of the remaining articles to ensure their direct relevance to the research question. The exclusion criteria, detailed in Table 5, were rigorously applied. This eligibility process was iteratively repeated three times to minimize errors and ensure that only truly pertinent data was retained. Following this meticulous process, 24 relevant papers were successfully obtained for the final analysis. The entire flow of this systematic literature review, encompassing research design, data assembly, and analysis, is visually represented in the technical roadmap shown in Figure 1.

Table 2: Keywords and Expended Keywords

Keyword	Expended Keywords
Artificial Intelligence	Machine Learning / Computer Intelligence / Intelligence Automation / Machine Intelligence / Smart Technology / AI Technology
Travel Experience	Travel Adventure / Journey Adventure / Trip Experience / Trip Adventure

Table 3: Search String Used for Data Searching

Database	Search String
Scopus	TITLE-ABS-KEY(("artificial intelligen*" OR "machine intelligen*" OR "computer intelligen*" OR "intelligen* automation" OR "machine learning" OR "smart technolog*" OR "AI technolog*") AND ("travel experienc*" OR "travel adventur*" OR "journey adventur*" OR "journey experienc*" OR "trip experienc*" OR "trip adventur*"))

Table 4: Inclusion criteria for Screening Stage

SCOPUS Database	Subject area: Social sciences / Business, Management and Accounting / Decision science Document types: article Language: English Source type: Journal Publication stage: Final

Table 5: Exclusion Criteria

Exclusion Criteria	Topic not related to AI affect tourist experience. An article that cannot be accessed by the authors.

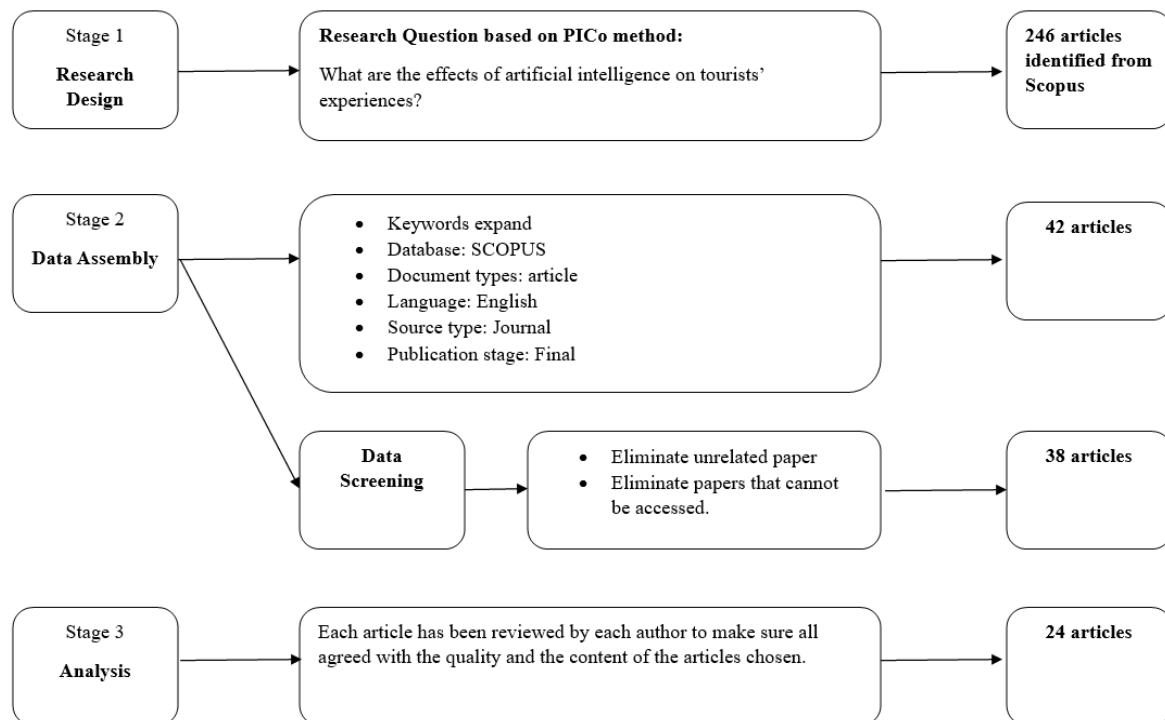


Figure 1: Technical Roadmap of The Systematic Literature Review Research

Source: Wee et al, (2023)

Data Analysis

In this systematic literature review, a stringent analysis after the selection of articles was applied to meet a predefined research question. To ensure transparency and minimise potential bias of data extracted from the identification, screening, and eligibility stages, the researchers strictly followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines in this part of the review. This technique is particularly useful to conduct transparent analysis of systematic literature review (Amin et al., 2022).

To ascertain the quality level of each selected article, the researchers employed a quality assessment (QA) framework comprising three main criteria:

- QA1: Have the review's inclusion and exclusion criteria for this study been clearly stated and understood by each researcher?
- QA2: Does the literature found include all relevant studies related to the research topic?
- QA3: Do the selected articles clearly explain the effects of Artificial Intelligence on tourist experiences and provide a robust methodology for their findings?

Although no particular software was used to check for the quality of the included studies, the researchers carefully adhered to PRISMA guidelines to conduct a fair, transparent, and comprehensive analysis. A knowledge-based quality assessment (QA) was conducted using the predefined QA questions, applied to all selected studies as well as to related literature. This process was repeated over three cycles to ensure consistency, objectivity, and accuracy in evaluating both the methodological soundness and relevance of the research works included in

this systematic review. This manual yet structured approach allowed for a rigorous appraisal of the selected studies without the need to depend on additional software. As a result, the robustness and credibility of the findings of the review was maintained.

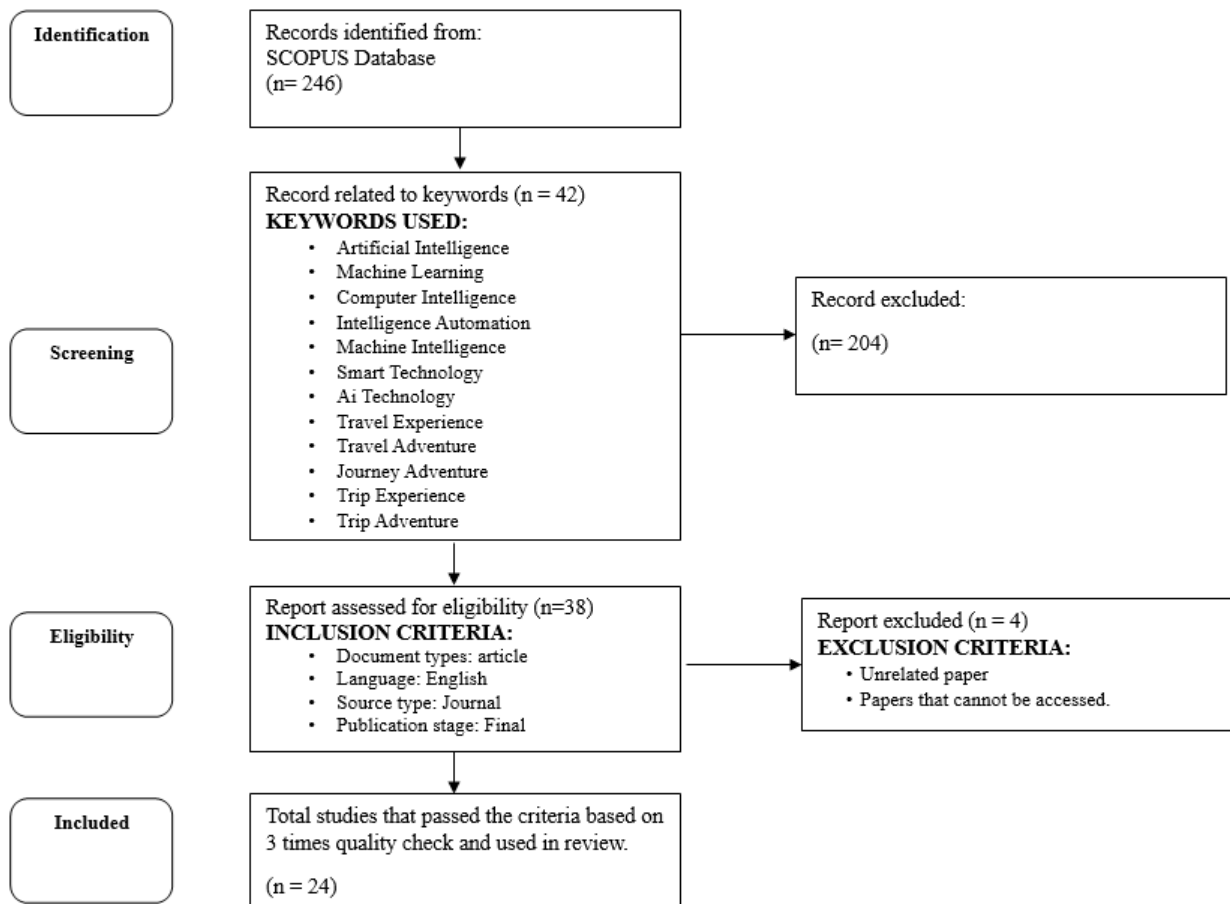


Figure 2: Data Collection and Selection flow diagram

Source: Adopted from PRISMA (2020)

Author (Year)	Study Objective / Research Questions	Methodology	Sample/ Population	Key Findings/Results	Theoretical Framework	Limitations	Recommendations /Future research
Aggarwal & Gour (2020)	Peeking inside the minds of tourists using a novel web analytics approach	Data extraction from online travel platforms (TripAdvisor) using web scraping tools (Python Selenium, BeautifulSoup).	Large-scale dataset of 42,893 online tourist reviews about Goa, India, posted over multiple years.	AI-enabled analytics successfully identified nuanced tourists' sentiments and experience drivers from unstructured data.	Experience design theory in tourism, emphasizing understanding and redesigning tourist experiences based on perceptions.	Sentiment lexicon not exhaustive, potentially missing nuanced emotional expressions.	Expand sentiment lexicons and AI models for better accuracy and context sensitivity.
	Identify drivers of negative and positive sentiments to understand and improve tourists' experiences.	Text pre-processing and cleaning for meaningful analysis.		Identified key issues influencing tourist satisfaction like cleanliness, safety, pricing, and services.	Advances existing theory by integrating AI and big data analytical methods to capture emotions and sentiments at scale.	Analysis focuses on a single destination; generalizability needs exploration.	Apply the AI framework to diverse tourist destinations and experiential contexts (shopping, dining, entertainment).
		Sentiment analysis using lexicons.		Clustering of destinations by common dissatisfaction enables targeted interventions.		Reliant on online UGC, which could include bias or fake reviews.	Utilize AI for real-time feedback monitoring to proactively improve tourist services.
		Topic modelling (LDA) to detect key issues affecting tourists.		AI facilitates real-time sentiment classification, allowing dynamic monitoring and faster response by stakeholders		AI classification performance depends on quality and representativeness of data.	Explore deeper AI methods (e.g., deep learning, multimodal sentiment analysis) to capture richer emotional data.
		Machine learning classification to categorize reviews by sentiment and theme.		Demonstrates AI's potential to transform unstructured user-generated content into actionable insights enhancing tourist experience management.			Investigate AI's impact on shaping tourists' expectations and behavioural patterns via personalized recommendations and virtual assistants.
	Clustering to group destinations with similar tourist experiences/issues.						
Application of crowdsourced data to infer user satisfaction with mobility as a Service (MaaS)	To explore user satisfaction features in Mobility as a Service (MaaS) platforms based on online user reviews.	Data collection of over 29,000 user reviews from MaaS apps (Moovit, CityMapper, Transit) via app store APIs.	29,818 reviews from users of three major MaaS mobility apps	Public transit remains the backbone of MaaS; micromobility and ridesharing less discussed.	User-centric, multimodal mobility management framework for MaaS.	Gender classification based on usernames prone to errors; non-binary users not captured.	Use additional data sources (surveys, interviews) to validate and extend findings.

Aman & Smith-Colin (2022)	Examine gender differences in perceptions of MaaS services.	Preprocessing of textual data using tokenization, stop word removal, etc.	spanning Jan 2019 - Apr 2020.	App-related features (maps, updates, technical issues) significantly affect user satisfaction.	Application of text mining and machine learning as digital tools for extracting latent user opinions.	Lack of spatial data limits understanding of geographic differences in perceptions.	Incorporate profile pictures or text-based gender classification methods to improve accuracy.
	Relevant adaptation: Understanding how AI analysis of user-generated data uncovers experience dimensions can be applied to tourist experience research.	Unsupervised machine learning (Latent Dirichlet Allocation - LDA) for topic extraction from reviews. Ordinal logistic regression to associate topics with satisfaction levels, separated by gender. Gender classification algorithm applied to associate reviews with gender.	Users classified by gender based on usernames (not fully accurate; non-binary not included). Though not tourists per se, users represent a diverse group interacting with digital mobility services.	Fare issues contribute to dissatisfaction despite integrated payment systems. Gender differences in topics discussed: women focus more on Pass and Map features; men more on Map and Train. AI-driven text mining provides cost-effective and less biased insight compared to surveys/interviews.	Gender theory considerations in transport and mobility services.	Online reviews may not fully represent all user demographics or experience facets. Focused on MaaS apps; direct tourist experience not studied.	Conduct spatio-temporal analysis to capture location-related perception variations. Analyse sentiment-topic associations using social media data like Tweets that lack direct satisfaction ratings. Include non-binary and broader gender identities in future studies. Apply these AI-driven text mining methods to study tourist experiences with mobility and other services to discern AI's impact on satisfaction and user attitudes.
The Future Is in Sustainable Urban Tourism: Technological Innovations, Emerging Mobility Systems, and Their	Examine how smart city technologies enhance urban tourism efficiency, digital engagement, and sustainability.	Quantitative research using a questionnaire with 31 Likert-scale statements. Sample size: 1239 tourists from Amsterdam,	Tourists in three major smart cities with diverse cultural and infrastructural backgrounds.	AI-driven digital tools (mobile apps, virtual tours, smart exhibits) significantly improve interactivity, personalization, and immersion in tourist experiences.	Positivist epistemology emphasizing empirical, data-driven analysis for establishing cause-effect relationships between smart tech adoption (including AI) and tourism outcomes.	Sample bias due to questionnaire distribution mainly in hotels, potentially excluding tourists using alternative accommodation (e.g., Airbnb).	Tailor smart tourism strategies incorporating AI to local cultural and infrastructural contexts, particularly in Serbian cities.

Role in Shaping Smart Cities		Barcelona, and Vienna.						
Vujko, Knezevix, Arsic (2025)	Identify key dimensions of smart tourism influencing tourist experience.	Data analysis through factor analysis and Structural Equation Modeling (SEM) to identify dimensions: smart efficiency, smart travel, digital enhancement	Age skewed towards younger (70% under 35), balanced gender (45% male, 55% female).	Real-time data access (via AI-enhanced apps) leads to more convenient, efficient, and less stressful travel.	Conceptual dimensions developed: Smart Efficiency, Smart Travel, Digital Enhancement—all supported by factor analysis and SEM.	Findings primarily based on European smart cities; transferability requires context-specific adjustments, especially for Serbian cities.	Address digital divide issues to ensure inclusive access to AI-driven tourism solutions.	
	Explore applicability of findings for improving tourism in Serbian cities.		Majority well-educated and tech-savvy.	AI contributes to sustainability by enabling smarter mobility systems (e.g., optimized routing, eco-friendly transport solutions) and waste management.	Smart digital infrastructure powered by AI enhances tourist satisfaction through personalized content and seamless services.	Technological adoption differences influenced by cultural, infrastructural context not fully resolved.	Further research on the cross-cultural applicability of AI-enabled smart tourism tools.	Explore deeper integration of AI in enhancing sustainability and resilience in urban tourism ecosystems.
Measuring Destination Image through Travel Reviews in Search Engines	To propose a big data-based method to analyse and measure the perceived tourist destination image (TDI) using online travel reviews (OTRs) displayed by search	Quantitative content analysis of 387,414 TripAdvisor OTRs from Île de France collected via search engines.	Online travel reviews (OTRs) specifically "Things to Do" in Île de France, written in English, between 2007 and 2016.	AI-enabled search engines organize and present vast tourism content, shaping the projected destination image travellers perceive.	Combines cognitive-affective and designative-appraisive destination theories.	Not all OTRs are indexed by search engines, possibly biasing accessible content.	Use regular expressions and advanced text mining (AI techniques) to extract deeper insights on attributes like identity, authenticity, sustainability, and	
Marine-Roig (2017)					Uses concepts from electronic word-of-			

	engines. To explore how user-generated content (UGC) shapes the cognitive, spatial, temporal, evaluative, and affective dimensions of TDI. (Relevance: Understanding how AI-powered search engines and big data analytics influence tourists' perception by filtering and presenting UGC.)	Metadata mining of titles, ratings, and textual content combining user-generated content and webmaster-generated content. (Relevance: Demonstrates AI/big data techniques applied to large-scale information filtering impacting tourist experiences.)	Over 123,000 valid OTR titles analysed for appraisive image. (Relevance: Large and diverse dataset representing real tourist feedback accessible through AI-influenced platforms.)	UGC provides real-time, reliable, and unsolicited evaluations influencing tourists' affective and cognitive dimensions about destinations. Identification of critical managerial insights (e.g., tourist crowding problems detected via common complaints in OTRs). AI's role in filtering and summarizing tourist reviews enables more efficient travel planning and image measurement. (Relevance: AI affects tourists by determining what content is visible and influential in shaping their travel decisions.)	mouth (eWOM) and metadata mining to understand destination image formation. (Relevance: Provides a theoretical basis for how AI tools and big data extract meaningful tourist perceptions.)	The study focuses on English language reviews, limiting representation. Prescriptive (what should be done) or conative (behavioural intention) image components are beyond the study's scope. (Relevance: AI-based systems might filter information unevenly, affecting the completeness of tourists' experiences.)	smartness of destinations from reviews. Explore hierarchical geographic and service classifications to refine AI-based destination image analysis. Expand beyond frequency analysis to semantic and emotional analysis of UGC to capture richer tourist experiences. (Relevance: Future AI tools can be developed to improve how tourists' experiences and perceptions are analyzed and personalized.)
The role of technology in enhancing the tourism experience in smart destinations: A meta-analysis Sustacha, Baños-Pino, Eduardo Del Valle (2023)	To integrate findings on how smart technology affects tourists' experience in smart destinations. To identify key attributes of smart technology (STT), including informativeness, interactivity, security, and privacy concerns.	Systematic review and meta-analysis using a random-effects model estimated with restricted maximum likelihood. Data sourced from Scopus and Web of Science, with no time limits, including studies until April 2023.	Studies covering various smart technologies (including AI-related tools) applied across countries such as South Korea, Indonesia, Macao, Taiwan, Spain, and others. Sample sizes across studies	Positive overall effect of smart technologies on tourism experience, with informativeness (quality of information) and interactivity (user engagement with technology) as the strongest contributors. Security and privacy concerns negatively affect the tourism experience.	Stress-coping theory, experience economy concepts, and ICT adoption models referenced in underlying studies contributing to the meta-analysis. The smart destination framework situates AI and other ICT tools as enablers of enhanced tourist experiences through improved	Potential publication bias and variability in study designs and context among analysed studies. Lack of granular data isolating AI explicitly from other smart technologies in some included studies.	Further studies explicitly isolating AI's unique contributions to tourist experience, beyond generic smart technology. Exploring how AI-driven personalization and real-time interaction influence emotional and behavioural outcomes of tourists.

Examine moderators such as ICT readiness impacting the relationship between STT and tourism experience.	ranged from ~100 to over 1000 participants in different tourism contexts.	AI-powered features can enhance informativeness and interactivity by personalizing content and facilitating real-time responses (implied through included technologies like chatbots, augmented reality).	service, delivery, information and engagement.	Security and privacy concerns require deeper exploration specific to AI applications.	Investigations into mitigating security/privacy risks specific to AI systems.
The Role of Artificial Intelligence in Shaping the Future of Travel Industry: An Expert Analysis of Artificial Intelligence-Generated Travel Itineraries	Assess acceptability of AI-generated Travel Itineraries (AITIs) in tourism.	Three-phase research including introduction of AI language model, expert selection/interviews, and data analysis.	Travel industry experts and professionals providing direct and indirect evaluations of AI-generated itineraries.	Majority of experts find AITIs acceptable with high satisfaction on itinerary organization and activities suggested.	Grounded in Sustainable Development Goals (SDGs), especially SDG 4 (Quality Education) and SDG 16 (Peace, Justice, and Strong Institutions) focusing on ethical AI use and innovation.
Štilić, Puška, Nicić, (2024)	Investigate factors influencing use and satisfaction with AITIs.	Use of OpenAI's GPT-based language model to generate itineraries.	Experts emphasized need for more personalized, culturally rich information to enhance travel experience.	Uses AI and ICT adoption theories including user satisfaction, trust, and acceptance models.	Research primarily relies on expert evaluations; user/tourist evaluations are yet to be explored.
Evaluate AITIs' design and quality compared to traditional itineraries.	Qualitative expert interviews and evaluations of AITIs.	Identified challenges include ethical concerns (privacy, bias), external	ICT readiness moderates the strength of the relationship; places with higher readiness see stronger positive effects from smart technologies.	The majority of studies focus on positive impacts, with less on negative or unintended consequences such as alienation or authenticity loss.	Cross-country comparisons in light of varying ICT readiness and digital inclusiveness.
Develop comprehensive AI training programs for travel agents to improve collaboration with AI tools.	Address ethical issues rigorously including GDPR compliance, data security, and algorithmic bias.	Enhance AI data processing capabilities to better respond to	Need for improved personalization and	Challenges in addressing real-world complexities such as geopolitical crises and data privacy issues.	Research addressing ethical considerations and balancing technology use with authenticity in tourism experience.

	Explore the future role of travel agents in an AI-augmented context.			factors (geopolitical events, crowds), and potential over-reliance on AI.		richer cultural content in AI-generated outputs.	external events impacting tourism.
				AI-driven itineraries can improve efficiency, cost-effectiveness, and sustainability in travel planning.			Expand research from expert to tourist-focused evaluations to capture actual user experiences and satisfaction.
				Predicted that AI could generate up to 99% of travel itineraries in the near future, shifting travel agents' roles towards AI collaboration and digital literacy.			Foster multi-stakeholder cooperation involving policymakers, technologists, and industry players to optimize AI's role in tourism.
				Integration of AI supports SDGs by driving innovation, sustainable tourism, and ethical standards.			
Employing waterborne autonomous vehicles for museum visits: a case study in Amsterdam	Investigate how AI-driven waterborne autonomous vehicles (WAVs) can enhance museum visitation experiences in Amsterdam.	Developed a multi-objective optimization model integrating big data analytics (historical museum visitation, social media data, canal networks).	Museums in Amsterdam Central area (48 out of 164 mapped museums near canals).	Tourists significantly prefer boats over road transport for museum visits, and WAVs are preferred over traditional boats.	AI and autonomous vehicle technologies as disruptive innovations transforming urban mobility and tourism.	Legal speed restrictions for boats limit WAV travel speeds, potentially affecting efficiency.	Extend WAV applications to other points of interest and expand to broader urban mobility contexts.
Rong, Tu, Duarte & Ratti (2020)	Explore the potential of AI and autonomous vehicle technology to improve urban tourism and tourist mobility.	Used genetic algorithms to solve the WAV routing problem for optimal museum tours.	Survey respondents: 268 total, 182 familiar with or experienced Amsterdam, 174 interested in museums, 168	WAV-based tours provide comparable travel efficiency despite slower boat speeds, and offer flexible, customizable transit experiences.	Big data analytics and social media as tools to understand visitor behaviour and preferences.	Technology adoption challenges remain, including safety, regulatory, and infrastructural issues.	Explore integration of WAVs with land transport systems for multimodal tourism solutions.
		Conducted a survey comparing			Multi-objective optimization approaches integrating online/offline	Study focused on central Amsterdam and museums near canals, limiting generalizability.	Further investigate policy, safety, and social acceptance issues

	Assess the acceptance of WAVs by tourists for cultural visits.	preferences for travel by road, traditional boats, and WAVs. Compared travel efficiency and convenience of WAV routes versus land transportation.	open to using WAVs.	Combining AI-optimized WAV routes with museum visitation can improve tourist experiences and distribute visitors more evenly among museums. Integration of online (social media) and offline data improves route optimization, aiding targeted tourism management. Accessibility and novelty of WAVs enhance tourists' travel experience, promoting wider cultural participation.	popularity and travel patterns to improve tourist routing.	Survey sample size and self-selection bias may affect representativeness.	around autonomous waterways. Use real-time data and AI improvements to enhance personalization and dynamic routing for tourists. Promote collaboration between museums and WAV operators to develop new tourist packages.
Toward a New Similarity Measure Based on Combining Tourist Check-ins and Their Trip Path for a Point-Of-Interest Recommendations in a LBSN Bettache & Dennai (2025)	To develop an improved similarity measure (SPPUR) combining tourists' check-ins and travel paths to enhance POI recommendations in LBSNs. To investigate how integrating geographic proximity and data affects recommendation accuracy and tourist guidance.	Proposal of a novel similarity measure inspired by TF-IDF adapted to tourist POI data and user proximity. Offline experimental evaluation using real-world Foursquare dataset. Comparative analysis against traditional similarity measures through collaborative filtering. Metrics used: PRECISION, RECALL, MAP, and NDCG.	Tourist check-in data extracted from the Foursquare dataset. Users represented by their check-in sequences and geographical trips over different POIs.	SPPUR similarity measure significantly improves POI recommendation accuracy compared to traditional approaches. Incorporation of geographical proximity and user trip paths enhances the relevance of recommendations. Optimal number of neighbour users is critical; increasing neighbours beyond a threshold degrades recommendation quality.	Based on the TF-IDF technique adapted from text mining to user check-in paths and POI frequentation. Collaborative Filtering framework employing user-based similarity enhanced with spatial and path information.	High computational complexity and difficulty scaling to large datasets. Potential biases from historical check-in behaviour. Cold-start problem remains partially unresolved. Evaluation limited to offline datasets without online user feedback.	Extend evaluation to online, real-world scenarios incorporating user feedback, especially in smart tourism applications. Integration of additional contextual factors such as semantic POI features, weather conditions, and seasonal effects. Improve scalability and address data sparsity through advanced machine learning or AI techniques.

				Limitations include computational complexity, scalability challenges, and cold-start problem.			Explore combining SPPUR with deep learning models or reinforcement learning for dynamic, personalized tourist experiences.	
Monitoring the well-being of vulnerable transit riders using machine learning based sentiment analysis and social media: Lessons from COVID-19				Around 120,000 Twitter users identified as transit riders.	Despite decreased ridership, about 20% continued using transit during the pandemic.	Combines transport equity theory with psychological aspects of travel behaviour.	Social media data biased towards users with mobile devices and Twitter accounts, excluding some demographics.	Integrate data from multiple social media platforms to reduce bias and improve coverage. Combine sentiment data with geolocation and real-time transit ridership data for more precise behavioural insights.
Tran, Wang, (2022)	Draeger, Nikbakht	To demonstrate how AI (machine learning) can augment traditional transport data collection methods by capturing psychological and behavioural experiences of transit users, including different demographics.	Data cleaning and validation by filtering keywords and comparing with General Transit Feed Specifications (GTFS).	Includes a diverse population segmented by gender, age (youth, middle-age, seniors), and language groups (English and non-English speakers).	Significant increase in negative sentiments (fear, sadness, anger) during COVID-19 waves, especially among vulnerable groups.	Uses sentiment analysis grounded in natural language processing and machine learning.	Data may reflect subjective, memory-biased perceptions rather than real-time experiences.	Extend methodology to other cities and contexts, including tourist environments.
			Machine learning-based sentiment analysis to detect emotions (fear, anger, trust, etc.) among users.	Focus on vulnerable populations such as women, youth, seniors, migrants, and ethnic minorities.	Women reported higher fear and disgust levels; non-English speakers showed heightened behavioural responses.	Draws on interdisciplinary research including urban mobility, social vulnerability, and risk perception.	Validation limited by availability of ridership data; tweets not always geolocated or time-stamped relative to trips.	Use AI sentiment analytics to inform targeted social-distancing and health communication strategies.
			Disaggregation of data by age, gender, and ethnicity.		AI-enabled sentiment analysis revealed disparities in transit experiences linked to psychological stress and safety concerns.		Focused on one metropolitan area (Vancouver), limiting generalizability.	Explore impacts of AI tools on psychological well-being and travel experiences for various user groups including tourists.
			Time series analysis covering pre-pandemic and pandemic periods (2019-2020).		The methodology can detect reactions to non-pandemic transit events (e.g., strikes).			Develop privacy-conscious data collection strategies to analyse real-time transit experiences.
				Provides granular data beyond traditional ridership counts, revealing				

emotions and perceptions tied to transit use.

A computer vision-based concept model to recommend domestic overseas-like travel experiences: A design science study Trieu, Vu, Indulska & Li (2024)	To develop and design an AI-driven recommendation artefact that helps domestic travellers discover exotic overseas-like travel experiences within their own country through analysis of travel photos. To support travel decision making for new, unfamiliar travel experiences without relying on prior travel histories.	Design Science Research (DSR) approach for artefact creation and evaluation. Use of latest advances in computer vision (concept modeling) to analyse and summarize large-scale photo datasets for travel experience identification. Qualitative evaluation using focus groups to assess efficacy and usability.	Dataset: Approximately 479,000 geotagged travel photos sourced from Flickr, covering multiple countries and domestic locations. Evaluation Participants: Four focus groups totalling 18 users with travel interests.	The system effectively recommends domestic locations presenting overseas-like travel experiences by analysing photo visual content rather than relying on travel histories or textual labels. Recommendations aid travel decision-making by offering new exotic experiences domestically, saving time and money. All focus group participants agreed that recommendations made their travel planning more effective and appropriate to their interests. The artefact enhances discovery of travel experiences that would otherwise be difficult to find via traditional search engines or prior RS.	Computer vision concept modeling for high-level visual content analysis. Decision Support Systems (DSS) and Recommender Systems (RS) theory applied within tourism behavioural context. Design Science Research (DSR) paradigm for system design and evaluation.	Limited to visual elements (architecture, scenery) detected from photos; other sensory or experiential features (local customs, cuisine, language) not captured. Reliance on Flickr photos may limit comprehensiveness; other photo sharing platforms recommended for future use. Prototype system not fully implemented online yet; tested only in controlled focus groups.	Extend testing to diverse countries and traveller profiles to adapt to cultural differences in travel preferences. Implement a fully operational online system with route planning and itinerary features integrated. Incorporate more diverse travel experience types beyond sightseeing (e.g., dining, shopping). Use multiple photo platforms and richer data sources for better coverage and personalization.
Tourists' willingness to contribute to smart tourism: a construal level theory perspective Sun & Sano (2024)	To explore tourists' willingness to share personal information and use smart technologies (including AI-driven tools) in smart tourism	Scenario-based laboratory experiment. 2 (far vs. near spatial distance) x 2 (gain vs. loss info framing) x 2 (altruistic	800 participants based in China. Varied demographics controlled for	Tourists' willingness to share personal info and use smart technology (like AI applications in tourism) increases significantly when spatial distance aligns with the framing of	Construal Level Theory (CLT): how psychological distance (temporal, spatial) influences decision-making and perception.	Sample limited to China, affecting generalizability to other cultures or regions.	Call for studies with broader, more diverse populations to validate findings cross-culturally.

	development.	vs. egoistic value orientation) between-subjects design.	geographical and cultural consistency.	information and their value orientation.				
	To examine how spatial distance, message framing, and value orientation influence this willingness.	Data collected via online platform (Credamo) with 800 China-based participants.		Gain-framed messages work better when spatial distance is far; loss-framed messages are more effective when spatial distance is near.	Information framing theory (gain vs. loss) intertwined with value orientation (egoistic vs. altruistic) guiding how messages impact behaviour.	Focused mainly on willingness to share data and use technologies, not on actual usage or experiential outcomes with AI.	Suggest exploring tourists' actual experiential impacts of AI in smart tourism beyond intention measures.	
		Quantitative analysis using factorial ANOVA.		Tourists with altruistic values respond better to gain-framed messages based on near spatial distance, while egoistic values respond more to loss-framed messages in far spatial contexts.		Did not specifically isolate AI effects, but included within broader "smart technology" concepts.	Recommend deeper examination of value co-creation behaviours and market segmentation in smart tourism with AI.	
				Perceived risk and concreteness of the destination due to spatial distance affect tourists' acceptance of AI-enabled smart technologies.				
A Cultural Route Recommendation Based on Optimization Techniques in Urban Spaces	To explore the role of cultural routes in heritage preservation and urban planning.	Development and application of an improved Ant Colony Optimization (ACO) algorithm enhanced with the 2-Opt method based on the Traveling Salesman Problem (TSP).	Urban space points of attraction representing cultural heritage sites, natural areas, and service facilities in city environments.	AI-driven route optimization can personalize tourists' experiences by tailoring routes according to individual preferences, time, and budget constraints.	Optimization algorithms inspired by natural phenomena (Ant Colony Optimization).	Challenges dealing with dynamic variables such as traffic, weather, and sudden disruptions in urban routes.	Further exploration of advanced technologies like virtual reality, augmented reality, and AI to enrich tourist experiences.	
Öztürk, & Aktan (2024)	To develop a model using AI-based optimization techniques that provide tourists with the most suitable cultural route in urban	Combination of cultural content, service content, and complementary	Model focuses on tourists and	Improved ACO algorithm enhances route planning	Traveling Salesman Problem as a mathematical framework for route planning.	Data privacy and security concerns related to collecting user location and preference data.	Enhance international collaboration to improve dissemination and development of AI	

	settings, enhancing efficiency in time and budget management.	activities as input variables for route optimization.	travellers planning their customized route.	by minimizing travel time and cost, while maximizing the number of sites visited.	Concepts of cultural heritage preservation and urban planning integrated with AI-based decision-making.	Technical issues regarding cross-platform compatibility of AI applications.	applications in cultural tourism.
		Scenario and spatial modeling within urban environments.		Digital tools incorporating AI can mitigate the time-consuming process of itinerary planning, making cultural tourism more accessible and engaging.			Address privacy, security, and technical challenges for broader adoption.
				Integration of AI supports sustainable urban tourism by promoting efficient cultural heritage management.			Research the alignment of cultural route planning with local economic development goals to benefit host communities sustainably.
Attitudes towards machine translation and languages among travelers Carvalho, Ramires, & Iglesias (2023)	Investigate how attitudes toward machine translation (MT), an AI-based technology, relate to tourists' profiles, travel behaviours, and language mindsets in the travel context.	- Quantitative study using statistical exploratory and inferential analyses (IBM SPSS Statistics v.28). - Two-part design: 1. Large sample (N=2535) assessing general tourists' attitudes toward MT and language. 2. Subsample of language tourists (N=907) focusing on MT's role in language-focused trips. - Data collected via questionnaires disseminated with support from EUNIC Portugal	General travelers and language tourists, diverse in age, language skills, and education. Convenience sample (limitation acknowledged)	Younger, less educated individuals with poorer language skills and higher valuation of English as lingua franca have more positive attitudes towards MT. Language tourists who rated MT as less important had higher foreign language fluency, engaged more in cultural activities, and had closer local contacts during trips. Use of MT does not negatively impact positive attitudes toward language roles or travel enjoyment.	Language mindsets (beliefs and attitudes towards languages) in travel. Broader field of Tourism 4.0 and IT-mediated tourism experiences examining transformational roles of AI and language technology in tourism. No specific detailed theory explicitly defined; acknowledges theoretical gap regarding MT's role in tourist communication	Convenience sample restricts generalizability. Lack of data for respondents not engaged in language tourism limits conclusions about general tourist experience with MT. Absence of prior theory to formulate hypotheses limited study design. Data sensitivity prevents open access, limiting replication.	Further studies should address general tourists beyond language tourism to explore MT's wider impact. Investigate how MT affects human interaction and cultural engagement during travel — is it transactional or immersive? Research how service providers utilize MT in both verbal and written communication. Technology developers should consider adapting MT tools to
	Specifically, analyse if perceptions of MT's importance differ among language tourists during their most significant language trips.						

				MT is seen as facilitating travel but did not play a major role in most significant language trips for many language tourists.			individual tourists' communicative needs, minority languages, diverse accents, and accessibility concerns.
				Neural MT advancements (post-2016) improved usability and possibly influenced younger travelers' appreciation of MT			Focus on privacy, reliability, and user-friendliness to improve travel experiences with AI-supported MT.
Understanding tourist barriers and personality influences in embracing generative AI for travel planning and decision-making	To investigate the barriers tourists face in adopting generative AI (GAI) for travel planning and decision-making.	Quantitative survey of potential travelers in South Korea and the United States.	Surveyed potential travelers in Korea and the US.	Personality traits significantly affect tourists' reluctance to adopt GAI for travel planning.	Innovation Resistance Theory (IRT): Focuses on functional barriers (usefulness, ease of use, reliability) influencing resistance to GAI.	Focuses only on functional barriers, not psychological barriers (e.g., loss of human interaction, perceived image).	Develop targeted marketing and user interface designs based on personality-driven preferences.
Seyfi, Kim, Nazifi, Murdy, Vo-Thanh (2025)	To assess how personality traits (Big Five) and innovation resistance affect tourists' reluctance to use GAI-powered travel recommendations.	Used structural equation modeling, multi-group analysis, and fuzzy-set qualitative comparative analysis to analyze data	Chosen for their advanced adoption of AI technologies and strong innovation infrastructure.	Tourists high in openness are more likely to embrace GAI, while those high in neuroticism show greater resistance due to risk sensitivity.	Big Five Personality Traits: Openness, conscientiousness, extraversion, agreeableness, neuroticism, used to explain individual differences in GAI adoption.	Survey limited to travelers in the US and Korea, which may affect generalizability to other cultural contexts.	Address consumer concerns with enhanced privacy features and human-like AI interactions.
	Research questions include:			Functional barriers (concerns about usefulness, ease of use, reliability) are key in resistance.		Cross-sectional survey limits ability to assess changes over time.	Future research should explore psychological barriers and expand to other cultural contexts.
	How do varying levels of innovation resistance shape tourists' perceptions and attitudes toward GAI technologies?			GAI enhances travel experiences by enabling personalized recommendations, real-time assistance, and improved engagement across all travel stages (pre-trip, during trip, post-trip).			Longitudinal studies recommended to examine changes in adoption and resistance over time.
	How do the Big Five personality traits relate						

	to tourists' resistance to adopting GAI-powered travel recommendations?			Despite benefits, concerns about content authenticity, privacy, and trustworthiness persist.			
Spatio-temporal intention learning for recommendation of next point-of-interest	To improve next point-of-interest (POI) recommendation systems by capturing both user preference patterns and intention patterns (especially the intention to revisit locations), enhancing the accuracy and relevance of recommendations for users (i.e., tourists).	Developed a novel deep learning model called Spatio-Temporal Intention Learning Self-Attention Network (STILSAN). Incorporated a preference-intention module to model both long-term user preferences and revisiting intentions. Designed a spatial encoder module using a pretrained variational graph auto-encoder (VGAE) to learn spatial features and simulate spatial clustering of POIs. Conducted experiments on two real-world check-in datasets to evaluate model performance.	Real-world check-in datasets from location-based social networks (LBSNs), representing user travel and check-in behaviours at various POIs.	STILSAN significantly outperformed state-of-the-art models in next POI recommendation accuracy. Explicitly modeling revisiting intentions and spatial proximity led to more accurate and user-relevant recommendations. The model successfully captured both the tendency of tourists to revisit familiar places and their interest in exploring new locations, improving the overall tourist experience.	Built on theories of user preference and intention patterns in mobility (distinguishing between exploring new places and revisiting known ones). Incorporated Tobler's first law of geography (spatial proximity principle: "near things are more related than distant things").	Increased computational cost due to embedding learning for each POI position. Balancing model training cost with effective spatial feature modeling remains a challenge.	Explore more efficient spatial embedding techniques to reduce computational overhead. Extend the model to other recommendation scenarios beyond tourism. Further investigate how different types of tourist behaviours (e.g., spontaneous vs. planned revisits) can be better captured and leveraged in AI-driven recommendation systems.
Technological evolution in tourism: a Horizon 2050 perspective	To examine how technological advancements, especially AI, have reshaped tourism experiences and operations from post-WWII to 2050.	Conceptual paper using a hybrid approach: Historical analysis (1946–2023) Future projections (to 2050)	Not empirical; no specific sample. Focuses on global tourism trends and technologies affecting tourists broadly.	AI enhances personalization through chatbots, virtual assistants, and recommender systems. AI-driven platforms improve customer service and streamline travel planning.	No explicit theory stated, but grounded in technological determinism and innovation diffusion concepts. Emphasizes longitudinal perspective on tech adoption in tourism.	Conceptual nature—no empirical validation. Broad scope may limit depth on specific AI applications. Future projections are speculative and context-dependent.	Empirical studies on AI's psychological and emotional effects on tourist satisfaction. Exploration of ethical implications of AI in tourism (e.g., data privacy, algorithmic bias).

	To forecast future impacts of AI, metaverse, and Web 3.0 on sustainable and ethical tourism.	Sources: archival data, academic literature, industry reports		AI enables immersive experiences via VR/AR and metaverse applications.		Development of frameworks for AI integration in sustainable tourism strategies.	
				AI supports smart destinations with real-time data for seamless tourist experiences.		Investigate AI's role in enhancing cultural authenticity and local engagement.	
				AI contributes to sustainability by optimizing resource use and reducing environmental impact.			
				AI empowers inclusive tourism (e.g., assistive tech for disabled travelers).			
The Role of Digital Tourism Platforms in Advancing Sustainable Development Goals in the Industry 4.0 Era	To explore how Industry 4.0 technologies (including AI) integrated into digital tourism platforms affect sustainability and market structures.	Conceptual, theory-building approach.	Not empirical; focuses on digital tourism platforms (e.g., Airbnb, Booking.com) and their global impact.	AI-driven personalization enhances tourist satisfaction through tailored recommendations and seamless booking.	Platform theory	Conceptual only; lacks empirical validation.	Empirical studies to validate the conceptual framework.
		Synthesizes multidisciplinary literature to develop a five-dimensional framework.		AI-powered pricing and automation improve operational efficiency but increase dependency on dominant platforms.	Techno-determinism	May oversimplify complex tourism contexts.	Investigate AI's impact on tourist emotions, trust, and post-travel behavior.
		No primary data collection; relies on secondary sources and theoretical integration.	Contextualized within sustainable tourism and Industry 4.0 technologies.	AI contributes to sustainability by optimizing travel routes and reducing resource waste.	Dynamic capabilities theory	Needs contextual testing across diverse tourism settings.	Explore governance models to ensure equitable AI access for SMEs and marginalized groups.
	To assess the dual role of these platforms in enhancing tourist experiences and raising governance challenges.				Sustainable Development Goals (SDGs) as evaluative lens		
Zeqiri, Youssef & Zahar (2025)							

Risks include algorithmic bias, data privacy concerns, and exclusion of SMEs from AI benefits.									
ChatGPT and Tourist Decision-Making: An Accessibility–Diagnostics Theory Perspective	To investigate how ChatGPT informs and influences tourist decision-making.	Qualitative approach using ChatGPT-3.5 outputs across 30 tourism contexts.	No human participants; data collected from ChatGPT responses.	ChatGPT enhances pre-trip experiences by improving access to tailored, relevant travel info.	Accessibility–Diagnostics Theory (ADT)	Based solely on ChatGPT-3.5 (not the latest versions).	Explore multi-platform AI (e.g. voice assistants, visual AIs) across tourist experiences.		
Stergiou & Nella (2024)	To explore its role through the lens of Accessibility–Diagnostics Theory (ADT) in enhancing information quality and personalisation.	Thematic analysis of 360 output units (intros, steps, and conclusions).	Simulated tourist inquiries (e.g. “how to choose the ideal destination”) covering diverse travel scenarios.	Emerged themes:	- Accessibility: Ease of retrieving useful travel information. - Diagnostics: Relevance and clarity in decision-making support.	Limited to text-based scenarios; lacks actual tourist behavioural validation.	Conduct empirical studies with tourists to validate AI’s impact.		
		Integration of inductive and deductive coding, guided by ADT.				Potential algorithmic bias and over-reliance on a single tool.	Examine post-trip engagement and long-term experience shaping via AI tools.		
		Contextual Variation: Advice is nuanced based on the travel scenario.							
		ChatGPT acts as a user-centric advisor, improving decision-making satisfaction.							
Empirical Approaches Regarding	To explore how technological advancements	Empirical literature synthesis from recent	Secondary data drawn from prior empirical studies,	AI enables personalized tourist experiences via real-time service,	Smart Ecosystem	Tourism Tech solutions, including AI, may widen the digital divide among	Examine tourists’ perception of AI-enabled services in		

Interdependency between Technology and Sustainable Tourism	(including AI) influence sustainable tourism practices and tourist experiences.	studies on tech-enabled tourism.	global tourism tech use cases.	recommendation systems, and smart interfaces.	Sustainable Development Goals (UN SDGs)	destinations and travelers.	different cultural contexts.
Nicola-Gavrila (2023)	To investigate the role of technology in enhancing sustainability and destination management.	Thematic analysis of technology applications (e.g., AI, VR, agent-based modeling) in sustainable tourism.	Includes contexts like smart destinations, mobile tourism apps, and agent-based simulations of tourist behaviour.	Agent-based modeling supported by AI helps simulate tourist decision-making and behavioural outcomes. AI integration improves destination sustainability by optimizing tourist flows and reducing environmental impact. Virtual and augmented reality tools (AI-enhanced) offer immersive, low-impact alternatives to physical visits.	Smart Governance and Data-Driven Decision Making	Ethical concerns: data privacy, algorithmic bias, and over-reliance on automation. Lack of empirical data on long-term impacts of AI on tourist satisfaction and authenticity.	Investigate AI's role in balancing personalization with authenticity in experiences. Develop socio-technical frameworks that integrate AI into community-based tourism. Need for real-time field studies to evaluate AI's effect on decision-making, trust, and repeat visitation.
Smart Tour Route Planning Algorithm Based on Naïve Bayes Interest Data Mining Machine Learning	To propose a smart tour route planning algorithm using AI (Naïve Bayes and machine learning)	Machine learning approach using Naïve Bayes algorithm.	Simulated tourists using tourism big data from online travel platforms (e.g., travel journals, evaluations)	The AI-based system accurately identifies tourist interest tendencies.	Naïve Bayes classification theory	Relies heavily on data quality and quantity from tourism platforms.	Expand model validation to real-world user studies or diverse geographic settings.
Zhou, Su, Liu, Hu, Sun & Feng (2020)	To enhance personalized tourism experiences by optimizing tour routes based on tourists' interests	Mining and analysing large datasets of tourists' feature attributes and preferences. Designing a propagating tree algorithm to construct optimal tour routes.	Focused on case city: Zhengzhou, China	Generated tour routes closely match tourist preferences, budgets, and accommodation proximity. Tourists experience improved satisfaction and travel efficiency. AI enables smarter decision-making and real-time customization, enhancing the overall experience.	Interest mining through data-driven probabilistic modeling Smart tourism and GIS integration principles	May not account for spontaneous behaviours or unstructured experiences. Context limited to urban tourism and single-city case.	Integrate real-time environmental data (e.g., weather, traffic). Explore more advanced machine learning models (e.g., deep learning) to improve personalization. Consider emotional or experiential factors beyond logistical optimization.

Exploring cross-cultural disparities in tourists' perceived images: a text mining and sentiment analysis study using LDA and BERT-BiLSTM models	To examine how tourists from different cultural backgrounds perceive a destination (Xiamen, China). To assess whether AI-driven text mining and sentiment analysis can reveal cross-cultural differences in destination image perception.	Two-stage hybrid AI approach: 1. LDA (Latent Dirichlet Allocation) for topic modeling 2. BERT-BiLSTM for sentiment analysis Comparative analysis using Hofstede's cultural dimensions theory.	93,545 Chinese-language reviews 16,553 English-language reviews Data sourced from major travel platforms (e.g., TripAdvisor, Ctrip, Airbnb)	AI models effectively identified nuanced cultural differences in perceived destination image. Chinese-speaking tourists emphasized family-oriented and cultural experiences. English-speaking tourists focused more on natural scenery and leisure. Sentiment analysis showed differing emotional responses to similar attractions.	Hofstede's Cultural Dimensions Theory Destination Image Theory (cognitive and affective dimensions)	Focused on a single destination (Xiamen), limiting generalizability. Language used as a proxy for culture may oversimplify cultural identity. AI models, while powerful, may miss subtle contextual meanings in text.	Apply the hybrid AI model to other destinations for broader insights. Explore deeper integration of AI in real-time tourist experience personalization. Investigate how AI-driven insights can inform culturally adaptive tourism marketing.
Building a Machine Learning Algorithm-Based Model to Suggest Tourist Attractions in Response to Travelers' "Slow Life" Requirements	To improve personalized recommendation systems for tourists. To explore the role of machine learning in fulfilling "slow life" travel demands. To enhance AI-driven travel planning experiences by recommending attractions aligned with relaxation-focused tourism.	Design and implementation of a collaborative filtering recommendation system. Use of user-generated data, machine learning algorithms, and web-crawled tourist attraction data. Integration of neural networks and TF-IDF weighting techniques for user interest modeling.	Digital users seeking personalized tourist destination suggestions. Data includes user demographics, behavioural logs (clicks, reviews), and attraction metadata.	The ML-based system outperformed traditional algorithms by 18% in effectiveness. Enhanced user satisfaction through customized travel routes catering to slow living. Improved recommendation accuracy, recall, and F1 scores—highlighting AI's role in enriching the user's tourism experience.	Underpinned by collaborative filtering theory and "slow travel" lifestyle principles. Draws from behavioural modeling, personalization theory, and neural network-based prediction.	Algorithm performance may degrade with demographic data sparsity or cold starts. Current frameworks lack real-time adaptation to shifting tourist preferences or external conditions (e.g., weather, availability).	Integrate situational awareness (e.g., time, climate, user sentiment) into recommendation logic. Explore gender-aware and image-based tourist modeling for deeper personalization. Extend models to consider emotional satisfaction and real-time feedback loops to optimize tourists' digital engagement.

The Analysis and AI Simulation of Passenger Flows in an Airport Terminal: A Decision-Making Tool Anagnostopoulou, Tolikas, Spyrou, Akac & Kappatos (2024)	To develop a decision-making tool using AI simulation to optimize passenger flows in airport terminals. To assess how AI-driven strategies can reduce overcrowding and enhance passenger experience.	Simulation modeling of passenger movements in an airport terminal. Comparative analysis of four crowd management strategies using 500 simulation runs per scenario.	Simulated environment with 800 passengers per hour in a sample airport terminal. Passenger profiles included flight details, ticket class, check-in status, and store preferences.	AI-guided navigation (via mobile app) significantly reduced waiting times and crowding. Technology integration improved passenger satisfaction by optimizing flow and minimizing stress. Scenario with AI support achieved a 25% reduction in crowdedness and nearly optimal waiting time (48 mins avg).	Implicitly grounded in operational efficiency and service quality theories. Focus on real-time decision-making and passenger-centric design.	Simulation-based; lacks real-world behavioural validation. Focused on airport terminals—findings may not generalize to broader tourism settings.	Apply the AI simulation model in real-world airport environments. Explore integration with other tourism touchpoints (e.g., hotels, attractions). Investigate long-term behavioral impacts of AI-guided travel experiences.
Augmenting Emerging Hospitality Services: A Playful Immersive Experience to Foster Interactions among Locals and Visitors Prandi, Nisi, Ceccarini & Nunes (2023)	Examine how immersive 360° VR visualizations impact visitor experiences in hospitality services. RQ1: Does immersive 360° VR differ from 2D visualization in enhancing the tourist experience? RQ2: What design implications emerge for playful information-sharing platforms in hospitality?	Experimental, within-subjects design comparing 2D vs. 360° VR interface. Mixed methods: Quantitative and qualitative data from usability, engagement, immersion questionnaires.	15 users experienced both versions of the ShareCities app (2D and 360° VR). Participants tested mobile-based simulations of tourist-local interactions.	360° VR enhanced user immersion, engagement, and playfulness. Immersive interactions fostered a greater sense of authenticity and connectedness with locals. The use of AI-enabled 360° VR created emotionally engaging and aesthetically pleasing tourism experiences.	Grounded in Human-Computer Interaction (HCI) and Playable Cities concepts. Referenced aesthetic experience theory (Desmet & Hekkert) and authenticity theory in tourism (MacCannell).	Small sample size limits generalizability. Short-term, controlled setting may not reflect real-world tourism dynamics. Focused primarily on visitor-side only, less on hosts' experience.	Expand studies with larger, more diverse participant pools. Explore real-time interaction with locals via AI-driven platforms. Investigate long-term impact of immersive AI tools on travel satisfaction and destination loyalty. Examine host perspectives to complete the picture of AI-mediated exchanges.

Results and Discussions

The pervasive integration of Artificial Intelligence (AI) into the tourism sector marks a significant paradigm shift, offering both immense opportunities and complex challenges. This critical review synthesizes findings from 24 selected articles, categorized by key thematic areas, to provide a nuanced understanding of AI's multifaceted impact on tourist experiences and destination management.

AI for Sentiment Analysis and Tourist Perception

The AI-based sentiment analysis has become a powerful method to recognize the subtle perception of tourists from large unstructured data sources, such as online reviews (Aggarwal & Gour, 2020). This approach enables the accurate identification of critical satisfaction drivers, including cleanliness, safety, pricing and service quality, thus supporting data-informed destination management strategies (Aggarwal & Gour, 2020). Secondly, AI helps in the clustering of destinations according to common in satisfactions, allowing stakeholders to design more targeted and efficient interventions (Aggarwal & Gour, 2020). AI-enabled text mining also presents a cost-effective and less biased alternative to conventional surveys or interviews (Aman & Smith-Colin, 2022). Although real-time sentiment classification capabilities are an important feature for tracking dynamics and engaging in immediate responses, limitations remain. One significant concern is the risk of potential bias and representativeness of online resources, which may not reflect all of every tourism demographic profile or experience fully (Aggarwal & Gour, 2020).

In addition to a general sentiment, AI-based text mining and sentiment analysis using models such as Latent Dirichlet Allocation (LDA) and Bidirectional Encoder Representations from Transformers-Bidirectional Long Short-Term Memory (BERT-BiLSTM) have uncovered cross-cultural variations in destination image perception. For example, family-oriented and culture experiences are the focuses of the Chinese-speaking tourists and natural scenery and relaxation are the focuses of the English-speaking tourists (Chen et al., 2024). Sentiment analysis also indicated different emotional reactions to the same attractions within different cultures (Chen et al., 2024). This emphasizes the need for culturally informed AI models even though it may be an oversimplification to use language as the single proxy for culture (Chen et al., 2024). Most importantly, User-Generated Content (UGC) is an important real-time, credible, and voluntary feedback that shapes both the affective and cognitive aspects of the Destination Image (DI) (Marine-Roig, 2017). AI can effectively filter and summarize hundreds of thousands of these tourist reviews, which helps speed up travel planning and destination image measurement, thus directly influencing the perception of tourists and their choice of destinations (Marine-Roig, 2017).

In the urban transit context, AI-based sentiment analysis towards social media data has revealed inequalities on experienced transit based on mental stress and safety perception especially regarding vulnerable group's travel behaviour during events such as the COVID-19 pandemic (Tran et al., 2022). These findings highlight AI's potential for granular data on emotions and perceptions, beyond classic ridership numbers (Tran et al., 2022). However, social media data may have a strong demographic bias and may represent subjective or recall-biased impressions rather than contemporaneous experience, which may constrain the generalisability of the findings (Tran et al., 2022).

Finally, it can be concluded that AI-facilitated sentiment analysis has a significant influence on tourists as it gives a new dimension of understanding of their perceptions and satisfaction factors. The technology helps in pinpointing the factors that impact satisfaction, including quality of services and safety, and assisting in this way the targeted destination management strategies (Aggarwal & Gour, 2020). In addition, the ability to explore intercultural variations in destination image (Chen et al., 2024) and emotional discrepancies with respect to urban transit experience (Tran et al., 2022) has a perceptive insight into the cross-cutting tourist needs and vulnerabilities. AI text mining is more cost-efficient and less biased than traditional data collection methods provide (Aman & Smith-Colin, 2022) but the inherent limitations of online data sources, which include issues of biases, issues of representativeness, and the potential for oversimplifying complex cultural cues and behaviour (Fortunato et al., 2020), mean that AI benefits are transformative, yet not without caveats. As such, AI certainly has the potential to better enable understanding, anticipation, as well as responses with respect to multiple dimensions of tourists' experience, but such potential remains contingent on data quality, ethical implications, and the development of more advanced, context-aware models that can effectively capture the richness of human travel.

AI in Urban Mobility and Mobility as a Service (MaaS)

The role of AI in urban mobility and MaaS can be similarly observed in the cost-effective and less biased process to acquire user opinions compared to traditional data collection methods (Aman & Smith-Colin, 2022). Among the app-related features, elements such as maps, updates, and technical performance have considerable impact on the satisfaction of users on MaaS platforms (Aman & Smith-Colin, 2022). However, persistent challenges remain, particularly regarding fare-related frustrations in the context of public transport combined with the complexity of integrated payment systems. While AI-enabled technologies, such as natural language processing (NLP), can support aspects of user interaction and service automation, they are insufficient in isolation to resolve these issues. Redesigning pricing mechanisms and doing more in-depth analyses of public opinion beyond sentiment may be necessary to address such issues in a more comprehensive manner (Aman & Smith-Colin, 2022). Moreover, gender disparities in topic coverage such as women discussing "Pass" and "Map" features, men discussing "Map" and "Train" features, further underscore the importance of AI applications having more customized interfaces for different users' needs (Aman & Smith-Colin, 2022).

Beyond the scope of the traditional travel technology, AI-optimized Waterborne Autonomous Vehicles (WAVs) have been investigated to provide intelligent museum visiting, with tourists exhibiting a strong preference for WAV over traditional boats and road transportation for cultural tours (Rong et al., 2020). Tourism efficiency of the WAV-based tour is similar with those of other tours even under slower speeds, allowing for variations and customization of cruise routes that enhance tourists' experience, and enables a better distribution of visitors among museums (Rong et al., 2020). Nevertheless, several challenges remain that include the constraint on speed, technological challenges on deployment such as safety and regulation, and the intractable computational complexity with large-scale data (Rong et al., 2020). In addition, AI simulation tools have proven effective in optimizing passenger flow in complex spaces such as airport terminals, leading to significant improvements in waiting time and crowd control (Anagnostopoulou et al., 2024). Such technology integration enhances passenger experience through stress reduction and flow

optimization and AI assistance to bring about substantial reductions in crowdedness and almost optimal waiting times under simulated environment (Anagnostopoulou et al., 2024).

To conclude, the application of AI in urban mobility and Mobility as a Service (MaaS) has a deep impact on the tourists' experience, promoting more efficient and user centred travel. AI's potential of reducing cost of less biased opinion extraction is relevant to the direct enhancement of app features such as maps and technical functionalities leading to user satisfaction (Aman & Smith-Colin, 2022). The identification of gender-sensitive preferences cements the potential of AI for enabling more customized and all-encompassing mobility offerings, that can be tailored more directly to various tourist needs (Aman & Smith-Colin, 2022). Beyond traditional transit systems, innovations such as AI-optimized Waterborne Autonomous Vehicles (WAVs) illustrate how AI can bring new, affordable, and tailored cultural exploration practices and experiences to the outside of museum and distribute the visitors in a more efficiently manner (Rong et al., 2020). Despite these advancements, persistent issues remain. Ongoing fare-related dissatisfaction (Aman & Smith-Colin, 2022) and practical challenges for WAVs, including legal barriers, take up, and its computational issues (Rong et al., 2020) both signify that AI effects upon tourist mobility are significantly positive but ultimately limited by wider system-level, regulatory and technology concerns that reach beyond algorithmic agency alone.

AI for Personalized Travel Planning and Recommendations

An important trend discussed in the recent literature is the changes brought by AI on personalized travel planning and recommendation. AI-based itinerary generators (AITGs) are widely acknowledged by the experts, who report high levels of satisfaction in terms of itinerary planning and recommended activities (Štilić et al., 2024). The experts also stress the necessity of even more personalized and culturally deep information provision to make the travel experience even better, predicting that up to 99% of travel schedule may soon be compiled by AI, possibly dislocating travel agents more and more towards AI-assistance and digital literacy (Štilić et al., 2024). However, this vision is constrained by the reliance on expert-based assessment over experiences by users/tourists themselves, as well as the ongoing need to address issues related to ethics such as privacy, bias, external factors such as geopolitical events, and the risk of dependence on AI (Štilić et al., 2024).

New models such as the Spatio-Temporal Intention Learning Self-Attention Network (STILSAN) obtain considerable improvement in Point-of-Interest (POI) recommendation accuracy concerning user interest and revisits intension, as well as capturing spatial clustering features (Li et al., 2024). The SPPUR similarity measure exploiting geographical vicinity and user's trip paths notably improves the relevancy of POI recommendations as compared to classical approaches (Bettache & Dennouni, 2025). Notably, the number of neighbouring users is an important factor as the increase of the number beyond a limit may deteriorate the quality of recommendation (Bettache & Dennouni, 2025). In another approach, an ML-based model tailored to recommend tourist sights according to a "slow life" approach showed better performance than traditional algorithms in terms of accuracy, recall, and F1 score (Li, 2025). These findings demonstrate AI's ability to be able to cater for more niche styles of travel and enhance the user's tourism experience. Yet, such sophisticated methods suffer from the issues of computational complexity, scalability, and the existing 'cold-start problem' where new users or POIs cannot be immediately matched due to the rigid data structure, not to mention the

absence of real-time update of tourists' requirements or changes in the outside environment (Bettache & Dennouni, 2025; Li, 2025).

According to Trieu et al, (2024), AI-based recommendation systems can efficiently discover destinations within the country that present “overseas-like” travel opportunities in terms of photo visual content, offering new and cheaper sources of travel decision support that are not based on previous travel records. In their study, focus group participants consistently found these recommendations to enhance travel planning effectiveness (Trieu et al., 2024). However, these systems are mainly confined to visual aspects such as architecture and scenery, and they do not capture others sensory or experiential aspects such as the local customs or food. The dependence on platforms such as Flickr also limit the completeness of the results (Trieu et al., 2024). In addition, AI-based smart tour route planning algorithms with so-called machine learning methods such as Naïve Bayes intend to optimize tour routes based on tourists' interest, which in turn could facilitate a personalized tourism experience (Zhou et al., 2020). Pre-trip experiences can also be greatly improved using ChatGPT, by providing tailored and pertinent travel information enabling personalized interaction, and providing diagnostic information to differentiate travel alternatives effectively (Stergiou & Nella, 2024). However, many studies on the effect of ChatGPT mainly conduct the simulated questions instead of conversing with real person, failing to fully understand its long-term effect on tourist satisfaction as well as trust (Stergiou & Nella, 2024). Furthermore, AI-powered chatbots and virtual assistants are able to enhance the efficiency of customer service through rapid response and managing routine duties, resulting in a higher level of customer satisfaction as they are available the entire day, solving issues promptly (Nicola-Gavrila, 2023). Customization provided by these AI techniques also intensifies user engagement and confidence, besides decreasing operational costs for travel entities (Nicola-Gavrila, 2023).

Finally, the groundbreaking shift from robot-like to personalized travel planning and recommendations promises to transform the way tourists enjoy the travel lifestyle, providing them with unprecedented relevance and efficiency. Tools such as AITIs in particular have been well-regarded for their organisational support and activity planning with a vision to automate travel planning with AI completing the travel planning up to thousands of destination activities, therefore enriching the pre-travel phase of the tourist processional journey (Štilić et al., 2024). Meanwhile, novel deep learning structures including STILSAN, and similarity metrics such as SPPUR provide precise Point-of-Interest (POI) recommendations, making them more targeted and reliable by accounting for user likings, revisits, and spatial closeness (Li et al., 2024; Bettache & Dennouni, 2025). Furthermore, the AI's capacity to discover novel overseas-like domestic experiences (Trieu et al., 2024) and optimal tour routes with PMIs (Trieu et al., 2024), tailored to individual tourists in mind (Zhou et al., 2020) satisfy tourists needs for novelty and customization. ChatGPT further assists by conveying contextualised data and enhancing a user's informed exploration, enhancing the accessibility and diagnostic of travel options (Stergiou & Nella, 2024). Yet, this deep, transformative impact on the tourism experience is counter balanced by serious challenges such as an overreliance upon professional opinion at the expense of user generated reviews, persistent ethical concerns over privacy and bias, computational complexity in employing advanced models, and the cold-start problem for new users (Štilić et al., 2024; Bettache & Dennouni, 2025). As such, given the shortfalls of visual only systems alone (Trieu et al., 2024), and the call for more interaction data from the world for generative AI processes (Stergiou & Nella, 2024), while AI underpins and frequently enhances the tourism experience in a radical form and fashion, maintaining its imagination,

involves the utmost focus on a user centric approach, consideration of ethical debiasing and full knowledge integration that enables tourism-domain wide progress to be made.

AI and Sustainable Tourism/Smart Destinations (Broader Impact)

AI plays a pivotal role in advancing sustainable urban tourism by improving the management of cultural heritage, optimising cultural route planning, and increasing both time and budget efficiency of tourism (Öztürk & Aktan, 2024). The general intelligence is accompanied by the use case of smart city tourism, consolidating efficiency, digital engagement and sustainability, allowing easier, faster and less stressful travel through the access to real-time data and personalized content (Vujko et al., 2025). AI can also contribute to sustainability by fostering smarter mobility systems such as improved routing, eco-friendly transportation solutions and waste management (Vujko et al., 2025). AI-based platforms further support effective resources allocation such as energy and waste, smart mobility, and customized services, positively affecting urban sustainability and improving the experiences of tourists by providing real-time information and a seamless interaction within the smart destination environment (Prandi et al., 2023).

Within the broader framework of Industry 4.0, AI influences not only sustainability but also market structures in tourism, while enhancing tourist experiences and formulating governance challenges associated with new market dynamics (Zeqiri et al., 2025). AI also assists smart destinations with real-time data to ensure seamless tourist experiences, contributes to sustainability through the optimization of resource and usage consumption and promotes inclusive tourism such as assistive technologies for disabled travelers (Zeqiri et al., 2025). In addition, virtual and augmented reality technologies (VR/AR), frequently enhanced with AI, provide low-impact solutions with more immersive experiences than physical visits (Stergiou & Nella, 2024). These AI-driven personalized content and interactive experiences (e.g., AR/VR tours, smart exhibits) enhance emotional engagement and create more memorable tourist experiences, while facilitating seamless navigation and real-time information to reduce stress and improve enjoyment (Chon & Hao, 2025). Despite these promising developments, there is also a lack of empirical data on the long-term impacts of AI on tourist satisfaction and authenticity (Stergiou & Nella, 2024; Chon & Hao, 2025).

In conclusion, AI's profound role in sustainable urban tourism and smart destinations significantly enhances various facets of the tourist experience. By optimizing cultural heritage management and routes, AI improves efficiency in time and budget for tourists, leading to a more convenient and less stressful journey (Öztürk & Aktan, 2024; Vujko et al., 2025). Its support for smarter mobility systems, waste management, and real time data access and other impacts in a direct manner enable more seamless, personalized, and environmentally-friendly travel thus influencing interaction between tourists and destinations positively (Vujko et al., 2025; Zeqiri et al., 2025). Moreover, AI-supported virtual and augmented-reality tools provide immersive substrate-free experiences, increasing access to cultural/media experiences (Stergiou & Nella, 2024). Nevertheless, although AI undoubtedly enhances efficiency and the digital visitor experience, a closer look underscores that some of these benefits are mainly theoretical as they are not empirically validated, and substantial implementation, operational, and security issues still constrain AI deployment at scale. Importantly, the limited empirical evidence regarding AI's long-term effects on tourist satisfaction and perceived authenticity (Stergiou & Nella, 2024) suggests the need for comprehensive, critical investigation. While AI

transforms the mechanisms of tourism, its deeper and more enduring effects on the quality and nature of the tourist experiences remains insufficiently understood.

Tourist Acceptance, Barriers, and Ethical Considerations of AI

Despite the notable benefits of AI in tourism, tourist acceptance and the ethical implications of AI remain critical areas of concern. Research shows that tourists are much more willing to disclose their personal information and use AI applications when the spatial distance matches with the information framing and their value orientation (Sun & Sano, 2024). Messages can be more effective in the distant spatial context with gain framing more effective and in the near with loss-framing (Sun & Sano, 2024). Similarly, perceived risk and the concreteness of the destination through spatial distance influence tourists' adoption of AI-driven smart technologies (Sun & Sano, 2024). Yet such results are constrained within sample demographics, such as population in China and a behavioural measure that is mostly on intention rather than actual use (Sun & Sano, 2024).

In the study conducted by Seyfi et al. (2025), several factors determine the barriers for tourists to use GAI for travel planning, including the personality traits and the attitude towards innovation resistance. This indicates a need for AI designs that consider diverse psychological profiles to enhance adoption (Seyfi et al., 2025). With respect to neural MT, the technological evolution has made it more user-friendly, which could potentially influence the younger generations' perception of MT experiences powered by AI (Carvalho et al., 2023). However, certain constraints or limitations on the accuracy of MT or the cultural differences in a travel domain remain unclear.

Beyond issues of usability, ethical concerns such as privacy, bias, and fairness are increasingly important. The AI-generated itineraries are acceptable by experts, however ethical issues such as privacy and bias and external factors such as geopolitical events and crowds have to be balanced (Štilić et al., 2024). Fortunately, research tends to overwhelmingly concentrate on the positive effects of transformative product use, though negative (Sustacha et al., 2033) and unintended effects are starting to gain attention such as alienation or loss of authenticity (Štilić et al., 2044). In addition, most of the studies are based on expert reviews, so it seems that the reality of tourists/users with AI-mediated systems is not completely understood (Štilić et al., 2024). The moderating role of ICT readiness in the smart things, including AI benefits, indicates that if appropriate policy action is not taken, such as proper telecommunication infrastructure investment, the benefits of AI applied in the tourism sector may not reach everyone to their full potential due to the problem of a digital divide (Sustacha et al., 2023). Future research should critically examine how to alleviate these privacy issues and narrow the ICT readiness divide so that AI tourism experiences are both more inclusive and secure to cater more general benefits.

Finally, while AI offers substantial enhancements to tourists' experiences through personalized services and improved efficiency, its overall effect is significantly mediated by factors of tourist acceptance and crucial ethical considerations. The willingness of tourists to use AI-enabled technologies and provide personal data also seems to strongly depend on situational variables such as physical proximity, message framing, and individual value orientations (Sun & Sano, 2024), and this, in turn, suggests that the positive effects of AI on tourists are not universally assured, instead, they depend on subtle psychological and situational dimensions.

In addition, personality and innovation resistance significantly limit the use of generative AI in travel planning (Seyfi et al., 2025), suggesting that there is no obvious route from benefits to usage. The widespread ethical concerns about privacy, algorithmic bias, and the possibility of unintended negative consequences such as the alienation or a loss of authenticity remain significant barriers to fully realizing AI's positive impact on the tourist experience, even though these developments and others centered on machine translation undoubtedly make it easier for younger travelers to become more fully introduced to new, unknown destinations (Štilić et al., 2024; Sustacha et al., 2023; Carvalho et al., 2023). Given the heavy reliance on expert evaluations, and the fact that most tourists will not experience AI for some time due to continuing digital divide, growing inequality in ICT readiness, the transformative potential of AI for tourists' experiences is unevenly distributed and may well be limited. Accordingly, to ensure AI genuinely enhances, rather than detracts from, the tourist experience, future development and implementation must prioritize robust ethical frameworks, address user-specific barriers, and bridge technological disparities, moving beyond mere functionality to cultivate trust and ensure equitable access.

Conclusion

This systematic literature review provides a thorough analysis of the multiple impacts that AI has on tourist experiences, both in terms of meaningful progress and ongoing challenges. AI dramatically improves the travel experience with advanced sentiment analysis, personalized travel insights, smart urban mobility services, and the promotion of responsible travel. These apps provide an unprecedented quality of efficiency, personalization and digital immersion, for a rich and personalized experience. However, AI's potential is clouded by serious concerns. Concerns pertaining to data privacy, algorithmic bias, the digital divide, and the lack of more quantitative empirical support for long-term tourist satisfaction and authenticity motivations still form some of the core future research and development areas. Ultimately, while AI undeniably reshapes and elevates various aspects of the tourist experience, its responsible and equitable deployment, alongside continuous ethical scrutiny, will be paramount to ensuring its sustained positive impact.

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THE 3D-IMPAK PARADIGM IN RURAL INDIGENOUS ENTREPRENEURSHIP: A PAPER REVIEW OF DIGITAL TRANSFORMATION, CULTURAL EMPOWERMENT, AND SOCIAL ENTERPRISE

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Abstract: Rural micro-entrepreneurship is a critical driver of socio-economic development in Southeast Asia, yet it remains fragmented and vulnerable. This urgency is emphasized by the fact that over 700 million individuals globally continue to reside in extreme poverty. Malaysia's policy frameworks (e.g., the MADANI Economy and MyDIGITAL Blueprint 2021–2030) echo global goals by emphasizing inclusive entrepreneurship and pledging to “leave no one behind” theedgemalaysia.com. However, a stark disconnect persists between these policy aspirations and rural realities. For example, in Bidayuh communities of Sarawak, many micro-entrepreneurs remain isolated from the opportunities promised by national agendas. Key barriers include a persistent digital divide (inadequate connectivity and skills) and structural market challenges (weak branding, narrow market access, minimal support networks). These deficiencies hinder rural entrepreneurs in their efforts to adopt technology or access wider markets. Existing support programs tend to operate in silos and lack the sustained, integrated approach needed for long-term success. To address these difficulties, this article presents a 3D-IMPAK paradigm focusing on Digital Transformation, Indigenous Empowerment, and Social Enterprise. The framework reconceptualizes rural entrepreneurship as a platform for cultural resilience, digital inclusion, and community agency. By promoting digital literacy, indigenous branding, and cooperative business models, 3D-IMPAK strives to solve structural gaps in the ecosystem. This method connects with Malaysia's digitalization and equity aims while advancing many Sustainable Development aims. 3D-IMPAK provides Bidayuh micro-entrepreneurs with a customized framework to enhance resilience, competitiveness, and dignity in the digital era.

Keywords: Rural micro-entrepreneurship, Indigenous empowerment, Digital storytelling, Social enterprise, Bidayuh community, 3D-IMPAK model



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Introduction

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Rural micro-entrepreneurship has become a vital catalyst for socioeconomic advancement in Southeast Asia, offering employment opportunities and enhancing community resilience. In Malaysia, micro, small, and medium-sized companies (MSMEs) constitute 97.4% of commercial establishments and contribute approximately 38% to GDP. In rural regions, the micro-entrepreneurship sector constitutes the second-largest employment source and is crucial for poverty reduction (Parthiban et al., 2024). These operations, ranging from smallholder farms to cottage industries, are regarded as essential for enhancing rural incomes and attaining inclusive growth. However, the potential of rural micro-entrepreneurship is mitigated by ongoing structural constraints associated with digital barriers, indigenous marginalization, policy effectiveness, and limitations in ability and market access. A primary obstacle for rural entrepreneurs is the digital gap. Despite swift digitalization in metropolitan areas, numerous rural populations remain disconnected or inadequately supplied. In rural Malaysia, approximately 32% of small enterprises employ digital tools, in contrast to more than 60% in urban regions (Economic Planning Unit, 2021). Inadequate internet infrastructure, inconsistent electrical supply, and elevated expenses exacerbate this discrepancy, resulting in rural entrepreneurs facing subpar connectivity and limited access to e-commerce and digital banking platforms. Research indicates that insufficient ICT infrastructure and limited digital literacy are primary obstacles to technology adoption in rural enterprises (Morris et al., 2022; Ismail et al., 2023). These infrastructural and skill deficiencies impede daily operations and obstruct contemporary business methods, diminishing the competitiveness of rural enterprises. Digital exclusion significantly exacerbates poverty and inequality by restricting rural entrepreneurs' access to information markets, and services. Addressing this digital divide is not solely a technological challenge but a developmental necessity, as the capacity to utilize digital tools increasingly dictates who succeeds in the contemporary economy.

The digital divide and associated disparities are particularly evident among indigenous and underprivileged populations. Indigenous populations in remote regions of Southeast Asia frequently experience dual exclusion: economic marginalization and digital disconnection. In East Malaysia, indigenous populations exhibit considerable deficiencies in internet connectivity despite governmental investments, indicating a persistent rural-urban digital divide (Fang et al., 2022). The Bidayuh of Sarawak, an indigenous Dayak community, exemplify these issues. Geographically and linguistically isolated, numerous Bidayuh villagers possess restricted access to digital infrastructure and markets, resulting in local micro-entrepreneurs (e.g., handicraft makers, farmers) having minimal connections to extensive supply chains. Such groups may be marginalized by national development initiatives if their specific demands are not acknowledged. Research on indigenous entrepreneurs in Malaysia has been limited; for example, Keling et al. (2022) observe that there are few studies or support initiatives aimed at Dayak (including Bidayuh) women entrepreneurs in Sarawak, highlighting a general oversight of indigenous viewpoints in entrepreneurship advancement. This marginalization not only raises equity concerns regarding beneficiaries of growth but also signifies a missed chance to leverage various indigenous expertise and cultural assets in rural enterprises.

In response to these challenges, Malaysian policymakers have implemented various programs to promote inclusive rural entrepreneurship. The MyDIGITAL Malaysia Digital Economy Blueprint (2021) specifically seeks to "promote digitalisation throughout Malaysia, including

addressing the digital divide," establishing a basis for equitable digital empowerment nationally. This strategy corresponds with the Twelfth Malaysia Plan and the Wawasan Kemakmuran Bersama 2030 goal for sustainable and inclusive growth, designating the digital economy as a primary catalyst for equitable economic distribution. Specifically, it advocates for the expansion of rural broadband, enhancement of digital literacy, and promotion of e-commerce adoption among micro-enterprises. Recently, the government's MADANI Economy: Rakyat Empowerment framework (introduced in 2023) has strengthened the emphasis on inclusive entrepreneurship strategy. The MADANI framework prioritizes innovation and equity, incorporating initiatives to enhance training and funding programs for marginalized communities. An extra RM400 million has been designated for micro-loans via agencies such as TEKUN and MARA to enhance micro- and small firms, prioritizing women and youth (Government of Malaysia, 2023). Such measures indicate a strong commitment to boosting rural entrepreneurs and bridging opportunity disparities. Moreover, Malaysia's National Entrepreneurship Policy 2030 and associated strategies, such as the National 4IR Policy and Start-up Ecosystem Roadmap, establish a policy framework designed to stimulate innovation and enhance the capabilities of entrepreneurs. These programs align with wider regional objectives, as seen by ASEAN's efforts in rural development and digital inclusion, and illustrate Malaysia's endeavor to reconcile economic modernity with social equality.

Notwithstanding these laudable initiatives, practical realities expose persistent capacity deficiencies and market limitations for rural micro-entrepreneurs. Numerous individuals lack the essential skills, expertise, and networks to exploit emerging opportunities. Surveys reveal that a considerable proportion of Malaysia's MSMEs, particularly those in rural areas or run by women, are inadequately prepared to implement digital technology in their operations. Insufficient digital literacy and education result in reluctance to change and ineffective utilization of current ICT resources (Ismail et al., 2023). The deficiency in human capital indicates that, despite the availability of infrastructure, entrepreneurs may encounter difficulties with e-payments, online marketing, or the management of digital platforms. Moreover, rural micro-enterprises encounter market constraints that hinder their expansion. Functioning within limited local economies, they frequently encounter difficulties in accessing wider markets and assimilating into supply chains beyond their immediate vicinity. Parthiban et al. (2024) note that numerous rural enterprises experience "knowledge disconnections," which are deficiencies in market information and relationships that hinder entrepreneurs from matching their offerings with broader demand. Such disconnects may lead to inefficiencies (overproduction, product misalignment) and lost chances for value addition or diversification. Restricted access to financial resources and contemporary business services in rural regions hinders expansion: despite the growth of microfinance efforts, micro-entrepreneurs continue to encounter challenges in securing affordable financing, insurance, and training (Jalil, 2021). The combined capacity and market obstacles perpetuate a cycle of diminished productivity and susceptibility among rural companies, despite an ostensibly more supportive governmental environment.

Towards a Contextualized Model for Rural Transformation. The interconnected issues of digital exclusion, indigenous marginalization, policy-practice discrepancies, and capacity limitations highlight the pressing necessity for a customized, community-oriented response. This paper recommends a targeted intervention. Empowering Bidayuh Micro-Entrepreneurs in Kampung Singai via Digital Storytelling, Branding, and Peer Networks: A 3D-IMPAK Model for Rural Transformation. This concept presents a comprehensive framework that incorporates

three essential dimensions: Digital empowerment, Indigenous cultural branding, and Peer-based social entrepreneurship networks. Utilizing digital storytelling, the concept enables Bidayuh entrepreneurs to authentically narrate and promote their products, while localized branding increases exposure and cultural significance. Peer networks provide collaborative mentorship and shared platforms, mitigating isolation and enhancing social capital. The 3D-IMPAK model is not a universal answer; instead, it is a culturally rooted strategy aimed at enhancing the distinctive characteristics of the Kampung Singai community while tackling persistent obstacles. This model corresponds with the objectives of the MADANI and MyDIGITAL frameworks and directly facilitates the Sustainable Development Goals, particularly SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), SDG 10 (Reduced Inequalities), and SDG 17 (Partnerships for the Goals). The 3D-IMPAK approach reconceptualizes rural micro-entrepreneurship not merely as an economic initiative, but as a means for cultural rejuvenation, digital integration, and communal empowerment.

Methodology

This study employs a critical integrative literature review methodology to integrate and assess current scholarship on rural micro-entrepreneurship, concentrating on digital storytelling, branding, social enterprise development, and Indigenous empowerment. The review is situated within the context of Southeast Asia, specifically Malaysia, and seeks to uncover conceptual and empirical deficiencies that influence the construction of the suggested 3D-IMPAK model. This research primarily utilizes Scopus-indexed journal articles published from 2020 to 2025, as well as specific policy documents, such as the MyDIGITAL Malaysia Digital Economy Blueprint, the MADANI Economic Framework, and the United Nations Sustainable Development Goals (SDGs). The primary search phrases employed were: “rural entrepreneurship,” “digital storytelling,” “social enterprise,” “branding,” and “indigenous empowerment.” Boolean operators and filters were utilized to refine results to peer-reviewed papers in English pertinent to rural, Indigenous, and micro-enterprise contexts. A total of 45 publications and 6 policy reports were selected according to inclusion criteria that emphasized empirical investigations, critical conceptual analyses, and regionally contextual insights. Each post was thematically coded via a hybrid deductive-inductive method consistent with the 3D-IMPAK paradigm, including three domains: Digital Empowerment, Indigenous Identity and Branding, and Peer-Driven Social Enterprise. Cross-cutting themes including digital inclusiveness, cultural relevance, commercial competitiveness, and ecosystem support were also documented. This thematic synthesis underscores the disjointed nature of current support systems and elucidates the strategic advantages of amalgamating digital storytelling, branding, and peer networks to empower rural Indigenous entrepreneurs, especially in Bidayuh communities such as Kampung Singai.

Theoretical Foundation

This review is fundamentally informed by multidisciplinary theories that converge on empowerment, literacy, digital inclusion, and the growth of rural social enterprises. Kabeer’s (1999) theory of empowerment posits that empowerment entails the enhancement of individuals’ capacity to make strategic life choices in circumstances where such capacity was previously restricted. Kabeer’s framework, there are comprising resources, agency, and achievements, provides a critical perspective for analyzing how rural Indigenous micro-

entrepreneurs, specifically Bidayuh women and youth, utilize digital tools, traditional knowledge, and collective networks to improve socio-economic engagement. This perspective is supported by New Literacy Studies (NLS) (Street, 2003), which defines literacy not as a neutral, technical ability but as a social practice intertwined with culture, identity, and power dynamics. From this viewpoint, digital storytelling transcends mere communication, serving as a medium of cultural authorship through which marginalized entrepreneurs express their voices, values, and histories. NLS facilitates the incorporation of culturally rooted digital branding techniques into the 3D-IMPAK model, highlighting the significance of language, narrative, and identity in fostering substantial market engagement.

Nicholls' (2009) social enterprise paradigm enhances this study by conceptualizing rural entrepreneurship not merely as economic activity but as mission-driven innovation. Social businesses, especially in Indigenous and rural contexts, serve as instruments for redistributive justice, community solidarity, and intergenerational knowledge exchange. Nicholls' typology emphasizes the significance of hybrid organizational forms that integrate profit and purpose, which aligns effectively with the suggested peer-led micro-cooperative frameworks in the Kampung Singai context. The digital inclusion framework provides a systemic view by emphasizing the simultaneous need to address access, skills, and usage to combat digital marginalization (OECD, 2021). Simply supplying infrastructure is inadequate without cultivating significant participation, pertinent content, and supportive ecosystems. This review embraces a place-based conception of resilience, defined not merely as human endurance, but as the ability of rural Indigenous communities to adapt, innovate, and maintain identity in the face of socio-economic and technical transformations (Wilson, 2014). In this context, resilience is relational, collective, and cultural, arising from storytelling, support networks, and localized empowerment.

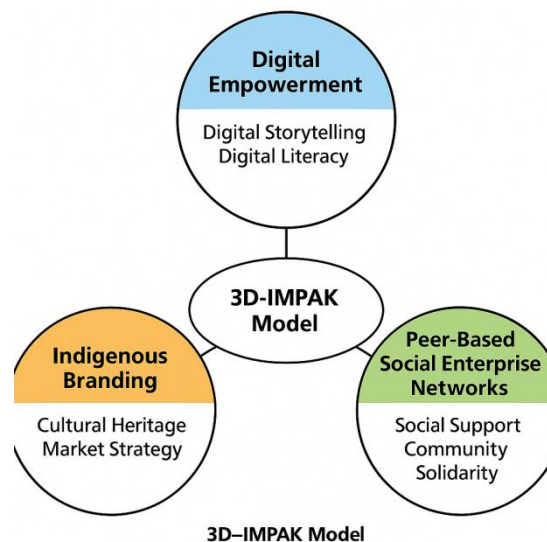


Figure 1: The 3D–IMPAK Model for Rural Indigenous Micro-Entrepreneur Empowerment

This conceptual model depicts the 3D–IMPAK framework, which encompasses three interconnected elements: (1) Digital Empowerment through digital storytelling and literacy; (2) Indigenous Branding through cultural heritage and marketing strategies; and (3) Peer-Based Social Enterprise Networks that promote community solidarity and support. The model offers

a comprehensive strategy for enhancing competitiveness, resilience, and identity among Bidayuh micro-entrepreneurs in Kampung Singai and analogous rural Indigenous communities.

Literature Review

Studies on rural entrepreneurship and community resilience frequently identify digital literacy, product competitiveness, and social support as essential pillars. These correspond with the 3D-IMPAK paradigm, which delineates rural development via three interrelated components: Digital Literacy, Product Competitiveness, and Social Enterprise Support. Micro-entrepreneurship is essential for rural economies, constituting the second-largest source of rural employment and a significant means of poverty reduction. In Southeast Asia, more than 71 million MSMEs (micro, small, and medium enterprises) constitute over 97% of registered firms and employ nearly 67% of the workforce. Empowering rural and Indigenous micro-entrepreneurs, particularly via digital tools and narrative techniques, has become essential for promoting equitable development and enhancing community resilience. This review consolidates Scopus-indexed works from 2020 to 2025 throughout Southeast Asia, concentrating on the interconnected topics of digital storytelling, rural entrepreneurship, branding, Indigenous empowerment, and social enterprise, structured according to the 3D-IMPAK framework. Table 1 summarizes selected scholarly and practical literature published between 2020 and 2025 that aligns with each dimension of the 3D-IMPAK framework there are, Digital Literacy, Product Competitiveness, and Social Support. These studies highlight the interconnections between digital capabilities, branding innovation, and socio-cultural empowerment in supporting rural Indigenous entrepreneurship.

Digital Literacy and Digital Storytelling in Rural Entrepreneurship

Digital literacy is recognized as a transformative catalyst for rural business, especially in the resource-limited contexts of Southeast Asia. Bai et al. (2023) assert that digital proficiency markedly enhances entrepreneurial success by facilitating access to mobile payments, e-marketplaces, and digital financial services. Simultaneously, Adel et al. (2024) demonstrate that integrating digital competencies with innovations like blockchain fosters financial inclusion and strengthens the resilience of rural MSMEs in Asia and Africa. These research affirm that digital literacy transcends mere technical proficiency; it constitutes a sort of agency that influences entrepreneurial adaptation in swiftly digitalizing economies. Nevertheless, this potential is not universally actualized. Multiple studies underscore enduring disparities in digital competencies among rural entrepreneurs in Malaysia and the surrounding region. Ismail et al. (2023) and Morris et al. (2022) indicate that infrastructure deficiencies, including unreliable internet connectivity and insufficient access to high-quality digital devices, hinder rural MSMEs from effectively employing technologies such as e-wallets, inventory applications, or social media platforms. The issue is exacerbated by a deficiency in confidence or familiarity with ICT, resulting in limited participation in digital training (Ismail et al., 2023). Parthiban et al. (2024) contend that, despite the existence of digital upskilling programs, many are inadequately contextualized, excessively generic, or devoid of post-training assistance, resulting in an inability to effectuate enduring behavioral change.

Digital literacy significantly impacts the cognitive and creative abilities of entrepreneurs. Zhao (2023) asserts that digitally literate businesses are more inclined to engage in digital storytelling

and content production, fostering emotional connections with clients through social media platforms. Hussein and Baharun (2021) substantiate the connection between digital literacy and enhanced entrepreneurial self-efficacy and inventiveness among women entrepreneurs in rural Malaysia. Soluk et al. (2021) assert that digital technologies can assist rural entrepreneurs in transcending survivalist business patterns, contingent upon context-sensitive and locally driven implementation. However, Parthiban et al. (2024) and Ismail et al. (2023) warn that these advantages are predominantly found in well-endowed areas or among entrepreneurs already familiar with ICT. In underprivileged or Indigenous groups, adoption is inconsistent due to insufficient culturally relevant training, mentorship, and infrastructure. This highlights the significance of digital storytelling not only as a marketing strategy but also as a means of cultural expression and economic positioning. Nair (2021) illustrates how narrative enhances learner empowerment in digital education, a concept applicable to business. Wake (2012) demonstrates that rural students utilizing digital narratives affirm their identities and life experiences, tactics that could improve branding in rural enterprises. Lowery (2020) contends that place-based storytelling provides distinct distinctiveness in oversaturated markets.

A significant study gap persists: the strategic application of digital storytelling as an entrepreneurial instrument for branding and market penetration among Indigenous rural entrepreneurs is little examined. Keling et al. (2022) demonstrate that storytelling within a cultural framework improves product-market alignment and identification among Dayak women in Sarawak; yet, these methodologies are seldom integrated into rural development plans. The literature delineates three enduring challenges: (1) digital literacy frequently encompasses only functional skills, neglecting branding and storytelling; (2) when storytelling is employed, it rarely aligns with entrepreneurial objectives or market positioning; and (3) supportive ecosystems, such as peer networks and mentoring, are deficient, resulting in entrepreneurs' isolation (Parthiban et al., 2024; Soluk et al., 2021). The problems are particularly pertinent to the Bidayuh community of Kampung Singai, where micro-entrepreneurs often engage in hybrid enterprises (e.g., homestays, handicrafts, agriculture) while remaining digitally isolated and commercially marginalized (Fang et al., 2022). Keling et al. (2022) observe that limited government initiatives directly assist Indigenous communities such as the Bidayuh with comprehensive entrepreneurial and technology training. The 3D-IMPAK paradigm addresses this deficiency by integrating digital skill enhancement, culturally rooted narratives, and peer network assistance. This corresponds with essential Sustainable Development Goals, namely SDG 1 (No Poverty), SDG 8 (Decent Work), SDG 9 (Industry & Innovation), and SDG 10 (Reduced Inequality), providing a framework for inclusive and culturally respectful business in rural Malaysia.

Enhancing Product Competitiveness through Branding and Innovation

Branding is widely recognized as a vital strategic tool for rural micro-enterprises aiming to enhance product competitiveness in resource-limited settings. Ahmad and Ariffin (2021) assert that branding enables micro-entrepreneurs to create identity, indicate product quality, and foster consumer trust—essential components for operating in saturated or value-oriented marketplaces. Their research on rural Malaysian enterprises illustrates that, even in the absence of substantial promotional expenditures, branded items continuously attract greater consumer attention and command higher price premiums than unbranded counterparts. Che Omar et al. (2023) contend that branding components, including packaging, narrative, and logo design, substantially affect consumer value perception and enduring loyalty, especially in low-income

and rural settings. Nonetheless, branding strategies among rural micro-entrepreneurs frequently remain disjointed and inadequately developed. Han, Awang, and Idris (2020) note that numerous rural producers depend on generic packaging and exhibit minimal understanding of how to synchronize branding with cultural identity or consumer preferences. This imbalance diminishes competitiveness, especially when products are launched in urban or overseas markets that prioritize authenticity and emotive narratives. In addressing this deficiency, Han et al. (2020) present the notion of “ethno-branding”, a culturally rooted branding strategy that integrates Indigenous symbols, narratives, and motifs to enhance product uniqueness and market attractiveness. This method has demonstrated notable potential in craft and tourism sectors, where cultural significance amplifies product distinction.

In addition to branding, product innovation is a vital factor influencing competitiveness in rural entrepreneurship. Nguyen and Nguyen (2021) observe that rural businesses often partake in incremental innovation, such as environmentally sustainable packaging, product reuse, or local design modification, that improves usability, aesthetic appeal, and consumer happiness. Liao and Wang (2023) assert that low-cost, user-informed innovations enhance consumer evaluations and encourage repeat purchases. Nonetheless, obstacles persist substantially. Ismail et al. (2023) indicate that the majority of rural entrepreneurs are deprived of access to innovation ecosystems, encompassing design thinking tools, collaborative environments, and mentorship initiatives that facilitate research and development endeavors. Moreover, innovative initiatives lacking cultural foundations may undermine traditional knowledge and estrange community members. Yusoff, Mustapha, and Khalid (2022) emphasize that numerous women-led micro-enterprises innovate out of necessity but lack structural support for growing or sustaining their innovations, especially in East Malaysia.

Recent study increasingly underscores the importance of merging branding and innovation into a unified strategy rather than considering them as distinct endeavors. Wu et al. (2022) promote “brand-led innovation,” wherein product development is directly connected to brand identity and consumer narratives. In rural micro-enterprises, this may involve creating new product lines infused with cultural motifs or employing digital tools (e.g., QR codes) to connect consumers with origin narratives. Soluk et al. (2021) assert that these tactics cultivate enhanced emotional bonds with consumers and facilitate competitive advantage via distinctiveness. Hossain et al. (2021) warn that the efficacy of this branding-innovation synergy relies on the existence of supportive ecosystems, networks that enable creative experimentation, access to design tools, and collaborative learning. In their absence, numerous rural enterprises function independently, resulting in fragmented branding, poor market alignment, and inefficient resource utilization. These observations are particularly relevant to Bidayuh micro-entrepreneurs in Kampung Singai. Notwithstanding the substantial cultural wealth represented in their products, spanning bamboo crafts to heritage-based homestays, branding and innovation initiatives are inconsistent, fragmented, and lack institutional support. The 3D-IMPAK approach fills this void by introducing a cohesive platform that synchronizes cultural branding with product innovation via community-driven capacity-building and peer support networks. This methodology promotes competitiveness while ensuring that innovation and branding strategies are culturally grounded and economically sustainable, thereby promoting market objectives and identity preservation.

In Indigenous communities like the Bidayuh of Kampung Singai, branding and innovation serve as instruments for cultural affirmation and inclusive economic engagement, rather than

solely as commercial initiatives. A significant number of Bidayuh micro-entrepreneurs participate in artisanal crafts, homestays, and agrotourism—industries abundant in history yet underutilized in official markets (Fang et al., 2022). Keling et al. (2022) contend that the lack of culturally relevant branding and innovation frameworks perpetuates the marginalization of Indigenous entrepreneurs from national and global economic agendas. This review introduces the 3D-IMPAK methodology, which effectively bridges this gap by combining digital storytelling, branding facilitation, and peer-driven innovation platforms. It empowers entrepreneurs to convert Indigenous identity into engaging brand narratives, collaboratively develop products via community-driven innovation laboratories, and enhance market access through social networking. This ecosystem-based concept promotes a transition from individual entrepreneurship to community-oriented economic resilience, closely correlating with SDG 8 (Decent Work), SDG 9 (Industry, Innovation and Infrastructure), and SDG 10 (Reduced Inequalities). The third pillar of the 3D-IMPAK model is Social Support includes the supportive environment that maintains rural micro-entrepreneurs. This encompasses community solidarity, leadership, governmental institutions, non-governmental organizations, and notably, social enterprises. Recent literature (2020–2025) highlights the pivotal significance of these support structures in fostering entrepreneurship within Indigenous and rural communities. Social enterprises function as mediators that integrate commercial goals with social effect. Parthiban et al. (2024) illustrate a situation in India where an ICT-enabled social enterprise addressed knowledge deficiencies using a four-phase strategy: foundational training, intra-community knowledge transfer, external market linkage, and blended online-offline engagement. This method, known as "technofication," revealed that when digital tools are culturally contextualized and integrated into social networks, they markedly enhance product-market alignment and entrepreneurial success. The approach affirmed Indigenous knowledge while enhancing digital competence, resulting in elevated income, resilience, and community agency with minimal financial investment.

In addition to formal firms, community-driven initiatives and grassroots leadership have been crucial in fostering rural entrepreneurial resilience. Velázquez (2020) illustrates that Indigenous social companies in Latin America often arise as communal reactions to social and economic upheavals, driven not by profit maximization but by the preservation of dignity, cultural continuity, and environmental sustainability. These firms prioritize communal welfare over profit, exemplifying an alternative development paradigm in which entrepreneurship serves as a means of self-determination. In Southeast Asia, community-based support mechanisms, such as cooperatives, microfinance initiatives, and mentorship programs, have demonstrated efficacy in promoting inclusivity in rural entrepreneurship (Yusoff et al., 2022; Soluk et al., 2021). Government and NGO-supported programs that provide training, funding, infrastructure, and access to new markets are essential in alleviating structural disparities encountered by Indigenous entrepreneurs. The Tanoti social enterprise in East Malaysia has assisted over 500 craftspeople across 25 villages in Sarawak since its establishment in 2012. Originally established to save traditional weaving among Borneo's Indigenous women, Tanoti has transformed into a comprehensive social enterprise, including branding, quality assurance, narrative development, and access to international markets. It functions as a cultural protector and economic facilitator, illustrating how community-focused and culturally congruent social support may rejuvenate Indigenous businesses. Tanoti's success narrative exemplifies the literature's persistent conclusions: social businesses can enhance livelihoods, mitigate urban migration, and rejuvenate pride in cultural heritage through organized support and substantive engagement.

In conclusion, boosting rural Indigenous entrepreneurs necessitates a multifaceted approach. Digital literacy and narrative skills facilitate engagement in digital economy and enhance visibility in saturated marketplaces. Innovative and branding strategies enhance competitiveness while preserving cultural values. Social support, whether via social enterprises or grassroots networks, is essential for sustaining entrepreneurial ecosystems. The 3D-IMPAK framework actualizes this synergy by integrating Indigenous identity, technological capability, and communal values into a comprehensive paradigm for rural development. This method signifies a means to economic dignity for communities such as Kampung Singai, while also serving as a paradigm for culturally sensitive and inclusive reform.

Table 1 summarizes key literature (2020–2025) related to each component of this framework.

Author (Year)	Focus	Key Findings	Relevance to 3D-IMPAK
Widjayanti (2024)	Digital marketing adoption by rural MSMEs (Indonesia, COVID-19 context)	Rural micro-enterprises face socio-technical barriers to digital adoption; identified four adaptation strategies blending online platforms with local business traditions. Introduced the concept of “indigenous digital marketing.”	Digital Literacy: Highlights need for culturally adapted digital skills and strategies for rural entrepreneurs.
Funk (2024)	Digital storytelling for sustainability in Asia	Digital storytelling amplifies marginalized voices and encourages social change. Emphasizes crafting authentic, culturally resonant narratives and ethical considerations in storytelling.	Digital Literacy: Demonstrates how storytelling (a digital competency) empowers communities and spreads awareness; underlines inclusive digital content creation.
Kaur et al. (2024)	Impact of digital storytelling on brand image	Found that authentic digital stories create emotional intimacy and trust with consumers, leading to improved brand image and customer loyalty. Storytelling is more effective than overt advertising when building a brand.	Product Competitiveness: Shows that integrating storytelling into branding can enhance product appeal and competitiveness by building trust.
Chua et al. (2025)	Indigenous product innovation in Sarawak (Borneo)	Documented R&D on indigenous foods (e.g., dabai fruit, wild pepper) to create value-added products. Revealed vast untapped economic potential of indigenous resources and stressed strategic product development for	Product Competitiveness: Illustrates leveraging local natural/cultural resources to innovate and improve product value, enhancing competitiveness of rural products.

		sustainability. Some local products gained Geographical Indication status.	
Parthiban et al. (2024)	“Technoficing” model – ICT and social enterprise support in rural India	Social enterprise intervened to connect rural micro-entrepreneurs with markets. Demonstrates the role of an Identified knowledge gaps and intermediary implemented a four-phase ICT enterprise) in providing integration (basic to offline-training, technology, and online) to mobilize indigenous market linkages – enabling knowledge. Empowering local rural entrepreneurs through institutions with simple tech external support. improved market alignment.	Support: (social)
Velázquez (2020)	Indigenous social enterprises and community well-being (Latin America)	Indigenous-run social enterprises emerged as responses to community crises. They follow local values and prioritize dignity, cultural preservation, and social well-outcomes. Showed improved community well-being (e.g., jobs, reduced inequalities) aligned with SDGs as a result. Challenges conventional profit-centric models by focusing on humanistic management.	Social Support: Highlights grassroots empowerment – local leadership and culturally grounded social enterprises provide community-centric support, leading to resilience and sustainable development.
Tanoti case – Top10 Asia (2021) [†]	Social enterprise empowers Sarawak artisans (Malaysia)	Tanoti social enterprise grew from 11 weavers to 500 artisans across rural Sarawak. It provides design training, ensures quality, and connects products to international markets, all while preserving heritage crafts. Achieved significant income improvements for participants.	Social Support & Product Competitiveness: Real-world example of a social enterprise boosting product quality, branding, and market access (competitiveness) and offering ongoing community support.

[†]Note: Although not a scholarly study, the Tanoti case (Top 10 of Asia, 2021) is included to illustrate practical impact, complementing the academic insights on social enterprise roles.

Synthesis and Discussion

The analysis of the literature indicates a significant necessity for a cohesive framework that integrates digital empowerment, indigenous branding, and peer-based social support. The suggested 3D-IMPAK model addresses this necessity by integrating these three elements into a unified framework designed to empower rural Indigenous micro-entrepreneurs, specifically within the Bidayuh community of Kampung Singai. Digital empowerment equips

entrepreneurs with the essential ability to access tools, information, and digital marketplaces. Nonetheless, digital access is inadequate without culturally relevant material and purposeful engagement. Indigenous branding serves a parallel function by enabling entrepreneurs to convert their cultural heritage into strategic assets. Digital storytelling conveys traditional crafts, food products, and services with identity, significance, and authenticity rather than merely marketing them. The collaboration between digital platforms and cultural branding improves both commercial reach and the exposure and acknowledgment of excluded communities.

Concurrently, peer-based social enterprise networks function as the supportive framework that underpins the other two elements. Social networks facilitate the flow of knowledge, provide emotional support, and foster collaborative resilience. Rural micro-entrepreneurs frequently face challenges in isolation; nevertheless, when linked through cooperatives or peer mentorships, they gain advantages from collective branding platforms, bulk purchasing, and collaborative storytelling initiatives. Literature indicates that community-anchored support systems, rather than individual-centric ones, exhibit greater sustainability, particularly in Indigenous contexts. The convergence of these three realms demonstrates a mutually reinforcing link. Branding is ineffective without digital platforms; digital technologies are inadequately employed without engaging and genuine content; and both necessitate a social infrastructure to expand, adjust, and endure. The literature robustly endorses this interconnectedness; yet, limited studies depict them as a cohesive model. This disparity is especially pronounced among East Malaysia and Borneo's Indigenous communities, where national initiatives predominantly see digital training, entrepreneurship, and cultural preservation as isolated entities.

A distinct regional and epistemological disparity exists in literature. Research on rural entrepreneurship in Malaysia predominantly emphasizes Peninsular regions, but East Malaysia, inhabited by communities such as the Bidayuh, Iban, and Orang Ulu, remains inadequately addressed in empirical studies and policy initiatives (Tan et al., 2022; Keling et al., 2022). Fewer studies integrate local Indigenous knowledge systems, values, or governance structures into entrepreneurial frameworks. This exclusion jeopardizes the continuation of uniform models that lack cultural relevance and community support. The 3D-IMPAK model provides a versatile but systematic framework that can be tailored to various Indigenous or rural populations. The paradigm, although grounded in the Bidayuh environment, features components there are digital access, cultural expression, and peer collaboration, that are adaptable with contextual adjustments. In Orang Asli communities of Peninsular Malaysia, digital storytelling may integrate themes of ecological stewardship; in coastal Bajau Laut communities, peer networks could be associated with marine-based livelihood cooperatives. The model's emphasis on bottom-up design, cultural inclusivity, and ecosystem thinking remains paramount. In conclusion, the 3D-IMPAK model fills a significant void in both theoretical and practical realms by providing a comprehensive, community-oriented approach to rural entrepreneurship. It connects disparate domains in literature and underscores relational, contextual, and culturally rooted avenues to empowerment and resilience.

Policy Implications and Recommendations

This research demonstrates that empowering rural Indigenous micro-entrepreneurs, shown by the Bidayuh community in Kampung Singai, necessitates an integrated, culturally attuned, and

community-centric strategy, such as the 3D-IMPAK model. Consequently, various policy implications and practical recommendations arise for primary stakeholders:

1. **Enhancing Location-Specific Initiatives:** Functions of KEDA, STIDC, and DBNA Organizations like the Kedah Regional Development Authority (KEDA) and the Sarawak Timber Industry Development Corporation (STIDC) are urged to transition from episodic training initiatives to sustained, location-specific interventions that foster branding, innovation, and digital narrative development. These authorities ought to engage with cultural organizations like the Dayak Bidayuh National Association (DBNA) to jointly formulate branding strategies that integrate local languages, historical themes, and community narratives. Cultural branding should be regarded not as a peripheral element, but as a fundamental strategy for product competitiveness in specialized tourism and heritage-based sectors.

2. **Inclusive Financing and Capacity Development:** The Role of TEKUN and Microfinance Institutions such as TEKUN Nasional could transcend micro-loans by incorporating branding mentorship, digital marketing assistance, and post-loan consulting services into their financing initiatives. Numerous rural entrepreneurs lack the confidence or capability to utilize finance for effective scaling. TEKUN and analogous organizations ought to initiate "Social Enterprise Incubators" in rural Sarawak, focusing on B40 Indigenous women and youth, with funding structures linked to cooperative results rather than individual profit maximization.

3. **Conforming to National Policy Frameworks:** MADANI and MyDIGITAL The 3D-IMPAK model aligns with the *MADANI Economy* and *MyDIGITAL Blueprint 2021–2030*, which emphasize inclusive growth and digital empowerment. However, a critical disconnect remains between these policies and the realities in rural Sarawak. For example, MyDIGITAL reports that less than 50% of rural SMEs have adopted digital tools, with Sarawak lagging due to weak infrastructure and lack of tailored support (EPU, 2021). Community voices also reveal that many national initiatives are "too generic" and urban-centric. Therefore, future iterations must allocate targeted funding for community-driven digital storytelling, branding, and social enterprise development, ensuring policy truly reaches indigenous entrepreneurs on the ground.

4. **Universities as Community Catalysts** Universities, especially public institutions in East Malaysia, serve a vital function as knowledge interpreters, design facilitators, and assessors. Academic researchers ought to collaboratively develop toolkits, perform impact evaluations, and deliver digital training modules specifically designed for Indigenous populations. Models such as 3D-IMPAK can be integrated into service-learning initiatives, research funding, and graduate entrepreneurial pathways. Universities must serve as impartial venues to assemble government officials, NGOs, and community leaders to facilitate participatory governance in rural entrepreneurial development. In conclusion, implementing the insights from this analysis necessitates a multi-stakeholder ecosystem. Policies should transcend technical solutions and adopt culturally informed, digitally inclusive, and socially integrated initiatives. The 3D-IMPAK model provides a scalable framework for this transformation.

Conclusion

This critical study has underscored the ongoing, interconnected obstacles encountered by rural Indigenous micro-entrepreneurs, specifically the Bidayuh community in Kampung Singai,

including digital exclusion, inadequate branding capabilities, restricted market access, and disjointed support systems. Although national policy frameworks such as the MADANI Economy and MyDIGITAL Blueprint present progressive ideas for inclusive development, their implementation at the grassroots level is inconsistent, particularly in East Malaysian contexts. This study offers the 3D-IMPAK paradigm to overcome structural gaps, a contextualized framework that merges Digital Empowerment, Cultural Branding, and Peer-Based Social Enterprise Networks. 3D-IMPAK reconceptualizes rural entrepreneurship by integrating infrastructure access with culturally pertinent content and community solidarity, viewing it as a means of fostering resilience, identity, and agency rather than merely an economic endeavor. The framework, initially developed for Kampung Singai, exhibits scalable potential for other Indigenous and rural communities in Malaysia and Southeast Asia, contingent upon the integration of local values, needs, and skills in its execution. Its adaptability is rooted in its human-centered design, which is informed by both policy alignment and actual experiences. Future study ought to employ longitudinal methodologies to evaluate the enduring effects of these integrated techniques. Comparative analyses of Peninsular and East Malaysian communities may uncover intricate socio-cultural processes, while participatory action research (PAR), involving community members in the co-design and co-leadership of initiatives, will be crucial for cultivating trust, ownership, and sustainable impact. In conclusion, harnessing the transformative potential of rural entrepreneurship necessitates a comprehensive approach encompassing digital, cultural, and social dimensions. The 3D-IMPAK model provides a prompt and locally anchored approach to fair rural development that is inclusive and sustainable.

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DETERMINATION OF MICROBIOLOGICAL QUALITY AND ACCEPTANCE OF IRRADIATED MEAT PRODUCTS DURING STORAGE

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Abstract: The demand for ready-to-eat meals is growing due to their convenience such as easy to serve and eat directly; and suitable for busy consumers with families, working people, school children and campers. Among food items, meat products are very popular. Sausages and burgers need to be cooked after been thawed from the frozen state before consumption. It would be very convenient if these products are easy to serve and can be eaten directly without any heating or cooked and displayed at room temperature on the shelves of retailers without frozen product facilities. Therefore, it is essential to evaluate how irradiation and storage conditions interact to maintain both the safety and quality of meat products, ensuring they meet regulatory standards and consumer expectations. Fresh chicken sausages and burgers were obtained from local meat product outlets and cooked thoroughly in oven (160°C) for 10 minutes and cooled. Samples were vacuumed packed individually in plastic-polyethylene pouches and irradiated at doses of 3 kGy, 5 kGy and 10 kGy, using ⁶⁰Co gamma irradiation at MINtec-Sinagama. Until irradiation was over, non-irradiated samples (control) were kept in refrigerator. The irradiated and non-irradiated samples were displayed at room temperature and tested after storage periods of 1 month. Microbiological analysis was carried out to determine status of bacteria (Total Plate Count) and fungi counts (cfu/g). Colour changes of the products were recorded using Colorimeter (Minolta) for lightness (L), redness (a) and yellowness (b) values. Acceptability of the irradiated products were determined through sensory evaluation by using 30 members (male and female) of untrained panellists. Pre-cooked chicken meat products samples irradiated with doses of 3 and 5 kGy were most preferred for most of the attributes. Irradiation with dose 5 kGy was suitable for pre-cooked chicken sausages and burgers for prolonged their shelf-life in room temperature for one-month storage. These results demonstrated the ability of gamma irradiation for the decontamination of pre-cooked meat products and reliable process for food storage in commercial industry.

Keywords: Gamma, Irradiation, Meat products, Microbial, Storage

Introduction

The demand for ready-to-eat meals is growing due to their convenience such as easy to serve and directly eaten; and suitable for busy consumers with families, working people, school children and campers. Among food items, meat products are very popular. Sausages and burgers need to be cooked after been thawed from the frozen state before consumption. It would

be very convenient if these products can be eaten directly without any heating or cooking procedure and displayed in the chilled temperature on the shelves of the retailers without frozen facilities. Vural et al. (2006) informed that the low-dose gamma irradiation applications have increased the hygienic quality of raw meatballs and possible public health risks can be prevented. However, Due to these demands, pre-cooked chicken sausages and burgers were formulated, packed in cooked condition instead of raw and frozen state and irradiated for decontamination and prolonged their shelf-life under refrigeration or room temperature. Gamma irradiation technology has positive effects for destroying the pathogen microorganisms and by improving the safety and shelf stability of food products without compromising the nutritional or sensory quality and its use is gradually increasing worldwide (Ahn and Nam 2004). While irradiation is an effective method to reduce microbial contamination, its impact on the texture, color, flavor, and overall quality of meat products over time is not fully understood. Additionally, improper storage conditions may lead to microbial growth or undesirable chemical changes, compromising product quality. Therefore, it is essential to evaluate how irradiation and storage conditions interact to maintain both the safety and quality of meat products, ensuring they meet regulatory standards and consumer expectations. The objective of this study was to determine suitable dose to reduce microbiological count and renders product free from pathogenic bacteria, with sensory evaluation of pre-cooked chicken meat products as the criteria in assessing the acceptability of irradiated pre-cooked chicken meat products.

Materials and Methods

Preparation and Irradiation of Pre-Cooked Chicken Meat Products Samples

Fresh chicken sausages and burgers were obtained from local meat product outlets and kept frozen at -5°C . The sausages and burgers were cooked thoroughly in oven (160°C) for 10 minutes, cooled and packed individually in packaging material (plastic-polyethylene) and vacuum sealed. For sensory evaluation, samples were packed separately. These packaged samples were irradiated in MINTec-SINAGAMA, Bangi, Malaysia with ^{60}Co gamma rays with doses of 3, 5 and 10 kGy. All samples were stored at room temperature for one month.

Microbiological and Colour Analysis

Samples (25g) in duplicates from the irradiated and their corresponding non-irradiated control batches were aseptically homogenized for 1 min with 225 ml sterile saline in a Stomacher (Seward Medical, UK). Appropriate serial dilutions of the homogenate were carried out. Total plate count by pour plate method, was determined using Plate Count Agar incubated at 30°C for 48 hour and Potato Dextrose Agar for molds (incubated at 30°C for 5 days). The results were expressed as colony forming units per gram. Colour changes of the products were recorded using Colorimeter (Minolta) for lightness (L), redness (a) and yellowness (b) values.

Sensory Evaluation

Acceptability of the irradiated pre-cooked chicken sausages and burgers was determined through sensory evaluation using 30 members (male and female) of untrained panelists comprising staff of Malaysian Nuclear Agency. A 5-points hedonic rating scale was used with number 5 as the most acceptable and number 1 as the most unacceptable. The attributes evaluated were color, smell, texture, taste, saltiness dryness, chewiness and overall acceptance.

Statistical analysis using ANOVA test (SAS Institute, 1991) and comparisons were made by Duncan's multiple range tests.

Results and Discussion

The irradiated chicken products with doses of 5 and 10 kGy were free from microbial counts (Table 1 and 3) and fungi counts (Table 2 and 4) after irradiation and one-month storage at room temperature. Application of gamma irradiation up to a dose level of 10 kGy can be used to reduce the numbers of food spoilage microorganisms as well as food-borne pathogens in food products (Abu-Tarboush et.al.1996).

There is no significant different for the L (lightness) and b (yellowness) values of pre-cooked meat products after irradiated with all doses. The redness (a) values decreased in pre-cooked chicken sausages irradiated with dose 5 and 10 kGy (Figure 1).The pre-cooked chicken sausages irradiated at 3 kGy were more accepted in sensory evaluation for all the attributes after storage one month at room temperature while pre-cooked chicken burgers irradiated at 5 kGy were more accepted (Figure 3 and 4). The highly penetrative ionising energy has the ability to inactivate spoilage and disease-causing microorganisms without causing harmful changes to the products. The ionising energy passes completely through the products and their packaging. Thus, the products can be irradiated in their final packaging ready for the end-user. This process is a cold treatment and suitable to retain the acceptability of the products. Other food preservation methods such as chemical and heat treatment can kill microorganisms including pathogens. However, chemical leaves residues and heating treatment can change the texture, colour and flavour of the products (MINTec-SINAGAMA)

Table 1: The Number of Bacterial Colonies in Irradiated Pre-Cooked Chicken Sausages with Different Doses in One-Month Storage at Room Temperature

Irradiation Doses	Microbial Count (CFU/g)	
	0 month	1 month
0 kGy (Control)	0	0
3 kGy	0	0
5 kGy	0	0
10 kGy	0	0

Table 2: The Number of Fungal Colonies in Irradiated Pre-Cooked Chicken Sausages with Different Doses in One-Month Storage at Room Temperature

Irradiation Doses	Microbial Count (CFU/g)	
	0 month	1 month
0 kGy (Control)	1.83×10^4	Spoilt
3 kGy	0	1.53×10^6
5 kGy	0	0
10 kGy	0	0

Table 3: The Number of Bacterial Colonies in Irradiated Pre-Cooked Chicken Burgers with Different Doses in One-Month Storage at Room Temperature

Irradiation Doses	Microbial Count (CFU/g)	
	0 month	1 month
0 kGy (Control)	0	0
3 kGy	0	0
5 kGy	0	0
10 kGy	0	0

Table 4: The Number of Fungal Colonies in Irradiated Pre-Cooked Chicken Burgers with Different Doses in One Month Storage at Room Temperature.

Irradiation Doses	Microbial Count (CFU/g)	
	0 month	1 month
0 kGy (Control)	3.33×10^3	Spoilt
3 kGy	4.57×10^2	2.53×10^3
5 kGy	0	0
10 kGy	0	0

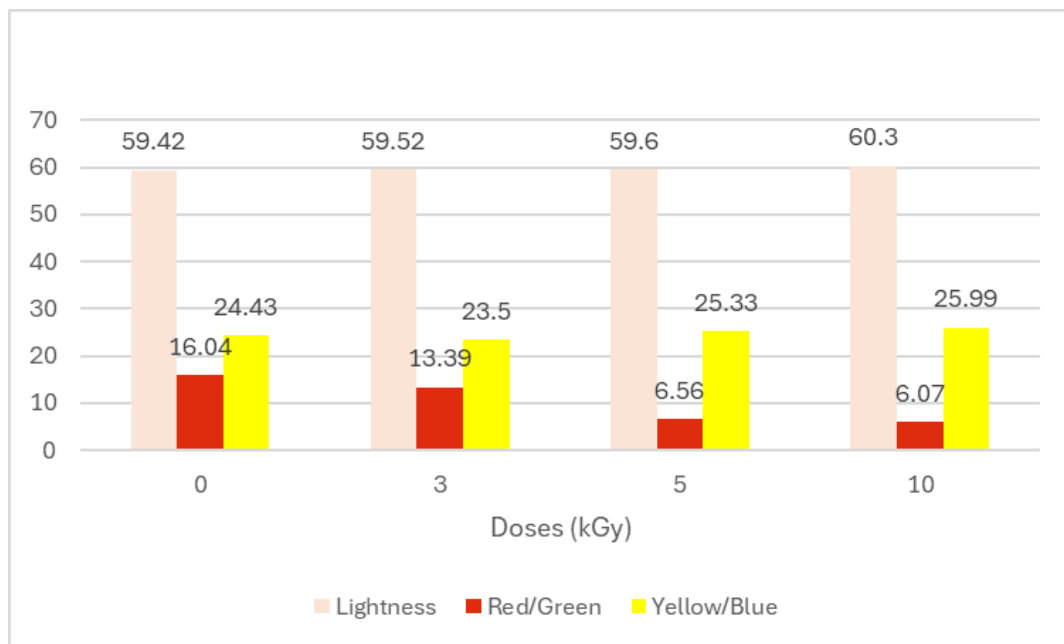


Figure 1: Lightness (L), redness (a) and yellowness (b) values of pre-cooked chicken sausages samples after irradiated with different doses

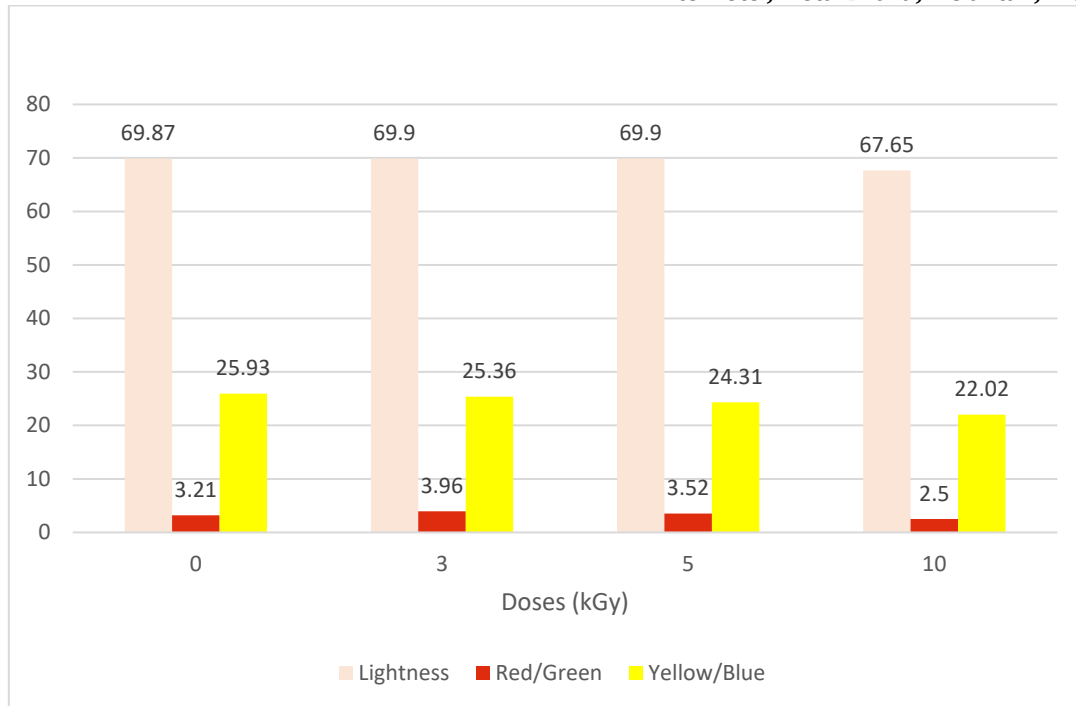


Figure 2: Lightness (L), redness (a) and yellowness (b) values of pre-cooked chicken burgers samples after irradiated with different doses

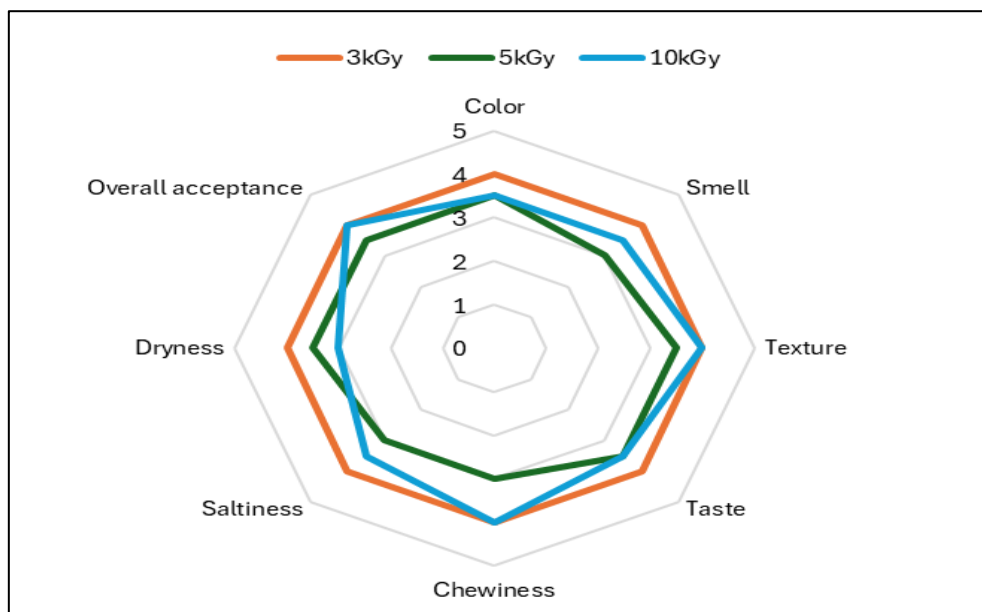


Figure 3: The acceptance of irradiated pre-cooked chicken sausages after one-month storage at room temperature in different attributes of sensory evaluation

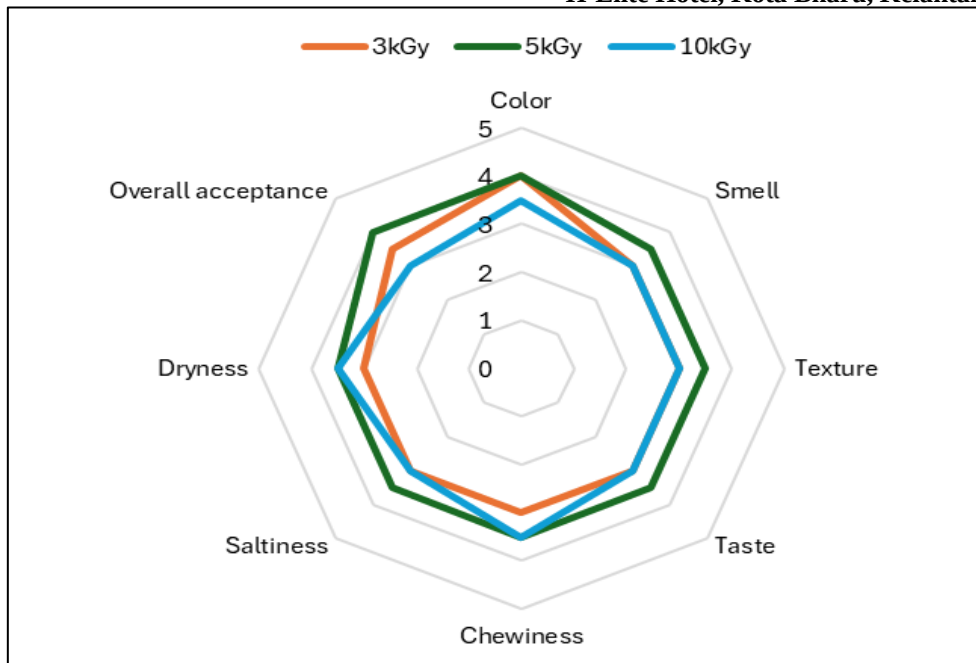


Figure 4: The acceptance of irradiated pre-cooked chicken burgers after one-month storage at room temperature in different attributes of sensory evaluation

Conclusion

Pre-cooked chicken meat products samples irradiated with doses of 3 and 5 kGy were most preferred for most of the attributes. Irradiation with dose 5 kGy was suitable for pre-cooked chicken sausages and burgers to extend their shelf-life in room temperature for one-month storage. These results demonstrated the ability of gamma irradiation for the decontamination of pre-cooked meat products and reliable process for food storage in commercial industry.

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MODEL PELAJAR PINTAR DAN BERBAKAT MENURUT AL-GHAZALI DAN IBNU KHALDUN: SUATU PENDEKATAN KONSEPTUAL DALAM PENDIDIKAN ISLAM

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Abstrak: Kajian ini bertujuan membina satu model konseptual pelajar pintar dan berbakat berdasarkan sintesis pemikiran dua tokoh agung Islam, iaitu al-Ghazali dan Ibn Khaldun. Pelajar pintar lazimnya dirujuk dalam konteks Barat berdasarkan ukuran kecerdasan intelek (IQ), kreativiti, dan prestasi akademik. Namun, pendekatan ini cenderung mengabaikan dimensi spiritual, etika dan sosial yang menjadi teras dalam pendidikan Islam. Justeru, pendekatan Islam perlu diketengahkan semula bagi mengimbangi pembangunan pelajar secara menyeluruh. Kajian ini menggunakan reka bentuk kualitatif berbentuk analisis dokumen, di mana karya utama kedua-dua tokoh seperti *Ihya' Ulum al-Din* dan *al-Muqaddimah* telah dianalisis secara tematik. Hasil kajian mengenal pasti lima komponen utama dalam model pelajar pintar dan berbakat menurut perspektif Islam: (1) asas tauhid dan akhlak, (2) kecerdasan pelbagai dimensi, (3) pembelajaran berperingkat, (4) keseimbangan ilmu duniawi dan ukhrawi, dan (5) kepimpinan serta sumbangan sosial. Model ini dirumuskan dalam bentuk piramid bertingkat dan lingkaran integratif bagi menggambarkan keseimbangan antara dimensi spiritual-intelektual dan sosial-kepimpinan. Kajian ini menyumbang kepada pemeraksanaan kurikulum pendidikan Islam, khususnya dalam kerangka pendidikan pelajar gifted dan berbakat yang menuntut pendekatan holistik berasaskan nilai. Sintesis pemikiran al-Ghazali yang menekankan adab dan tazkiyah al-nafs, serta Ibn Khaldun yang menekankan struktur sosial, pengalaman dan pengulangan dalam pendidikan, memberikan asas kukuh untuk membentuk pelajar cemerlang dari segi dalaman dan luaran. Kajian ini diharap dapat menjadi asas kepada pembangunan dasar, latihan guru, dan penyelidikan lanjutan dalam bidang pendidikan Islam kontemporari berasaskan pemikiran tokoh klasik.

Kata Kunci: Pelajar Pintar dan Berbakat, Model Pintar Islam, Tazkiyah al-nafs

Abstract: This study aims to construct a conceptual model of gifted and talented students based on the synthesis of thought from two great Islamic scholars, al-Ghazali and Ibn Khaldun. Gifted students are typically defined within a Western context using measures such as intelligence quotient (IQ), creativity, and academic performance. However, this approach tends to overlook the spiritual, ethical, and social dimensions that are central to Islamic education. Therefore, an Islamic approach needs to be reintroduced to ensure a more holistic development of students. This study employs a qualitative research design through document analysis, focusing on the primary works of both scholars, namely *Ihya' Ulum al-Din* and *al-*

Muqaddimah, which were thematically analysed. The findings identify five key components in the Islamic model of gifted and talented students: (1) the foundation of tawhid and ethics, (2) multidimensional intelligence, (3) staged learning, (4) balance between worldly and spiritual knowledge, and (5) leadership and social contribution. This model is conceptualized as a tiered pyramid and an integrative circle to represent the balance between spiritual-intellectual and social-leadership dimensions. The study contributes to the enhancement of the Islamic education curriculum, particularly within the framework of gifted and talented education, which requires a value-based holistic approach. The synthesis of al-Ghazali's emphasis on adab and tazkiyah al-nafs, alongside Ibn Khaldun's focus on social structures, experiential learning, and repetition, provides a strong foundation for developing students who excel both internally and externally. It is hoped that this study will serve as a basis for policy development, teacher training, and further research in contemporary Islamic education grounded in classical thought.

Keywords: Gifted and Talented Students, Islamic Gifted Model, *Tazkiyah al-nafs*.

Pengenalan

Perbincangan mengenai pendidikan pelajar pintar dan berbakat telah mendapat perhatian meluas dalam kalangan penyelidik, pendidik dan pembuat dasar. Dalam konteks pendidikan moden, pelajar pintar sering dikaitkan dengan kecerdasan tinggi, kreativiti, pencapaian akademik luar biasa serta potensi kepimpinan (Subotnik, Olszewski-Kubilius, & Worrell, 2011). Namun begitu, pendekatan yang terlalu berorientasikan kognitif ini berisiko mengabaikan dimensi rohani, etika dan nilai yang penting dalam pembentukan insan seimbang.

Dalam kerangka pendidikan Islam, pembangunan insan tidak hanya terhad kepada penguasaan ilmu atau pencapaian akademik semata-mata. Ia turut merangkumi pembangunan rohani, akhlak, dan tanggungjawab sosial (Rosnani, 2007). Konsep insan kamil menjadi teras dalam kerangka ini, iaitu manusia yang seimbang dari sudut akal, jasmani dan ruhani (Hashim & Langgulung, 2008). Justeru, pelajar pintar menurut perspektif Islam perlu dinilai bukan sahaja dari segi kecemerlangan intelektual, tetapi juga tahap akhlak, keikhlasan, dan sumbangan kepada masyarakat.

al-Ghazali dan Ibn Khaldun merupakan dua tokoh pemikir Islam yang telah mengemukakan idea-idea penting dalam falsafah pendidikan dan pembangunan potensi insan. al-Ghazali menekankan pentingnya penyucian jiwa (*tazkiyah al-nafs*) dan adab sebagai asas kepada pencapaian ilmu yang benar (Nasr, 2001). Beliau melihat tujuan pendidikan bukan sekadar untuk memperoleh maklumat, tetapi untuk mendekatkan diri kepada Allah dan membentuk akhlak yang mulia. Ibn Khaldun pula mengemukakan pandangan yang sistematik mengenai pendidikan sebagai alat pembentukan manusia dan pembangunan tamadun, dengan menekankan aspek pengalaman, interaksi sosial dan peringkat perkembangan kognitif (Zarkasyi, 2010).

Walaupun terdapat banyak kajian mengenai konsep pelajar pintar dan berbakat dari perspektif Barat mahupun Islam, masih kurang kajian yang mensintesiskan pemikiran tokoh ilmuwan Islam seperti al-Ghazali dan Ibn Khaldun secara sistematik dalam membina satu model pendidikan yang relevan untuk pelajar Pintar dan Berbakat. Oleh itu, artikel ini bertujuan membina satu

model konseptual pelajar pintar dan berbakat berasaskan sintesis pemikiran kedua-dua tokoh tersebut sebagai satu sumbangan kepada kerangka pendidikan Islam kontemporari.

Metodologi Kajian

Kajian ini menggunakan pendekatan kualitatif dengan reka bentuk analisis dokumen. Pendekatan ini dipilih kerana kajian bertujuan untuk menyelami dan mensintesis pemikiran tokoh klasik Islam iaitu al-Ghazali dan Ibn Khaldun berkaitan dengan konsep pelajar pintar dan berbakat dari sumber-sumber primer. Kaedah ini sesuai untuk menganalisis kandungan teks ilmiah secara mendalam, khususnya dalam kajian falsafah dan pendidikan Islam (Bowen, 2009).

Sumber utama yang dianalisis ialah karya-karya asli seperti *Ihya' 'Ulum al-Din* dan *al-Risalah fi Ta'lim al-Atfal* oleh al-Ghazali, serta *al-Muqaddimah* oleh Ibn Khaldun. Karya-karya ini telah dikenalpasti sebagai teks utama yang memuatkan pemikiran mereka tentang pendidikan, pembentukan insan, kecerdasan, adab, dan pembangunan sosial (Rosenthal, 2005; Watt, 1963).

Prosedur kajian melibatkan analisis tematik berdasarkan pendekatan Braun dan Clarke (2006), yang melibatkan enam langkah utama: (1) pengenalan data, (2) pengekodan awal, (3) pencarian tema, (4) semakan tema, (5) penamaan tema, dan (6) penulisan laporan. Teks yang dianalisis diterjemahkan dari bahasa Arab kepada bahasa Melayu dan Inggeris, kemudian dikaji dengan tumpuan kepada konsep-konsep seperti kecerdasan ('aql), pembangunan akhlak, proses pembelajaran, serta sumbangan sosial.

Pemilihan tema dibuat berdasarkan kerangka induktif, di mana makna dan idea dikembangkan daripada teks itu sendiri, bukan berdasarkan teori sedia ada. Pendekatan ini membolehkan kajian mengekalkan keaslian pemikiran tokoh dan mengelakkan penyusupan bias moden secara tidak kritikal (Tesch, 1990).

Setelah tema utama dikenalpasti, data dianalisis secara perbandingan dan sintesis antara al-Ghazali dan Ibn Khaldun. Langkah ini menghasilkan satu model konseptual yang menggabungkan pemikiran kedua-dua tokoh secara holistik dan konsisten dengan prinsip epistemologi Islam (Hashim, 2014; Al-Attas, 1991).

Reka bentuk ini juga disokong oleh amalan kajian terdahulu yang membina model pendidikan berasaskan tokoh atau tradisi keilmuan, terutamanya dalam konteks pendidikan Islam (Hussin et al., 2020; Wan Daud, 1998).

Kajian Literatur

Kajian mengenai pelajar pintar dan berbakat telah berkembang pesat, terutamanya dalam kerangka psikologi Barat yang berfokus kepada IQ, kreativiti, pencapaian akademik, dan teori kecerdasan pelbagai (Gardner, 2006; Sternberg & Davidson, 2005). Dalam konteks pendidikan Islam, isu ini mula mendapat perhatian melalui integrasi nilai spiritual, akhlak, dan sosial dalam takrif pelajar cemerlang (Hashim & Langgulong, 2008).

Menurut Subotnik et al. (2011), pendidikan pelajar berbakat memerlukan pemahaman holistik yang merangkumi potensi semula jadi dan faktor persekitaran. Namun, model Barat ini

seringkali bersifat sekular dan tidak menekankan peranan nilai dan akhlak. Ini menjadi cabaran kepada institusi pendidikan Islam yang mahu membina model tersendiri berasaskan epistemologi Islam.

Perspektif Islam Terhadap Pendidikan Pelajar Pintar

Pendidikan Islam mempunyai pendekatan tersendiri dalam memahami konsep pelajar pintar dan berbakat. Tidak seperti pendekatan konvensional yang menumpukan kepada kecerdasan intelek atau prestasi akademik semata-mata, pendidikan Islam menekankan pembangunan secara menyeluruh (*holistic development*) yang merangkumi akal ('aql), jasad (fizikal), dan roh (spiritual) (Al-Attas, 1991).

Konsep insan kamil merupakan matlamat utama dalam pendidikan Islam, iaitu pembentukan manusia yang seimbang dari sudut intelek, emosi, spiritual dan sosial. Al-Attas (1991) menegaskan bahawa tujuan pendidikan dalam Islam ialah untuk melahirkan insan yang menyedari tanggungjawabnya sebagai hamba Allah dan khalifah di muka bumi. Ini bermaksud, pelajar pintar dalam perspektif Islam bukan sahaja mempunyai daya intelek yang tinggi, tetapi juga memiliki nilai-nilai adab, etika dan spiritual yang mantap.

Adab merupakan teras dalam pendidikan Islam. Rosnani (2007) menjelaskan bahawa adab bukan hanya sopan santun, tetapi merangkumi penempatan yang betul terhadap sesuatu perkara, termasuk ilmu dan diri sendiri. Justeru, pelajar yang memiliki adab yang tinggi akan menguruskan ilmu dengan hikmah, serta berinteraksi dengan guru, rakan dan masyarakat dengan penuh hormat dan tanggungjawab.

Selain itu, tazkiyah al-nafs (penyucian jiwa) merupakan proses penting dalam pembentukan pelajar pintar menurut Islam. Hashim (2014) menyatakan bahawa pendidikan Islam mesti bermula dengan pembersihan hati, kerana ilmu yang sebenar hanya akan masuk ke dalam hati yang bersih. Pelajar yang berakhlak, ikhlas dan amanah dalam menuntut ilmu akan menjadi individu yang bukan sahaja cemerlang secara akademik, tetapi juga menyumbang secara positif kepada masyarakat.

Dalam konteks ini, pelajar pintar menurut Islam ialah mereka yang menguasai ilmu secara mendalam, berakhlak mulia, dan mampu memimpin dengan hikmah (Hashim & Langgulung, 2008). Mereka bukan hanya aset kepada institusi pendidikan, tetapi juga kepada pembangunan ummah secara keseluruhan.

Pemikiran Pendidikan al-Ghazali

Imam al-Ghazali (w. 1111M) merupakan antara tokoh terpenting dalam tradisi keilmuan Islam yang telah membentuk asas falsafah pendidikan Islam. Pemikiran beliau dalam *Ihya' Ulum al-Din*, *al-Risalah fi Ta'lim al-Atfal*, dan karya-karya lain bukan sahaja memberi panduan kepada kandungan pendidikan, tetapi juga terhadap tujuan dan metodologi pengajaran.

al-Ghazali melihat pendidikan sebagai proses penyucian jiwa (*tazkiyah al-nafs*) yang bertujuan membawa manusia lebih dekat kepada Allah. Dalam pandangannya, ilmu yang tidak disertai dengan niat yang betul, keikhlasan, dan adab adalah tidak bermanfaat, bahkan boleh menjerumuskan kepada kebinasaan rohani (al-Ghazali, 2005; Nasr, 2001). Justeru, pendidikan

menurut al-Ghazali bukanlah proses akumulasi maklumat semata-mata, tetapi satu proses transformasi diri.

Beliau meletakkan peranan hati (qalb) sebagai pusat pemahaman dan penerimaan ilmu. Menurutnya, hati yang bersih mampu menerima cahaya ilmu, manakala hati yang rosak akan menolak kebenaran (Al-Attas, 1991; Hashim, 2014). Maka, penyucian hati menjadi syarat utama dalam proses pendidikan. Ini selari dengan konsep *adab* yang ditekankan oleh al-Ghazali sebagai asas untuk mengenal tempat sebenar setiap ilmu, diri sendiri dan hubungan dengan Allah (Rosnani, 2007).

Selain itu, al-Ghazali menekankan pentingnya niat dan keikhlasan dalam menuntut ilmu. Dalam *Ihya'*, beliau menegaskan bahawa ilmu yang tidak diniatkan kerana Allah akan menjadi beban dan tidak memberi cahaya kepada hati. Ini menunjukkan penekanan beliau terhadap dimensi etika dan spiritual dalam pendidikan.

Dalam hal pendekatan pedagogi, al-Ghazali menyarankan pendidikan berperingkat dan berasaskan perkembangan kognitif pelajar. Pelajar perlu diajar berdasarkan tahap kefahaman mereka, bukan dengan kaedah yang terlalu berat atau tidak relevan (Watt, 1963; Makdisi, 1981). Beliau menyarankan penggunaan kaedah nasihat, cerita, dan peneguhan secara beransur-ansur, yang kini turut diiktiraf dalam teori pembelajaran moden (Ormrod, 2020).

Di samping itu, beliau juga mengkritik pembelajaran yang berasaskan kompetisi dan kesombongan. Ilmu bukan untuk menunjuk-nunjuk atau bermegah, tetapi untuk berkhidmat kepada kebenaran dan masyarakat (Al-Ghazali, 2005; Siddiqi, 2007). Pelajar pintar menurut al-Ghazali ialah mereka yang memanfaatkan ilmu untuk tujuan spiritual, etika, dan sosial.

Pemikiran Pendidikan Ibn Khaldun

Ibn Khaldun (w. 1406M) ialah seorang ahli sejarah, sosiologis dan ilmuwan Islam yang mengemukakan teori pendidikan yang bersifat progresif, empirikal dan sosiologikal melalui karya agungnya *al-Muqaddimah*. Dalam pemikirannya, pendidikan bukan hanya alat untuk pemindahan ilmu, tetapi juga merupakan wahana penting bagi pembangunan tamadun (*'umrān*) (Ibn Khaldun, 1967; Rosenthal, 2005).

Menurut Ibn Khaldun, manusia ialah makhluk sosial (*madaniyyun bi al-tab'*) yang tidak dapat berkembang tanpa interaksi sosial dan pendidikan. Oleh itu, beliau melihat pendidikan sebagai satu proses kebudayaan dan pemasyarakatan (*enculturation*) yang menyumbang kepada kestabilan dan kesinambungan tamadun (Alatas, 2006). Dalam konteks ini, pelajar berbakat bukan sahaja perlu menguasai ilmu, tetapi juga berfungsi dalam konteks sosial yang lebih luas.

Salah satu sumbangan penting Ibn Khaldun ialah penekanannya terhadap kaedah pembelajaran yang berperingkat (*tadrīj*) dan pengulangan (*takrār*). Beliau berpandangan bahawa ilmu tidak boleh dicapai sekaligus, sebaliknya perlu diperoleh secara beransur-ansur dengan bimbingan dan latihan berterusan (Zarkasyi, 2010; Rosenthal, 2005). Kaedah ini membina pemahaman mendalam dan mengelakkan penghafalan kosong. Prinsip ini selari dengan teori kognitif moden tentang “scaffolding” dan “spiral curriculum” (Bruner, 1977).

Selain itu, Ibn Khaldun mengiktiraf pengalaman dan pemerhatian sebagai sumber penting dalam pembentukan ilmu dan kecerdasan manusia. Beliau membezakan antara *'ilm naqlī* (berdasarkan teks) dan *'ilm tajrībī* (berdasarkan pengalaman), dan menekankan keseimbangan antara keduanya dalam proses pendidikan (Bagley, 1964; Zaydan, 1997). Dalam konteks ini, pelajar pintar ialah mereka yang dapat memahami, menganalisis, dan mengaplikasikan ilmu dalam konteks dunia sebenar.

Ibn Khaldun juga memberi perhatian kepada kebiasaan dan latihan berterusan sebagai asas pengukuhan akhlak dan kemahiran. Pendidikan, menurut beliau, bukan hanya tentang isi kandungan, tetapi juga tentang pembinaan watak melalui pembiasaan (Rosenthal, 2005; Al-Samarrai, 1992). Beliau turut mengkritik sistem pendidikan yang terlalu menekan atau terlalu cepat memaksa pelajar menguasai ilmu, kerana ini boleh mematahkan semangat dan merosakkan potensi pelajar (Zarkasyi, 2010).

Pemikiran Ibn Khaldun memberikan asas yang kukuh untuk membina satu model pendidikan Islam yang progresif dan holistik, sesuai untuk pelajar berbakat dan pintar yang perlu diasuh bukan hanya dari segi intelek, tetapi juga dari sudut sosial, etika, dan pengalaman dunia nyata.

Sintesis Kedua Tokoh dalam Konteks Pelajar Pintar dan Berbakat

Pemikiran al-Ghazali dan Ibn Khaldun dalam pendidikan, walaupun berakar daripada pendekatan yang berbeza al-Ghazali bersifat spiritual dan tasawuf, manakala Ibn Khaldun berasaskan realiti sosial dan sejarah kedua-duanya saling melengkapi dalam membentuk satu kerangka pendidikan Islam yang menyeluruh. Dalam konteks pelajar pintar dan berbakat, sintesis ini menjadi sangat signifikan kerana ia menjanjikan pembangunan pelajar dari sudut dalaman (rohani, akhlak, niat) dan luaran (akal, pengalaman, interaksi sosial) secara harmoni (Wan Daud, 1998; Alatas, 2006).

al-Ghazali memberikan penekanan kepada tazkiyah al-nafs (penyucian jiwa) sebagai asas pendidikan. Bagi beliau, kecemerlangan pelajar bukanlah semata-mata kehebatan intelek, tetapi kebersihan hati, keikhlasan niat, dan akhlak yang mulia (Al-Ghazali, 2005; Al-Attas, 1991). Pelajar pintar ialah mereka yang bukan sahaja bijak, tetapi juga mempunyai kesedaran ketuhanan dan komitmen moral yang tinggi.

Sebaliknya, Ibn Khaldun mengemukakan bahawa pendidikan ialah proses sosial dan budaya yang berlaku secara berperingkat. Beliau menekankan aspek pengalaman, latihan berulang, dan pembinaan daya fikir melalui interaksi sosial, yang menghasilkan pelajar berfikiran kritikal dan berdaya saing (Rosenthal, 2005; Zarkasyi, 2010). Ciri-ciri ini sangat relevan dalam konteks pendidikan pelajar berbakat yang memerlukan pendekatan strategik, berperingkat dan praktikal.

Gabungan kedua-dua pandangan ini membawa kepada satu model pendidikan Islam holistik, di mana pelajar bukan hanya diasuh untuk menguasai ilmu duniawi, tetapi juga disemai dengan hikmah, adab dan tujuan hidup yang jelas. Menurut Hashim (2014), pelajar gifted dalam Islam bukan sahaja dilatih untuk mencapai potensi maksimum dari aspek IQ, tetapi juga EQ (kecerdasan emosi), SQ (spiritual intelligence) dan AQ (adversity quotient).

Kedua-dua tokoh juga memperakui pentingnya guru sebagai murabbi. al-Ghazali menekankan hubungan spiritual antara guru dan pelajar sebagai jalan penyucian ilmu, manakala Ibn Khaldun menekankan guru sebagai pembentuk akhlak dan pembimbing proses sosial (Hashim & Langgulung, 2008; Al-Samarrai, 1992). Ini menunjukkan bahawa pembinaan pelajar pintar dalam Islam ialah proses manusiawi dan transformatif, bukan mekanistik seperti dalam sistem pendidikan moden.

Kajian semasa (Hussin et al., 2020; Zain et al., 2022) menunjukkan bahawa pendekatan integratif ini mampu menjadi asas kepada model pendidikan pelajar gifted yang sesuai dalam konteks Islam kontemporari – yang menekankan kesepaduan ilmu, nilai, dan peranan sosial.

Kajian Terkini dan Aplikasi

Kajian pendidikan pelajar pintar dan berbakat dalam konteks Islam semakin mendapat perhatian, namun masih berada di peringkat permulaan jika dibandingkan dengan kerangka pemikiran Barat yang telah lama mengkaji isu ini secara mendalam (Subotnik et al., 2011; Sternberg & Davidson, 2005). Kebanyakan kajian semasa dalam pendidikan Islam lebih menumpukan kepada pembangunan kurikulum bersepadu, falsafah pendidikan Islam, atau konsep insan kamil, namun fokus spesifik kepada pelajar gifted dan berbakat masih terhad (Hashim, 2014; Rosnani, 2007).

Beberapa usaha telah dibuat untuk membina model pendidikan Islam berasaskan tokoh-tokoh tradisional seperti al-Ghazali dan Ibn Khaldun. Contohnya, kajian oleh Hussin et al. (2020) membangunkan satu kerangka pendidikan holistik berdasarkan pemikiran kedua-dua tokoh ini, manakala Zain et al. (2022) mencadangkan pendekatan integratif bagi sistem sekolah Islam. Namun begitu, kajian-kajian ini belum memberi fokus khusus kepada golongan pelajar gifted, iaitu mereka yang menunjukkan keupayaan intelek, kreatif dan kepimpinan luar biasa.

Dalam konteks pelajar gifted, pendekatan Barat banyak bergantung pada model seperti Three Ring Conception (Renzulli, 1978), Multiple Intelligences (Gardner, 2006), dan Gagné's DMGT Model (Gagné, 2004). Walaupun bermanfaat, model-model ini sering kali mengabaikan aspek rohani, nilai akhlak dan tujuan hidup, yang merupakan teras penting dalam pendidikan Islam (Al-Attas, 1991; Hashim & Langgulung, 2008).

Kajian oleh Azmi et al. (2021) menekankan perlunya model pendidikan Islam yang menyepadukan kecemerlangan intelek dengan pengukuhan spiritual. Sementara itu, Rahim & Omar (2019) menunjukkan bahawa pelajar gifted dalam institusi tahfiz memerlukan pendekatan pedagogi khas yang berasaskan nilai dan kesedaran diri.

Kajian juga menunjukkan bahawa pelajar Pintar memerlukan bukan sahaja cabaran intelek, tetapi juga bimbingan kerohanian dan akhlak untuk mencegah tekanan, kesombongan atau kebosanan dalam pembelajaran (Zain et al., 2022; Ahmad et al., 2021). Justeru, keperluan kepada satu model konseptual yang menyeluruh dan Islami menjadi amat mendesak.

Kajian ini bertujuan untuk mengisi jurang tersebut dengan membina model konseptual berasaskan sintesis pemikiran al-Ghazali dan Ibn Khaldun, yang menekankan pembangunan aspek intelek, akhlak, sosial, dan rohani pelajar gifted dan berbakat. Sintesis ini juga menyediakan asas untuk merangka dasar pendidikan, kurikulum khas, dan latihan guru untuk

pelajar gifted dalam sistem pendidikan Islam kontemporari (Hussin et al., 2020; Wan Daud, 1998).

Perbincangan

Asas Tauhid dan Akhlak

Dalam pemikiran al-Ghazali, pendidikan berasaskan tauhid ialah asas kepada pembentukan insan yang seimbang. Ilmu tidak akan membawa manfaat sekiranya tidak disertai dengan keikhlasan dan akhlak. Beliau menegaskan bahawa tujuan utama ilmu ialah mendekatkan diri kepada Allah dan membersihkan jiwa daripada sifat mazmumah (al-Ghazali, 2005; Nasr, 2001). Konsep *tazkiyah al-nafs* bukan sekadar aspek moral, tetapi juga prasyarat kepada kecemerlangan intelektual sebenar (Hashim, 2014).

Ibn Khaldun pula melihat pendidikan sebagai alat untuk membentuk peribadi berdisiplin dan bermoral, yang mampu menyumbang kepada kesejahteraan masyarakat (Rosenthal, 2005; Zarkasyi, 2010). Menurut beliau, adab dan nilai (al-‘ādāt) perlu dididik sejak awal sebelum pelajar mampu memahami ilmu secara mendalam.

Kecerdasan Pelbagai Dimensi

al-Ghazali menolak idea kecerdasan yang bersifat semata-mata rasional. Beliau menekankan keseimbangan antara akal (‘aql), hati (qalb), dan roh (ruh) sebagai asas kepada keutuhan intelektual dan rohani (al-Attas, 1991; Al-Ghazali, 2000). Dalam *Ihya’*, beliau menyatakan bahawa kecerdasan sejati ialah yang membawa manusia kepada kebaikan dan pengabdian kepada Allah.

Ibn Khaldun pula menekankan bahawa kecerdasan berkembang melalui pengalaman, pemerhatian, dan persekitaran sosial (Ibn Khaldun, 1967; Alatas, 2006). Beliau menegaskan bahawa persekitaran yang dinamik, latihan berulang, dan pengalaman sebenar akan membentuk keupayaan berfikir secara kritikal dan strategik – satu ciri utama pelajar berbakat (Wan Daud, 1998).

Pembelajaran Berperingkat

al-Ghazali menggariskan bahawa pengajaran perlu sesuai dengan tahap perkembangan kognitif pelajar. Pendidikan yang terlalu cepat atau melangkaui kemampuan akan merosakkan semangat dan pemahaman pelajar (al-Ghazali, 2005). Beliau menyokong pendekatan *tadrīb* dan latihan berperingkat yang menekankan *hikmah* dalam mengajar.

Ibn Khaldun pula mengemukakan konsep *tadrīj* (pembelajaran secara beransur-ansur) dan *takrār* (pengulangan) dalam pembelajaran. Menurutnya, pelajar perlu diberikan masa dan latihan berulang untuk menguasai konsep secara mendalam (Rosenthal, 2005; Al-Samarrai, 1992). Ini konsisten dengan teori pembelajaran moden yang mengiktiraf pentingnya pengukuhan (*reinforcement*) dalam membina kefahaman yang kukuh (Ormrod, 2020).

Keseimbangan Ilmu Duniawi dan Ukhrawi

al-Ghazali membahagikan ilmu kepada dua kategori utama: fardu ‘ain (ilmu agama seperti tauhid dan fiqh) dan fardu kifayah (ilmu keduniaan seperti perubatan dan matematik). Kedua-duanya perlu dikuasai secara seimbang untuk melahirkan insan kamil (Nasr, 2001; Wan Mohd Nor, 1998). Beliau menolak dikotomi antara ilmu agama dan sekular yang menjadi ciri pendidikan moden.

Ibn Khaldun turut menegaskan pentingnya ilmu rasional seperti logik, falsafah, matematik, dan sains sebagai pelengkap kepada ilmu syariah (Ibn Khaldun, 1967). Malah, beliau menyatakan bahawa kemajuan tamadun bergantung kepada perkembangan kedua-dua jenis ilmu (Bagley, 1964; Zarkasyi, 2010). Ini mencerminkan pendekatan holistik dalam pendidikan yang perlu diterapkan dalam sistem kontemporari.

Kepimpinan dan Sumbangan Sosial

Menurut al-Ghazali, pelajar pintar ialah mereka yang bukan sahaja berilmu tetapi juga berakhlak, amanah, dan mampu menyumbang kepada ummah (al-Ghazali, 2005; Al-Attas, 1991). Pendidikan bertujuan untuk melahirkan insan yang membawa maslahat kepada masyarakat, bukan sekadar mengejar kejayaan individu.

Ibn Khaldun pula melihat pelajar berbakat sebagai pemimpin masa depan yang berperanan membentuk struktur sosial dan politik. Melalui ilmu, pelajar dapat menjadi agen perubahan dan kemajuan dalam masyarakat (Rosenthal, 2005; Alatas, 2006). Kepimpinan menurut Ibn Khaldun terbina atas kefahaman realiti masyarakat, bukan sekadar teori atau idealisme.

Model Konseptual yang Dicadangkan

Berdasarkan sintesis lima tema utama di atas, model pelajar pintar dan berbakat menurut al-Ghazali dan Ibn Khaldun boleh dirumuskan seperti berikut:

1. Asas Tauhid dan Akhlak sebagai teras utama pembangunan pelajar.
2. Kecerdasan Pelbagai Dimensi merangkumi aspek intelek, rohani, dan sosial.
3. Pembelajaran Berperingkat pendekatan progresif dan sesuai tahap pelajar.
4. Keseimbangan Ilmu Duniawi dan Ukhrawi integrasi ilmu agama dan sains.
5. Kepimpinan dan Sumbangan Sosial pembentukan pemimpin yang beradab dan berfungsi dalam masyarakat.

**Model Piramid Bertingkat: Pelajar Pintar & Berbakat
(al-Ghazali & Ibn Khaldun)**



Model: Pintar dan Berbakat al-Ghazali dan Ibnu Khaldun

Kesimpulan

Kajian ini mengetengahkan satu model konseptual pelajar pintar dan berbakat yang bersumberkan sintesis pemikiran dua tokoh agung Islam, iaitu al-Ghazali dan Ibn Khaldun. Dalam menghadapi cabaran pendidikan masa kini yang cenderung terlalu berorientasikan kecemerlangan akademik dan ukuran intelek semata-mata, pendidikan Islam menawarkan alternatif yang menyeluruh dan seimbang, yang menitikberatkan pembangunan insan secara holistik. Model yang dibina melalui kajian ini merangkumi lima komponen utama yang saling berkait dan membentuk asas kukuh kepada pendidikan pelajar gifted menurut kerangka Islam: asas tauhid dan akhlak, kecerdasan pelbagai dimensi, pembelajaran berperingkat, keseimbangan ilmu duniawi dan ukhrawi, serta kepimpinan dan sumbangan sosial.

Pertama, asas tauhid dan akhlak menjadi teras kepada seluruh proses pendidikan. Al-Ghazali menekankan tazkiyah al-nafs dan keikhlasan dalam menuntut ilmu sebagai syarat mutlak untuk mencapai kejayaan sebenar. Ini menunjukkan bahawa pembinaan pelajar cemerlang menurut Islam bermula daripada dalam diri, dengan niat yang tulus, hati yang bersih, dan akhlak yang terpuji. Ibn Khaldun juga mengakui pentingnya nilai moral dan akhlak sebagai asas kepada pembinaan masyarakat yang stabil. Oleh itu, pembangunan dalaman pelajar tidak boleh dipisahkan daripada tujuan pendidikan itu sendiri.

Kedua, model ini mengiktiraf kepelbagaian bentuk kecerdasan pelajar. al-Ghazali membahagikan kecerdasan kepada elemen akal (*ʿaql*), hati (*qalb*), dan roh (*ruh*), manakala Ibn Khaldun menekankan aspek pengalaman, pemerhatian, dan kebolehan berfikir secara kritis sebagai penanda kecerdasan yang tinggi. Sintesis ini memberikan gambaran bahawa pelajar pintar bukan hanya bijak dari sudut akademik, tetapi juga mampu memahami kehidupan, mengendalikan emosi, serta membuat keputusan yang bijaksana. Pendekatan ini melangkaui konsep IQ semata-mata dan mendekati konsep insan kamil dalam pendidikan Islam.

Ketiga, dari aspek pedagogi, kedua-dua tokoh bersetuju bahawa proses pembelajaran perlu berlaku secara bertahap dan berterusan. Konsep *tadrīj* dan *takrār* yang dikemukakan oleh Ibn Khaldun, serta pendekatan hikmah yang ditekankan oleh al-Ghazali, membuktikan bahawa pendidikan memerlukan kesesuaian dengan tahap kemampuan pelajar. Ini sejajar dengan

prinsip pendidikan moden seperti teori perkembangan kognitif dan pembelajaran konstruktivis, namun ia dimantapkan lagi dengan dimensi spiritual dan nilai-nilai Islam.

Keempat, keseimbangan antara ilmu duniawi dan ukhrawi merupakan prinsip penting dalam model ini. Kedua-dua tokoh tidak menolak kepentingan ilmu keduniaan, malah menganggapnya sebagai pelengkap kepada ilmu wahyu. al-Ghazali membahagikan ilmu kepada fardu 'ain dan fardu kifayah, manakala Ibn Khaldun melihat ilmu rasional sebagai asas kepada kemajuan tamadun. Pelajar pintar menurut Islam harus mampu menguasai kedua-dua jenis ilmu ini secara seimbang agar dapat memberikan sumbangan yang bermakna kepada ummah.

Kelima, matlamat akhir pendidikan menurut kedua-dua tokoh ialah melahirkan pelajar yang mampu menjadi pemimpin dan menyumbang kepada masyarakat. Kepimpinan dalam konteks ini bukan sekadar kemampuan memimpin organisasi, tetapi juga meliputi keupayaan untuk menjadi contoh akhlak, menyelesaikan masalah masyarakat, serta memacu pembangunan yang sejahtera. Pelajar berbakat perlu diasuh untuk memiliki visi, hikmah, dan tanggungjawab sosial, bukan hanya kebolehan teknikal atau akademik.

Model konseptual yang dibina daripada sintesis al-Ghazali dan Ibn Khaldun ini dapat digambarkan dalam bentuk piramid bertingkat, yang bermula dari asas dalaman pelajar (tauhid dan akhlak) dan berakhir dengan peranan sosial (kepimpinan). Ia juga boleh divisualkan dalam bentuk lingkaran integratif, menggambarkan interaksi berterusan antara dimensi spiritual, intelektual, dan sosial dalam membentuk pelajar pintar. Model ini membawa pendekatan integratif yang sesuai dengan keperluan pendidikan abad ke-21, khususnya dalam membangunkan pelajar gifted di institusi pendidikan Islam.

Kesimpulannya, kajian ini memberikan sumbangan penting terhadap pembangunan teori pendidikan Islam yang khusus untuk pelajar pintar dan berbakat. Ia bukan sahaja menekankan pencapaian intelek, tetapi turut menggariskan kepentingan adab, spiritual, dan tanggungjawab sosial sebagai komponen penting dalam pembinaan pelajar gifted menurut Islam. Model ini diharap dapat menjadi rujukan dalam pembangunan kurikulum, latihan guru, dan dasar pendidikan yang lebih berpaksikan nilai, serta membuka ruang kepada kajian lanjutan dalam konteks aplikasi sebenar di sekolah, pusat tahfiz, atau institusi pendidikan tinggi Islam. Dengan menggabungkan kekuatan pemikiran klasik dan keperluan semasa, model ini berpotensi menjadi sumbangan bermakna kepada reformasi pendidikan Islam kontemporari.

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KESAN LITERASI KEWANGAN TERHADAP KECEKAPAN PENGURUSAN KEWANGAN DALAM KALANGAN PEKERJA DI UNIVERSITI AWAM

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Abstrak: *Pengurusan kewangan diri yang baik adalah sangat penting untuk memastikan kestabilan kewangan dan perancangan masa depan pekerja akan lebih tersusun. Masalah sering berlaku apabila pekerja gagal mengurus kewangan diri dengan berbelanja tanpa mengambil kira keperluan atau kehendak diri. Kajian ini bertujuan untuk mengkaji kesan literasi kewangan iaitu pengetahuan, tingkah laku dan pengalaman kewangan terhadap pengurusan kewangan dalam kalangan pekerja universiti awam di Malaysia. Seramai 148 orang staf akademik dan staf bukan akademik di sebuah universiti awam telah terlibat dalam kajian ini. Kajian ini menggunakan kaedah kuantitatif dalam proses pengumpulan data melalui pengedaran borang soal selidik dalam talian menggunakan platform Google Form. Dapatan data yang diperolehi telah dianalisis menggunakan aplikasi Statistical Package for Social Science (SPSS). Analisis kajian yang telah dilakukan melalui ujian korelasi Pearson mendapati terdapat hubungan signifikan positif yang tinggi antara pengetahuan kewangan, tingkah laku kewangan dan pengalaman kewangan terhadap kompetensi pengurusan kewangan dalam kalangan pekerja. Pekerja yang memiliki pengetahuan, tingkah laku dan pengalaman yang baik terhadap kewangan diri mempunyai kemampuan untuk mengurus perbelanjaan. Oleh itu, majikan seharusnya memainkan peranan penting dalam meningkatkan kesedaran dan pengetahuan para pekerja terhadap pengurusan kewangan diri bagi memastikan pekerja mempunyai kompetensi pengurusan kewangan yang baik dan terkawal. Seterusnya majikan dapat mengatasi isu pekerja yang mengalami masalah pengurusan kewangan diri yang sering mengganggu prestasi dan operasi organisasi. Lazimnya pekerja yang memiliki kemahiran dan kemampuan mengurus kewangan diri dengan baik akan mempamerkan prestasi kerja yang cemerlang.*

Kata Kunci: Literasi Kewangan, Pengetahuan Kewangan, Tingkah Laku Kewangan dan Pengalaman kewangan, Pengurusan Kewangan

Abstract: *Effective personal financial management is crucial for ensuring financial stability and facilitating organized future planning for employees. Issues often arise when employees fail to manage their finances, leading to spending without consideration of their needs or wants. This study aims to investigate the impact of financial literacy—comprising knowledge, behavior, and financial experience—on financial management among employees of public universities in Malaysia. A total of 148 academic and non-academic staff at a public university participated in this study. Utilizing quantitative methods, data were collected through the distribution of online questionnaires via the Google Form platform. The collected data were analyzed using the Statistical Package for Social Science (SPSS). The analysis, conducted through Pearson correlation tests, revealed a significant positive relationship between financial knowledge, financial behavior, and financial experience, and financial management competence among employees. Employees with robust knowledge, behavior, and experience in personal finance demonstrate the ability to manage expenses effectively. Consequently, employers should play a pivotal role in enhancing employees' awareness and knowledge of personal financial management to ensure they possess strong and controlled financial management competence. Addressing issues related to employees' personal financial management problems can mitigate disruptions to organizational performance and operations. Generally, employees who exhibit proficient personal financial management skills tend to demonstrate excellent work performance.*

Keywords: *Financial Literacy, Financial Knowledge, Financial Behavior and Financial Experience, Financial Management*

Latarbelakang

Pengurusan Kewangan merupakan satu siri tingkah laku dan keputusan yang kompleks serta cenderung berubah mengikut kepentingan dan kemudahan serta dipengaruhi oleh keperluan, keutamaan dan kemahiran individu (Setiawan et al., 2025). Individu yang berkeupayaan mengurus kewangan dapat mengekalkan kawalan kewangan diri dengan berkesan seterusnya meningkatkan status kewangan dengan lebih optimum (Atmadja et al., 2021). Kemahiran seperti perancangan, mengurus, belanjawan, pengauditan, mencari, mengawal dan menyimpan aktiviti kewangan harian adalah rangkuman kepada pengurusan kewangan. Elemen-elemen ini semuanya adalah berkait rapat dengan peranan pengurusan kewangan dan keputusan pembiayaan untuk tujuan mencapai keuntungan (Mashud et al., 2021).

Mengimbangi pendapatan dan perbelanjaan merupakan aspek yang penting untuk memenuhi kehidupan tanpa mengalami masalah kewangan melalui pengurusan kewangan yang efektif (Imawan et al., 2025). Terdapat tinjauan kajian yang telah dilakukan oleh Bank Negara Malaysia (BNM) berkaitan Indeks Celik dan Keupayaan Kewangan Malaysia (MYFLIC) mendapati tahap celik kewangan dalam kalangan rakyat di Malaysia tidak berlaku peningkatan sejak tahun 2021 di mana Indeks MYFLIC merekodkan skor 59.1 berbanding tahun 2021 mencatatkan skor 59.0 (Bank Negara Malaysia, 2024). Walaupun terdapat sedikit peningkatan skor dari segi pengetahuan kewangan (+2.7), tinjauan ini mendapati berlaku penurunan skor terhadap tingkah laku kewangan (-2.0) dan sikap kewangan (-0.3) dalam kalangan rakyat Malaysia. Malah rakyat Malaysia juga dibelenggu dengan isu sumber pendapatan yang rendah

dan tidak stabil serta dibebani dengan peningkatan kos sara hidup yang menyukarkan mereka mengurus kewangan dengan baik (Bank Negara Malaysia, 2024).

Selain itu, literasi kewangan pula telah muncul sebagai pemboleh ubah kritikal yang mempunyai impak signifikan terhadap kecekapan pengurusan kewangan individu, terutamanya dalam kalangan pekerja di universiti awam. Literasi kewangan merupakan elemen yang sangat penting dalam kelangsungan hidup setiap individu (Pangestu et al., 2020). Malah kelemahan terhadap literasi kewangan dalam kalangan individu akan memberi kesan yang besar kepada pengurusan kewangan seharian dan juga kekurangan terhadap membuat simpanan jangka masa panjang (Tahir et al., 2021). Literasi Kewangan merupakan keperluan asas yang perlu ada pada diri seseorang yang boleh digunakan dalam mengatasi masalah kewangan (Muizzuddin et al., 2017). Ramavhea et al., (2017) mendefinisikan literasi kewangan sebagai kebolehan seseorang mengaplikasikan pandangan dan kebolehan dalam mengendalikan aset kewangan bagi mencapai keselamatan kewangan pada masa kini dan akan datang. Literasi Kewangan memainkan peranan penting dalam mempengaruhi corak seseorang itu mengurus kewangan diri (Napitupulu et al., 2021). Kesejahteraan kewangan dapat ditingkatkan dengan literasi kewangan yang dimiliki individu yang berkebolehan membuat keputusan kewangan yang bijak (Lusardi & Messy, 2023). Walaupun literasi kewangan dan kecekapan pengurusan kewangan sangat penting pada masa kini, namun tahap celik kewangan dalam kalangan penduduk masih lagi rendah. Berdasarkan tinjauan global mengenai tahap literasi kewangan dalam kalangan penduduk kebanyakan negara-negara yang tergolong dalam blok G7 dan G20 masih lagi di tahap rendah (Lusardi & Messy, 2023).

Oleh yang demikian, kajian ini adalah bertujuan untuk mengenalpasti pengaruh tiga elemen utama literasi kewangan iaitu pengetahuan kewangan, tingkah laku kewangan dan pengalaman kewangan terhadap kecekapan kewangan dalam kalangan pekerja di universiti awam.

Kajian Literatur

Kajian literatur terkini secara konsisten menunjukkan hubungan yang kukuh dan saling berkait antara literasi kewangan dan kecekapan pengurusan kewangan (Ahmad et al., 2025; Apriani et al., 2024; Imawan et al., 2025; Tejero et al., 2019). Literasi kewangan, yang merangkumi pengetahuan, kemahiran, dan sikap terhadap kewangan, adalah pemboleh ubah asas yang mempengaruhi bagaimana individu membuat keputusan kewangan. Kajian yang pernah dijalankan oleh Oppong et al., (2023) dalam kalangan pekerja di sektor swasta mendapati pengurusan kewangan peribadi mempunyai hubungan yang signifikan yang positif dengan literasi kewangan. Malah terdapat beberapa kajian lain mendapati literasi kewangan secara signifikan mempengaruhi tingkah laku pengurusan kewangan (Humaidi et al., 2020; Tejero et al., 2019; Wijaya et al., 2024; Yap et al., 2018). Manakala kajian yang dilakukan oleh Sajid et al., (2024) pula mendapati literasi kewangan dapat mempengaruhi kesejahteraan kewangan secara langsung dan tingkah laku kewangan secara tidak langsung. Individu yang memiliki tahap literasi kewangan yang tinggi akan membentuk tingkah laku kewangan yang lebih bertanggungjawab. Literasi kewangan membantu individu dalam membuat keputusan dan berperilaku untuk memahami persekitaran kewangan serta menganalisis dan memilih tindakan terbaik mengurus kewangan. Oleh itu, individu yang memiliki tahap literasi kewangan yang tinggi mempunyai kemampuan membuat keputusan kewangan yang baik dan bertingkah laku yang lebih positif (Anderson & Seay, 2019).

Berdasarkan teori tingkahlaku kewangan Modigliani & Brumberg (1954) yang mengabungkan hipotesis kitaran hayat telah mencadangkan bahawa pengguna yang memiliki pengetahuan dan berkemampuan membuat keputusan yang rasional serta mampu merancang kewangan jangka panjang dapat memaksimumkan utiliti sepanjang kitaran hidup mereka. Malah bukti empirikal mendapati perkara sebaliknya berlaku apabila pengguna yang tidak memiliki pengetahuan akan bergelut untuk membuat keputusan yang lebih rasional (Campbell et al., 2011).

Hubungan Pengetahuan Kewangan dengan Kecekapan Pengurusan Kewangan

Pengetahuan kewangan adalah bermula daripada asas pendidikan kewangan dari dalam keluarga di mana ibu bapa yang bertindak sebagai pendidik (Darmawan & Pratiwi, 2020). Menurut Sajid et al., (2024), individu yang memiliki pengetahuan yang tinggi dalam kewangan mempunyai keupayaan untuk memproses dan mengumpulkan maklumat kewangan, bertindak balas dengan cekap dan mampu mengoptimumkan kesejahteraan kewangan diri. Malah individu yang memiliki pengetahuan kewangan yang baik dapat mencegah mereka daripada melakukan kesilapan dan mengelakkan daripada pertimbangan dan tingkah laku kewangan yang salah (Sajid et al., 2024).

Pengetahuan Kewangan merupakan pembentukan tingkah laku pengurusan kewangan yang melibatkan pendidikan kewangan dan pengalaman kewangan yang membantu meningkatkan keupayaan membuat keputusan yang lebih berkesan (Adiputra & Patricia, 2020). Manakala Swiecka et al (2019) berpendapat bahawa Pengetahuan Kewangan merujuk kepada pemahaman tentang konsep dan prosedur kewangan dan penggunaan pemahaman untuk menyelesaikan masalah kewangan.

Menurut Arifin et al., (2017) individu yang memiliki pengetahuan kewangan yang rendah tidak dapat membezakan baik atau buruknya sesuatu tindakan pelaburan berbanding dengan individu yang memiliki pengetahuan kewangan yang tinggi cenderung untuk meningkatkan tahap kepuasan hidup dan memperbaiki kewangan semasa. Selain itu, individu yang mempunyai pengetahuan kewangan yang mencukupi lebih cenderung membuat keputusan yang lebih rasional dan sedar seterusnya meminimumkan kesilapan dalam pengurusan kewangan (Moko et al., 2022).

Terdapat beberapa kajian empirikal menunjukkan pengetahuan kewangan mempunyai hubungan yang signifikan dengan kecekapan pengurusan kewangan (Adiputra & Patricia, 2020; Jennifer & Widoatmodjo, 2023; Luke et al., 2021; Moko et al., 2022; Siswanti & Halida, 2020)

Hubungan Tingkah laku Kewangan dengan Kecekapan Pengurusan Kewangan

Tingkah laku kewangan yang positif mampu meningkatkan kesejahteraan kewangan, meningkatkan kepuasan kewangan serta mengurangkan tekanan kewangan (Sajid et al., 2024). Setiap individu perlu memiliki keupayaan dalam merancang kewangan diri dengan berhemah dan tersusun untuk kesenangan pada masa depan. Sikap terhadap pengurusan kewangan yang betul sangat penting untuk mencapai tahap yang lebih baik dan menjadi pemacu penting untuk memperbaiki tingkah laku kewangan individu (Çera et al., 2021). Tingkah laku kewangan merujuk kepada tanggungjawab individu untuk mengurus kewangan diri melibatkan proses mengurus wang dan aset lain dengan cara yang produktif (Prayuda & Purwanto, 2024). Selain

itu, tingkah laku kewangan juga boleh ditaksirkan sebagai keupayaan individu dalam merancang dan mengekalkan kewangan diri untuk masa hadapan (Rai et al., 2019). Menurut Prayuda dan Purwanto (2024), individu yang celik kewangan akan mempamerkan tingkah laku kewangan dengan menggunakan sumber maklumat yang penting dan relevan dalam membuat sesuatu keputusan pengurusan kewangan yang tepat. Manakala mereka yang sering beranggapan keputusan kewangan adalah disebabkan oleh peluang atau orang lain yang berkuasa akan lebih cenderung untuk tidak mengambil langkah untuk mengurus kewangan mereka.

Menurut Rahman et al., (2021) tingkah laku kewangan merupakan elemen utama dalam meramal kesejahteraan kewangan dan meningkatkan kecelikan individu dalam menguruskan kewangan. Selain itu, tingkah laku kewangan juga dikaitkan dengan teknik pengurusan kewangan yang melibatkan pengurusan simpanan, perbelanjaan dan belanjawan individu (Klontz & Britt, 2012; Perry & Morris, 2005). Terdapat beberapa kajian literatur yang mendapati tingkahlaku kewangan mempunyai hubungan yang signifikan positif dengan kecekapan pengurusan kewangan (Juldan, 2024; Setiawan et al., 2025; Prayuda & Purwanto, 2024).

Hubungan Pengalaman Kewangan dengan Kecekapan Pengurusan Kewangan

Pengalaman Kewangan masa lalu sangat penting untuk diri seseorang dalam kelangsungan kehidupan masa kini dan pada masa akan datang (Nuraeni & Ari, 2021). Dalam aspek kewangan, pengalaman merupakan pengajaran yang dapat membantu individu membuat keputusan kewangan dengan lebih fokus dan bijak (Sahara et al., 2022). Menurut Li et al., (2020), Pengalaman Kewangan merujuk kepada kemampuan individu atau kumpulan menilai dan memastikan keputusan pengurusan kewangan masa lalu digunakan untuk menentukan keberkesanan pengurusan kewangan masa kini dan masa hadapan. Pengalaman kewangan juga memberi pengajaran agar kesilapan lampau tidak berulang seperti tingkah laku hutang lapuk dan kelewatan pembayaran balik (Brilianti & Lutfi, 2020). Selain itu, pengalaman juga membantu individu meramal keadaan, mengira keuntungan dan kerugian serta membuat keputusan yang lebih bijak (Elghaish et al., 2022; Paarima et al., 2021). Pengalaman Kewangan bagi setiap individu adalah berbeza-beza bermula daripada merancang dan mengurus semua perkara berkaitan kewangan pada masa akan datang (Fatimah & Susanti 2018). Pengalaman kewangan termasuk pengalaman dalam pelbagai aspek kewangan, pelaburan, pengurusan kewangan dan kerjaya kewangan (Wang et al., 2023).

Kajian lepas telah menunjukkan bahawa Pengalaman Kewangan mempunyai hubungan signifikan dengan Kecekapan Pengurusan Kewangan (Brahmastra & Wikartika, 2023; Rahmadani et al., 2024; Rosita et al., 2024; Sahara et al., 2022).

Metodologi Kajian

Kajian ini menggunakan kaedah kuantitatif dengan reka bentuk tinjauan untuk meneliti kesan literasi kewangan terhadap kecekapan pengurusan kewangan dalam kalangan staf di Universiti Pertahanan Nasional Malaysia (UPNM). Dengan populasi seramai 1,006 staf di UPNM, sejumlah 148 responden dipilih melalui persampelan rawak mudah bagi memastikan kebolehgeneralisasian penemuan. Data dikumpul menggunakan set soal selidik yang distrukturkan dengan soalan-soalan berdasarkan skala Likert 5-mata, meliputi dimensi

pengetahuan kewangan (Cronbach's Alpha = 0.940), tingkah laku kewangan (Cronbach's Alpha = 0.848), pengalaman kewangan (Cronbach's Alpha = 0.875), dan kecekapan pengurusan kewangan (Cronbach's Alpha = 0.787), di mana semua nilai alpha menunjukkan tahap kebolehpercayaan instrumen yang tinggi. Prosedur kajian melibatkan pengedaran soal selidik, pengumpulan data, dan analisis statistik untuk menguji hipotesis hubungan antara pemboleh ubah yang relevan, sekali gus membolehkan penyelidik memperoleh pandangan yang kukuh dan boleh dipercayai mengenai topik yang dikaji.

Dapatan dan Analisis Kajian

Analisis Kebolehpercayaan

Jadual 1 menunjukkan nilai Cronbach's Alpha untuk setiap pemboleh ubah yang diukur dalam kajian ini, baik untuk kajian rintis mahupun kajian sebenar. Nilai-nilai ini adalah petunjuk penting bagi kebolehpercayaan instrumen soal selidik, memastikan bahawa soalan-soalan yang digunakan untuk mengukur setiap konstruk adalah konsisten secara dalaman. Secara umumnya, nilai Cronbach's Alpha 0.70 dan ke atas dianggap boleh diterima untuk tujuan penyelidikan (Hair et al., 2023).

Bagi pemboleh ubah Pengetahuan Kewangan, nilai Cronbach's Alpha dalam kajian rintis adalah 0.860, manakala dalam kajian sebenar ia adalah 0.791. Kedua-dua nilai ini sangat baik, menunjukkan bahawa item-item yang digunakan untuk mengukur pengetahuan kewangan adalah sangat konsisten dan boleh dipercayai. Ini bermakna responden memahami soalan yang diajukan dan memberikan jawapan yang konsisten mengenai tahap pengetahuan kewangan mereka.

Seterusnya, untuk Tingkah Laku Kewangan, kajian rintis mencatatkan alpha 0.856, dan kajian sebenar pula 0.791. Nilai-nilai ini juga menunjukkan kebolehpercayaan yang kukuh. Ini mengesahkan bahawa soalan-soalan yang berkaitan dengan tingkah laku kewangan, seperti amalan belanjawan atau tabungan, adalah stabil dan boleh diandalkan dalam mengukur corak tingkah laku kewangan responden.

Bagi Pengalaman Kewangan, nilai Cronbach's Alpha dalam kajian rintis adalah 0.770, dan meningkat kepada 0.848 dalam kajian sebenar. Peningkatan ini adalah positif dan menunjukkan bahawa instrumen untuk mengukur pengalaman kewangan menjadi lebih konsisten dan boleh dipercayai dalam pelaksanaan kajian sebenar. Ini memberi keyakinan bahawa pengukuran terhadap pendedahan dan interaksi responden dengan situasi kewangan adalah mantap.

Akhir sekali, untuk Kecekapan Pengurusan Kewangan, nilai alpha dalam kajian rintis adalah 0.792, dan sedikit menurun kepada 0.711 dalam kajian sebenar. Walaupun terdapat sedikit penurunan, nilai 0.711 masih berada dalam julat yang boleh diterima, menunjukkan bahawa item-item yang mengukur keupayaan responden menguruskan kewangan mereka adalah konsisten dan boleh dipercayai.

Secara keseluruhan, semua nilai Cronbach's Alpha yang dilaporkan dalam Jadual 1, sama ada untuk kajian rintis atau kajian sebenar, berada di atas ambang 0.70. Ini memberikan bukti kukuh tentang kebolehpercayaan dalaman setiap instrumen yang digunakan dalam kajian ini. Oleh itu, data yang dikumpul melalui soal selidik ini boleh dipercayai untuk analisis lanjut, dan hasil kajian ini akan mempunyai kredibiliti yang tinggi dari segi kualiti pengukuran.

Jadual 1: Ujian Kebolehpercayaan

Konstruk	Cronbach's Alpha (Kajian Rintis)	Cronbach's Alpha (Kajian Sebenar)
Pengetahuan Kewangan	0.860	0.791
Tingkah laku Kewangan	0.856	0.791
Pengalaman Kewangan	0.770	0.848
Kecekapan Kewangan	0.792	0.711

Analisis Demografi

Jadual 2 menyediakan gambaran demografi terperinci bagi 148 responden yang terlibat dalam kajian ini, menawarkan konteks penting tentang ciri-ciri utama kumpulan yang diselidiki. Analisis menunjukkan bahawa majoriti responden adalah perempuan (54.1%), mencerminkan kemungkinan perwakilan yang lebih tinggi bagi gender ini dalam populasi staf yang dikaji atau corak maklumbalas dalam persampelan. Dari segi etnik, kajian ini mendapati bahawa bangsa Melayu membentuk peratusan yang sangat dominan (96.6%) daripada keseluruhan responden. Ini adalah ciri demografi yang sangat spesifik dan penting untuk dipertimbangkan, terutamanya dalam konteks budaya dan sosial yang mungkin mempengaruhi persepsi dan amalan kewangan. Selain itu, aspek umur menunjukkan bahawa kumpulan 31 hingga 40 tahun merupakan kategori terbesar (48.6%), menandakan bahawa sebahagian besar responden berada dalam fasa kehidupan di mana tanggungjawab kewangan seperti pembayaran pinjaman perumahan, perancangan keluarga, dan simpanan pendidikan anak-anak mungkin berada di kemuncaknya. Akhir sekali, dari segi kategori pekerjaan, staf bukan akademik mendominasi dengan 64.9% daripada responden. Ini menunjukkan bahawa kajian ini lebih banyak melibatkan kakitangan pentadbiran dan sokongan berbanding dengan pensyarah atau penyelidik, yang mungkin mempunyai corak pendapatan dan pendedahan kewangan yang berbeza. Maklumat demografi ini amat penting kerana ia membolehkan penyelidik memahami dengan lebih baik konteks di mana isu literasi dan pengurusan kewangan beroperasi, dan juga membantu dalam menafsirkan penemuan kajian berdasarkan ciri-ciri khusus responden yang terlibat.

Jadual 2: Demografi Responden (N= 148)

Demografi Responden	Kekerapan (N)	Peratusan (%)
Jantina		
Lelaki	68	45.9
Perempuan	80	54.1
Jumlah	148	100
Bangsa		
Melayu	143	96.6
Cina	1	0.7
India	3	2.0
Lain-lain	1	0.7
Jumlah	148	100
Umur		
25 – 30 tahun	17	11.5
31 – 40 tahun	72	48.6

41 – 50 tahun	56	37.8
50> tahun	3	2.0
Jumlah	148	100
Kategori Perkhidmatan		
Kakitangan Akademik	52	35.1
Kakitangan Bukan Akademik	96	64.9
Jumlah	148	100

Analisis Kolerasi Peason

Jadual 3 membentangkan hasil analisis korelasi Pearson, yang digunakan untuk menilai kekuatan dan arah hubungan linear antara pemboleh ubah bebas (pengetahuan kewangan, tingkah laku kewangan, dan pengalaman kewangan) dengan pemboleh ubah bersandar (kecekapan pengurusan kewangan). Simbol "***" yang disertakan pada setiap nilai korelasi menunjukkan bahawa hubungan tersebut adalah signifikan secara statistik pada aras $p < 0.01$, menandakan penemuan yang sangat signifikan dan bukan berlaku secara kebetulan. Hasil analisis menunjukkan bahawa pengetahuan kewangan mempunyai hubungan positif yang kuat dengan kecekapan pengurusan kewangan ($r = .624^{**}$). Ini bermakna, semakin tinggi tahap pengetahuan kewangan seseorang, semakin cekap mereka dalam menguruskan kewangan peribadi. Penemuan ini sejajar dengan literatur sedia ada yang menekankan kepentingan pengetahuan sebagai asas kepada keputusan kewangan yang bijak (Lusardi & Mitchell, 2014). Seterusnya, tingkah laku kewangan menunjukkan hubungan yang lebih kuat dengan kecekapan pengurusan kewangan ($r = .736^{**}$). Korelasi yang tinggi ini menggarisbawahi bahawa amalan sebenar dan tabiat kewangan yang positif, seperti membuat belanjawan dan menabung secara konsisten, adalah sangat berpengaruh dalam menentukan kecekapan individu menguruskan kewangan mereka. Ini menyokong pandangan bahawa pengetahuan semata-mata tidak mencukupi; tingkah laku yang berdisiplin adalah kunci kepada pengurusan kewangan yang efektif (Hilgert et al., 2003). Akhir sekali, pengalaman kewangan juga menunjukkan hubungan positif yang kuat dengan kecekapan pengurusan kewangan ($r = .712^{**}$). Ini mencerminkan bahawa pendedahan dan pembelajaran daripada pengalaman kewangan lalu, sama ada positif atau negatif, memainkan peranan signifikan dalam membentuk kemahiran dan kecekapan individu dalam menguruskan wang mereka. Secara keseluruhan, hasil daripada Ujian Korelasi Pearson ini secara konsisten menunjukkan bahawa ketiga-tiga aspek literasi kewangan (pengetahuan, tingkah laku, dan pengalaman) mempunyai kaitan yang signifikan dan positif terhadap kecekapan pengurusan kewangan dalam kalangan responden kajian.

Jadual 3: Keputusan Kolerasi Antara Pemboleh Ubah

	Kecekapan Kewangan	Penggetahuan Kewangan	Tingkah laku Kewangan	Pengalaman Kewangan
Kecekapan Kewangan	1	.624**	.736**	.712**
Pengetahuan Kewangan		1	.611**	.660**
Tingkah laku Kewangan			1	.705**
Pengalaman Kewangan				1

Analisis Regresi Berganda bagi Pemboleh Ubah

Jadual 4 memaparkan keputusan Analisis Regresi Berganda, yang bertujuan untuk mengenal pasti sumbangan relatif setiap pemboleh ubah bebas (pengetahuan kewangan, tingkah laku kewangan, dan pengalaman kewangan) terhadap kecekapan pengurusan kewangan. Salah satu penemuan utama daripada jadual ini ialah nilai $R^2 = .630$. Ini bermakna model regresi ini mampu menjelaskan 63.0% daripada jumlah varians dalam kecekapan pengurusan kewangan. Ini adalah peratusan yang sangat tinggi, menunjukkan bahawa pemboleh ubah pengetahuan kewangan, tingkah laku kewangan, dan pengalaman kewangan secara kolektif mempunyai kuasa penjelasan yang signifikan terhadap kecekapan individu dalam menguruskan kewangan mereka.

Pengetahuan Kewangan mencatatkan pekali *Beta* (.173) dengan nilai-t 2.355, tetapi nilai signifikan adalah .200. Memandangkan nilai signifikan ini melebihi .05, ia menunjukkan bahawa pengetahuan kewangan tidak mempunyai pengaruh yang signifikan secara statistik terhadap kecekapan pengurusan kewangan apabila pemboleh ubah lain turut diambil kira dalam model regresi. Ini mungkin disebabkan oleh fakta bahawa tingkah laku dan pengalaman memainkan peranan yang lebih dominan dalam menjelaskan varians kecekapan pengurusan kewangan.

Sebaliknya, Tingkah Laku Kewangan menunjukkan pekali *Beta* yang paling tinggi (.375) dengan nilai-t yang sangat signifikan (5.603) dan nilai sig. = .000 ($p < .001$). Ini menandakan bahawa tingkah laku kewangan adalah peramal yang paling kuat dan signifikan terhadap kecekapan pengurusan kewangan. Penemuan ini menekankan betapa pentingnya amalan dan disiplin dalam menguruskan wang, seperti membuat belanjawan dan menabung secara konsisten, dalam mencapai kecekapan pengurusan kewangan yang tinggi.

Pengalaman Kewangan juga menunjukkan pekali *Beta* yang signifikan (.335) dengan nilai-t 3.944 dan nilai sig. = .000 ($p < .001$). Ini menunjukkan bahawa pengalaman kewangan mempunyai pengaruh yang signifikan secara statistik dan positif terhadap kecekapan pengurusan kewangan. Pendedahan kepada pelbagai situasi kewangan dan pembelajaran daripada pengalaman tersebut memainkan peranan penting dalam membentuk kemahiran pengurusan kewangan yang lebih cekap.

Secara ringkas, walaupun pengetahuan kewangan adalah penting, analisis regresi berganda ini mendedahkan bahawa tingkah laku kewangan dan pengalaman kewangan adalah faktor penyumbang yang lebih dominan dan signifikan dalam menjelaskan kecekapan pengurusan kewangan dalam kalangan responden kajian. Ini mengukuhkan pandangan bahawa pengurusan kewangan yang cekap bukan hanya bergantung pada apa yang diketahui, tetapi lebih kepada apa yang dilakukan (tingkah laku) dan apa yang telah dipelajari daripada interaksi kewangan sepanjang hayat (pengalaman).

Jadual 4: Analisis Regresi Berganda bagi Pemboleh Ubah

Pemboleh Ubah Bersandar: Prestasi Kerja			
Pemboleh Ubah Bebas	<i>Beta Coefficients</i>	<i>t</i>	Sig.
Pengetahuan Kewangan	.173	2.355	.020
Tingkah laku Kewangan	.375	5.603	.000
Pengalaman Kewangan	.335	3.944	.000
$R^2 = .630$			

Ujian Hipotesis

Berdasarkan dapatan kajian, kesimpulan mengenai hipotesis adalah bercampur-campur, menunjukkan hubungan antara pemboleh ubah yang dikaji.

H₁: Terdapat hubungan positif dan signifikan antara Pengetahuan Kewangan dengan Kecekapan Pengurusan Kewangan.

Hipotesis ini diterima berdasarkan analisis korelasi Pearson ($r = .624^{**}$), yang menunjukkan hubungan positif dan signifikan. Ini bermakna individu yang mempunyai pengetahuan kewangan yang lebih baik cenderung untuk memiliki kecekapan pengurusan kewangan yang lebih tinggi. Walau bagaimanapun, apabila diuji dalam model regresi berganda (Jadual 4), pengetahuan kewangan menunjukkan pekali Beta positif (.173) tetapi tidak signifikan secara statistik ($\text{sig.} = .200$). Kajian ini mencadangkan bahawa apabila tingkah laku dan pengalaman kewangan turut diambil kira, sumbangan unik pengetahuan kewangan terhadap kecekapan pengurusan kewangan menjadi kurang ketara, mungkin kerana peranannya sebagai prasyarat kepada tingkah laku yang baik atau kesan bersamanya diserap oleh pemboleh ubah lain dalam model.

H₂: Terdapat hubungan positif dan signifikan antara Tingkah Laku Kewangan dengan Kecekapan Pengurusan Kewangan.

Hipotesis ini diterima sepenuhnya dan disokong kuat oleh kedua-dua analisis korelasi Pearson ($r = .736^{**}$) dan analisis regresi berganda ($\text{Beta} = .375$, $\text{sig.} = .000$). Ini adalah penemuan yang paling dominan dalam kajian ini, menunjukkan bahawa tingkah laku kewangan yang positif dan berdisiplin (seperti membuat belanjawan, menabung, dan mengurus hutang) adalah faktor yang paling kuat dan signifikan dalam menentukan kecekapan seseorang menguruskan kewangan mereka. Ini menekankan bahawa tindakan sebenar dan tabiat kewangan adalah lebih kritikal berbanding pengetahuan semata-mata.

H₃: Terdapat hubungan signifikan antara Pengalaman Kewangan dengan Kecekapan Pengurusan Kewangan.

Hipotesis ini juga diterima dan disokong kuat oleh analisis korelasi Pearson ($r = .712^{**}$) dan analisis regresi berganda ($Beta = .335$, $sig. = .000$). Ini menunjukkan bahawa pengalaman yang diperoleh daripada interaksi dan situasi kewangan sepanjang hayat memainkan peranan penting dalam membentuk kecekapan pengurusan kewangan. Pembelajaran daripada pengalaman lalu, sama ada kejayaan atau kegagalan, menyumbang secara signifikan kepada keupayaan individu untuk membuat keputusan kewangan yang lebih cekap di kemudian hari.

Secara keseluruhan, dapatan kajian ini menegaskan bahawa tingkah laku kewangan dan pengalaman kewangan adalah peramal yang lebih signifikan dan kuat terhadap kecekapan pengurusan kewangan berbanding pengetahuan kewangan semata-mata dalam konteks kajian ini. Walaupun pengetahuan kewangan mempunyai hubungan positif, impaknya mungkin lebih tidak langsung atau berfungsi sebagai pemboleh ubah yang perlu ada untuk menggalakkan tingkah laku dan pengalaman yang efektif. Ini menggariskan keperluan untuk program literasi kewangan yang bukan sahaja meningkatkan pengetahuan, tetapi juga memupuk tingkah laku positif dan membolehkan pembelajaran melalui pengalaman.

Perbincangan

Dapatan kajian ini mendedahkan bahawa walaupun pengetahuan kewangan menunjukkan hubungan positif dengan kecekapan pengurusan kewangan dalam analisis korelasi, ia tidak lagi signifikan apabila faktor tingkah laku kewangan dan pengalaman kewangan turut dipertimbangkan dalam model regresi. Sebaliknya, tingkah laku kewangan ($Beta = .375$, $sig. = .000$) terbukti menjadi penyumbang paling signifikan dan kuat terhadap kecekapan pengurusan kewangan, menekankan bahawa amalan dan disiplin sebenar dalam menguruskan wang adalah kunci. Di samping itu, pengalaman kewangan ($Beta = .335$, $sig. = .000$) juga menunjukkan pengaruh yang signifikan dan positif, menunjukkan pembelajaran daripada interaksi kewangan lampau membentuk keupayaan mengurus kewangan. Secara kolektif, ketiga-tiga pemboleh ubah ini menjelaskan 63.0% varians dalam kecekapan pengurusan kewangan, namun penemuan ini menggariskan bahawa bagi staf UPNM, tumpuan perlu diberikan kepada memupuk tingkah laku yang baik dan memanfaatkan pengalaman, bukan hanya meningkatkan pengetahuan semata-mata, untuk mencapai kecekapan pengurusan kewangan yang optimum.

Sumbangan dan Cadangan

Kajian ini memberikan sumbangan signifikan dengan mengukuhkan bukti empirikal tentang peranan tingkah laku kewangan dan pengalaman kewangan sebagai pemacu utama kecekapan pengurusan kewangan dalam kalangan pekerja universiti awam, mengatasi pengaruh semata-mata pengetahuan kewangan apabila semua pemboleh ubah dipertimbangkan secara serentak. Secara praktikal, penemuan ini memberi cadangan penting kepada Universiti Pertahanan Nasional Malaysia (UPNM) dan institusi awam lain untuk merekabentuk program literasi kewangan yang lebih holistik. Cadangan kajian masa hadapan adalah untuk meneroka kaedah intervensi yang inovatif bagi memupuk tingkah laku kewangan yang positif melalui bengkel praktikal, simulasi kehidupan sebenar, atau aplikasi gamifikasi, serta mengkaji impak jangka panjang pengalaman kewangan yang distrukturkan. Selain itu, kajian akan datang boleh melibatkan populasi yang lebih pelbagai merangkumi kategori staf yang berbeza atau universiti lain untuk meningkatkan kebolehgeneralisasian penemuan.

Kesimpulan

Secara keseluruhan, kajian ini secara komprehensif mengukuhkan hujah bahawa literasi kewangan memainkan peranan penting dalam menentukan kecekapan pengurusan kewangan dalam kalangan pekerja, khususnya di Universiti Pertahanan Nasional Malaysia (UPNM). Walaupun hubungan positif dikesan antara pengetahuan kewangan dan kecekapan pengurusan kewangan dalam analisis awal, dapatan regresi berganda mendedahkan bahawa tingkah laku kewangan dan pengalaman kewangan adalah faktor penyumbang yang lebih dominan dan signifikan. Ini menunjukkan bahawa kefahaman teori sahaja tidak mencukupi; sebaliknya, amalan disiplin dalam menguruskan wang serta pembelajaran daripada pengalaman lalu adalah kunci utama kepada pengurusan kewangan yang cekap. Dengan 63.0% daripada varians kecekapan pengurusan kewangan dijelaskan oleh model ini, ia menegaskan kepentingan ketiga-tiga dimensi literasi kewangan dalam membentuk kemampuan seseorang menguruskan sumber kewangan mereka. Oleh itu, implikasi daripada kajian ini adalah jelas: sebarang inisiatif yang bertujuan untuk meningkatkan kesejahteraan kewangan dan kecekapan pengurusan kewangan dalam kalangan staf universiti awam perlu melangkaui pendidikan semata-mata, dan sebaliknya memberi tumpuan kepada pemupukan tingkah laku kewangan yang sihat dan penyediaan peluang untuk membina pengalaman kewangan yang praktikal.

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HUBUNGAN KESEDARAN KESELAMATAN DAN KESIHATAN, PERSEKITARAN KERJA DAN TEKANAN PEKERJA TERHADAP PRESTASI KERJA

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Abstrak: Prestasi kerja merupakan faktor yang penting kepada kejayaan sesebuah institusi demi untuk mencapai visi dan misi organisasi. Prestasi kerja yang tidak konsisten dalam kalangan pekerja boleh membawa kepada pelbagai implikasi negatif dari segi produktiviti, moral pekerja, reputasi organisasi dan kos operasi. Kajian ini bertujuan untuk mengkaji kesedaran keselamatan dan kesihatan, persekitaran dan tekanan dalam mempengaruhi prestasi kerja dalam kalangan pekerja di institusi keselamatan sosial yang melibatkan pengurusan persaraan pekerja di Malaysia. Seramai 152 pekerja telah terlibat sebagai responden dalam kajian ini di mana proses kutipan data melibatkan kaedah kuantitatif melalui pengedaran borang soal selidik menggunakan Google Form sebagai platform untuk responden mengisi maklumat yang diperlukan. Analisis yang digunakan dalam kajian ini adalah analisis deskriptif dan analisis inferensi untuk mengukur taburan demografi serta menguji hubungan di antara pemboleh ubah. Dapatan kajian mendapati terdapat hubungan yang signifikan antara kesedaran keselamatan dan kesihatan, persekitaran tempat kerja dan tekanan terhadap prestasi kerja dalam kalangan pekerja. Kajian ini menunjukkan bahawa terdapat tiga faktor utama yang mendorong prestasi kerja seseorang pekerja iaitu kesedaran keselamatan dan kesihatan pekerja, persekitaran dan tekanan kerja. Majikan perlu menekankan tahap kesedaran keselamatan dan kesihatan dalam kalangan pekerja di samping memastikan persekitaran di tempat kerja yang lebih selesa dan seronok. Tekanan kerja juga dapat dikurangkan dan meningkatkan kesejahteraan dalam kalangan pekerja. Pembudayaan terhadap amalan mengutamakan keselamatan dan kesihatan di tempat kerja dapat mewujudkan persekitaran kerja yang lebih selamat dan positif dalam kalangan pekerja.

Kata Kunci: Keselamatan dan Kesihatan, Persekitaran Kerja, Tekanan Kerja dan Prestasi Kerja

Abstract: *Work performance is a crucial factor for the success of an institution in achieving its vision and mission. Inconsistent work performance among employees can lead to various negative implications in terms of productivity, employee morale, organizational reputation, and operational costs. This study aims to examine the awareness of safety and health, environment, and stress in influencing work performance among employees in social security institutions involved in managing employee retirement in Malaysia. A total of 152 employees participated as respondents in this study, where the data collection process involved quantitative methods through the distribution of questionnaires using Google Forms as a platform for respondents to fill in the required information. The analyses used in this study are descriptive analysis and inferential analysis to measure demographic distribution and test the relationships between variables. The findings of the study indicate a significant relationship between safety and health awareness, workplace environment, and stress on work performance among employees. This study shows that there are three main factors driving an employee's work performance: safety and health awareness, environment, and work stress. Employers need to emphasize the level of safety and health awareness among employees while ensuring a more comfortable and enjoyable workplace environment. Work stress can also be reduced, enhancing employee well-being. Cultivating a culture that prioritizes safety and health practices in the workplace can create a safer and more positive work environment for employees.*

Keywords: *Safety and Health, Work Environment, Work Stress, and Job Performance*

Latarbelakang

Kejayaan sesebuah organisasi ditentukan oleh peranan sumber manusia sebagai aset yang berharga dalam merancang, melaksana dan mengawal pelbagai aktiviti operasi organisasi (Anwar & Abdullah, 2021). Peningkatan dalam persaingan global telah menggalakkan majikan mengambil dan mengekalkan pekerja yang berbakat dan berprestasi tinggi dalam organisasi. Organisasi yang memiliki kecekapan sumber manusia akan memiliki kelebihan bersaing dalam pasaran yang kompetitif (Collins, 2021).

Sebelum dekat terakhir abad ke-20, prestasi kerja merupakan aspek yang penting dalam bidang pengurusan di mana prestasi kerja melibatkan hasil gabungan antara bakat, motivasi dan sumber yang mencukupi untuk menghasilkan produktiviti dalam organisasi (Zhenjing, et al., 2022). Prestasi juga merupakan elemen yang utama bagi organisasi mencapai matlamat mereka (Arisandi & Heryjanto, 2024). Penggunaan sumber manusia dengan kapasiti yang besar mampu menghasilkan produktiviti, kecekapan dan prestasi tanpa had (Zhenjing, et al., 2022). Bira et al., (2025) mencadangkan organisasi perlu memupuk kesedaran dalam kalangan pekerja melalui medium komunikasi dan latihan yang berkesan serta konsisten untuk mengoptimumkan intervensi keselamatan di tempat kerja seterusnya meningkatkan prestasi pekerja.

Cabaran organisasi untuk mengekalkan prestasi organisasi adalah bergantung kepada pengurusan sumber manusia yang menitik beratkan soal keselamatan dan kesihatan pekerja, persekitaran tempat kerja yang baik serta pengurusan tekanan dalam kalangan pekerja. Faktor-faktor ini boleh mempengaruhi kualiti dan produktiviti pekerja di mana majikan perlu memastikan keperluan pekerja dipenuhi untuk menjamin kecekapan dan keberkesanan pekerja (Pramestuti & Perkasa, 2020).

Kajian Literatur

Pekerja yang mempunyai prestasi yang baik memainkan peranan yang penting dalam kejayaan dan pembangunan organisasi dalam jangka masa panjang. Pekerja lazimnya mempamerkan prestasi melalui kemahiran, pengetahuan, dan pelbagai kecekapan ke arah keberkesanan organisasi (Otoo, 2024). Menurut Arisandi & Heryjanto (2024), pekerja yang memiliki prestasi yang baik cenderung ke arah yang lebih produktif dalam melaksanakan dan menyelesaikan tugas dengan lebih berkesan dan cekap.

Pengaruh Kesedaran Keselamatan dan Kesihatan terhadap Prestasi Pekerja

Penyelidikan pada masa kini semakin menekankan kepentingan amalan Keselamatan dan Kesihatan Pekerjaan untuk menjadikannya budaya dan amalan dalam organisasi bukan sahaja bertujuan untuk menjamin keselamatan di tempat kerja malah meningkatkan prestasi organisasi (Bira et al., 2025). Keselamatan dan Kesihatan Pekerjaan merujuk kepada perlindungan kepada pekerja daripada semua risiko kemalangan dan penyakit di tempat kerja yang berpotensi berlaku dan majikan perlu menyediakan tempat kerja yang selamat serta sihat (Günaydın, et al., 2024). Manakala menurut Campbell (1990), prestasi pekerja pula adalah merujuk kepada pelbagai dimensi yang merangkumi kualiti kerja, kecekapan tugas, produktiviti serta pematuhan kepada Prosedur Operasi Standard (SOP) dan protokol keselamatan. Risiko keselamatan dan kesihatan seperti kemalangan dan penularan penyakit di persekitaran tempat kerja boleh menyebabkan kerugian kepada organisasi serta pengurangan produktiviti terhadap pekerja (Günaydın, et al., 2024). Malah kekurangan kesedaran dan komitmen oleh pihak pengurusan terhadap keselamatan di tempat kerja boleh meningkatkan kebarangkalian berlakunya kemalangan dan seterusnya memberi kesan terhadap prestasi keseluruhan organisasi (Hassan, 2023).

Amalan pengurusan keselamatan yang berkesan didapati mampu untuk mengurangkan risiko kemalangan di tempat kerja sekiranya majikan mengamalkan dan memupuk budaya organisasi yang berorientasikan keselamatan dalam kalangan pekerja seterusnya membantu organisasi mencapai prestasi yang cemerlang (Ajmal et al., 2021). Pandangan ini dikukuhkan dengan kajian yang dilakukan oleh Baluti et al., (2024), bahawa prosedur dan langkah-langkah Keselamatan dan Kesihatan Pekerjaan yang berkesan seperti latihan yang berkala akan menyumbang kepada peningkatan prestasi kerja dalam organisasi. Malah dapatan ini juga disokong dengan kajian oleh Lari (2024) yang menunjukkan amalan intervensi Keselamatan dan Kesihatan Pekerjaan secara berterusan di tempat kerja adalah dikaitkan dengan peningkatan produktiviti pekerja disamping memberi kepuasan kerja dan pengurangan ketidakhadiran yang ketara dalam kalangan pekerja. Selain itu, penguatkuasaan undang-undang yang berkaitan dengan keselamatan dan kesihatan di tempat kerja juga menggalakkan peningkatan statistik yang signifikan dalam prestasi pekerja (Segbenya & Yeboah, 2022).

Baluti et al., (2024) mengaitkan teori Herzberg dalam menjelaskan hubungan antara persekitaran kerja yang positif akan menghasilkan pekerja yang lebih produktif. Berdasarkan teori Herzberg faktor persekitaran tempat kerja dapat memberi impak kepada kepuasan kerja dalam kalangan pekerja. Pekerja akan merasai kepuasan bekerja dalam persekitaran yang selamat seterusnya menghasilkan prestasi yang positif kepada organisasi (Baluti et al., 2024).

Terdapat beberapa kajian literatur yang telah membuktikan bahawa terdapat hubungan antara Kesedaran Keselamatan dan Kesihatan terhadap Prestasi Pekerja dalam kalangan pekerja (Ajmal et al., 2021; Aprianti & Almanshur, 2022; Baluti et al., 2024; Lari, 2024; Perera, 2019). Oleh itu kajian ini akan menguji hipotesis berikut:

H₁: Terdapat hubungan yang signifikan antara Kesedaran Keselamatan dan Kesihatan terhadap Prestasi Pekerja

Pengaruh Persekitaran Kerja terhadap Prestasi Pekerja

Sebilangan besar organisasi di negara membangun tidak mencapai sasaran persekitaran kerja yang selamat disebabkan majikan beranggapan mereka tidak perlu melabur dan berbelanja lebih untuk mengekalkan persekitaran yang selesa di tempat kerja (Aghaji et al., 2021; Hoque et al., 2019). Sebahagian besar masa pekerja dihabiskan di tempat kerja maka persekitaran merupakan aspek yang penting dalam mempengaruhi prestasi pekerja (Wang et al., 2021). Zhenjing et al., (2022), para penyelidik mendapati persekitaran kerja merupakan faktor yang penting untuk mewujudkan pekerja yang lebih cekap melakukan kerja yang seterusnya menghasilkan prestasi kerja dan produktiviti yang lebih tinggi. Kajian empirikal telah mendedahkan bahawa elemen yang membentuk persekitaran kerja dapat memberi kesan terhadap prestasi dalam kalangan pekerja (Awada et al., 2022). Persekitaran kerja yang kondusif akan mempengaruhi keupayaan psikologi pekerja ke arah membentuk tingkah laku yang positif terhadap kerja (Zhenjing et al., 2022). Kajian lepas yang dijalankan oleh Zhenjing et al., (2022) mendapati persekitaran kerja yang positif mempunyai pengaruh yang kuat terhadap prestasi pekerja serta meningkatkan komitmen kerja dan keupayaan untuk berusaha terhadap pencapaian yang meningkatkan lagi prestasi pekerja. Menurut Zhenjing et al., (2022) lagi, pekerja akan lebih berdedikasi terhadap tugas yang diberikan sekiranya persekitaran kerja yang disediakan majikan adalah memuaskan.

Berdasarkan Teori Sistem Ekologi yang dibangunkan oleh Urie Bronfenbrenner melihat bagaimana kerangka kerja dalam pelbagai sistem persekitaran dapat mempengaruhi pembangunan manusia di tempat kerja di mana persekitaran kerja mempunyai hubungan dinamik dengan persekitaran sosial, fisiologi dan fizikal pekerja (Zhenjing et al., 2022). Malah menurut Teori Pertukaran Sosial pula menggambarkan proses pertukaran sosial antara organisasi dengan pekerja melalui persekitaran tempat kerja yang menggalakkan dapat memberikan motivasi kepada pekerja untuk bekerja dengan lebih baik (Christensen-Salem et al., 2021). Sasaran yang ditetapkan oleh organisasi dapat dicapai apabila pekerja melakukan kerja dengan terbaik dan mempamerkan prestasi yang cemerlang kesan daripada persekitaran yang menggalakkan. Menurut Zhenjing et al., (2022), Teori Pertukaran Sosial menjadi asas kepada faktor yang memberi kesan kepada komitmen kerja adalah persekitaran tempat kerja yang baik akan membangkitkan kepercayaan pekerja terhadap organisasi.

Beberapa kajian lepas telah menunjukkan pemboleh ubah persekitaran kerja memberi pengaruh yang signifikan terhadap prestasi dalam kalangan pekerja (Arisandi & Heryjanto, 2024; Awada et al., 2022; Wang et al., 2021; Zhenjing et al., 2022). Oleh itu kajian ini akan menguji hipotesis berikut:

H₂: Terdapat hubungan yang signifikan antara Persekitaran Kerja terhadap Prestasi Pekerja

Pengaruh Tekanan Kerja terhadap Prestasi Pekerja

Tekanan kerja sudah menjadi isu yang lazim berlaku di tempat kerja dan banyak kajian telah membuktikan bahawa tekanan kerja sering dikaitkan dengan tuntutan tugas, peranan individu, tuntutan kumpulan dan organisasi (Weni et al., 2023). Malah tekanan dalam kalangan pekerja telah menjadi topik yang penting dalam kalangan penyelidik (Chen et al., 2022). Tekanan kerja dari perspektif psikologi dapat mempengaruhi keadaan psikologi pekerja serta memberi kesan kepada tahap usaha mereka di tempat kerja (Lai et al., 2022).

Menurut penyelidik daripada kajian lepas, tidak ada konsep tekanan kerja yang tetap kerana tidak ada profesion atau pekerjaan yang bebas dengan tekanan disebabkan sifat dan keadaan kerja yang berbeza antara tempat kerja (Pradoto et al., 2022). Terdapat beberapa kajian lepas yang menunjukkan wujudnya hubungan signifikan antara tekanan kerja dengan prestasi kerja secara positif (Fahmi et al., 2022; Paramita & Suwandana, 2022; Perez-Floriano & Gonzalez, 2019) mahu pun secara negatif (Archer et al., 2024; Pradoto et al., 2022; Weni et al., 2023).

Pandangan terhadap hubungan secara positif menunjukkan tekanan mampu membina daya motivasi untuk menggalakkan pekerja untuk bekerja lebih keras dan meningkatkan kecekapan kerja. Selain itu, hubungan secara negatif pula menggambarkan pekerja perlu meluangkan lebih masa dan tenaga yang lebih untuk menghadapi tekanan, bebanan kerja yang berlebihan dan seterusnya mengakibatkan kecekapan mereka berkurangan. Kedua-dua situasi hubungan ini boleh berlaku dan dikaitkan dengan dua kategori tekanan iaitu tekanan cabaran dan tekanan halangan (Cavanaugh et al., 2000; LePine et al., 2005). Tekanan cabaran merujuk kepada kesan positif kepada sikap dan tingkah laku pekerja untuk menghasilkan prestasi kerja dan meningkatkan tanggungjawab kerja. Manakala tekanan halangan pula merujuk kepada impak negatif yang dihasilkan oleh sikap dan tingkah laku pekerja seterusnya memberi kesan kepada prestasi yang lemah (Hon & Chan, 2013; Deng et al., 2019).

Menurut Archer et al., (2024), faktor yang menyumbang kesan negatif kepada prestasi pekerja adalah disebabkan oleh keletihan dan juga tekanan terhadap kerja. Keletihan akan menyebabkan penurunan stamina dan prestasi manakala tekanan akan menyebabkan penurunan kepada produktiviti dan prestasi akibat daripada banyak kesilapan kerja berlaku, penurunan motivasi dan kepuasan kerja. Tekanan yang tidak dikendalikan dengan baik akan mengakibatkan ketidakupayaan individu untuk berinteraksi secara positif dengan persekitaran kerja dan persekitaran luaran (Fahmi et al., 2022).

Beberapa kajian lepas telah menunjukkan pemboleh ubah tekanan kerja memberi pengaruh yang signifikan terhadap prestasi dalam kalangan pekerja secara positif (Fahmi et al., 2022; Paramita & Suwandana, 2022; Perez-Floriano & Gonzalez, 2019) mahu pun secara negatif (Archer et al., 2024; Pradoto et al., 2022; Weni et al., 2023). Oleh itu kajian ini akan menguji hipotesis seperti berikut:

H₃: Terdapat hubungan yang signifikan antara Tekanan Kerja terhadap Prestasi Pekerja

Metodologi Kajian

Kajian ini menggunakan kaedah kuantitatif melalui tinjauan kajian terhadap penerokaan terhadap hubungan antara kesedaran keselamatan dan kesihatan, persekitaran kerja, dan

tekanan pekerja terhadap prestasi kerja. Populasi kajian merangkumi kesemua pekerja di Kumpulan Wang Simpanan Pekerja (KWSP) cawangan Johor Bahru. Seramai 152 responden telah memberi maklumbalas dengan mengembalikan set soal selidik yang telah diisi. Kaedah persampelan rawak mudah telah digunakan untuk memastikan sampel yang dipilih dapat mewakili populasi kajian ini.

Instrumen soal selidik yang digunakan dalam kajian ini diukur melalui skala pengukuran Likert 5 mata di mana 1 mewakili 'Sangat Tidak Setuju' dan 5 mewakili 'Sangat Setuju'. Set soal selidik yang digunakan dalam kajian ini mengandungi empat bahagian utama bagi mengukur pemboleh ubah iaitu Kesedaran Keselamatan dan Kesihatan, Persekitaran Kerja, Tekanan Kerja, dan Prestasi Kerja. Nilai kesahan dan kebolehpercayaan instrumen untuk setiap bahagian ini adalah tinggi dengan nilai Cronbach's Alpha yang cemerlang untuk setiap pemboleh ubah: Kesedaran Keselamatan dan Kesihatan ($\alpha=0.823$), Persekitaran Kerja ($\alpha=0.872$), Tekanan Kerja ($\alpha=0.914$), dan Prestasi Kerja ($\alpha=0.934$). Keputusan nilai Cronbach's Alpha yang melebihi 0.70 menunjukkan instrumen yang digunakan memiliki konsistensi dalaman yang kuat untuk setiap skala (Hair et al., 2023).

Data kajian ini dianalisis menggunakan perisian terkini Statistical Package for the Social Sciences (SPSS) versi 28.0. Statistik deskriptif dan statistik inferensi adalah Analisa yang digunakan dalam kajian ini. Statistik deskriptif melibatkan ujian kekerapan, peratusan, min, dan sisihan piawai untuk menghuraikan ciri-ciri demografi responden serta tahap pemboleh ubah kajian (kesedaran keselamatan dan kesihatan, persekitaran kerja, tekanan kerja, dan prestasi kerja). Manakala, ujian korelasi Pearson pula digunakan untuk menguji kekuatan dan arah hubungan linear antara setiap pemboleh ubah bebas (kesedaran keselamatan dan kesihatan, persekitaran kerja, dan tekanan kerja) dengan pemboleh ubah bersandar (prestasi kerja). Ujian ini juga bertujuan untuk menguji hipotesis kajian dan mengenal pasti sama ada terdapat hubungan positif atau negatif yang signifikan antara faktor-faktor yang dikaji.

Dapatan dan Analisis Kajian

Analisis daripada dapatan kajian ini adalah berdasarkan 152 set soal selidik yang telah dikembalikan semula oleh responden setelah mengisi borang soal selidik yang telah diedarkan kepada mereka.

Analisis Kebolehpercayaan

Jadual 1 di bawah memperincikan nilai Cronbach's Alpha yang diperoleh daripada kedua-dua kajian rintis dan kajian sebenar bagi setiap pemboleh ubah yang dikaji. Nilai Cronbach's Alpha adalah ukuran kebolehpercayaan konsistensi dalaman sesuatu skala, dengan nilai yang lebih tinggi menunjukkan item-item dalam skala tersebut mengukur konstruk yang sama secara konsisten. Secara keseluruhan, analisis kebolehpercayaan yang dijalankan melalui ujian Cronbach's Alpha menunjukkan bahawa instrumen soal selidik yang digunakan dalam kajian ini adalah sah dan boleh dipercayai untuk mengukur pemboleh ubah-pemboleh ubah yang berkaitan. Kebolehpercayaan yang tinggi ini penting untuk memastikan bahawa data yang dikumpul adalah konsisten dan boleh diguna pakai untuk membuat inferens yang bermakna berkaitan hubungan antara kesedaran keselamatan dan kesihatan, persekitaran kerja, tekanan pekerja, dan prestasi kerja.

Jadual 1: Ujian Kebolehpercayaan

Konstruk	Cronbach's Alpha (Kajian Rintis)	Cronbach's Alpha (Kajian Sebenar)
Keselamatan dan Kesihatan Pekerjaan	0.921	0.864
Persekitaran Kerja	0.915	0.831
Tekanan Kerja	0.826	0.814

Analisis Demografi

Analisis demografi responden dalam kajian ini adalah berdasarkan jantina, bangsa, umur dan tempoh perkhidmatan yang dipaparkan dalam Jadual 2 di bawah. Analisis demografi menunjukkan bahawa majoriti responden kajian terdiri daripada lelaki, iaitu sebanyak 91 orang atau 59.9% daripada keseluruhan sampel. Berbanding dengan 61 orang responden perempuan yang membentuk 40.1%. Berdasarkan komposisi bangsa, seramai 140 responden (92%) berbangsa Melayu adalah merupakan majoriti dalam kajian ini diikuti dengan bangsa Cina, India, dan lain-lain.

Bagi kategori umur, dapat diperhatikan bahawa hampir separuh daripada responden, iaitu 49.3% (75 orang), adalah berumur 40 tahun ke atas. Tren ini juga selari dengan data tempoh perkhidmatan, di mana majoriti responden (49.3% atau 75 orang) mempunyai pengalaman bekerja melebihi 16 tahun. Ini menunjukkan bahawa sampel kajian ini terdiri daripada pekerja yang stabil dan telah berkhidmat lama di organisasi, memberikan perspektif yang kaya dan mendalam berdasarkan pengalaman kerjaya mereka.

Secara keseluruhan, profil demografi ini memberikan gambaran tentang tenaga kerja di KWSP Johor Bahru sebagai kumpulan yang dominan lelaki, Melayu, dan mempunyai pengalaman serta kematangan yang tinggi.

Jadual 2: Demografi Responden (N= 152)

Demografi Responden	Kekerapan (N)	Peratusan (%)
Jantina		
Lelaki	91	59.9
Perempuan	61	40.1
Jumlah	152	100
Bangsa		
Melayu	140	92.1
Cina	5	3.3
India	4	2.6
Lain-lain	3	2
Jumlah	152	100
Umur		
< 20 tahun	22	14.4
21 – 25 tahun	12	7.9
26 – 30 tahun	14	9.2
31 – 35 tahun	9	6

36 – 40 tahun	20	13.2
40> tahun	75	49.3
Jumlah	152	100
Tempoh Perkhidmatan		
< 1 tahun	25	16.5
2 – 5 tahun	19	12.5
6 – 10 tahun	14	9.2
11 – 15 tahun	19	12.5
16> tahun	75	49.3
Jumlah	152	100

Analisis Kolerasi Peason

Jadual 3 memaparkan keputusan analisis ujian korelasi Pearson yang dijalankan untuk menilai kekuatan dan arah hubungan linear antara pemboleh ubah bebas (Keselamatan dan Kesihatan Pekerjaan, Persekitaran Kerja, dan Tekanan Kerja) dengan pemboleh ubah bersandar (Prestasi Kerja). Nilai pekali korelasi Pearson (r) berada dalam julat -1 hingga +1, di mana nilai yang mendekati +1 menunjukkan hubungan positif yang kuat, nilai yang mendekati -1 menunjukkan hubungan negatif yang kuat, dan nilai yang mendekati 0 menunjukkan tiada hubungan linear. Nilai asterik (**) menunjukkan hubungan yang signifikan pada tahap $p < 0.01$, yang bermaksud terdapat kurang daripada 1% kebarangkalian bahawa hubungan ini berlaku secara kebetulan.

Jadual 3: Keputusan Kolerasi Antara Pemboleh Ubah

	Prestasi Kerja	Keselamatan dan Kesihatan	Persekitaran Kerja	Tekanan Kerja
Prestasi Kerja	1	.736**	.835**	.839**
Keselamatan dan Kesihatan		1	.802**	.679**
Persekitaran Kerja			1	.789**
Tekanan Kerja				1

Hubungan antara Keselamatan dan Kesihatan Pekerja dengan Prestasi Kerja

Hasil analisis kolerasi yang dijalankan antara pemboleh ubah mendapati terdapat hubungan positif yang kuat dan signifikan antara Keselamatan dan Kesihatan Pekerjaan dengan Prestasi Kerja ($r = .736^{**}$, $p < 0.01$). Keputusan ini menunjukkan tahap kesedaran dan amalan keselamatan serta kesihatan pekerja mempengaruhi prestasi pekerja. Semakin tinggi tahap kesedaran mereka kepada keselamatan dan kesihatan di tempat kerja maka semakin tinggi tahap prestasi terhadap kerja. Pekerja yang memiliki kesedaran yang tinggi terhadap kepentingan keselamatan dan kesihatan semasa di tempat kerja akan lebih fokus terhadap kerja dan cekap melakukan tugas. Dapatan ini menyokong kajian lepas yang pernah dilakukan sebelum ini berkaitan pengaruh kesedaran keselamatan dan kesihatan terhadap prestasi kerja (Ajmal et al., 2021; Aprianti & Almanshur, 2022; Baluti et al., 2024; Lari, 2024; Perera, 2019). Oleh yang demikian, hipotesis H_1 adalah disokong.

Hubungan antara Persekitaran Kerja dengan Prestasi Kerja

Keputusan ini juga menunjukkan hubungan positif yang sangat kuat dan signifikan antara Persekitaran Kerja dengan Prestasi Kerja ($r=.835^{**}$, $p<0.01$). Korelasi yang tinggi ini mengindikasikan bahawa persekitaran kerja yang kondusif, baik dari segi fizikal mahupun psikologi, memainkan peranan yang amat penting dalam meningkatkan prestasi kerja pekerja. Apabila pekerja berpuas hati dengan keadaan fizikal tempat kerja (seperti ergonomik, pencahayaan) dan aspek psikologi (seperti sokongan sosial, budaya organisasi), mereka cenderung untuk menjadi lebih bermotivasi, terlibat, dan akhirnya berprestasi lebih baik (Ng & Loo, 2018; Robbins & Judge, 2018). Keputusan ini telah menyokong kajian lepas yang pernah dilakukan sebelum ini berkaitan pengaruh persekitaran terhadap prestasi kerja (Arisandi & Heryjanto, 2024; Awada et al., 2022; Wang et al., 2021; Zhenjing et al., 2022).

Hubungan antara Tekanan Kerja dengan Prestasi Kerja

Menariknya, terdapat hubungan positif yang sangat kuat dan signifikan antara Tekanan Kerja dengan Prestasi Kerja ($r=.839^{**}$, $p<0.01$). Pada pandangan pertama, penemuan ini mungkin kelihatan bercanggah dengan pandangan yang menyatakan tekanan kerja yang tinggi akan mengurangkan prestasi. Walau bagaimanapun, nilai korelasi positif yang tinggi ini mungkin menunjukkan fenomena *eustress*, di mana tahap tekanan yang optimum atau cabaran yang menggalakkan dapat mendorong pekerja untuk bekerja dengan lebih keras dan mencapai prestasi yang lebih tinggi. Pekerja mungkin melihat tekanan sebagai pemangkin untuk meningkatkan tumpuan dan output, terutamanya jika mereka mempunyai kemahiran daya tindak yang baik dan sokongan yang mencukupi (Akkermans & Kubic, 2020). Dapatan ini juga disokong dengan kajian literatur bahawa tekanan kerja akan memberi kesan signifikan positif terhadap prestasi pekerja (Fahmi et al., 2022; Paramita & Suwandana, 2022; Perez-Floriano & Gonzalez, 2019). Keputusan analisis ini juga mencerminkan bahawa dalam konteks kerja di KWSP Johor Bahru, pekerja yang menghadapi tekanan mungkin menunjukkan prestasi tinggi sebagai tindak balas untuk memenuhi jangkaan atau mengelakkan akibat negatif, namun perlu diingat bahawa tekanan kronik masih boleh membawa kesan buruk jangka panjang. Kajian lanjut dengan analisis regresi berganda mungkin dapat menjelaskan interaksi ini dengan lebih mendalam.

Secara keseluruhan, analisis korelasi Pearson ini menegaskan bahawa ketiga-tiga pemboleh ubah bebas yang dikaji iaitu Keselamatan dan Kesihatan Pekerjaan, Persekitaran Kerja, dan Tekanan Kerja adalah berkaitan secara signifikan dengan Prestasi Kerja dalam konteks kajian ini. Penemuan ini menyediakan asas yang kukuh untuk penyelidikan seterusnya, terutamanya untuk memahami sifat hubungan positif yang kuat dengan tekanan kerja.

Analisis Regresi Berganda bagi Pemboleh Ubah

Analisis keputusan regresi berganda telah dilaksanakan (rujuk Jadual 4) untuk mengukur kesan pengaruh relatif bagi setiap pemboleh ubah bebas (Keselamatan dan Kesihatan Pekerjaan, Persekitaran Kerja, dan Tekanan Kerja) terhadap Prestasi Kerja. Analisis regresi berganda yang dijalankan mendedahkan bahawa ketiga-tiga pemboleh ubah bebas iaitu Keselamatan dan Kesihatan Pekerjaan, Persekitaran Kerja, dan Tekanan Kerja, secara signifikan mempengaruhi Prestasi Kerja dalam kalangan pekerja KWSP Johor Bahru. Dengan pekali *Beta Standardized* yang paling tinggi ($Beta=.439$, $p=.000$), Keselamatan dan Kesihatan Pekerjaan muncul sebagai

peramal yang paling dominan, menunjukkan bahawa amalan dan kesedaran keselamatan yang tinggi adalah faktor utama yang menyumbang kepada prestasi pekerja. Persekitaran Kerja juga menunjukkan pengaruh positif yang signifikan ($Beta=.206$, $p=.000$), mengesahkan bahawa suasana kerja yang kondusif menyumbang secara positif kepada hasil kerja.

Hasil keputusan analisis berkaitan Tekanan Kerja menunjukkan keputusan yang menarik kerana didapati mempunyai pengaruh positif dan signifikan terhadap Prestasi Kerja ($Beta=.163$, $p=.000$). Dalam konteks ini, tahap tekanan berkemungkinan bertindak sebagai pemangkin atau *eustress* yang memacu pekerja untuk mencapai matlamat. Walau bagaimanapun, Tekanan Kerja masih mampu memberi impak yang negative dalam jangka masa Panjang sekiranya tekanan berpanjangan tanpa dibending. Secara keseluruhan, model regresi ini menggariskan kepentingan pelbagai aspek persekitaran kerja dalam membentuk prestasi individu.

Jadual 4: Analisis Regresi Berganda bagi Pemboleh Ubah

Pemboleh Ubah Bersandar: Prestasi Kerja			
Pemboleh Ubah Bebas	<i>Beta Coefficients</i>	<i>t</i>	Sig.
Keselamatan dan Kesihatan	.439	4.489	.000
Persekitaran Kerja	.206	1.079	.000
Tekanan Kerja	.163	1.400	.000
$R^2 = .819$			

Ujian Hipotesis

Berdasarkan keputusan analisis korelasi Pearson yang dibentangkan dalam Jadual 3, hipotesis-hipotesis kajian yang mengkaji hubungan antara pemboleh ubah bebas dan pemboleh ubah bersandar adalah disokong.

- H₁: Terdapat hubungan positif dan signifikan antara Keselamatan dan Kesihatan Pekerjaan dengan Prestasi Kerja.
- H₂: Terdapat hubungan positif dan signifikan antara Persekitaran Kerja dengan Prestasi Kerja.
- H₃: Terdapat hubungan signifikan antara Tekanan Kerja dengan Prestasi Kerja.

Berdasarkan analisis korelasi Pearson, kesemua hipotesis alternatif kajian telah disokong, menunjukkan adanya hubungan yang signifikan antara pemboleh ubah bebas dan bersandar. Secara spesifik, ujian ini mengesahkan hubungan positif dan signifikan yang kuat antara Keselamatan dan Kesihatan Pekerjaan dengan Prestasi Kerja ($r=.736^{**}$, $p<0.01$). Ini menunjukkan bahawa peningkatan kesedaran keselamatan dan kesihatan dalam kalangan pekerja berkait rapat dengan peningkatan prestasi mereka. Seterusnya, terdapat juga hubungan positif dan signifikan yang sangat kuat antara Persekitaran Kerja dengan Prestasi Kerja ($r=.835^{**}$, $p<0.01$), membuktikan bahawa persekitaran kerja yang kondusif adalah faktor utama dalam meningkatkan hasil kerja. Akhir sekali, analisis turut mendedahkan hubungan

positif dan signifikan yang sangat kuat antara Tekanan Kerja dengan Prestasi Kerja ($r=.839^{**}$, $p<0.01$). Penemuan ini menarik dan mungkin mencerminkan peranan *eustress* dalam konteks organisasi ini, di mana tahap tekanan tertentu boleh memacu prestasi pekerja, meskipun tekanan kronik perlu diuruskan untuk kesejahteraan jangka panjang.

Perbincangan

Dapatan kajian ini memberikan gambaran yang komprehensif mengenai peranan kesedaran keselamatan dan kesihatan, persekitaran kerja, dan tekanan pekerja terhadap prestasi kerja dalam kalangan pekerja Kumpulan Wang Simpanan Pekerja (KWSP) cawangan Johor Bahru. Analisis kebolehpercayaan instrumen, seperti yang ditunjukkan oleh nilai Cronbach's Alpha yang tinggi bagi Keselamatan dan Kesihatan Pekerjaan ($\alpha=0.864$), Suasana Kerja ($\alpha=0.831$), dan Tekanan Kerja ($\alpha=0.814$), mengesahkan bahawa data yang dikumpul adalah konsisten dan boleh dipercayai untuk tujuan analisis. Profil demografi sampel menunjukkan dominasi pekerja lelaki dan berbangsa Melayu, dengan sebahagian besar responden berusia 40 tahun ke atas dan mempunyai tempoh perkhidmatan melebihi 16 tahun. Komposisi ini mencerminkan tenaga kerja yang matang dan berpengalaman, yang mungkin mempengaruhi persepsi mereka terhadap faktor-faktor kerja dan prestasi.

Hasil analisis korelasi Pearson menunjukkan hubungan positif yang signifikan dan kuat antara ketiga-tiga pemboleh ubah bebas dengan Prestasi Kerja. Keselamatan dan Kesihatan Pekerjaan menunjukkan korelasi positif yang kuat ($r=.736^{**}$), menekankan bahawa peningkatan kesedaran dan amalan keselamatan dan kesihatan secara langsung berkaitan dengan peningkatan prestasi. Penemuan ini sejajar dengan literatur yang menegaskan bahawa persekitaran kerja yang selamat dan sihat mengurangkan gangguan dan meningkatkan fokus pekerja (Mohd Noor & Zulkifli, 2019). Persekitaran Kerja turut menunjukkan korelasi positif yang sangat kuat ($r=.835^{**}$), menggariskan peranan kritikal aspek fizikal dan psikologi tempat kerja dalam mendorong motivasi dan kepuasan yang akhirnya meningkatkan prestasi (Ng & Loo, 2018). Yang paling menarik, Tekanan Kerja juga menunjukkan korelasi positif yang sangat kuat ($r=.839^{**}$), yang pada awalnya mungkin kelihatan bertentangan dengan pandangan konvensional. Korelasi positif ini boleh diinterpretasikan sebagai kesan *eustress*, di mana tahap tekanan yang optimum atau cabaran yang menggalakkan sebenarnya dapat memacu pekerja untuk mencapai matlamat yang lebih tinggi dan meningkatkan prestasi mereka (Yerkes & Dodson, 1908). Ini mungkin berlaku dalam konteks KWSP Johor Bahru di mana pekerja yang berpengalaman mampu menguruskan tekanan dan mengubahnya menjadi pendorong positif.

Selanjutnya, analisis regresi berganda memberikan pandangan yang lebih mendalam mengenai pengaruh relatif setiap pemboleh ubah. Keselamatan dan Kesihatan Pekerjaan muncul sebagai prediktor yang paling dominan terhadap Prestasi Kerja (Beta=.439, $p=.000$). Ini menegaskan bahawa faktor ini adalah penyumbang utama kepada variasi dalam prestasi kerja apabila faktor-faktor lain dikawal. Pemerkasaan pekerja melalui latihan keselamatan, pematuhan prosedur, dan amalan kesihatan proaktif secara jelas diterjemahkan kepada produktiviti yang lebih baik. Persekitaran Kerja turut memberikan sumbangan signifikan yang positif (Beta=.206, $p=.000$), menunjukkan bahawa walaupun Keselamatan dan Kesihatan Pekerjaan mempunyai impak terbesar, persekitaran yang kondusif (baik dari segi fizikal seperti ergonomik mahupun psikologi seperti sokongan pengurusan) adalah penting untuk menyokong prestasi pekerja. Akhirnya, Tekanan Kerja turut menunjukkan pengaruh positif yang signifikan (Beta=.163, $p=.000$). Ini mengukuhkan interpretasi awal bahawa tekanan kerja dalam konteks ini mungkin

bertindak sebagai pemangkin positif. Pekerja mungkin mempunyai daya tahan yang tinggi atau melihat tekanan sebagai peluang untuk menunjukkan kecekapan mereka, yang membawa kepada peningkatan prestasi. Walau bagaimanapun, adalah penting bagi pihak pengurusan untuk berhati-hati dan tidak menganggap semua jenis tekanan adalah baik; tekanan kronik yang tidak terkawal masih boleh membawa kepada burnout dan masalah kesihatan jangka panjang. Penemuan ini secara kolektif menyokong keperluan untuk pendekatan holistik dalam pengurusan sumber manusia, yang bukan sahaja memberi tumpuan kepada keselamatan dan persekitaran fizikal, tetapi juga kepada pengurusan tekanan untuk mengoptimumkan prestasi dan kesejahteraan pekerja.)

Sumbangan dan Cadangan

Kajian ini menyumbang secara teoritis dengan mengukuhkan hubungan kompleks antara kesedaran keselamatan dan kesihatan, persekitaran kerja, dan tekanan pekerja dengan prestasi kerja, terutamanya dengan menyoroti potensi eustress sebagai pemacu positif prestasi dalam konteks organisasi perkhidmatan awam. Secara praktikal, penemuan ini memberikan panduan kepada pengurusan KWSP dan organisasi lain untuk mengutamakan pelaburan dalam program keselamatan dan kesihatan, mewujudkan persekitaran kerja yang kondusif, dan membangunkan strategi pengurusan tekanan yang bijak untuk mengoptimumkan prestasi pekerja. Untuk kajian masa depan, dicadangkan untuk meneroka lebih mendalam mekanisme di sebalik hubungan positif tekanan kerja, menjalankan kajian longitudinal, memperluas skop sampel ke organisasi lain, dan menggunakan kaedah campuran untuk mendapatkan pemahaman yang lebih kaya dan objektif mengenai dinamika faktor-faktor ini.

Kesimpulan

Kajian ini merumuskan bahawa kesedaran keselamatan dan kesihatan pekerjaan, persekitaran kerja, dan tekanan kerja adalah faktor-faktor signifikan yang saling berkait dan secara positif mempengaruhi prestasi kerja di KWSP cawangan Johor Bahru. Keselamatan dan kesihatan adalah pemangkin utama, diikuti oleh persekitaran kerja yang kondusif. Menariknya, tekanan kerja juga dilihat sebagai pendorong positif (eustress), menunjukkan bahawa dalam konteks ini, tekanan tertentu dapat memacu prestasi. Oleh itu, organisasi perlu mengamalkan pendekatan holistik dalam pengurusan sumber manusia untuk mengoptimumkan ketiga-tiga aspek ini demi meningkatkan prestasi dan kesejahteraan pekerja secara lestari.

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SALAH LAKU SEKSUAL DI KELANTAN

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Abstrak: Di Kelantan salah laku seksual bukan merupakan fenomena baharu. Laporan Majlis Agama Islam dan Istiadat Melayu Kelantan menunjukkan kegiatan pelacuran dalam kalangan wanita Melayu berlaku sejak tahun 1916. Sementara khalwat dan bersekedudukan serta rogol dikesan berlaku pada tahun 1920an. Perbincangan kertas kerja ini memfokuskan kepada analisis laporan bertulis Pejabat Polis Kuala Krai dan Pejabat Polis Kontinjen Kelantan mengenai kegiatan pelacuran di Kelantan pada tahun 1960an dan 1970an. Perbincangan dicerakinkan kepada distribusi dan populasi pelacur di Kota Bharu, lokasi dan operasi serta langkah pencegahan. Kertas kerja ini memberi latar belakang sejarah mengenai peranan pihak polis dalam membanteras masalah salah laku seksual di Kelantan. Perlu kajian yang lebih mendalam mengenai mencari punca atau faktor mengapa kegiatan yang berkaitan dengan isu salah laku seksual masih terus berakar umbi dalam kalangan masyarakat Kelantan amnya dan Kota Bharu khasnya. Permasalahan yang dihadapi bukan menjadi tanggungjawab pihak polis semata-mata sebaliknya pihak kerajaan negeri dan majlis agama serta kalangan masyarakat perlu menangani bersama.

Kata Kunci: Salah laku, seksual, pelacuran, polis, Kelantan.

Pendahuluan

Salah laku seksual bukan merupakan fenomena baharu di Kelantan. Dari sudut sejarah kegiatan pelacuran dapat dikesan melalui laporan Majlis Agama Islam dan Istiadat Melayu Kelantan (Majlis atau MAIK) sejak tahun 1916 (MAIK, 1916). Sementara khalwat dan bersekedudukan serta rogol dikesan pada tahun 1920an dan 1930an. (Haryati Hasan, 2007). Pada hari ini Kelantan terutama Kota Bharu antara negeri yang mempunyai kadar salah laku seksual yang tinggi di Malaysia. Isu rogol misalnya direkodkan meningkat dari tahun ke tahun terutama pada tempoh masa selepas Perintah Kawalan Pergerakan (PKP). (Temubual Mohd Yusoff bin Mamat, 2025)

Metodologi Kajian

Artikel ini menganalisis sebanyak 25 buah laporann bertulis polis. Laporan terdiri daripada minit mesyuarat Pejabat Polis Kuala Krai yang meliputi tahun (1965, 1966, 1968, 1969 dan 1970 yang berjumlah sebanyak 14 buah). Selain itu artkel ini turut menganalisis sebanyak 11 buah minit mesyuarat daripada Pejabat Polis Kontinjen Kelantan yang bertarikh tahun (1970, 1972 dan 1973). Berdasarkan laporan tersebut artikel ini membincangkan mengenai distribusi dan populasi pelacur di Kota Bharu, lokasi dan operasi serta langkah pencegahan.

Kajian Literatur

Di kebanyakan tempat di dunia kajian mengenai pelacuran telah banyak diusahakan. Di Singapura misalnya James Francis Warren telah mengkaji mengenai kegiatan pelacuran dalam

kalangan wanita bangsa Cina dan Jepun dari tahun 1870 sehingga 1940. Perbincangan menyentuh mengenai rumah pelacuran serta kehidupan pelacur wanita yang dikenali sebagai Ah Ku dan Karayuki-San. (J.F. Warren, 1993). Murray, pula membincangkan mengenai aktiviti ekonomi masyarakat kelas bawah di sebuah kampung di Manggarai, Jakarta. Kaum wanita di kawasan tersebut kebanyakannya bekerja dalam sektor informal dan hanya lebih kurang lima peratus sahaja yang bekerja dalam sektor formal. Aktiviti pelacuran berlaku kerana masalah kemiskinan dan kekurangan kemudahan di kawasan berkenaan. Terdapat beberapa ciri persamaan antara wanita Manggarai dan wanita Kelantan seperti berdikari, rajin bekerja dan menjadi penjaja kecil. Ada juga yang bergiat dalam aktiviti pelacuran (A.J. Murray, 1991).

Di Malaysia, terdapat kajian mengenai pelacuran yang dilakukan oleh Ruslan Khatib, Shaik Mohamed Mohd Sahed, Hassan Abd. Ghani, Abdul Hadi Zakaria dan Haryati Hasan. Ruslan Khatib (1966) mengetengahkan mengenai kegiatan pelacuran Melayu di Kuala Lumpur. Dalam tulisannya, pengkaji ini menyatakan bahawa kebanyakan wanita menjadi pelacur kerana latar belakang kehidupannya yang berasal daripada keluarga yang miskin, perkahwinan yang berakhir dengan perceraian, tidak mendapat pendidikan yang baik dan berhijrah ke bandar untuk mencari pekerjaan bagi menyara kehidupan diri sendiri dan keluarga. Sementara itu, Shaik Mohamed Mohd Sahed (1977) pula menumpukan perbincangan terhadap aspek pencegahan dari sudut undang-undang. Pengkaji ini menjelaskan keperluan pemulihan akhlak, cara dan teknik pemulihan, serta peruntukan undang-undang mengenai pemulihan.

Berbeza daripada kedua-kedua kajian tersebut, Hassan Abd. Ghani (1984) memfokuskan kajian tentang kegiatan pelacuran dalam kalangan gadis di bawah umur. Skop kajian ini meliputi kerangka yang lebih luas, iaitu Malaysia, berbanding dengan sebelumnya yang memfokuskan kajian di Kuala Lumpur dan Pulau Pinang. Antara inti pati kajian pengkaji ini termasuklah sejarah pelacuran di Malaysia, punca kegiatan pelacuran dianggap sebagai masalah masyarakat, sebab dan kawalan undang-undang.

Seterusnya, Abdul Hadi Zakaria (1980) menganalisis faktor yang mendorong wanita menjadi pelacur. Selain itu, pengkaji ini turut menghujahkan persoalan dalam penyimpangan seksual, termasuklah hujah oleh penulis barat berhubung dengan konsep pelacur dan pelacuran. Menurutnya lagi, pelacuran merupakan suatu bidang pekerjaan yang menjadi pilihan bagi segelintir kaum wanita. Haryati Hasan (2004) pula memfokus kepada dinamika kegiatan pelacuran di Kota Bharu, Kelantan pada 1950an sehingga 1970an. Kepelbagaian faktor terutamanya peningkatan perceraian, kemiskinan dan masalah mendapatkan peluang pekerjaan mempengaruhi perkembangan kegiatan pelacuran dalam tempoh tersebut.

Hasil dan Perbincangan

Hasil analisis ke atas laporan Pejabat Polis Kuala Krai dan Pejabat Polis Kontinjen Kelantan artikel ini mencerakinkan perbincangan kepada tiga bahagian iaitu distribusi dan populasi pelacur di Kota Bharu, lokasi dan operasi serta langkah pencegahan.

Distribusi dan Populasi Pelacur di Kota Bharu

Di Kelantan, pihak polis merupakan salah satu daripada tiga agensi utama kerajaan yang dipertanggungjawabkan membasmi kegiatan pelacuran selain daripada MAIK dan Jabatan

Kebajikan Masyarakat. (*Brothels and prostitution in Kelantan*, 1968). Berkenaan kuasa polis dalam menjalankan tugasnya, diperuntukkan di bawah 'Women and Girls Protection Enactment Chapter 156' yang mana polis diberi kuasa untuk 'search, arrest and seizure'. Ketiga-tiga kuasa tersebut terkandung di dalam Seksyen 21, 21A dan 22 (ii) enakmen tersebut.

Sehingga menjelang Perang Dunia Kedua terdapat seramai 149 orang pelacur yang beroperasi di jajahan Kota Bharu (Haryati Hasan, 2003). Selepas negara mencapai kemerdekaan pada 1957, bilangan pelacur yang telah ditangkap didapati meningkat. Dalam tahun 1972 misalnya Badan Pencegah Maksiat Kelantan telah menangkap seramai 339 orang pelacur (*Laporan maksiat Negeri Kelantan*, Januari 1972 hingga 31 Mei 1973). Seramai 113 orang pula telah ditangkap antara 1 Januari 1973 hingga 31 Mei 1973 (*Laporan maksiat Negeri Kelantan*, 1973).

Perangkaan tersebut, tidak mewakili keseluruhan jumlah pelacur yang ada di Kelantan. Ini kerana pihak polis di dalam kertas kerja yang bertajuk *Brothels and prostitution in Kelantan* yang bertarikh 4 Disember 1968 telah menyebut bahawa di bandar Kota Bharu sahaja terdapat kira-kira 200 orang pelacur aktif (*Brothels and prostitution in Kelantan*, 1968). Laporan tersebut juga menyatakan kira-kira 200 hingga 300 orang pelacur dari Kelantan telah berhijrah ke Pulau Pinang, Kuala Lumpur, Melaka, Johor Bahru dan Singapura.

Laporan *Half-yearly return on vice* yang bertarikh 30 Jun 1970 pula menyebut, kira-kira 40 peratus daripada pelacur tempatan telah berhijrah ke Trengganu, Pahang dan Selangor. (*Half-yearly return on vice*, 30 Jun 1970 dan 14 September 1970). Perangkaan tersebut merupakan angka-angka berdasarkan tangkapan dan anggaran kasar. Jumlah pelacur yang sebenar terdapat di Kota Bharu mungkin lebih ramai daripada itu jika berdasarkan kepada tempat-tempat kegiatan pelacuran di sekitar Kota Bharu yang berjumlah sebanyak 83 buah. (*Brothels and prostitution in Kelantan*, 1968).

Apakah yang menyebabkan berlakunya aktiviti pelacuran? Persoalan ini kerap ditanya dalam kalangan masyarakat hari ini. Walaupun kegiatan atau aktiviti pelacuran dianggap keji dan hina dalam agama dan juga masyarakat, tetapi masih ramai lagi wanita yang sanggup untuk menjadi pelacur. Terdapat pelbagai sebab mengapa wanita menjadi pelacur, antaranya kerana masalah kemiskinan, keruntuhan moral, keinginan mendapat kehidupan yang senang, dicerai oleh suami serta terpedaya (Haryati Hasan, 2003).

Lokasi dan Operasi

Sudah menjadi satu keadaan yang lumrah, pelacuran dijalankan di tempat-tempat tertentu yang selalunya tersembunyi dan sukar dikesan. Kebiasaannya kegiatan berkenaan dijalankan secara sulit dan amat jarang dijalankan di kawasan terang atau di tempat awam. Di bandar Kota Bharu terdapat sebanyak 83 buah kediaman yang digunakan untuk tujuan pelacuran (*Brothels and prostitution in Kelantan*, 1968). Laporan lain pula menyebut kira-kira 75 peratus kegiatan pelacuran beroperasi di rumah pelacuran dan hotel (*Half-yearly return on vice*, 30 Jun 1970 dan 14 September 1970). Selebihnya dikesan di kelab malam (*Minutes of the 3rd meeting of the contingent planning committee on brothels and prostitution*, 1969) dan lorong-lorong gelap. Salah satu tempat 'lorong gelap' yang terkenal ialah di 'Lorong Tuar' atau Lorong Che Kadir. Selain kawasan berkenaan, kegiatan pelacuran turut dikesan berlaku di tempat awam seperti di taman hiburan *Biaritz Park*. (*Biaritz Park* merupakan tempat pertemuan antara pelacur-pelanggan. Jarang aktiviti seksual berlaku di situ kerana tiadanya kemudahan bilik. Lagi pun

tempat tersebut merupakan tempat awam). Kawasan pantai (Pantai yang terkenal ialah pantai Cinta Berahi) dan padang turut digemari untuk aktiviti-aktiviti kejantinaan (*Vice/brothels*, 1 Januari 1970 to 30 Jun 1970).

Menggelidih sarang pelacuran merupakan salah satu daripada tugas pihak polis dalam usaha membasmi kegiatan pelacuran. Tugas tersebut dijalankan bersama-sama dengan pihak pencegah maksiat Majlis Agama. Menggelidih seringkali dijalankan di tempat yang dikenalpasti terdapat kegiatan pelacuran misalnya hotel. Di bandar Kota Bharu terdapat sekurang-kurangnya 29 buah hotel (*Minutes of the 1st meeting of the contingent planning committee on brothels and prostitution*, 1968). Namun, hanya beberapa buah hotel yang sering diserbu oleh pihak polis. Ini termasuklah tiga buah hotel yang telah disenarai hitam (*black-list*), kerana termasuk di dalam senarai '81 dwelling houses' yang menjadi sarang kegiatan pelacuran di Kota Bharu. (*Brothels and prostitution in Kelantan*, 1968).

Hotel tersebut ialah NM, B dan S (*Minutes of the 1st meeting of the contingent planning committee on brothels and prostitution*, 1968). Hotel NM yang terletak di Jalan Tok Hakim sekurang-kurangnya sekali pernah diserbu oleh pihak polis. Hasil serbuan tersebut dua orang pelacur bersama pasangan masing-masing telah ditahan untuk disoal-siasat. (*Minutes of the contingent anti-crime planning committee meeting*, 1965). Berikutan maklumat mereka, pengurus dan penjaga hotel telah ditahan dan didakwa di bawah 'Sec 7(b) of the Women and Girls Protection Enactment Cap.156'. Mereka telah didenda sebanyak \$150 atau dua bulan penjara. (*Minutes of the contingent anti-crime planning committee meeting*, 1966)

Hotel B yang juga terletak di Jalan Tok Hakim turut dikesan sebagai salah satu tempat yang menjadi tumpuan kegiatan pelacuran. Kebanyakan pelacur di sini berbangsa Cina yang berasal dari luar Kelantan. (*Minutes of the 2nd meeting of the contingent planning committee on brothels and prostitution*, 1969). Beberapa buah laporan menyebut bahawa seorang lelaki mualaf, yang bekerja sebagai 'hotel keeper' adalah bertanggungjawab membawa mereka masuk untuk memenuhi permintaan dalam kalangan pelanggan yang berbangsa Cina. Ekoran daripada itu lelaki berkenaan telah disoalsiasat. Beliau akhirnya didapati bersalah dan telah dipenjarakan serta dihadkan tempat kediamannya selama tiga tahun. (*Pelacur-perancangan kontinjen Kelantan no.9*, 1969).

Hotel S yang terletak di Jalan Post Office Lama, turut diserbu oleh pihak polis sebagaimana hotel NM dan hotel B. (*Minutes of the 1st meeting of the contingent planning committee on brothels and prostitution*, 1968). Sebuah laporan menyebut, pihak polis telah 81 kali membuat serbuan ke atas ketiga-tiga hotel berkenaan antara 3 Disember 1968 hingga 21 Januari 1969. (*Minutes of the 2nd meeting of the contingent planning committee on brothels and prostitution*, 1969). Ini bermakna hampir setiap hari serbuan dilakukan ke atas ketiga-tiga buah hotel tersebut. Laporan lain pula menyebut pihak polis telah menyerbu hotel berkenaan lebih daripada tiga kali sehari terutamanya pada hari Khamis dan Sabtu. (*Minutes of the 1st meeting of the contingent planning committee on brothels and prostitution*, 1968). Ini kerana pada hari tersebut ramai pelacur separuh masa yang terdiri daripada bekas isteri nelayan dan petani telah datang ke hotel tersebut untuk melacur. Berhubung dengan serbuan di ketiga-tiga hotel berkenaan beberapa laporan juga menyebut bahawa pemeriksaan ke atas hotel telah dilakukan dari masa ke semasa sebagai satu cara menghalang para pelacur daripada menjalankan kegiatan mereka di sana (*Minutes of the 3rd meeting of the contingent planning committee on brothels and prostitution*, 1969).

Selain tiga hotel berkenaan, Hotel C juga pernah diserbu oleh pihak polis kerana disyaki menjadi tempat tumpuan pelacur. Namun, pihak polis gagal memperolehi bukti dan penyiasatan ke atas hotel tersebut telah dihentikan. (*Minutes of the contingent anti-crime committee meeting*, 1965). Hal yang sama juga dapat diperhatikan di dalam kes hotel R. Beberapa laporan mengesyaki bahawa tempat berkenaan telah digunakan sebagai rumah pelacuran. Namun, setelah menjalankan pemeriksaan pihak polis gagal memperolehi sebarang bukti. (*Minutes of the 2nd meeting of the contingent planning committee on brothels and prostitution*, 1969). Akhirnya penyiasatan ke atas hotel C dan R telah dihentikan. Ini menunjukkan hanya sebahagian kecil sahaja hotel yang telah diserbu dan tumpuannya pula hanya kepada hotel yang telah disenarai hitam. *Double standard* di dalam menjalankan tugas berhubung dengan pemeriksaan ke atas hotel telah mengakibatkan kegiatan pelacuran di hotel berterusan walaupun pemeriksaan yang kerap serta berterusan.

Pelacur yang beroperasi di hotel terdiri daripada pelacur Melayu yang berasal dari kawasan luar bandar serta bekerja pada musim-musim dan hari-hari tertentu kerana desakan nafkah zahir dan batin. (Haryati Hasan, 2005). Selain itu, pelacur berbangsa Cina dari luar Kelantan turut mewarnai kegiatan pelacuran di hotel-hotel di Kelantan kerana adanya permintaan daripada pelanggan yang juga berbangsa Cina. Wujudnya faktor 'supply-demand' antara pelacur-pelanggan telah menjelaskan mengapa kegiatan pelacuran sukar dibasmikan. Selain itu, orang perantara seperti penjaga hotel merupakan pemangkin yang merancakkan lagi aktiviti pelacuran di hotel. Hukuman tidak pernah menakutkan mereka untuk meneruskan kerja yang berhubung dengan kegiatan pelacuran serta yang berkaitan dengannya. Dan ini merupakan satu sebab lagi mengapa kegiatan pelacuran masih gagal dibanteras walau pun adanya usaha yang bersungguh-sungguh daripada pihak polis untuk membasmi kegiatan tersebut.

Rumah pelacuran, selain daripada hotel merupakan tempat yang sering diperiksa dan diserbu oleh pihak polis. Ini termasuklah rumah di hadapan Lucky Bar, Jalan Post Office Lama serta rumah di Belakang Kota. Rumah tersebut telah digunakan sebagai rumah pelacuran oleh sebilangan pelacur tempatan di bawah anjuran tuan punya rumah itu sendiri. Rumah-rumah di Belakang Kota misalnya dipunyai oleh pemilik berlainan yang dikenali sebagai Munah (Gila), Mahmud dan Deraman). Mereka umumnya mengenakan bayaran sewa bilik antara \$1.00 hingga \$3.00 setiap kali digunakan. (*Rumah-rumah pelacuran dalam daerah Kota Bharu*).

Langkah Pencegahan

Penganjur rumah pelacuran yang telah dikenal pasti akan dipanggil oleh pihak polis untuk disoal siasat. Buat pertama kali mereka akan diberi amaran keras supaya berhenti daripada menjalankan aktiviti dalam kegiatan maksiat. Hal tersebut dapat dilihat di dalam kes Abdullah bin Awang @ Dollah. Setelah dipanggil dan diberi amaran, beliau telah berhenti daripada menganjurkan rumah pelacuran sebaliknya telah mencari pekerjaan halal untuk menyara kehidupannya. Beliau telah mendapat kerja sebagai pengetam papan di sebuah kilang papan dengan gaji sebanyak \$5.00 sehari. (*Per: Abdullah bin Awang @ Dollah*).

Hasil serbuan ke atas hotel NM, pihak polis telah berjaya menahan seramai dua orang pelacur bersama pasangan masing-masing. Mereka kemudiannya telah dibawa ke balai polis untuk disoal-siasat (*Minutes of the contingent anti-crime planning committee meeting*, 1965).

Berikutan maklumat daripada mereka, pengurus dan penjaga hotel telah turut ditahan dan didakwa di bawah ‘*Sec 7(b) of the Women and Girls Protection Enactment Cap.156*’. Kedua-duanya telah didenda sebanyak \$150 atau dua bulan penjara (*Minutes of the contingent anti-crime planning committee meeting, 1966* dan *Minutes of the the contingent anti-crime planning committee meeting, 1965*).

Selain itu, ada yang dikenakan tindakan penjara dan buang daerah atau dihadkan tempat kediaman. Mek Nga (bukan nama sebenar), seorang wanita berbangsa Siam, berperanan mengurus dan menjaga pelacur berbangsa Siam yang diambil dari Sungai Golok, Thailand. Beliau telah didakwa di bawah Seksyen 7(a) Cap.156 KN Ord.37/67 dan dikenakan denda sebanyak \$70 kerana membenarkan rumahnya digunakan untuk tujuan pelacuran. (*Pelacuran-perancangan Kelantan kontinjen no.11, 1970*).

Mak Su Minah (bukan nama sebenar) yang menjalankan kegiatan sebagai penganjur rumah pelacuran di Hulu Kota (*Pelachor-perancangan jawatankuasa kontinjen no.8, 1969*) juga telah turut didakwa di bawah Sec.7(b) Cap.156 Ext.37/67 (*Pelacur-perancangan kontinjen Kelantan no.9, 1969*) dan beliau telah dihukum denda sebanyak \$150 (*Pelacuran-perancangan Kelantan kontinjen no.10, 1970*).

Selain hukuman denda, ada dalam kalangan penganjur rumah pelacuran yang telah dihukum penjara. Nik Mat (bukan nama sebenar) misalnya telah dipenjarakan selama lima bulan (*Minutes of the 2nd meeting of the contingent planning committee on brothels and prostitution, 1969* dan *Minutes of the 3rd meeting of the contingent planning committee on brothels and prostitution, 1969*).

Selain itu, ada juga penganjur rumah pelacuran yang dijatuhkan hukuman penjara serta dibuang daerah. Pa’Su Mat (bukan nama sebenar) yang menjalankan kegiatan di Belakang Kota (*Minutes of the 1st meeting of the contingent planning committee, 1968*) misalnya telah menjalani hukuman penjara di penjara Pengkalan Chepa (*Minutes of the 5th meeting of the contingent planning committee on brothels and prostitution, 1969*) sementara mendapat perintah dibuang daerah di Dabong, daerah Stong, Ulu Kelantan selama tiga tahun (*Mencegah pelacuran-minit perancangan jawatankuasa kontinjen no.7, 1969*).

Tindakan menghadkan kediaman turut dikenakan ke atas Che Mood (bukan nama sebenar). Beliau telah ditahan di penjara Pengkalan Chepa (*Minutes of the 3rd meeting of the contingent planning committee on brothels and prostitution, 1969*) sementara menunggu perintah untuk menghadkan kediamannya di mukim To’ Uban selama tiga tahun. (*Minutes of 5th meeting of the contingent planning committee on brothels and prostitution, 1969*).

Selain kedua-dua kes tersebut, seorang yang bergelar Tengku yang menjalankan kegiatannya di Jalan Pengkalan Chepa serta merupakan salah sebuah daripada ‘*established places*, (*Minutes of the contingent anti-crime committee meeting, 1965*) juga telah dikenakan tindakan di bawah undang-undang ‘*Restricted Resident*’ (RR) (*Pelacuran-perancangan Kelantan kontinjen no.10, 1970*). Sebelum tindakan tersebut dikenakan sekurang-kurangnya sekali premis beliau telah digelidah (*Minutes of the 1st meeting of the contingent planning committee on brothels and prostitution, 1968*). Pihak polis juga telah menjalankan siasatan yang terperinci sebelum mengambil tindakan ke atas beliau. (*Mencegah pelacuran-minit perancangan jawatankuasa kontinjen no.7, 1969*). Akhirnya beliau telah didakwa di bawah Sec.7(b) Chapter 156 kerana

didapati bersalah menganjurkan rumah pelacuran (*Pelacur-perancangan kontinjen Kelantan no.9, 1969*).

Pendakwaan tidak dapat dilaksanakan sekiranya pihak polis tidak mempunyai bukti lengkap. Ini bermakna fail-fail mengenai mereka yang disyaki terpaksa ditutup untuk sementara. Mek China Gemok (bukan nama sebenar), misalnya adalah salah seorang daripada mereka yang bernasib baik kerana terlepas daripada pendakwaan disebabkan pihak polis tidak menemui sebarang bukti untuk mendakwa beliau. (*Minutes of the 1st meeting of the contingent planning committee on brothels and prostitution, 1968*). Pendakwaan juga, akan terhalang atau gagal dilaksanakan kerana individu yang disyaki telah melarikan diri atau menghilangkan diri. Mahmood (bukan nama sebenar) telah melarikan diri ke Selatan Thai. (*Mencegah pelachoran-minit perancangan jawatankuasa kontinjen no.7, 1969*). Ismail (bukan nama sebenar) pula bersembunyi di Singapura. (*Pelacur-perancangan kontinjen Kelantan no.9, 1969*). Kes-kes sedemikian ternyata merumitkan pihak polis untuk mencegah kegiatan pelacuran.

Berhubung dengan kes-kes melarikan diri keluar dari Kelantan pihak polis akan bertindak dengan membuka fail ke atas mereka yang disyaki dengan tujuanengehadkan kediamannya. Selain itu pihak polis akan mendapatkan saksi-saksi untuk memberi keterangan di atas aktiviti haram yang telah dijalankannya. Selain itu pihak polis juga akan menghubungi pihak polis di negara mereka berada untuk membantu melicinkan siasatan yang lengkap ke atas orang yang dituduh. Hal tersebut dapat dirujuk mengenai kes Yakob (bukan nama sebenar) yang berasal dari Kelantan tetapi melacurkan wanita Kelantan ke Singapura. 'Personal' fail untuk mengehadkan kediaman beliau telah dibuka. Selain itu saksi yang berjumlah seramai lapan orang juga telah dipanggil untuk memberi keterangan mengenai kegiatan beliau dalam maksiat. Pihak polis Kelantan juga telah berhubung dengan pihak polis Singapura untuk membantu melicinkan siasatan ke atas tertuduh (*Kegiatan pelacuran di Kota Bharu*).

Prosedur yang sama juga telah digunakan untuk menangkap Mahmood (bukan nama sebenar) yang telah melarikan diri ke Selatan Thailand. Mahmood sebelumnya mengusahakan tempat pelacuran di Kampung Dalam, Jalan Kebun Sultan Kota Bharu sebelum melarikan diri ke Selatan Thailand pada 7 September 1969 (*Mencegah pelachoran-minit perancangan jawatankuasa kontinjen no.7, 1969*). Beliau akhirnya berjaya ditangkap pihak polis dan telah dihadkan tempat kediamannya di Marang Terengganu pada 21 Julai 1976. Penahanan beliau adalah di bawah Enakmen Kediaman Terhad Bab 39. (*Tindakan terhadap mereka-mereka yang hidup di atas hasil pelacuran di bawah Enakmen Kediaman Terhad Bab 39*). Berdasarkan tarikh beliau melarikan diri dan tarikh beliau ditahan ternyata kes tersebut mengambil masa yang panjang untuk diselesaikan.

Enakmen Kediaman Terhad, Bab 39 juga turut dikenakan ke atas pengelola rumah urut haram. Selain itu pengelola rumah urut berlesen juga turut diambil tindakan sekiranya digunakan untuk salah satu daripada daripada tujuan berikut. Pertama, rumah urut itu juga digunakan untuk pelacuran dan para penganjur sebenarnya hidup atas hasil pelacuran. Kedua, gadis di bawah umur telah kerap kali diselamatkan dari tempat itu dan mereka adalah terdedah kepada bahaya moral semasa berada di tempat sama. Ketiga, tempat berkenaan merupakan tapak atau tempat perlindungan kegiatan kongsi gelap yang mana ahli kongsi gelap hidup di atas pendapatan tempat sama atau komisyen melalui perlindungan statik. (*Tindakan terhadap mereka-mereka yang hidup di atas hasil pelacuran di bawah Enakmen Kediaman Terhad Bab 39*).

Bagi rumah urut haram lain yang mana tindakan di bawah Enakmen Kediaman Terhad, Bab 39 difikirkan tidak sesuai, maka tindakan mahkamah hendaklah diusahakan melalui serbuan polis yang kemudiannya diikuti dengan permohonan untuk mendapatkan saman terhadap penganjur. Sungguhpun hukuman denda yang dikenakan oleh mahkamah jarang dapat memberi keinsafan kepada penganjur berkenaan, akan tetapi jika serbuan mengejut dan tindakan ‘*harrassment*’ lain kerap dilakukan, maka sudah tentu lambat-laun penganjur itu akan mengundur diri dari lapangan tersebut. Lagi pula para pelanggan akan turut menghilangkan diri kerana tiada sesiapa yang ingin sentiasa ditangkap oleh pihak polis. (*Tindakan di atas penganjur rumah urut yang tidak berlesen*).

Kewujudan hubungan kegiatan kongsi gelap atau pemeras wang dengan kegiatan pelacuran sukar untuk dinafikan. Surat aduan daripada orang awam yang hanya dikenali sebagai Zainal Abidin dari jalan Hulu Kota telah menjelaskan akan hal berkenaan. Menurut surat tersebut, “...di jalan Hulu Kota (*Istana Balai Besar*)- ada beberapa buah rumah haram tempat simpan perempuan-perempuan lacor, di kawasan rumah inilah hidup dengan mewah, hidup dengan kebebasan memaksa, bergaduh, memungut wang dengan perempuan-perempuan lacur. (*Ambil tindakan tegas ke atas orang-orang ini kerana memaksa dan memeras wang daripada perempuan pelacor*).

Di dalam surat berkenaan juga penulis telah menyertakan senarai nama 10 orang lelaki yang merupakan ‘gangster’ atau pemeras ugut. Salah seorang daripada mereka adalah anggota polis sendiri.

Laporan Minit Mesyuarat Kontinjen Polis pada 2 Oktober, 1965 menyebut kegiatan pelacuran di Kelantan sebagai;

Prostitution in Kelantan can be quite easily contained, as parties to the sexual acts are mostly persons professing the Islamic faith. The Council of Religious and Malay Custom and Kathis Courts Enactment 1953, sets out very stringent measures that prohibit the retirement of Muslims in suspicious proximity to any women. (Minutes of the contingent anti-crime committee meeting, 1965).

Dalam usaha membasmi kegiatan maksiat di Kelantan pihak polis dan jabatan Agama kerap melakukan serbuan di tempat-tempat awam, hotel serta rumah pelacuran. (*Brothels and prostitution in Kelantan*, 1968 dan *Vice/Brothels*, 1 Januari 1970 to 30 Jun 1970). Hasilnya banyak tangkapan telah dibuat. Dalam tahun 1972 misalnya Badan Pencegah Maksiat telah menangkap seramai 339 orang. Seramai 113 orang telah ditangkap antara 1 Januari 1973 hingga 31 Mei 1973. (*Maksiat*, Jun, 1973 dan *Laporan maksiat negeri Kelantan*, Januari 1972 hingga 31 Mei 1973).

Terdapat laporan yang menyebut bahawa penguatkuasaan undang-undang yang ketat menyebabkan kegiatan pelacuran di Kelantan semakin berkurang (*Maksiat*, 1973). Ramai daripada mereka telah berhijrah keluar ke negeri-negeri lain. (*Minutes of the contingent anti-crime committee meeting*, 1965). Sementara itu yang ada di Kelantan pula tidak berani menjalankan kegiatan secara terbuka, sebaliknya mereka menjalankan kegiatan tersebut secara perseorangan dan bersendirian di tempat-tempat sulit dan tidak tetap serta dalam jangka masa yang amat pendek. (*Laporan Maksiat/pelacuran di Kelantan*).

Menurut laporan Maksiat, pada Jun, 1973 ramai lelaki mencari hiburan di luar Kelantan iaitu ke Sungai Golok. (Maksiat, Jun, 1973). Laporan juga menyebut mengenai kemasukan pelacur dari Sungai Golok, Thailand yang berusia antara 15 hingga 25 tahun. Kes-kes seperti ini akan diletakkan di bawah bidangkuasa jabatan Imigresen untuk diambil tindakan selanjutnya. (Vice/Brothels, 1 Januari 1970 to 30 Jun 1970).

Kesimpulan

Pihak penguatkuasaan undang-undang iaitu MAIK dan polis menjalankan tugas mereka berpandukan undang-undang persekutuan dan negeri. Undang-undang tersebut pula telah menentukan had dan bidang kuasa kedua-dua badan berkenaan untuk bertindak. Oleh itu sejauhmana keberkesanan tindakan kedua-dua agensi berkenaan bergantung kepada sejauhmanakah pula isi kandungan undang-undang tersebut, pelaksanaan dan masalah di dalam agensi berkenaan. Kelancaran operasi penguatkuasaan juga banyak bergantung kepada faktor-faktor lain termasuklah sokongan daripada kerajaan negeri. Masalah salah laku seksual ini perlu diatasi dan selain peranan MAIK dan polis, masyarakat perlu memberi pendidikan agama kepada anak-anak lelaki dan perempuan sejak daripada mereka kecil. Sebagaimana pepatah Melayu menyatakan kalau hendak "melentur buluh biarlah dari rebungnya". Penyakit sosial ini jika dibiarkan ia akan menjadi duri dalam daging. Adalah "lebih baik mencegah daripada mengobati" kerana jika sudah terlambat, tidak berguna lagi untuk menangi kerana "nasi sudah menjadi bubur".

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PENGLIBATAN KOMUNITI BISAYA DALAM PEMBANGUNAN E-GAYAD MABALUT GLOSARI

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Abstrak: Penggunaan bahasa ibunda dalam kalangan komuniti minoriti, khususnya generasi muda, menunjukkan trend penurunan yang membimbangkan. Turut mengalami penurunan, antaranya penggunaan bahasa ibunda dalam kalangan komuniti Bisaya di Beaufort, Sabah. Bahasa Bisaya semakin kurang digunakan, terutamanya akibat pengaruh bahasa dominan yang lebih meluas dan berpengaruh dalam kehidupan seharian. Bagi menangani isu ini, kajian ini menumpukan kepada penglibatan aktif komuniti Bisaya dalam pembangunan E-Gayad Mabalut Glosari, iaitu sebuah glosari digital yang dibangunkan secara partisipatif bagi tujuan pemeliharaan dan pendokumentasian bahasa serta warisan budaya komuniti, khususnya dalam kalangan generasi muda. Kajian ini turut mengenal pasti isu-isu utama seperti ketiadaan bahan rujukan digital yang sistematik serta tahap penglibatan komuniti yang masih terhad dalam inisiatif pendokumentasian bahasa. Objektif kajian adalah untuk memahami bentuk dan tahap penglibatan komuniti, mengenal pasti cabaran sepanjang pelaksanaan projek, serta menilai implikasi pembangunan glosari tersebut. Pendekatan kualitatif berasaskan kajian kes digunakan, dengan data dikumpul melalui temu bual separa berstruktur dan bengkel pengumpulan istilah bersama komuniti. Seramai tujuh orang informan telah dipilih melalui kaedah persampelan bertujuan, melibatkan penutur asli, guru, dan pemimpin tempatan yang aktif dalam usaha pemeliharaan bahasa dan budaya Bisaya. Data dianalisis secara tematik bagi mengenal pasti bentuk penglibatan serta kesannya terhadap pembangunan glosari digital. Dapatan kajian menunjukkan terdapat tiga bentuk utama penglibatan komuniti, iaitu sumbangan istilah, pengesahan kandungan, dan penyebaran glosari. Secara keseluruhan, komuniti memberikan maklum balas yang positif terhadap pendekatan ini, meskipun berhadapan dengan cabaran seperti kekangan masa dan kemahiran digital yang terhad. Kajian ini membuktikan bahawa pendekatan partisipatif bukan sahaja dapat memperkukuh proses dokumentasi bahasa minoriti, malah berpotensi menjadi model rujukan bagi komuniti lain di Malaysia dalam usaha memelihara warisan bahasa dan budaya tempatan.

Kata Kunci: Bahasa Bisaya, Penglibatan Komuniti, Pendekatan Partisipatif, Dokumentasi Bahasa, E-Gayad Mabalut Glosari

Abstract: The use of mother tongues among minority communities, particularly the younger generation, is showing a worrying declining trend. One such example is the diminishing use of the native language among the Bisaya community in Beaufort, Sabah. The Bisaya language is

increasingly less spoken, mainly due to the influence of dominant languages that are more widely used and integrated into daily life. To address this issue, this study focuses on the active involvement of the Bisaya community in the development of E-Gayad Mabalut Glosari, a participatory digital glossary aimed at preserving and documenting the community's language and cultural heritage, particularly among the younger generation. The study also identifies key issues, such as the lack of systematic digital reference materials and the limited level of community involvement in language documentation initiatives. The objectives of this study are to understand the forms and extent of community participation, identify challenges during project implementation, and evaluate the implications of the glossary development. A qualitative case study approach was employed, with data collected through semi-structured interviews and terminology-gathering workshops conducted with the community. A total of seven informants were selected through purposive sampling, involving native speakers, teachers, and local leaders actively engaged in efforts to preserve the Bisaya language and culture. Data were thematically analysed to identify the types of community involvement and their impact on the development of the digital glossary. The findings reveal three main forms of participation: contribution of terms, content validation, and dissemination of the glossary. Overall, the community responded positively to this participatory approach, despite challenges such as time constraints and limited digital literacy. This study demonstrates that participatory methods not only strengthen the process of documenting minority languages, but also hold the potential to serve as a reference model for other communities in Malaysia striving to preserve their linguistic and cultural heritage.

Keywords: *Bisaya Language, Community Engagement, Participatory Approach, Language Documentation, E-Gayad Mabalut Glosari*

Pengenalan

Bahasa ibunda memainkan peranan penting dalam membentuk identiti, warisan budaya, dan jati diri sesebuah komuniti. Namun begitu, penggunaan bahasa ibunda dalam kalangan komuniti minoriti di Malaysia semakin menunjukkan trend kemerosotan, malah sering kali tidak diberikan keutamaan dalam kehidupan seharian. Kajian oleh Haji Othman dan McLellan (2021) menyokong dapatan ini apabila mereka mendapati bahawa banyak bahasa etnik di Borneo kini berada dalam keadaan terancam, terutamanya disebabkan oleh proses peralihan bahasa. Fenomena ini dilihat ketara dalam kalangan generasi muda yang lebih cenderung menggunakan bahasa dominan seperti Bahasa Melayu dan Inggeris untuk berkomunikasi. Dapatan ini turut seiring dengan kajian Alagappar et al. (2018) yang menunjukkan bahawa golongan muda berusia antara 12 hingga 21 tahun lebih kerap menggunakan kedua-dua bahasa dominan tersebut, khususnya dalam konteks kekeluargaan dan pergaulan sesama rakan. Sebaliknya, generasi lebih tua masih mengekalkan penggunaan bahasa warisan seperti bahasa Tamil, memperlihatkan jurang yang semakin melebar dalam kesinambungan penggunaan bahasa ibunda antara generasi.

Kajian oleh Noraisikin et al. (2020) mendapati bahawa penggunaan bahasa Cham dalam kalangan generasi muda di Ulu Tiram, Johor semakin berkurangan akibat faktor seperti urbanisasi, pendidikan formal, pengaruh media, dan keperluan sosial yang mengutamakan Bahasa Melayu dan Inggeris. Situasi serupa turut dihadapi oleh komuniti Bisaya di Beaufort, Sabah, apabila kajian oleh Dani & Seruji (2024) menunjukkan bahawa bahasa Bisaya berada dalam keadaan terancam berikutan gangguan dalam transmisi antara generasi dan penurunan

penggunaan dalam pelbagai domain komunikasi. Walaupun terdapat bahan bertulis, penggunaannya masih terhad dan tiada sokongan pendidikan formal, namun komuniti tetap menunjukkan sikap positif terhadap usaha pemeliharaan bahasa mereka. Sehubungan itu, pembangunan *E-Gayad Mabalut Glosari* secara partisipatif dilihat sebagai langkah strategik dalam usaha dokumentasi dan pemeliharaan bahasa Bisaya. Inisiatif digital ini bukan sahaja mengisi kekosongan sumber rujukan dalam talian, malah menggalakkan penglibatan komuniti dalam mendokumentasikan istilah-istilah yang mencerminkan nilai dan budaya tempatan. Konsep ‘Gayad Mabalut’ yang menjadi teras glosari ini turut memelihara dimensi etika dan warisan budaya Bisaya, menjadikan usaha ini berpotensi sebagai model rujukan bagi pemeliharaan bahasa dan budaya etnik lain di Malaysia.

Isu dan Permasalahan Kajian

Bahasa-bahasa etnik di Malaysia kini berhadapan dengan ancaman **penyusutan penggunaan**, terutamanya dalam kalangan generasi muda yang lebih terdedah kepada pengaruh bahasa dominan seperti Bahasa Melayu dan Bahasa Inggeris. Penggunaan meluas Bahasa Melayu sebagai bahasa kebangsaan dalam pendidikan, media, dan urusan rasmi, serta kedudukan Bahasa Inggeris yang tinggi dari segi nilai ekonomi dan sosial (Gill, 2005), merupakan antara faktor utama yang mendorong peralihan bahasa. Di Sabah, meskipun terkenal dengan kepelbagaian linguistik, tekanan untuk menguasai bahasa dominan ini telah menyebabkan bahasa etnik seperti Bahasa Bisaya semakin terpinggir dan kurang digunakan dalam kehidupan harian.

Sorotan literatur

Sorotan literatur ini bertujuan untuk menelusuri dapatan kajian terdahulu berkaitan penyusutan penggunaan bahasa etnik dalam kalangan komuniti minoriti, dengan memberi penekanan kepada penggunaan Bahasa Bisaya dalam komuniti Beaufort yang semakin merosot, khususnya dalam kalangan generasi muda. Faktor-faktor seperti pengaruh bahasa dominan, keterbatasan dokumentasi digital, kekangan sumber, dan inisiatif pembelajaran yang terhad dikenal pasti sebagai pendorong utama peralihan bahasa. Selain itu, dinamika keluarga turut memainkan peranan penting dalam menentukan pola pewarisan bahasa, apabila ibu bapa lebih cenderung menggunakan Bahasa Melayu atau Inggeris dalam komunikasi harian demi kesesuaian pendidikan dan sosial anak-anak. Keterlibatan komuniti dalam usaha pendokumentasian Bahasa Bisaya juga masih terbatas, disebabkan oleh kekurangan pendekatan yang inklusif dan berstruktur. Oleh itu, sorotan ini turut meninjau pelbagai pendekatan pemeliharaan dan revitalisasi bahasa yang pernah dilaksanakan, termasuk pembangunan glosari digital secara partisipatif seperti *E-Gayad Mabalut*, yang berpotensi menjadi strategi berkesan dalam mendokumentasikan dan menghidupkan semula penggunaan Bahasa Bisaya dalam kalangan komuniti setempat.

Penggunaan Bahasa Bisaya Dalam Komuniti

Menurut kajian Suhailin et al. (2020), penggunaan Bahasa Bisaya masih diamalkan dalam kalangan warga emas dan dalam situasi tertentu seperti upacara ritual tradisional, sekali gus mencerminkan pemeliharaan nilai budaya yang berterusan dalam komuniti. Dalam kalangan generasi muda pula, terdapat perubahan corak penggunaan bahasa yang membuka ruang kepada pelaksanaan pelbagai inisiatif bagi memperkasakan bahasa tersebut. Seperti yang

dinyatakan oleh Fishman (1991), kelangsungan sesuatu bahasa warisan sangat bergantung kepada keberkesanan proses pewarisan antara generasi, khususnya dalam konteks domestik seperti keluarga dan komuniti setempat. Justeru, pengukuhan peranan bahasa dalam kehidupan keluarga dan sosial amat penting untuk memastikan kesinambungan fungsinya bukan sahaja sebagai alat komunikasi, malah sebagai penanda identiti budaya. Sehubungan itu, pendekatan berasaskan penglibatan komuniti dilihat berpotensi tinggi dalam menyokong usaha pendokumentasian dan pemeliharaan Bahasa Bisaya secara sistematik dan berkesan.

Penglibatan Komuniti Terhadap Dalam Proses Pendokumentasian Bahasa

Selain penurunan penggunaan, usaha mendokumentasi dan memelihara bahasa Bisaya turut menghadapi kekangan akibat penglibatan komuniti yang masih terhad. Norazuna (2021) melaporkan pengalaman mendokumentasikan bahasa Miriek, salah satu bahasa etnik terancam di Sarawak, dan mendapati generasi muda semakin jarang menggunakan bahasa tersebut. Komuniti berdepan cabaran seperti kekurangan tenaga kerja, ketiadaan bahan rujukan sistematik, serta penglibatan yang tidak menyeluruh. Walaupun sebahagian ahli komuniti menunjukkan minat untuk menghidupkan semula bahasa ini, mereka sukar melaksanakannya tanpa sokongan kolektif yang kukuh. Grenoble dan Whaley (2006) menegaskan bahawa kejayaan dokumentasi dan pemulihan bahasa sangat bergantung kepada penglibatan aktif komuniti penutur. Namun, kebanyakan inisiatif masih meletakkan komuniti sebagai subjek kajian dan bukan rakan kolaboratif utama, sekaligus mengehadkan keberkesanan jangka panjang usaha pemeliharaan bahasa.

Kekangan Sumber dan Inisiatif Terhadap dalam Pembelajaran Bahasa Bisaya

Kekurangan bahan pembelajaran seperti kamus, buku teks, dan modul sokongan terus menjadi antara cabaran utama dalam usaha mempelajari dan memulihkan bahasa Bisaya. Menyedari keperluan ini, Dewan Bahasa dan Pustaka (Cawangan Sabah) bersama Persatuan Bisaya Bersatu Sabah (PBBS) telah mengambil inisiatif menganjurkan taklimat bagi merangka dan menerbitkan *Kamus Saku Bisaya–Melayu*. Kamus ini dirancang sebagai rujukan ringkas kepada penutur muda serta penyelidik, dan merupakan sebahagian daripada usaha memperkukuh pendokumentasian bahasa sukuan di Sabah. Namun begitu, sehingga kini kamus tersebut masih belum diterbitkan secara rasmi. Dalam masa yang sama, usaha terdahulu seperti penerbitan *Daftar Kata Bahasa Malaysia – Dialek Bisaya* oleh DBP pada tahun 1992 membuktikan wujudnya komitmen awal terhadap dokumentasi bahasa ini, meskipun penggunaannya kekal terhad dari segi akses dan aplikasi dalam konteks pembelajaran masa kini.

Keterbatasan Dokumentasi Digital Bahasa Bisaya

Dokumentasi bahasa Bisaya dalam bentuk digital masih sangat terhad, meskipun medium digital kini menjadi saluran utama komunikasi dan pembelajaran generasi muda. Menurut Moseley (2010), dokumentasi digital merupakan strategi paling berkesan untuk menyelamatkan bahasa yang berisiko pupus. Tanpa usaha dokumentasi yang formal, tersusun dan mudah diakses, bahasa Bisaya berisiko untuk lenyap dalam beberapa dekad akan datang. Eisenlohr (2004) turut menekankan peranan penting teknologi dalam revitalisasi bahasa minoriti, yang sering terpinggir akibat dominasi budaya lisan dan ketiadaan dokumentasi bertulis. Beliau menambah bahawa media digital seperti laman web, audio dan video bukan

sahaja menyokong pengajaran dan dokumentasi, malah berpotensi membentuk komuniti maya yang menghubungkan penutur asal dan diaspora. Namun begitu, ketidaksamarataan akses kepada teknologi masih menjadi cabaran yang menghalang potensi penuh usaha revitalisasi ini.

Pengaruh Dinamika Keluarga terhadap Peralihan Bahasa Bisaya

Dalam kalangan komuniti etnik minoriti, keluarga memainkan peranan penting dalam kesinambungan penggunaan bahasa ibunda. Namun, semakin banyak keluarga memilih untuk menggunakan Bahasa Melayu dalam komunikasi harian bagi memudahkan penyesuaian anak-anak dalam sistem pendidikan dan kehidupan sosial arus perdana. Kajian oleh Berawati et al. (2020) mendapati bahawa generasi muda Bajau Sama telah beralih kepada Bahasa Melayu dalam domain kekeluargaan dan awam, sekali gus mempercepatkan proses peralihan bahasa. Generasi ini secara tidak langsung menjadi pemangkin kepada kemerosotan daya hidup bahasa etnik, terutama dalam konteks tidak formal seperti interaksi keluarga dan kejiwaan. Dapatan ini turut disokong oleh Noor Aina dan Syeril (2016), yang melaporkan bahawa generasi muda peribumi Sabah jarang menggunakan bahasa ibunda ketika berkomunikasi dengan ahli keluarga mereka.

E-Gayad Mabalut Glosari

Konsep *Gayad Mabalut* berasal daripada ungkapan tradisi komuniti Bisaya yang merujuk kepada sikap beradab, berbudi pekerti dan menjaga tatasusila dalam hubungan sosial. Pemilihan konsep ini sebagai asas kepada pembangunan glosari bukan sekadar menonjolkan bahasa sebagai alat komunikasi, tetapi sebagai pemangkin pemupukan nilai budaya dan identiti etnik. Istilah yang dikumpulkan dalam glosari bukan sahaja bersifat literal, malah sarat dengan makna budaya yang mencerminkan struktur sosial dan falsafah hidup komuniti Bisaya. *E-Gayad Mabalut Glosari* dibangunkan sebagai alat dokumentasi dan pembelajaran yang sistematik, mudah diakses dan mesra pengguna, dengan matlamat untuk menyokong pemeliharaan bahasa dalam kalangan generasi muda serta menjadi rujukan sahih kepada pengguna luar komuniti. Menurut Grenoble & Whaley (2006), dokumentasi bahasa yang menekankan nilai budaya dan konteks penggunaannya dalam kehidupan seharian adalah lebih berkesan berbanding pendekatan leksikal semata-mata. Jacob et al. (2015) turut menegaskan bahawa kehilangan bahasa berpunca daripada dasar pendidikan kolonial dan proses asimilasi yang telah melemahkan kedudukan bahasa ibunda dalam sistem formal, sekaligus menjejaskan peranan bahasa dalam pembentukan identiti generasi muda.

Dari sudut teknologi, glosari ini dibangunkan dalam format digital mesra pengguna yang boleh diakses melalui telefon pintar, tablet dan komputer, sejajar dengan pendekatan global dalam pendigitalan sumber linguistik (Bird, 2020). Dengan ciri navigasi intuitif, penjelasan bergambar, rakaman audio serta ruang maklum balas komuniti, glosari ini berkembang secara dinamik melalui reka bentuk berpusatkan komuniti. Pendekatan partisipatif ini terbukti berkesan sebagaimana dibuktikan oleh Renganathan dan Kral (2018) dalam projek dokumentasi komuniti Orang Asli Semai di Perak. Dalam projek tersebut, golongan tua menyumbang pengetahuan, manakala golongan muda mengendalikan aspek rakaman, penyuntingan dan penterjemahan. Hasilnya termasuk filem pendek dan buku digital yang bukan sahaja mendokumentasikan bahasa tetapi turut memperkukuh identiti komuniti. Ini menunjukkan potensi teknologi sebagai pemangkin penglibatan komuniti dalam usaha pemeliharaan bahasa minoriti secara mampan.



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1. Meneroka bentuk dan tahap penglibatan komuniti Bisaya dalam pembangunan *E-Gayad Mabalut Glosari*;
2. Mengenal pasti cabaran dan potensi pelaksanaan pendekatan dokumentasi bahasa secara partisipatif;
3. Menilai implikasi pembangunan *E-Gayad Mabalut Glosari* terhadap usaha pemeliharaan dan penguatan bahasa Bisaya.

Metodologi Kajian

Kajian ini menggunakan pendekatan kualitatif berasaskan kajian kes, yang dianggap sesuai untuk meneroka secara mendalam bentuk penglibatan komuniti dalam konteks tempatan yang spesifik, iaitu komuniti Bisaya di Beaufort, Sabah. Pendekatan kajian kes membolehkan penyelidik memahami secara menyeluruh situasi yang unik dan kompleks, terutamanya dalam konteks pendidikan, budaya dan masyarakat (Merriam, 2009). Pemilihan pendekatan ini juga membolehkan kajian menangkap pelbagai dimensi pengalaman komuniti, termasuk aspek nilai, persepsi dan bentuk interaksi yang berlaku dalam pembangunan *E-Gayad Mabalut Glosari*. Dalam kerangka ini, penyelidik tidak berperanan sebagai pemerhati pasif semata-mata, sebaliknya bertindak sebagai fasilitator yang melibatkan komuniti secara aktif sepanjang proses penyelidikan.

Kaedah Pengumpulan Data: Temu Bual dan Bengkel Istilah

Kajian ini menggunakan dua kaedah utama pengumpulan data, iaitu temu bual separa berstruktur dan bengkel istilah. Temu bual separa berstruktur membolehkan penyelidik meneroka pandangan informan secara terbuka, namun masih berpandukan tema utama, khususnya berkaitan terjemahan dan pemahaman istilah-istilah yang merangkumi nilai-nilai murni dalam budaya Bisaya. Menurut Kvale & Brinkmann (2014), kaedah ini memungkinkan dialog yang fleksibel dan mendalam antara penyelidik dan informan, sekaligus membantu menggali maklumat kontekstual yang lebih bermakna. Selain itu, bengkel istilah dilaksanakan sebagai platform kolaboratif untuk mengenal pasti, menyusun, dan mendefinisikan istilah-istilah Bisaya yang berkaitan dengan konsep *Gayad Mabalut*. Bengkel ini juga berperanan sebagai ruang interaksi dua hala antara komuniti dan penyelidik, yang bukan sahaja memperkukuh penglibatan komuniti tetapi juga menggalakkan pemindahan pengetahuan secara timbal balik.

Kriteria dan Strategi Pemilihan Informan

Kajian ini menggunakan kaedah persampelan bertujuan (*purposive sampling*) bagi memastikan informan yang dipilih mampu memberikan maklumat yang relevan dan mendalam. Seramai tujuh orang informan telah dikenalpasti, merangkumi penutur asli yang aktif, guru bahasa yang terlibat dalam pendidikan komuniti, serta pemimpin tempatan yang berperanan dalam pelestarian budaya. Pemilihan informan dibuat berdasarkan kriteria seperti penguasaan bahasa Bisaya, pengalaman dalam aktiviti kebudayaan, dan kesediaan untuk menyumbang secara aktif dalam proses pembangunan glosari. Seperti yang ditegaskan oleh Patton (2014), pemilihan informan dalam kajian kualitatif haruslah berdasarkan keupayaan mereka untuk memberikan data yang kaya, kontekstual dan bermakna terhadap isu yang sedang dikaji

Pendekatan Analisis Tematik

Proses analisis data kajian ini dilaksanakan secara tematik, dengan mengenal pasti corak serta tema utama yang muncul daripada data temu bual dan bengkel yang dikumpul. Kaedah ini melibatkan beberapa peringkat seperti transkripsi, pengekodan awal, pengelompokan tema, dan penafsiran data secara induktif (Braun & Clarke, 2006). Menurut Nowell et al. (2017), analisis tematik menyediakan pendekatan yang fleksibel dan sistematik, membolehkan penyelidik menyusun data ke dalam tema-tema bermakna yang sejajar dengan objektif penyelidikan. Pendekatan ini membolehkan penyelidik mengenal pasti bentuk penglibatan komuniti secara terperinci serta memahami kaitan antara nilai budaya, motivasi komuniti dan hasil dokumentasi yang dihasilkan. Di samping itu, analisis tematik turut memberi ruang untuk menyampaikan suara komuniti secara naratif, kontekstual dan berasaskan pengalaman sebenar, selari dengan prinsip penyelidikan berasaskan komuniti.

Hasil Dapatan Kajian

Kajian mendapati bahawa penglibatan komuniti memainkan peranan penting dalam pembangunan *E-Gayad Mabalut Glosari*, khususnya dalam proses pengumpulan, pengesahan, dan pemurnian istilah bahasa Bisaya. Penutur asli, warga emas dan pendidik tempatan menunjukkan kesediaan untuk menyumbang pengetahuan bahasa. Namun begitu, tahap penglibatan masih tidak menyeluruh kerana ianya banyak bergantung kepada inisiatif individu yang aktif secara sukarela dalam komuniti.

Bentuk dan Tahap Penglibatan Komuniti Bisaya

Penglibatan komuniti Bisaya dalam pembangunan *E-Gayad Mabalut Glosari* dapat dikenal pasti melalui tiga bentuk utama iaitu sumbangan istilah, pengesahan kandungan, dan penyebaran glosari. Ketiga-tiga bentuk ini mencerminkan penglibatan aktif komuniti dari peringkat awal pengumpulan data hingga ke peringkat penyebaran hasil akhir. Pendekatan ini sejajar dengan prinsip *Community-Based Participatory Research* (CBPR) yang menekankan kerjasama saling menghormati antara penyelidik dan komuniti, di mana komuniti bukan sekadar objek kajian tetapi berperanan sebagai rakan penyelidikan (Israel et al., 2012).

Sumbangan istilah merupakan bentuk penglibatan asas yang penting dalam pembangunan *E-Gayad Mabalut Glosari*. Penutur asli, warga emas dan pendidik tempatan telah berkongsi pelbagai istilah berkaitan nilai etika, moral dan sosial dalam bahasa Bisaya, yang dikumpulkan melalui bengkel bahasa dan sesi temu bual secara kolaboratif. Proses ini memperkayakan kandungan glosari serta memelihara makna budaya di sebalik setiap istilah yang dihipunkan. Sumbangan komuniti ini memastikan glosari mencerminkan penggunaan sebenar bahasa dalam konteks harian dan budaya setempat. Seperti yang dinyatakan oleh Czaykowska-Higgins (2009), penglibatan komuniti dalam penentuan kandungan linguistik menjamin ketulenan serta kepentingan makna istilah dalam konteks budaya mereka. Beberapa contoh istilah tersebut disenaraikan dalam Jadual 1.

Jadual 1: Istilah dalam *E-Gayad Mabalut* Glosari

Aspek Moral	Aspek Etika	Aspek Sosial
<i>Mabalut</i> - Baik	<i>Maulud</i> – Sopan	<i>Maparas/ Matojo</i> - Cantik
<i>Masaga</i> - Rajin	<i>Misapul</i> – Kerjasama	<i>Masuaka</i> - Mesra
<i>Marunus</i> - Lurus	<i>Mapuang</i> - Bersih	<i>Makarati</i> – Mengerti

Sumber: Kajian Lapangan (2025)

Selain sumbangan istilah, komuniti turut terlibat dalam proses pengesahan kandungan, iaitu semakan semula terhadap ketepatan makna istilah dari sudut Bahasa dan budaya sebelum dimasukkan secara rasmi ke dalam glosari. Proses ini melibatkan perbincangan berfokus bersama individu berautoriti seperti guru bahasa tempatan dan pemimpin adat yang memahami konteks penggunaan serta nuansa makna istilah dalam pelbagai situasi sosial. Verifikasi ini penting untuk memastikan glosari yang dihasilkan bukan sahaja tepat dari segi semantik, tetapi juga sejajar dengan nilai dan norma masyarakat Bisaya. Seperti yang dinyatakan oleh Hinton (2011), pengesahan oleh komuniti merupakan elemen penting dalam dokumentasi bahasa kerana ianya dapat mengelakkan kesilapan tafsiran serta memberikan legitimasi terhadap hasil dokumentasi tersebut.

Seterusnya, komuniti juga memainkan peranan penting dalam penyebaran e-glosari dengan mempromosikan penggunaannya dalam kalangan masyarakat setempat dan lebih luas. Penyebaran ini berlaku melalui pelbagai saluran seperti program komuniti, institusi pendidikan, media sosial, serta acara kebudayaan tempatan. Misalnya, guru-guru telah mengintegrasikan glosari dalam aktiviti kokurikulum di sekolah, manakala golongan belia menggunakan platform seperti TikTok dan Facebook untuk menghasilkan kandungan video pendek berunsur pendidikan bahasa. Penglibatan aktif ini mencerminkan rasa tanggungjawab dan kepemilikan terhadap glosari tersebut. Seperti yang ditegaskan oleh Austin & Sallabank (2011), penglibatan komuniti dalam penyebaran bahan dokumentasi bahasa merupakan elemen kritikal untuk menjamin kelangsungan dan impak jangka panjang penggunaannya.

Cabaran Penglibatan Komuniti dalam Pembangunan *E-Gayad Mabalut* Glosari

Walaupun pendekatan partisipatif dalam pembangunan *E-Gayad Mabalut* Glosari telah membuka ruang kepada penglibatan aktif komuniti Bisaya, pelaksanaan projek ini turut berdepan beberapa cabaran utama. Cabaran-cabaran ini secara langsung mempengaruhi tahap penyertaan serta keberkesanan proses dokumentasi dan pembangunan glosari secara menyeluruh.

Kekangan Masa dan Keterbatasan Sumber Manusia

Salah satu cabaran ketara dalam pembangunan *E-Gayad Mabalut* Glosari ialah kekangan masa dalam kalangan ahli komuniti, terutamanya mereka yang terlibat dengan rutin harian seperti pekerjaan, pertanian, dan tanggungjawab keluarga. Ramai dalam kalangan informan menghadapi kesukaran untuk memberikan komitmen berterusan terhadap bengkel dan temu bual, sekali gus menjejaskan kelancaran proses pengumpulan data dan kesinambungan aktiviti glosari. Dapatan ini seiring dengan kajian Somnuk et al. (2023) yang menunjukkan bahawa kekangan masa dan beban kerja merupakan halangan utama penglibatan komuniti dalam projek berasaskan kerjasama. Dalam konteks akademik pula, Couillou et al. (2022) turut melaporkan bahawa kekurangan insentif seperti pengiktirafan formal dan beban kerja tambahan menjadi

faktor penghalang penyertaan staf fakulti dalam projek komuniti. Hal ini menggambarkan bahawa kekangan masa bukan sahaja berlaku dalam kalangan masyarakat umum, malah turut dialami dalam kalangan profesional, dan perlu ditangani melalui pendekatan yang lebih fleksibel dan menyokong.

Cabaran Literasi Digital dalam Kalangan Komuniti

Tahap celik digital yang tidak seimbang dalam kalangan komuniti Bisaya, khususnya dalam kalangan warga emas, menjadi cabaran signifikan dalam pembangunan *E-Gayad Mabalut Glosari*. Sebahagian besar informan menunjukkan tahap kemahiran yang rendah dalam menggunakan peranti seperti telefon pintar atau komputer, dan mengalami kesukaran memahami fungsi asas platform digital yang digunakan, sekali gus menjejaskan penyertaan mereka selepas sesi bengkel. Warschauer (2003) menegaskan bahawa jurang digital bukan hanya berkait dengan akses teknologi, tetapi juga melibatkan literasi, keyakinan dan kecekapan penggunaannya. Ketidakupayaan kumpulan ini untuk terus terlibat secara aktif boleh menyebabkan mereka terpinggir daripada proses dokumentasi, meskipun mereka memiliki pengetahuan linguistik dan budaya yang kaya. Justeru, projek ini memerlukan pendekatan sokongan seperti latihan asas teknologi, bimbingan berterusan dan penggunaan kaedah yang lebih inklusif agar penyertaan daripada semua lapisan komuniti dapat diperkasa secara seimbang dan berkesan.

Keperluan Latihan dan Fasilitasi Berterusan

Cabaran lain yang dikenal pasti ialah keperluan latihan dan fasilitasi berterusan, khususnya dalam aspek dokumentasi istilah, penyuntingan makna, serta penggunaan platform digital. Ramai informan memerlukan bimbingan praktikal dan tunjuk ajar secara berperingkat sebelum dapat menyumbang secara efektif dalam pembangunan *E-Gayad Mabalut Glosari*. Fasilitasi yang konsisten amat penting bagi memastikan penglibatan komuniti dapat dikekalkan, terutama dalam kalangan mereka yang kurang terdedah kepada kaedah dokumentasi bahasa yang sistematik. Menurut Minkler dan Wallerstein (2011), keberkesanan pendekatan partisipatif dalam komuniti bergantung kepada peranan fasilitator dalam membina kapasiti, memperjelas matlamat secara kolektif, serta mengurus kepercayaan dan komunikasi dalam kumpulan – aspek yang menjadi teras kepada kejayaan dan kelestarian projek berasaskan komuniti (CBPR). Sebagai usaha memperkukuh kapasiti komuniti, Persatuan Bisaya Bersatu Sabah (PBBS) menganjurkan program penyediaan kamus Bisaya setiap hari Sabtu di bangunan PBBS Beaufort sebagai platform latihan informal dalam pendokumentasian bahasa.

Implikasi Penglibatan Komuniti Bisaya

Penglibatan komuniti dalam penghasilan *E-Gayad Mabalut Glosari* menyumbang secara langsung kepada usaha pemuliharaan bahasa dan penguatan identiti budaya, di samping membina rasa tanggungjawab bersama dalam mendokumentasikan warisan bahasa Bisaya.

Pemupukan Kesedaran Budaya dan Bahasa Melalui Penglibatan Komuniti

Penglibatan komuniti Bisaya dalam pembangunan *E-Gayad Mabalut Glosari* telah meningkatkan kesedaran terhadap kepentingan bahasa dan budaya, terutama dalam kalangan generasi muda. Melalui bengkel istilah, sesi perkongsian, dan interaksi digital, komuniti mula

menyedari peranan bahasa sebagai lambang identiti dan alat perpaduan sosial. Proses ini turut membangkitkan refleksi terhadap ancaman kepupusan dan mengaktifkan semula minat terhadap bahasa Bisaya. Menurut Grenoble dan Whaley (2006), penglibatan komuniti dalam dokumentasi bahasa berupaya meningkatkan kesedaran linguistik dan identiti etnik. Dalam konteks Malaysia, kajian Renganathan & Kral (2018) menunjukkan usaha dokumentasi digital dalam kalangan komuniti Orang Asli bukan sahaja membantu mengekalkan warisan bahasa, tetapi turut memperkukuh rasa kepemilikan budaya melalui kerjasama antara generasi.

Pemeriksaan Komuniti dan Rasa Kepemilikan dalam Dokumentasi Bahasa

Pendekatan partisipatif *E-Gayad Mabalut Glosari* memberi komuniti Bisaya peranan penting sebagai penyumbang, bukan sekadar objek kajian. Proses menyumbang istilah, menyemak makna, dan membantu penyebaran glosari membolehkan mereka melihat pengetahuan tempatan dihargai, sekaligus memperkukuh rasa kepemilikan dan harga diri. Seiring dengan Smith (2012), dapatan menunjukkan bahawa komuniti yang aktif memberi input berterusan lebih berdaya dalam pemeliharaan warisan budaya. Sokongan ini sejajar dengan kajian di Malaysia oleh Dilah & Chong (2021) yang menunjukkan bahawa penglibatan komuniti di Kampung Telok Melano, Sarawak, bukan sahaja membangkitkan rasa bangga terhadap bahasa dan identiti etnik, tetapi turut menggalakkan solidariti komuniti antara generasi. Hal ini membuktikan bahawa dokumentasi bahasa yang berpaksikan komuniti mampu menjadi medium pemerikasaan sosial yang berkesan.

Model Rujukan Dokumentasi Bahasa Minoriti

Pembangunan *E-Gayad Mabalut Glosari* menunjukkan potensi sebagai model amalan terbaik yang boleh dicontohi oleh komuniti etnik lain di Malaysia dalam usaha pemeliharaan bahasa minoriti. Pendekatan partisipatif yang menggabungkan penglibatan aktif komuniti dengan penggunaan teknologi digital seperti bengkel istilah, temu bual separa berstruktur, dan semakan bersama komuniti boleh disesuaikan mengikut konteks linguistik dan budaya tempatan. Model ini sejajar dengan dapatan kajian Norazuna (2021) yang menekankan keperluan penyertaan komuniti dalam dokumentasi bahasa terancam di Sarawak, serta kajian Renganathan & Kral (2018) yang menunjukkan kejayaan kerjasama antara generasi dalam projek dokumentasi bahasa Orang Asli. Seperti yang ditegaskan oleh Hornberger (2008), penggabungan teknologi, kolaborasi komuniti dan pendekatan linguistik kontekstual mampu menyumbang kepada agenda pemuliharaan bahasa secara berkesan di peringkat nasional dan global.

Kesimpulan

Secara keseluruhan, kajian ini menegaskan bahawa penglibatan komuniti merupakan asas penting dalam kejayaan dokumentasi dan pemuliharaan bahasa minoriti, seperti yang dibuktikan melalui pembangunan *E-Gayad Mabalut Glosari* oleh komuniti Bisaya di Beaufort, Sabah. Sumbangan aktif komuniti dalam mengenal pasti istilah, mengesahkan makna, dan menyebarkan glosari telah menghasilkan dokumentasi bahasa yang lebih autentik, kontekstual dan bermakna. Pendekatan partisipatif yang diguna pakai bukan sahaja memperkukuh kualiti kandungan, tetapi juga membina rasa kepemilikan, penghargaan dan kebanggaan terhadap warisan bahasa sendiri. Walau bagaimanapun, cabaran seperti kekangan masa, tahap celik digital yang rendah dan keperluan fasilitasi berterusan menuntut perancangan strategik yang lebih inklusif dan responsif terhadap keupayaan sebenar komuniti.

Sehubungan itu, kesinambungan projek ini perlu disokong dengan penyediaan latihan literasi digital secara berfasa, pemerkasaan komuniti akar umbi, serta kerjasama erat dengan institusi pendidikan, NGO dan agensi berkaitan. Inisiatif seperti program penyediaan kamus oleh PBBS setiap Sabtu di Beaufort boleh dijadikan model sokongan komuniti yang mampan. Selain itu, peluasan penggunaan glosari ke institusi pendidikan, terutama sekolah rendah dan menengah, mampu memupuk kefahaman awal terhadap kepelbagaian bahasa etnik sebagai sebahagian daripada pendidikan sivik dan warisan budaya tempatan. Maka, *E-Gayad Mabalut Glosari* bukan sekadar platform digital, tetapi simbol pemerkasaan komuniti dalam menjaga, menghidupkan dan meneruskan kesinambungan bahasa dan identiti Bisaya untuk generasi mendatang.

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KESAN INTERVENSI RELAKSASI BERBEZA TERHADAP PRESTASI UJIAN SPESIFIK PEMAINBOLA SEPAK

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Abstrak: Kajian ini bertujuan untuk mengenalpasti kesan intervensi relaksasi berbeza (relaksasi otot progresif) ROP, (relaksasi autogenik) RA dan (latihan pernafasan mendalam) LPM terhadap prestasi pemain bola sepak. 60 orang pelajar lelaki berumur 13 hingga 16 tahun yang aktif bermain bola sepak dipilih setelah menjalani ujian penilaian menggunakan bateri ujian spesifik bola sepak. setelah itu, peserta kajian telah dibahagikan kepada 4 kumpulan iaitu kumpulan ROP ($n = 15$), kumpulan RA ($n = 15$), kumpulan LPM ($n = 15$) dan kumpulan KK ($n = 15$). Kesemua peserta kajian menjalani ujian pra dan pasca. Peserta kajian menerima intervensi 8 sesi 2 kali seminggu. Data yang diperolehi dianalisis dengan menggunakan Analisis mixed-design ANOVA dan ujian Poc Hoc ujian Tukey. Dapatan kajian menunjukkan terdapat perbezaan yang signifikan bagi peningkatan prestasi berdasarkan kumpulan iaitu $F(3,56) = 3.23$, $P = .029$, partial $\eta^2 = .15$, kesan saiz adalah kecil. Seterusnya, dapatan kajian juga menunjukkan terdapat perbezaan signifikan skor prestasi di antara ujian pra dan ujian pasca bagi kumpulan iaitu Greenhouse-Geisser = 261.07, $F(1,56) = 66.49$, $P < .001$, partial $\eta^2 = .54$, kesan saiz adalah besar. Hal ini kerana terdapat peningkatan skor prestasi di seluruh dua tempoh masa iaitu semasa ujian pra dan ujian pasca. Berdasarkan data min, kumpulan intervensi LPM menunjukkan peningkatan tertinggi iaitu ($M = 10.37$, $SD = 2.53$), disusuli oleh kumpulan intervensi RA iaitu ($M = 9.07$, $SD = 2.32$) dan kumpulan intervensi ROP iaitu ($M = 8.80$, $SD = 3.90$). Sementara itu, kumpulan kawalan KK ($M = 8.13$, $SD = 2.60$) tidak menunjukkan peningkatan. Interaksi antara kumpulan dan masa juga menunjukkan terdapat perbezaan yang signifikan iaitu Greenhouse Geisser = 80.56, $F(3,56) = 6.84$, $P < .001$, partial $\eta^2 = .27$, kesan saiz adalah kecil. Ini menunjukkan bahawa intervensi relaksasi memberi kesan positif terhadap peningkatan prestasi peserta kajian. Ujian Post Hoc menggunakan Tukey terhadap skor min prestasi ujian spesifik bola sepak menunjukkan hanya kumpulan intervensi LPM ($M = 10.37$, $SD = 2.53$) berbeza secara signifikan daripada kumpulan kawalan KK ($M = 8.13$, $SD = 2.60$) dengan perbezaan min sebanyak 2.23 mata. Walaupun kumpulan intervensi ROP dan kumpulan intervensi RA menunjukkan peningkatan namun tidak menunjukkan sebarang perbezaan yang signifikan terhadap kumpulan kawalan KK. Pengkaji menyarankan kajian seterusnya melibatkan atlet bola sepak yang bermain di peringkat tinggi dengan kaedah yang sama.

Kata kunci: Prebezaan, Intervensi Relaksasi, Prestasi, Bola Sepak

Abstract: This study aims to identify the effects of different relaxation interventions (progressive muscle relaxation) PMR, (autogenic relaxation) AR, and (deep breathing exercise) DBE on soccer-specific test performance. Sixty male students aged 13 to 16 years, who actively play soccer, were selected after completing an assessment using a soccer specific test battery. Participants were then randomly divided into four groups: PMR ($n = 15$), RA (n

= 15), DBE ($n = 15$), and a (control group) CG ($n = 15$). All participants underwent both pre- and post-tests. The intervention was administered over 8 sessions, twice a week. The data were analyzed using mixed-design ANOVA and Tukey's Post Hoc test. The findings revealed a significant difference in performance improvement between the groups, $F(3, 56) = 3.23$, $p = .029$, partial $\eta^2 = .15$, indicating a small effect size. Additionally, there was a significant difference in performance scores between the pre-test and post-test across all groups, Greenhouse-Geisser = 261.07, $F(1, 56) = 66.49$, $p < .001$, partial $\eta^2 = .54$, indicating a large effect size. This suggests an overall improvement in performance scores from pre-test to post-test. Based on the mean data, the LPM group showed the highest improvement ($M = 10.37$, $SD = 2.53$), followed by the RA group ($M = 9.07$, $SD = 2.32$), and the ROP group ($M = 8.80$, $SD = 3.90$). The KK control group ($M = 8.13$, $SD = 2.60$) did not show significant improvement. The interaction between group and time was also significant, Greenhouse-Geisser = 80.56, $F(3, 56) = 6.84$, $p < .001$, partial $\eta^2 = .27$, indicating a small effect size. This demonstrates that the relaxation interventions had a positive effect on participants' performance. Tukey's Post Hoc test on the mean soccer-specific test scores revealed that only the DBE group ($M = 10.37$, $SD = 2.53$) was significantly different from the CG ($M = 8.13$, $SD = 2.60$), with a mean difference of 2.23 points. Although the PMR and AR groups also showed improvements, the differences compared to the control group were not statistically significant. The researcher recommends that future studies include high-level soccer athletes using the same intervention methods.

Keywords: deferent, relaxation intervention, performance, football

Pengenalan

Bola sepak merupakan salah satu sukan bersifat kompetitif dan bertekanan tinggi di mana prestasi bukan sekadar bergantung pada kemahiran fizikal tetapi juga menuntut kemahiran psikologi seperti motivasi dan ketahanan mental pemain. Ini kerana, terdapat banyak faktor yang boleh menghalang seseorang pemain bola sepak mencapai prestasi terbaik seperti tuntutan fizikal, teknikal dan sosial (Singh, 2020). Salah satu sebab kenapa pemain sukar mencapai atau mengekalkan tahap prestasi maksimum secara konsisten boleh dikaitkan dengan dua faktor iaitu faktor dalaman dan faktor luaran. Faktor dalaman seperti kurang bermotivasi, tekanan psikologi, mengalami kecederaan, bimbingan yang lemah, tahap pemulihan yang tidak mencukupi, dan gaya hidup tidak sihat. Faktor luaran pula seperti, masalah keluarga, pengaruh rakan sebaya, orang sekeliling, budaya, dan keadaan ekonomi. Memahami halangan ini adalah penting bukan sahaja untuk meningkatkan prestasi individu tetapi juga untuk meningkatkan kejayaan pasukan dan umur panjang pemain dalam sukan ini.

Sejak beberapa tahun kebelakangan ini, pihak bertanggungjawab seperti jurulatih dan ahli psikologi sukan telah meneroka teknik yang lebih senang dan memudahkan pemain untuk menjaga prestasi dengan lebih konsisten. Salah satu teknik yang mendapat perhatian ialah teknik latihan pernafasan mendalam. Teknik ini selalu diaplikasikan untuk membantu menenangkan pernafasan apabila tertekan atau bimbang. Semasa menggunakan pernafasan mendalam, udara disedut melalui hidung dan dikeluarkan melalui mulut secara perlahan-lahan. Sebagai tindak balas kepada sensasi tersebut, maka tubuh akan bertindak balas dengan keadaan yang lebih baik semasa berhadapan dengan kebimbangan atau panik (Sykes, 2018). Beberapa kajian mendapati pemain bola sepak yang cedera dengan persepsi sokongan sosial yang lebih

tinggi akan mengalami kurang keseimbangan kecederaan semula semasa pemulihan dan, sebagai hasilnya, atlet lebih bersedia dari segi psikologi apabila kembali bersukan (Forsdyke, 2022). Kajian lain menunjukkan latihan pernafasan mendalam juga sangat baik untuk menguatkan bahagian otot bahagian bawah pemain bola sepak muda (Eswaramoorthi & Vijayamurugan, 2021) dan menghembuskan udara lebih banyak berbanding kumpulan kawalan (Shukla, 2020). Kajian terdahulu menunjukkan bahawa teknik pernafasan mendalam mempunyai perhubungan positif terhadap prestasi dan kekuatan mental atlet dan boleh digunakan untuk persediaan mental atlet (Ismail et al., 2022).

Walaupun keputusan kajian awal telah menunjukkan kesan positif terhadap prestasi, tekanan, keseimbangan, serta keadaan psikologi seperti motivasi dan kekuatan mental, namun masih banyak kajian yang masih tidak dapat dibuktikan. Sebagai contoh, sejauh manakah latihan pernafasan mendalam boleh meningkatkan prestasi pemain bola sepak berumur 16 tahun kebawah? Kajian ini bertujuan untuk mengetahui dengan jelas bagaimana intervensi latihan pernafasan mendalam menggunakan audio mempengaruhi prestasi pemain bola sepak. Dengan adanya kajian ini, diharap dapat menawarkan strategi praktikal yang disokong melalui eksperimen yang boleh digunakan oleh atlet dan jurulatih untuk memperoleh kelebihan secara mental dan fizikal.

Metodologi

Reka bentuk kajian ini adalah berbentuk penyelidikan kuantitatif dengan menggunakan kajian berbentuk Kuasi-eksperimental. Dalam kajian ini, jenis reka bentuk kuasi-eksperimental yang digunakan ialah reka bentuk ujian pra pasca bagi ujian kumpulan-kumpulan tidak seimbang (nonequivalent groups pre-posttest design) (May, 2023). Reka bentuk kuasi-eksperimen ini adalah melibatkan kumpulan yang tidak setara dan tidak melibatkan pemilihan peserta kajian secara rawak.

Kajian ini hanya melibatkan kelab bola sepak di sebuah sekolah menengah kebangsaan iaitu Sekolah Menengah Kebangsaan Kota Marudu II, yang melibatkan kelab bola sepak di sekolah tersebut. Seterusnya, pelajar yang dipilih adalah pelajar lelaki yang aktif bermain bola sepak sama ada mewakili sekolah atau sebagai sukan rekreasi, dan berumur antara 13 tahun hingga 16 tahun.

Saiz sampel bagi ujian ini ditentukan berdasarkan kuasa dan saiz kesan. Kuasa diertikan sebagai kemungkinan menolak hipotesis nul yang palsu (Cohen, 1988). Dalam kajian ini kawasan pertemuan berada pada angka 15 maka kajian memerlukan $n=15$ peserta rawatan bagi menolak hipotesis nul pada aras signifikan 0.05 apabila kuasa dan saiz kesan ditetapkan pada 0.50.

Disebabkan kuasa meningkat apabila peserta kajian bertambah, maka sampel yang lebih ramai adalah lebih meyakinkan keputusan kajian. Menurut Cohen (1988), dalam mengambil saiz sampel, perlu mengambil kira saiz kesan iaitu saiz hubungan antara pemboleh ubah dan ujian statistik yang digunakan. Nilai konvensional saiz kesan bagi analisis varian adalah .20 (kecil), .50 (sederhana) dan .80 (besar). Dalam konteks kajian ini, penentuan saiz Intervensi yang digunakan dalam kajian ini terbahagi kepada tiga jenis teknik relaksasi iaitu ROP, RA, dan LPM. Dalam kajian ini, kumpulan ROP, RA, dan LPM akan menjalani intervensi selama empat minggu dengan kekerapan latihan dua kali seminggu (8 sesi) (Hazliza et al., 2017). Manakala

kumpulan kawalan hanya menjawab borang soal selidik yang diberi pada sesi pertama dan sesi terakhir sahaja tanpa menjalani sebarang latihan intervensi. Setiap kali menjalankan sesi intervensi, para peserta dikumpulkan dalam sebuah bilik yang tenang dan nyaman. Seterusnya memulakan sesi intervensi secara berkumpulan. Sebelum intervensi dijalankan pada sesi pertama, peserta kajian diberi taklimat ringkas tentang tujuan, prosedur, dan syarat sepanjang intervensi dijalankan. Sepanjang sesi pengkaji hanya menjadi pemerhati dan tidak melakukan apa-apa bertujuan meminimumkan ralat dalam kajian. Seseorang yang berkecualan menjalankan sesi latihan sehinggalah kajian itu selesai. Bagi memastikan kelancaran sepanjang intervensi, setiap kali perjumpaan sesi intervensi latihan (sesi pertama hingga sesi kelapan), peserta kajian telah mencatat tarikh, masa, dan tandatangan pada buku log yang disediakan oleh pengkaji mengikut kumpulan masing-masing. Intervensi berlangsung antara 15 minit-20 minit setiap sesi.

Kajian menggunakan bateri ujian ini adalah mengukur tahap kemahiran yang diperlukan dalam sukan bola sepak. Antara komponen utama yang dimaksudkan ialah Ujian Menimang Bola, Ujian Hantaran Dekat (bola leret), Ujian Hantaran Jauh (bola tinggi), Ujian Menggelecek dan Ujian Menjaring. Melalui kajian oleh Muhamad Hafiz Ismail dan Ahmad Hashim (2014), mereka mengesahkan bateri ujian ini sesuai digunakan dalam menguji kemahiran spesifik sukan bola sepak di kalangan remaja. Setelah selesai semua ujian, segala keputusan yang diperoleh telah dikumpulkan dan direkodkan dalam borang yang telah disediakan oleh pengkaji.

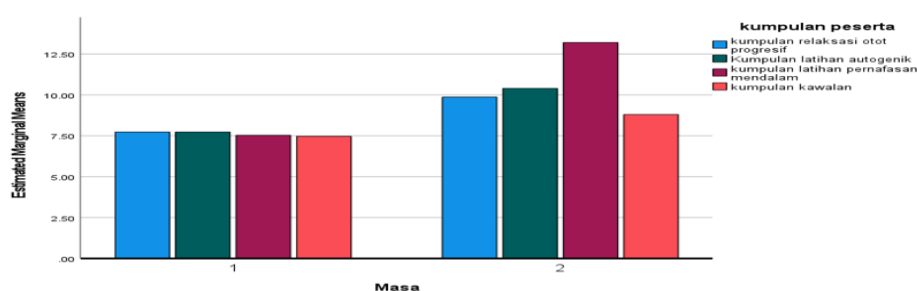
Dapatan Kajian

Berdasarkan Jadual 1, kajian menunjukkan terdapat perbezaan yang signifikan bagi peningkatan prestasi berdasarkan kumpulan iaitu $F(3,56) = 3.23$, $P = .029$, partial $\eta^2 = .15$, kesan saiz adalah kecil. Berdasarkan data min, kumpulan intervensi ROP, RA, dan LPM menunjukkan peningkatan yang ketara dan memberi kesan utama terhadap peningkatan prestasi kepada peserta kajian berbanding kumpulan kawalan. Seterusnya, dapatan kajian juga menunjukkan terdapat perbezaan signifikan skor prestasi di antara ujian pra dan ujian pasca bagi kumpulan intervensi ROP, RA, dan LPM iaitu *Greenhouse-Geisser* = 261.07, $F(1,56) = 66.49$, $P < .001$, partial $\eta^2 = .54$, kesan saiz adalah besar. Hal ini kerana terdapat peningkatan skor prestasi di seluruh dua tempoh masa iaitu semasa ujian pra dan ujian pasca. Berdasarkan data min, kumpulan intervensi LPM menunjukkan peningkatan tertinggi iaitu ($M = 10.37$, $SD = 2.53$), disusuli oleh kumpulan intervensi RA iaitu ($M = 9.07$, $SD = 2.32$) dan kumpulan intervensi ROP iaitu ($M = 8.80$, $SD = 3.90$). Sementara itu, kumpulan kawalan KK ($M = 8.13$, $SD = 2.60$) menunjukkan peningkatan.

Jadual 1: Kesan intervensi relaksasi berbeza terhadap prestasi peserta kajian)

Bab 11. Kesan Interaksi Relaksasi Berbeza terhadap prestasi peserta kajian)								
Dv			Mean	SD	df	f	Sig	eta
Prestasi	ROP	Pra	7.73	2.22				
		Pasca	9.87	1.68				
		Jumlah	8.80	3.9				
	RA	Pra	7.73	2.12				
		Pasca	10.40	2.53				
		Jumlah	9.07	2.32				
	LPM	Pra	7.53	2.42				
		Pasca	13.20	2.65				
		Jumlah	10.37	2.53				
	KK	Pra	7.47	1.35				
		Pasca	8.80	3.86				
		Jumlah	8.13	2.60				
Antara Kumpulan				78.89	3	3.23	.029	.15
					56			
Dalam Kumpulan				261.07	1	66.49	<.001	.54
					56			
Kesan Interaksi				80.56	3	6.84	<.001	.27
					56			

Interaksi antara kumpulan dan masa juga menunjukkan terdapat perbezaan yang signifikan iaitu *Greenhouse Geisser* = 80.56, $F(3,56) = 6.84$, $P < .001$, partial $\eta^2 = .27$, kesan saiz adalah kecil. Ini menunjukkan bahawa intervensi relaksasi memberi kesan positif terhadap peningkatan prestasi peserta kajian. Berdasarkan Rajah 1, graf bar min pra dan pasca prestasi menunjukkan terdapat perubahan yang ketara pada ujian pasca pada kumpulan ROP, RA, dan LPM berbanding kumpulan kawalan. Peningkatan skor yang ketara menunjukkan ketiga-tiga ujian relaksasi tersebut memberikan kesan utama terhadap peningkatan prestasi peserta kajian berbanding kumpulan kawalan yang tidak diberikan sebarang intervensi.



Rajah 1: Graf bar min ujian pra dan pasca bagi intervensi relaksasi terhadap prestasi

Ujian *Post Hoc* menggunakan *Tukey* terhadap skor min prestasi ujian spesifik bola sepak seperti dalam Jadual 2, menunjukkan hanya kumpulan intervensi LPM ($M = 10.37$, $SD = 2.53$) berbeza secara signifikan daripada kumpulan kawalan KK ($M = 8.13$, $SD = 2.60$) dengan perbezaan min sebanyak 2.23 mata. Walaupun kumpulan intervensi ROP dan kumpulan intervensi RA menunjukkan peningkatan namun tidak menunjukkan sebarang perbezaan yang signifikan terhadap kumpulan kawalan KK.

Jadual 2: Perbandingan skor prestasi ujian spesifik bola sepak antara kumpulan

		(I) kumpulan peserta	(J) kumpulan peserta	Mean Difference (I-J)	Std. Error	Sig.
Prestasi	Tukey HSD	ROP	KK	0.67	.74	.010
		RA	KK	0.93	.74	.039
		LPM	KK	2.23*	.74	.000

Perbincangan dan Kesimpulan

Setiap kaedah latihan relaksasi memberikan kesan yang berbeza kepada atlet. Laredo-Aguilera, Carmona-Torres, García-Pinillos & Latorre-Román (2018) menjelaskan bahawa atlet yang menjalankan latihan biasa menunjukkan kemerosotan yang ketara terhadap tahap kesakitan, mood, kualiti tidur, dan kemurungan selepas 10 minggu latihan berbanding atlet yang mendapat intervensi. Dalam bola sepak moden, kecekapan fizikal dan taktikal adalah sangat diperlukan untuk mencapai prestasi tetapi ia tidak akan mencukupi sekiranya tidak menggunakan kemahiran psikologi. Menurut Konter, Backmann dan Mallett (2019), menyatakan bahawa atlet yang paling berjaya secara konsisten dalam sukan memerlukan dan menggunakan kemahiran psikologi untuk meningkatkan prestasi seperti menggunakan teknik relaksasi, imageri, penatapan matlamat dan self-talk. Berdasarkan petikan, dapat disimpulkan bahawa kemahiran psikologi sangat diperlukan dalam mencapai prestasi yang konsisten.

Mereka yang mampu mengekalkan prestasi terbaik sepanjang kejohanan berkemungkinan besar menang dalam pertandingan. Latihan semata-mata pada zaman yang mencabar kini bukanlah pilihan terbaik melainkan memasukkan elemen psikologi dalam latihan. Vincent Parnabas et al. (2014) menjelaskan bahawa teknik pernafasan mempunyai nilai signifikan terhadap prestasi. Kajian ini juga menyatakan semakin kerap atlet menggunakan teknik relaksasi pernafasan semakin tinggi prestasi atlet.

Semasa dalam keadaan tegang atau stress, pernafasan akan menjadi cepat tanpa kawalan. Hal ini akan menyebabkan pembuluh darah mengecut dan akhirnya mengurangkan kadar oksigen dalam badan. Metabolisme dalam badan seharusnya dijaga supaya dapat mengawal stres. Dengan mengamalkan teknik pernafasan yang betul, fikiran menjadi lebih tenang ketika berhadapan dengan situasi yang tegang, selain itu, ia juga mampu meningkatkan pertukaran antara oksigen dan karbon dioksida, meningkatkan peredaran darah dan mengurangkan ketegangan tubuh.

Berdasarkan kajian semasa, intervensi LPM menunjukkan kesan yang signifikan terhadap peningkatan prestasi atlet bola sepak berbanding intervensi ROP dan RA. Hal ini kerana latihan LPM senang dan boleh dilakukan pada bila-bila masa walaupun dalam masa kritikal atau sedang dalam permainan. Apa yang perlu dilakukan adalah menarik nafas perlahan-lahan dan menghembuskannya dgn cara perlahan-lahan dan diulangi beberapa kali sehingga merasa lega. Selari dengan kajian oleh Cleary (2019) juga mendapati terdapat hubungan yang signifikan antara intervensi LPM dengan kecekapan lokomotor atlet. Kajian oleh Stephens et al. (2017) juga mendapati pengaruh latihan pernafasan diafragma mampu mempengaruhi keseimbangan statik dan dinamik setrusnya dapat meningkatkan keseimbangan peserta kajian.

Yadav dan Mutha (2016) menyatakan dengan latihan pernafasan diafragma selama 30 minit, atlit mampu mengekalkan kemahiran motor yang baru dipelajari. Ini bermakna teknik pernafasan mendalam arahan mempunyai implikasi penting untuk latihan sukan dan pemulihan neuromotor di mana pengekal prestasi yang lebih baik terhadap kemahiran motor yang dipelajari. Semasa fikiran dalam keadaan tenang, fokus tumpuan diri semakin baik dan pekerjaan yang sedang dilakukan seperti menimbang bola, menghantar serta menendang tepat kearah sasaran akan semakin baik. Ini disebabkan ketiadaan stress pada bahagian fikiran mahupun tubuh yang akhirnya memberikan hasil atau keputusan yang lebih baik kepada sesuatu perlakuan atau perbuatan.

Kajian oleh Nichols (2017) menjelaskan bahawa strategi teknik pernafasan diafragmatik mungkin bukan strategi yang berkesan untuk atlit baru yang menghadapi situasi tekanan dalam sukan. Namun begitu, berdasarkan statistik demografi, para peserta kajian adalah berumur 16 tahun kebawah serta 58.3% daripada mereka mempunyai pengalaman bermain bola sepak bawah 3 tahun, manakala selebihnya mempunyai pengalaman lebih empat tahun. Oleh itu, peserta kajian masih berada dalam lingkungan pemain bola sepak pemula dan tidak di klasifikasikan sebagai pemain bola sepak professional. Namun begitu, kajian semasa membuktikan bahawa teknik relaksasi jenis LPM dengan menggunakan arahan dalam bentuk audio yang dijalankan 10 hingga 15 minit yang dilakukan dua kali seminggu selama empat minggu menunjukkan kesan yang utama dan signifikan terhadap skor prestasi peserta kajian. Hal ini membuktikan bahawa intervensi relaksasi seperti LPM adalah sesuai digunakan serta mampu meningkatkan prestasi kepada atlet bola sepak pemula.

Selain itu, jangka masa yang diambil oleh pengkaji sudah memadai untuk mendapatkan perbezaan skor terhadap dua masa yang berbeza serta memberikan kesan yang utama dan positif terhadap prestasi peserta kajian dalam menjalankan ujian spesifik sukan bola sepak. Berdasarkan kajian semasa, dengan data yang ada para atlet remaja terutama dalam sukan bola sepak percaya dan yakin penggunaan intervensi LPM sesuai diterapkan dalam diri pada bila-bila masa dalam keadaan tertentu sama ada dalam latihan atau semasa pertandingan kompetitif.

Kesimpulan

Sebagai kesimpulan, kajian ini menunjukkan bahawa intervensi relaksasi yang berbeza memberikan kesan yang ketara terhadap prestasi ujian khusus dalam kalangan pemain bola sepak. Dapatan kajian membuktikan bahawa teknik relaksasi seperti LPM, RA dan LPM mampu meningkatkan prestasi dalam tugas fizikal dan kognitif yang berkaitan dengan bola sepak. Antara intervensi yang dikaji, intervensi LPM didapati paling berkesan dalam meningkatkan keputusan prestasi ujian spesifik bola sepak. Kesan positif ini berkemungkinan disebabkan oleh kejelasan mental dan pengawalan emosi yang lebih baik hasil daripada amalan relaksasi tersebut. Hasil kajian ini menekankan kepentingan memasukkan rutin relaksasi secara sistematik dalam program latihan atlet bola sepak bagi mengoptimumkan prestasi dalam situasi tekanan. Jurulatih dan ahli psikologi sukan disarankan menyesuaikan intervensi ini mengikut keperluan dan kecenderungan individu atlet untuk mencapai kesan maksimum. Walaupun kajian lanjutan dengan saiz sampel yang lebih besar dan tahap persaingan yang berbeza digalakkan, kajian ini menyediakan asas kukuh tentang peranan pemulihan psikologi dan persediaan mental dalam meningkatkan prestasi sukan. Amalan relaksasi bukan sahaja meningkatkan prestasi, malah menyokong kesejahteraan mental dan daya tahan atlet dalam jangka panjang.

sepak. Keadaan ini juga menjadi salah satu faktor terhadap kurang ketepatan dan kebolehppercayaan terhadap kajian. Seterusnya, pengkaji mencadangkan agar skop kajian diperluaskan bagi tujuan penambahbaikan supaya lebih banyak pembolehubah-pembolehubah kajian dapat dikaji. Contohnya, membandingkan dapatan kajian mood, efikasi sendiri, serta prestasi di kalangan pemain bola sepak bawah 16 tahun yang bersekolah di bandar dengan mereka yang bersekolah d luar bandar serta membuat perbandingan antara jantina.

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MEMAHAMI PENGGUNAAN KECERDASAN BUATAN (AI) DALAM KALANGAN GURU KBD USULUDDIN

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Abstract: *Perkembangan penggunaan Kecerdasan Buatan (AI) telah banyak mempengaruhi kehidupan manusia dalam semua bidang. Pembuatan mesin yang dilengkapi dengan perisian AI mampu menjadikan mesin tersebut menjadi lebih pintar dalam melaksanakan pekerjaan atau tugas yang diberikan. Perkembangan penyelidikan AI turut mempengaruhi bidang pendidikan. Oleh itu, terdapat banyak gesaan supaya bidang pendidikan menitikberatkan penggunaan AI pada semua peringkat pembelajaran bermula daripada sekolah sehingga ke pusat pengajian tinggi. Perubahan bidang pendidikan kepada persekitaran baharu yang mementingkan pengaplikasian TMK dalam pengajaran telah menimbulkan pelbagai perspektif dalam kalangan guru. Namun begitu, guru tidak mampu untuk melawan perkembangan arus permodenan dan perlu bersedia untuk mempelajari kemahiran yang baharu. Begitu juga dengan guru KBD Usuluddin yang tidak berkecuali dalam menggunakan TMK dalam pengajaran mereka terutamanya teknologi AI. Kurikulum Bersepadu Dini (KBD) merupakan kurikulum baharu yang telah mula dilaksanakan pada tahun 2015 yang menggunakan bahasa arab sebagai bahasa pengantar. Kajian ini menggunakan kaedah kualitatif analisis kandungan daripada artikel-artikel yang berkaitan. Dapatan kajian menunjukkan bahawa kemahiran digital guru dalam menggunakan teknologi terutamanya AI masih lagi terbatas. Selain itu, kekurangan prasarana dalam menggunakan teknologi dan bebanan tugas menyebabkan guru kesuntukkan masa untuk membina bahan bantu mengajar berasaskan teknologi juga merupakan cabaran yang dihadapi oleh guru KBD Usuluddin. Hasil daripada kajian ini akan dapat memberi gambaran kepada pihak Kementerian Pendidikan Malaysia (KPM) dalam menilai pelaksanaan dan keberkesanan KBD Usuluddin yang merupakan kurikulum yang baharu. Selain itu juga, KPM dapat menilai sejauh mana guru menggunakan TMK dalam pengajaran di bilik darjah bagi memastikannya selari dengan apa yang dihasratkan dalam Dasar Pendidikan Digital dalam meningkatkan tahap kebestarian sekolah.*

Kata Kunci: *AI, KBD, Usuluddin*

Pengenalan

Perkembangan penggunaan Kecerdasan Buatan (AI) telah banyak mempengaruhi kehidupan manusia dalam semua bidang. AI adalah satu sistem yang dimasukkan ke dalam mesin dan boleh berfungsi mirip sebagai seorang manusia yang mempunyai emosi, kemampuan berfikir dan membuat keputusan yang pertama kali mula digunakan dalam penyelidikan yang dijalankan oleh John McCarthy pada tahun 1956 (Alif Nawi et al., 2021).

Penggunaan dan perkembangan penyelidikan AI telah banyak memberi kelebihan dan manfaat kepada kehidupan manusia. Pembuatan mesin yang dilengkapi dengan perisian AI mampu

menjadikan mesin tersebut menjadi lebih pintar dalam melaksanakan pekerjaan atau tugas yang diberikan. Menurut Francisca et al. (2024), penggunaan AI dalam bidang kesihatan telah meningkatkan tahap kecekapan dan ketepatan dalam mengesan sesuatu penyakit seperti kanser. Dalam bidang ekonomi pula, AI telah menyumbang kepada peningkatan inovasi servis dan penghasilan produk baru (Yuan et al., 2024). Selain itu juga, perkembangan penyelidikan AI turut memberikan kesan terhadap bidang pendidikan. Integrasi AI dalam pendidikan boleh mempromosi konsep pembelajaran sepanjang hayat kepada semua individu (SDG, 2023). Oleh itu, terdapat banyak gesaan supaya bidang pendidikan menitikberatkan penggunaan AI pada semua peringkat pembelajaran bermula daripada sekolah sehingga ke pusat pengajian tinggi (Kong et al., 2025).

Sehubungan dengan itu, bagi memastikan kurikulum pendidikan selari dengan perubahan global, Kementerian Pendidikan Malaysia (KPM) telah mewujudkan Pelan Pembangunan Pendidikan Malaysia 2013-2025 (PPPM) bagi mentransformasi pendidikan di negara ini dengan memanfaatkan teknologi dan maklumat (TMK) dalam meningkatkan kualiti pembelajaran. Selain itu juga, Dasar Pendidikan Digital turut digubal bagi memacu perubahan landskap pendidikan digital (KPM, 2023). Pendidikan digital ini merangkumi pembelajaran mengenai pengetahuan, kemahiran dan nilai berkaitan dengan teknologi digital serta pengajaran dan pembelajaran (PdP) yang menggunakan teknologi digital secara bersepadu, kreatif dan inovasi untuk melahirkan generasi yang fasih digital.

KBD merupakan singkatan kepada Kurikulum Bersepadu Dini yang telah diiktiraf sebagai kurikulum kebangsaan dan mula diajar pada tahun 2015. Menurut Kamarul et al. (2018), KBD menawarkan pendidikan agama yang berkualiti kepada murid serta memperkasakan Pendidikan Agama Islam dalam aliran perdana. Tambahan itu juga, bahasa arab digunakan sebagai pengantar dalam mata pelajaran KBD Usuluddin ini. M. Fuad et al. (2018) menyatakan bahawa penggunaan bahasa arab sebagai bahasa pengantar dalam PdP akan dapat mengembangkan potensi dan keupayaan murid dalam ilmu agama dan bahasa arab. Menurut penulis yang sama, terdapat lima bab utama yang diajar dalam mata pelajaran KBD Usuluddin iaitu Tauhid, Tafsir, Hadis, Sirah dan Adab. Namun begitu, bab Akidah adalah topik yang paling sukar kerana memerlukan kemahiran berfikir yang mendalam serta hujah-hujah yang kognitif.

Oleh itu, guru sebagai pelaksana kurikulum perlu menjadi pemudah cara dalam menyampaikan pengetahuan kepada murid di dalam bilik darjah (Fatimah et al., 2020). Salah satu cara yang memudahkan penyampaian guru adalah dengan mengintegrasikan TMK dalam pengajaran yang dijalankan. Sehubungan dengan itu, artikel ini bertujuan untuk mengenal pasti cabaran yang dihadapi oleh para guru dalam usaha mengintegrasikan penggunaan TMK dalam sesi PdP.

Pernyataan Masalah

Perubahan bidang pendidikan kepada persekitaran baharu yang mementingkan pengaplikasian TMK dalam pengajaran telah menimbulkan pelbagai perspektif dalam kalangan guru. Sebahagian guru merasakan TMK tidak sesuai digunakan untuk mengajar semua subjek (Sylvia & Tharshini, 2024). Namun begitu, guru tidak mampu untuk melawan perkembangan arus permodenan dan perlu bersedia untuk mempelajari kemahiran yang baharu. Begitu juga dengan guru KBD Usuluddin yang tidak berkecuali dalam menggunakan TMK dalam pengajaran mereka terutamanya teknologi AI.

Perkembangan pesat penyelidikan AI telah menyebabkan berlakunya desakan untuk menekankan penggunaan AI dalam pendidikan (Siu. C. K et al., 2025). Kewujudan platform DELIMa merupakan hasil kerjasama KPM dengan pihak Google bagi mendokong inisiatif pendidikan digital di Malaysia. Namun begitu, penggunaan platform DELIMa ini masih berada pada tahap yang sederhana berikutan terdapat guru yang kurang berkemahiran dalam penggunaan TMK (Sylvia & Tharshini, 2024).

Akhir sekali, kajian ini penting bagi mendapatkan maklumat tentang penggunaan AI dalam bidang pendidikan Islam khususnya KBD Usuluddin. Hal ini kerana, kajian tentang KBD Usuluddin masih sukar untuk ditemui. Selain itu juga, hasil dapatan kajian ini juga boleh digunakan oleh pihak KPM bagi menilai pelaksanaan dan keberkesanan KBD Usuluddin.

Objektif

Objektif kajian ini adalah untuk:

1. Meneroka cabaran yang dihadapi guru KBD Usuluddin dalam penggunaan AI.

Kajian Kepustakaan

Penggunaan Kecerdasan Buatan (AI) Dalam Pendidikan

Sustainable Development Goal (SDG) objektif keempat yang berhasrat untuk menjadikan pendidikan berkualiti kepada semua penduduk global menganggap penggunaan AI akan menjadi sebagai salah satu alat bagi mencapai hasrat tersebut. Kesan daripada perkembangan teknologi yang semakin canggih telah menyebabkan penduduk di negara mundur ketinggalan dalam pembelajaran. Dengan pendidikan dapat menghapuskan ketidaksamarataan dalam semua aspek kehidupan (UNESCO, 2022). AI dalam pendidikan mampu menyokong pelbagai tahap pembelajaran individu melalui pembelajaran diperibadikan. Selain itu, murid dapat belajar mengikuti tahap pencapaian dan motivasi mereka. Dengan bantuan AI, urusan pembelajaran dapat direka sesuai dengan objektif yang ingin dicapai dan mempromosi konsep pembelajaran sepanjang hayat selaras dengan tujuan yang ingin dicapai dalam SDG.

Penggunaan AI dalam pendidikan di USA, China dan India lebih berfokus kepada pembelajaran personal (personalized learning). Pengajaran personal bermaksud pembelajaran yang mampu meramal tahap pencapaian murid dan memberi maklum balas tentang bagaimana cara untuk mengoptimumkan pembelajaran selepas mengkaji latar belakang pencapaian murid. Dengan erti kata lain, Pembelajaran personal adalah pembelajaran yang mengikut tahap kefahaman dan kemampuan murid dalam mempelajari sesuatu perkara (Siu. C. K et al., 2025). Di Emiriah Arab Bersatu (UAE) pula, strategi perkembangan AI dalam semua sektor termasuklah bidang pendidikan telah bermula pada tahun 2017. The Adaptive Learning Framework (ALEF) merupakan inisiatif penting dalam strategi perkembangan AI di UAE yang menawarkan pembelajaran personal, menilai kekuatan dan kelemahan murid serta maklum balas langsung tentang tahap pencapaian murid kepada ibu bapa (Alyammahi, 2019). Program ALEF telah berjaya meningkatkan motivasi dan penglibatan murid.

Kajian yang dijalankan oleh University of Eastern di Finland yang melibatkan 200 orang murid gred empat dan tujuh telah membuktikan bahawa pembelajaran amali atau secara praktikal dengan pendidikan berasaskan teknologi dapat menambahbaik pemahaman mereka tentang AI. Kajian tersebut juga turut mengkaji kolaborasi antara aplikasi model AI dapat membantu murid

memahami konsep AI sambil mengambil kira isu-isu etika dalam penggunaan AI. Kaedah ini menekankan kepentingan pembelajaran interaktif dalam pengajaran berasaskan teknologi. Namun begitu, masih terdapat banyak sekolah yang belum mengajar murid mereka tentang manfaat AI serta fungsi dan kesannya. Oleh itu, jurang ini perlu dibaiki supaya penggunaan AI dapat diintegrasikan dalam semua aspek kehidupan masyarakat.

Di Malaysia, Kementerian Pendidikan Malaysia memainkan peranan penting dalam menjayakan AI dalam bidang pendidikan. Dasar Pendidikan Digital (DPD) yang digubal pada tahun 2023 merupakan salah satu komitmen kerajaan dalam pembangunan pendidikan untuk menggalakan penggunaan teknologi dalam pengajaran dan pembelajaran secara bersepadu, kreatif, inovatif dan bertanggungjawab serta beretika. Pelaksanaan DPD adalah selari dengan Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025 melalui aspirasi ke tujuh iaitu “memanfaatkan ICT bagi meningkatkan kualiti pembelajaran di Malaysia”. Seiring dengan perkembangan IR4.0, pembangunan bakat murid menjadi fokus utama melalui program Tech@School. Program ini menekankan kepada pembangunan modul pemikiran komputasional, pemugaran aktiviti kokurikulum berasaskan teknologi dan latihan tentang pemikiran komputasional kepada guru dan pemimpin pendidikan. KPM turut melancarkan platform pembelajaran atas talian DELIMa (Digital Educational Learning Initiative Malaysia) yang bertujuan menyediakan persekitaran pembelajaran digital yang inklusif dan dinamik untuk semua guru dan murid di sekolah. Platform DELIMa ini dilengkapi dengan pelbagai sumber bahan seperti buku teks digital dan aplikasi pembelajaran terdiri daripada ChatGPT, Gemini dan MS Copilot. DELIMa juga turut bekerjasama rakan DELIMa terdiri daripada syarikat seperti Google, Apple, Shell dan Maxis. Secara keseluruhannya jelas menunjukkan bahawa AI mempunyai potensi yang amat besar untuk mengubah landskap pendidikan di Malaysia melalui fleksibiliti dan inovatif.

Menurut Tumiran et al., (2025), antara cara AI dapat mempengaruhi pendidikan di Malaysia adalah seperti yang berikut:

i- Pengupayaan pembelajaran personal

Pembelajaran berasaskan AI mampu mempromosi pembelajaran personal. AI mampu mencadangkan sumber pembelajaran yang sesuai dan sepadan dengan kebolehan murid serta memenuhi keperluan mereka dan seterusnya dapat meningkatkan hasil pembelajaran (Siu. C.K. et al., 2025). Selain itu juga, pembelajaran personal dapat meningkatkan keupayaan belajar dalam sesuatu kandungan dan penilaian kursus berdasarkan mod yang dipilih oleh murid. Medium pembelajaran personal juga menawarkan pelbagai faedah antaranya akses tanpa had masa dan lokasi kepada latihan, kandungan yang sesuai dengan keperluan murid, maklum balasa nyata, cadangan penambahbaikan dan ransangan mental. Hal ini juga menggalakkan persekitaran pembelajaran yang fleksibel dan meningkatkan kecekapan pembelajaran. AI dalam pembelajaran personal juga mampu menganalisis data murid serta mengenal pasti kekuatan dan kelemahan murid. Tuntasnya, AI merupakan alat berharga dalam pembelajaran personal khususnya dalam meningkatkan kecerdasan emosi dan pembentukan karakter serta mempromosi konsep pembelajaran sepanjang hayat.

ii- Pembelajaran interaktif

Pembelajaran interaktif yang disediakan oleh sistem AI dapat memberikan pengalaman belajar yang menyeronokkan terutamanya melalui pembelajaran realiti maya (VR) dan realiti

augmentasi (AR). Fariyah et al., (2020) menyatakan bahawa kemahiran dan pengetahuan guru yang kreatif akan dapat mewujudkan persekitaran pembelajaran yang menarik serta mampu menarik minat murid untuk terlibat secara aktif dalam pembelajaran. Pembelajaran interaktif juga mampu meningkatkan tahap pemahaman dan tahap prestasi murid. Oleh itu, guru perlu bersedia mendepani cabaran perkembangan teknologi pada masa kini bagi memastikan pengajaran mereka mampu diterima dan difahami oleh murid.

iii- Pembangunan perisian dan aplikasi

Terdapat potensi besar AI bagi membangunkan perisian dan aplikasi dalam bidang pendidikan. Perisian dan aplikasi yang dibangunkan oleh AI dapat menjimatkan kos, meningkatkan tahap kreatif pembangun, automasi kerja rutin dan menganalisis data besar. AI juga memainkan peranan penting dalam penciptaan robot sosial dan pembelajaran pintar. Teknologi AI juga boleh dimanfaatkan menerusi sistem yang pantas dan terperinci. Pembangunan perisian dan aplikasi ini boleh dijalankan dengan kerjasama daripada pihak berkepentingan terutamanya yang melibatkan penyepaduan pendidikan dan storan awam yang bercirikan neurosains. Selain itu juga, pembangunan perisian dan aplikasi boleh dilakukan untuk meramal prestasi ujian dan peperiksaan serta penilaian terhadap murid.

Penggunaan AI dalam pendidikan merupakan satu tuntutan pada masa kini. Kemahiran dalam penggunaan AI memerlukan setiap daripada individu terutamanya para guru untuk menguasai kemahiran TMK. Oleh itu, guru perlu sentiasa meningkatkan pengetahuan sendiri dalam kemahiran TMK demi menghasilkan pengajaran yang menarik selari dengan tuntutan Pendidikan Abad ke-21 (PAK21). Selain itu juga, sokongan padu daripada kerajaan dalam memastikan penggunaan AI dalam pendidikan amat diperlukan bagi memastikan objektif dalam dasar-dasar yang digubal tercapai seterusnya menghasilkan pendidikan yang berkualiti dan melahirkan murid yang seimbang dan bersepadu seperti mana yang dihasratkan di dalam Falsafah Pendidikan Kebangsaan (FPK).

Pengajaran KBD Usuluddin

Usuluddin merupakan bidang ilmu yang meliputi ilmu untuk mengenal Allah, para rasul, perkara-perkara sam'iyat, dalil-dalil khusus dan umum daripada al-Quran serta hadis (M. Fuad et al., 2018). Bidang usuluddin merupakan teras dalam Pendidikan Islam. Pembelajaran berkaitan usuluddin dapat mempengaruhi pembentukan diri remaja muslim di sekolah. Imam al-Syatibiy menjelaskan bahawa pembelajaran tentang ilmu usuluddin ini mengambil masa yang lama sepertimana Rasulullah mengambil masa yang panjang untuk menjelaskan konsep akidah dan menerapkan kefahaman Islam dalam jiwa manusia.

Usuluddin merupakan salah satu mata pelajaran yang ditawarkan di bawah Kurikulum Bersepadu Dini (KBD). KBD merupakan komponen kurikulum yang penting dalam pendidikan dan digubal bagi memenuhi hasrat Falsafah Pendidikan Kebangsaan (FPK). KBD telah dibentuk bagi menggantikan kurikulum Azhari. Sehubungan dengan itu, KBD telah dilaksanakan pada tahun 2015 di sekolah-sekolah agama bantuan kerajaan (SABK). M. Fuad et al. 2018 menyatakan bahawa KBD Usuluddin ini masih belum dikaji sepenuhnya bagi mengenal pasti tahap pelaksanaan dan keberkesanannya.

Objektif KBD adalah untuk melahirkan murid yang seimbang dan cemerlang berasaskan naqli dan aqli bagi menyediakan bakal ulama dan agamawan muthaqqaf (Nursafra et al., 2020). KBD juga bertujuan untuk menawarkan pendidikan agama yang berkualiti kepada murid dan memperkasakan Pendidikan Islam dalam aliran perdana (Kamarul et al., 2018). Terdapat lima bidang utama yang diajar dalam mata pelajaran KBD Usuluddin iaitu Tauhid, Tafsir, Sirah, Hadis dan Akhlak yang menggunakan bahasa arab sebagai bahasa pengantar. Buku teks yang digunakan adalah rujukan daripada kitab-kitab muktabar dalam agama Islam.

Enam penilaian asas dalam mata pelajaran KBD Usuluddin terdiri daripada penilaian objektif kurikulum, penguasaan guru dalam kemahiran Teknologi Maklumat dan Komunikasi (TMK), penguasaan bahasa Arab dalam kalangan murid, kemudahan prasarana, pendekatan pengajaran guru dan pencapaian murid. Pengkaji akan memfokuskan kepada penguasaan guru dalam TMK kerana penguasaan TMK berkait rapat dengan penggunaan AI dalam pendidikan pada masa kini.

Dapatan daripada kajian M. Fuad et al., (2018) menunjukkan bahawa aspek pengetahuan dan kemahiran TMK dalam kalangan guru SABK berada pada tahap yang sederhana. Majoriti daripada mereka seramai 79 peratus kurang menghadiri kursus TMK yang dianjurkan oleh pelbagai pihak. Dapatan ini disokong oleh Fariyah et al. 2020 yang turut menyatakan bahawa guru mempunyai perspektif yang positif terhadap penggunaan TMK tetapi penggunaannya masih berada pada tahap yang rendah terutamanya guru-guru SABK. Penggunaan TMK dalam bilik darjah dapat menjadikan pengajaran guru lebih menarik serta dapat menarik minat murid (Nurul Osman, 2022). Selain itu, gaya pengajaran guru akan dapat menjadikan murid lebih bermotivasi, memberikan kefahaman dan melatih menjadi individu yang bertanggungjawab. Oleh itu, guru perlulah meningkatkan kualiti pengajaran dan pembelajaran dengan menguasai TMK yang terkini sama ada dalam bentuk penggunaan bahan bantu mengajar, sumber pembelajaran atau pendekatan pengajaran.

Perbincangan

Cabaran Penggunaan AI Dalam Pengajaran dan Pembelajaran Kemahiran Guru Dalam Penggunaan Teknologi

Kajian yang dijalankan oleh Sylvia dan Tharshini (2024) menyatakan bahawa kemahiran guru dalam penggunaan teknologi adalah terhad. Kebanyakkan mereka berkemahiran dalam menggunakan komputer riba dan projekter. Terdapat guru yang masih takut untuk mencuba alatan dan perisian teknologi digital yang lain dengan alasan tidak tahu untuk menggunakannya. Menurut Fariyah et al., (2020), penggunaan bahan bantu mengajar (BBM) berasaskan teknologi masih berada pada tahap yang rendah. Perkara ini menunjukkan bahawa tahap penggunaan teknologi dalam kalangan guru masih berada pada tahap yang rendah terutamanya guru di sekolah menengah agama walaupun mereka mempunyai perspektif yang positif terhadap penggunaan teknologi dalam pengajaran. Oleh itu, mereka masih memilih untuk mengajar menggunakan kaedah tradisonal yang berpusatkan guru. Pengajaran yang berpusatkan guru tidak dapat menyokong konsep Pendidikan Abad ke-21 yang menekankan aspek kolaboratif, kreativiti, kritis, komunikasi dan nilai. Selain itu juga, penggunaan kaedah pengajaran tradisional tidak mampu menerapkan Kemahiran Berfikir Aras Tinggi (KBAT) dalam bilik darjah (Nursafra et al., 2020).

Penggunaan teknologi terutamanya AI boleh menyokong KBAT dalam pengajaran dan pembelajaran. KBAT diperlukan oleh murid bagi melakukan penaakulan dan refleksi untuk

berinovasi. Berdasarkan Taksonomi Bloom edisi semakan terkini, KBAT terdiri daripada kemahiran mengaplikasi, menganalisis, menilai dan mencipta. Sehubungan dengan itu, guru perlu menterjemahkan penggunaan KBAT dalam pengajaran dan pembelajaran mereka bagi merangsang kognitif murid (Wan Ali Akbar et al., 2020). Perkembangan AI juga telah memperkenalkan pelbagai sistem yang dapat memudahkan pelbagai urusan terutamanya bidang pendidikan. Seperti contoh, penggunaan sistem pengurusan pembelajaran (LMS) dan chatbot. Kurangnya kemahiran teknikal dalam mengendalikan AI juga turut menyumbang kepada penggunaan AI dalam kalangan guru (Thian & Zaimuarifuddin, 2024). Dalam kajian yang dijalankan oleh Ting dan Helmi (2024), seramai 13 orang responden sahaja daripada 73 orang responden yang merupakan guru telah memilih untuk menggunakan AI. Faktor pemilihan penggunaan AI adalah disebabkan oleh rakan sekerja dan orang atasan.

Sehubungan dengan itu, guru perlu mencari penyelesaian terhadap permasalahan ini. Tuntutan penggunaan teknologi dalam pengajaran dan pembelajaran terutamanya AI tidak dapat dielakkan lagi. Guru perlu sedar bahawa murid pada masa kini telah terdedah dengan penggunaan teknologi terutamanya gajet sejak daripada mereka kecil lagi. Penggunaan teknologi dalam pengajaran dan pembelajaran akan dapat meningkatkan minat dan motivasi murid dalam pembelajaran (Yusriza et al., 2021).

Kekurangan Kemudahan Prasarana

Prasarana yang lengkap dan mencukupi dapat menyokong penggunaan teknologi AI dalam pendidikan. Penggunaan AI memerlukan kepada penggunaan capaian internet. Tanpa capaian internet yang baik, AI tidak akan dapat diakses dan digunakan dalam pengajaran dan pembelajaran. Selain itu juga, kekurangan kemudahan dan infrastruktur di kawasan pedalaman jugat turut menyukarkan proses pengintegrasian teknologi dalam pengajaran dan pembelajaran (Alice & Rohaizat, 2024).

Kekurangan prasaran yang utama adalah capaian internet yang baik. Bagi sekolah yang berada di kawasan luar bandar khususnya, mereka sukar untuk mendapat capaian internet yang baik dan stabil. Isu Veveonah Mosibin yang merupakan seorang murid dari Sabah yang terpaksa duduk di atas pokok bagi mendapatkan capaian internet yang stabil bagi menjawab peperiksaan pernah menjadi tular pada tahun 2020 (Ibnu et al., 2021). Hal ini selari dengan dapatan kajian M Afiq dan M. Taufiq (2025) menyatakan bahawa capaian internet yang tidak baik menjadi faktor utama yang menjejaskan keberkesanan pembelajaran. Hal ini menyukarkan mereka untuk mengakses dan menggunakan aplikasi atas talian yang berasaskan AI seperti Canva dan Quizizz.

Selain itu juga, aplikasi tersebut tidak dapat diakses dan digunakan sepenuhnya kerana pengguna perlu membuat bayaran bagi mendapatkan langganan secara bulanan. Seperti contoh, untuk mengakses semua bahan Canva Premium berasaskan AI yang menawarkan pelbagai janaan gambar, video dan text secara automatik, pengguna perlu membuat langganan mengikut bayaran yang ditetapkan pada setiap bulan (Seprian et al., 2022). Oleh itu, guru memilih untuk menggunakan pakej percuma yang tidak berasaskan AI. Perkara ini akan menyebabkan guru tidak mempunyai sumber bahan pengajaran yang mencukupi (Sani et al., 2023).

Menurut Norazly dan Juppri (2021), kebanyakan negara-negara membangun seperti Malaysia masih menghadapi masalah dalam menyediakan kemudahan fizikal, sokongan dan

penyelenggaraan sumber-sumber teknologi. Selain itu juga, bilangan kemudahan peranti seperti komputer riba dan pemancar LCD masih tidak mencukupi (Sumathi et al., 2023). Murid terpaksa berkongsi peranti bersama rakan semasa pembelajaran berlangsung. Tambahan itu juga, kebanyakan peranti yang ada di sekolah-sekolah berada dalam keadaan usang dan tidak diselenggara. Terdapat juga peranti yang telah rosak dan tidak diganti. Peranti juga merupakan komponen penting yang perlu disediakan bagi menyokong keberkesanan pengajaran dan pembelajaran berasaskan teknologi.

Beban Tugas Guru

Saban tahun, beban tugas guru semakin meningkat. Beban tugas guru yang pelbagai turut mempengaruhi kualiti pengajaran guru dan pembelajaran murid. Pada masa kini, tugas guru bukan sahaja untuk mengajar di dalam kelas bahkan turut perlu menghadiri mesyuarat dan melakukan tugas-tugas pentadbiran (Gurumoorthy et al., 2023). Antara tugas luar yang perlu dilakukan oleh guru adalah mengelola program ko-akademik dan aktiviti sukan, menghadiri mesyuarat serta program-program badan kerajaan yang lain. Pertambahan tugas guru secara keseluruhannya boleh mengurangkan fokus mereka daripada melakukan tugas hakiki yang sebenar.

Menurut kajian yang dijalankan oleh Thompson.G et al., (2024), guru menggunakan kebanyakan masa mereka untuk melakukan tugas selain daripada mengajar. Hal ini menyebabkan masa guru tidak mencukupi untuk menyediakan bahan-bahan pengajaran. Tinjauan yang dijalankan oleh Alliance of Concern Teachers (ACT) Part List pada tahun 2021 menunjukkan bahawa guru bekerja selama 9 hingga 16 jam sehari disebabkan oleh beban tugas yang banyak. Selain itu juga, kajian yang dijalankan oleh Santi dan Joy (2024) menunjukkan bahawa terdapat hubungan yang positif antara beban tugas guru yang banyak dengan tahap kesihatan mental guru.

Isu kekurangan guru turut menyumbang kepada pertambahan beban tugas guru. Kekurangan guru mengikut opsyen mengakibatkan sesuatu mata pelajaran itu tidak dapat diajar dengan sebaiknya (Ismatiah et al., 2023). Oleh itu, guru bukan opsyen terpaksa mengajar mata pelajaran tersebut dan mengakibatkan jadual waktu mengajar mereka bertambah serta kekurangan masa dalam menyediakan bahan pengajaran terutamanya bahan pembelajaran berasaskan teknologi. Penyediaan bahan pengajaran berasaskan teknologi menggunakan masa yang agak lama untuk disiapkan kerana perlu menggabungkan pelbagai elemen multimedia seperti teks, audio dan media. AI boleh membantu guru dalam menyediakan bahan pengajaran dengan cepat akan tetapi bagi mata pelajaran KBD Usuluddin, setiap bahan pengajaran yang diberikan perlu disemak bagi memastikan tiada unsur penambahan dan penyelewengan terutamanya perkara yang berkaitan dengan al-Quran dan hadis. Menurut M. Khairulazfar et al., (2024), penggunaan platform AI seperti ChatGPT dalam bidang kajian al-Quran dan hadis dapat meningkatkan pengalaman pendidikan dan pembelajaran. Namun begitu, penggunaan AI tidak mampu memberikan 100 peratus maklumat yang tepat dan sahih dalam bidang al-Quran dan hadis.

Cadangan Penyelesaian***Bengkel Bimbingan Penggunaan Teknologi***

Menurut Lee (2021), tahap penggunaan teknologi rakyat Malaysia lebih tertumpu kepada penggunaan media sosial dan emel sahaja. Hal ini menunjukkan bahawa tahap penggunaan teknologi rakyat Malaysia masih berada pada tahap penggunaan asas sahaja termasuklah golongan guru sekolah. Penggunaan teknologi dalam pengajaran dan pembelajaran perlu dioptimumkan bagi memastikan manfaat teknologi dapat dirasakan oleh semua murid dan jurang teknologi dapat dikurangkan. Oleh itu, bengkel bimbingan penggunaan teknologi secara berkala dan berterusan perlu disediakan kepada semua guru. Bengkel bimbingan ini dapat melatih guru menggunakan peralatan berkaitan teknologi seterusnya menghilangkan rasa takut dan risau guru bagi menggunakan teknologi dalam pengajaran mereka.

Pentadbir sekolah memainkan peranan penting dalam mengesan tahap kemahiran penggunaan teknologi guru di sekolah. Mohd 'Adlan (2023) menyatakan bahawa pentadbir sekolah boleh menentukan guru mana yang dikehendaki menyertai bengkel bimbingan tersebut. Selain itu latihan dalam perkhidmatan (LADAP) berkaitan penggunaan teknologi boleh disampaikan kepada guru oleh Guru Pendidikan Digital yang berkemahiran yang ada di sesebuah sekolah (Geoffrey & Marlissa, 2023).

Menaiktaraf Infrastruktur Dan Prasarana Sekolah

Kemudahan infrastruktur dan prasarana di sekolah memainkan peranan penting dalam menjayakan proses pengajaran dan pembelajaran. Infrastruktur dan prasarana sekolah yang lengkap dan mencukupi dapat menyumbang kepada kelancaran aktiviti pengajaran dan pembelajaran. Antara infrastruktur dan prasarana yang perlu dititikberatkan dalam proses mengintegrasikan penggunaan teknologi dalam pengajaran khususnya penggunaan AI adalah seperti bilik komputer, peranti digital dan jaringan internet yang kuat dan stabil. Menurut Zetty et al., (2021), penggunaan teknologi dalam pendidikan menjadi pemacu ke arah pendidikan berkualiti yang lebih komprehensif selari dengan peredaran zaman. Tambahan itu juga, infrastruktur dan prasarana yang diurus dengan baik dapat membantu ke arah pembelajaran dan penyampaian kurikulum yang berkesan.

Selain itu, kewangan juga merupakan faktor utama keberkesanan pengintegrasian teknologi dalam pengajaran dan pembelajaran. Sumber kewangan yang banyak dan kukuh dapat menyediakan rangkaian internet yang stabil dan laju serta peranti digital terkini yang mencukupi untuk digunakan oleh guru dan murid di sekolah. Kewangan yang terhad akan mengakibatkan kemahiran dan produktivi yang rendah. Hal ini akan turut menyumbang kepada ketidakmampuan untuk mendapatkan pendidikan yang berkualiti (Diah & Sunarti, 2023). Oleh itu, menjadi tugas barisan pentadbiran sekolah untuk menyusun bajet serta melakukan pemantauan perbelanjaan terhadap Geran Per Kapita (PCG) yang diterima bagi memastikan kewangan yang diperoleh mencukupi dalam menyediakan dan memastikan infrastruktur dan prasarana yang kondusif di sekolah mereka (Ranjinie & Aida, 2024).

Pengurangan Beban Tugas Guru

Beban tugas yang digalas oleh seorang guru boleh mempengaruhi kualiti pengajaran guru terhadap murid. Oleh itu, antara langkah yang boleh dilakukan oleh KPM adalah dengan

mengurangkan keperluan laporan yang tidak penting dan mempermudah urusan pentadbiran (Muhammad Haniff & Nurulhuda, 2024). Laporan bagi setiap program yang perlu dilakukan akan menambahkan lagi tugas pengkeranian guru dan mengakibatkan fokus guru terhadap tugas hakiki mereka terganggu. Selain itu juga, KPM disarankan untuk menambah bilangan guru sesuai dengan bilangan murid di sesebuah sekolah. Bilangan guru yang ramai akan menyebabkan pembahagian tugas di sekolah menjadi seimbang. Tambahan itu juga, pihak pentadbir sekolah hendaklah memastikan pembahagian tugas bagi setiap guru adalah adil dan seimbang serta tidak berlebihan.

Kesimpulan

Kesimpulannya, penggunaan teknologi dalam pengajaran terutamanya AI dalam pendidikan dapat menyumbang kepada peningkatan kualiti pengajaran guru dan pembelajaran murid khususnya bagi mata pelajaran KBD Usuluddin. Guru perlu sentiasa meningkatkan pengetahuan tentang teknologi terkini bagi memastikan murid dapat merasai kebaikan pengintegrasian teknologi dalam pendidikan. Sehubungan dengan itu, pihak KPM perlu memastikan cabaran dan halangan yang dihadapi oleh guru dalam menggunakan teknologi dalam pengajaran dapat diatasi bagi memastikan kualiti pendidikan di Malaysia setanding dengan negara-negara maju yang lain. Kajian lanjutan pada masa hadapan boleh menjalankan kajian menggunakan reka bentuk kuantitatif dan mengkaji aplikasi AI yang berkesan bagi memudahkan pengajaran guru dalam bilik darjah terutamanya bagi mata pelajaran KBD Usuluddin.

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KESAN NEGATIF PENGGUNAAN MEDIA SOSIAL DALAM KALANGAN PELAJAR GENERASI ALPHA DI DAERAH SANDAKAN

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Abstrak: Dalam era globalisasi digital masa kini, penggunaan media sosial dalam kalangan pelajar generasi alpha menjadi kebiasaan dan keperluan dalam kehidupan seharian mereka. Generasi Alpha, iaitu individu yang lahir antara tahun 2010 hingga 2024, merupakan generasi pertama yang tumbuh dalam persekitaran serba canggih dan digital, serta dianggap sebagai pengguna digital asli. Akses kepada gajet pintar, internet berkelajuan tinggi serta aplikasi media sosial sejak usia awal menjadikan generasi ini lebih terdedah kepada pengaruh dan kesan langsung dunia maya dalam proses pembentukan identiti dan perkembangan sosial mereka. Sebahagian besar murid sekolah rendah semakin terdedah kepada dunia maya tanpa pemantauan ibu bapa melalui sosial Facebook, Instagram, TikTok, dan Twitter. Walaupun media sosial menjanjikan pelbagai manfaat komunikasi dan maklumat, penggunaannya yang tidak terkawal memberi kesan negatif yang tidak boleh dipandang ringan. Kertas konsep ini bertujuan untuk meneroka kesan negatif penggunaan media sosial dalam kalangan pelajar generasi alpha menerusi pendekatan kualitatif kajian kepustakaan. Metodologi kajian kepustakaan melibatkan usaha mencari dan meneliti pelbagai sumber literatur daripada jurnal, artikel, buku, dan laporan kajian yang membolehkan penulis mengenal pasti tema-tema utama isu yang berkaitan. Pendekatan ini memberi tumpuan kepada mengenal pasti antara lain isu yang dikenal pasti ialah gangguan emosi, kemerosotan hubungan sosial, ketagihan serta peningkatan risiko masalah kesihatan mental seperti kebimbangan dan kemurungan. Justeru itu, kajian ini mencadangkan agar pendekatan intervensi secara holistik digerakkan melalui kerjasama antara institusi pendidikan, ibu bapa dan komuniti setempat bagi membentuk penggunaan media sosial yang lebih seimbang dan beretika dalam kalangan generasi alpha. Implikasi penyelidikan ini diharapkan dapat memberikan sumbangan signifikan kepada pembangunan garis panduan yang lebih sistematik serta menyokong pelaksanaan intervensi pendidikan dan sosial bagi menjamin kesejahteraan generasi alpha di peringkat komuniti dan daerah.

Kata kunci: Generasi Alpha, media sosial, kesan negatif, pelajar.

Pengenalan

Perkembangan teknologi digital masa kini telah mengubah landskap kehidupan sosial, ekonomi dan pendidikan secara menyeluruh. Salah satu elemen utama dalam era digital ialah penggunaan media sosial yang menjadi sebahagian daripada kehidupan harian, terutamanya dalam kalangan generasi muda. Media sosial merujuk kepada sekumpulan aplikasi berasaskan internet yang membolehkan penciptaan, perkongsian dan pertukaran kandungan pengguna, termasuklah platform seperti TikTok, Instagram, YouTube, WhatsApp dan Facebook. Media sosial bukan sahaja berfungsi sebagai alat komunikasi dan hiburan, malah turut mempengaruhi cara pelajar memperoleh maklumat, berinteraksi sosial dan membentuk identiti diri.

Generasi Alpha, iaitu kumpulan individu yang lahir antara tahun 2010 hingga 2025, merupakan generasi pertama yang dilahirkan sepenuhnya dalam era digital dan terdedah secara langsung kepada teknologi sejak kecil. Mereka dikenali sebagai ‘digital natives’ kerana kebiasaan mereka menggunakan peranti pintar dan sambungan internet dalam kehidupan seharian. Di Malaysia, kadar penembusan internet dalam kalangan kanak-kanak dan remaja adalah sangat tinggi. Laporan UNICEF (2020) menunjukkan bahawa sembilan daripada sepuluh kanak-kanak berumur 5 hingga 17 tahun adalah pengguna internet aktif, dan majoritinya memiliki akaun media sosial seawal usia 13 tahun.

Meskipun media sosial menawarkan banyak kelebihan seperti mempercepatkan akses kepada maklumat, meningkatkan kreativiti dan meluaskan jaringan komunikasi, penggunaannya yang tidak terkawal turut menimbulkan kebimbangan yang serius. Dalam konteks pendidikan, terdapat bukti yang menunjukkan bahawa penggunaan media sosial secara berlebihan boleh menjejaskan tumpuan dalam pembelajaran, menurunkan prestasi akademik, mempengaruhi kesejahteraan emosi serta membentuk tingkah laku sosial yang negatif seperti buli siber dan ketagihan gajet.

Justeru, kajian ini dijalankan untuk meneliti secara menyeluruh kesan negatif penggunaan media sosial terhadap pelajar Generasi Alpha. Kajian ini juga bertujuan untuk mengenal pasti hubungan antara tahap penggunaan media sosial dengan prestasi akademik serta tingkah laku pelajar, di samping mencadangkan intervensi yang sesuai bagi membendung kesan yang tidak diingini. Dengan memahami cabaran sebenar yang dihadapi oleh generasi ini, diharapkan dapatan kajian ini dapat menyumbang kepada pembentukan dasar dan amalan pendidikan yang lebih holistik dan responsif terhadap keperluan semasa.

Sorotan Literatur

Media sosial merujuk kepada platform digital yang membolehkan interaksi dua hala dan perkongsian kandungan secara masa nyata antara pengguna. Kaplan dan Haenlein (2010) mendefinisikan media sosial sebagai aplikasi berasaskan internet yang dibina menggunakan prinsip Web 2.0 dan membolehkan penciptaan serta pertukaran kandungan yang dijana oleh pengguna. Dalam kalangan pelajar, platform seperti TikTok, YouTube, Instagram dan WhatsApp menjadi pilihan utama kerana sifatnya yang interaktif, visual dan mudah diakses.

Generasi Alpha merupakan kelompok individu yang lahir antara tahun 2010 hingga 2025. Mereka dilahirkan dalam era teknologi canggih dan membesar dengan peranti pintar, internet, serta kandungan digital sebagai sebahagian daripada pengalaman harian. McCrindle (2021) menyatakan bahawa generasi ini mempunyai tahap kebergantungan yang tinggi terhadap teknologi dan mengadaptasi media sosial sebagai medium utama komunikasi, pembelajaran dan hiburan. Walau bagaimanapun, tahap kematangan kognitif dan emosi mereka yang masih berkembang menjadikan mereka lebih terdedah kepada pengaruh negatif dari media digital yang tidak disaring dengan betul.

Kesan Negatif Penggunaan Media Sosial

Walaupun media sosial mempunyai potensi sebagai alat sokongan pembelajaran dan pembangunan sendiri, penggunaan secara berlebihan dan tanpa bimbingan boleh membawa

pelbagai kesan negatif. Empat aspek utama kesan negatif yang dikenal pasti berdasarkan kajian lepas adalah seperti berikut:

Kekangan Teknologi

Pelajar di kawasan luar bandar sering berdepan dengan akses internet yang tidak stabil, kekurangan peranti pintar dan kemudahan teknologi yang terhad. Menurut Kemp (2023), jurang digital antara bandar dan luar bandar di Malaysia masih wujud dan boleh menjejaskan penggunaan media sosial secara produktif. Akibatnya, pelajar cenderung menggunakan media sosial untuk tujuan hiburan semata-mata berbanding pembelajaran, di samping terdedah kepada kandungan yang tidak sesuai kerana tiada sistem kawalan atau perlindungan siber yang kukuh.

Kurangnya Latihan Guru dan Peranan Ibu Bapa

Salah satu punca utama penyalahgunaan media sosial oleh pelajar ialah kurangnya kesedaran dan bimbingan daripada guru serta ibu bapa. Kajian oleh Sulong dan Sulong (2022) menunjukkan bahawa ramai guru tidak menerima latihan khusus berkaitan literasi digital atau keselamatan dalam talian. Ibu bapa pula sering tidak memahami aplikasi yang digunakan oleh anak-anak mereka, menyebabkan pemantauan menjadi sukar. Kekurangan ini membuka ruang kepada ketagihan gajet, kebergantungan terhadap media sosial, dan pengabaian tanggungjawab akademik.

Kekangan Masa dan Kandungan Tidak Sesuai

Media sosial juga terbukti menyebabkan pelajar kurang tidur, hilang tumpuan dalam kelas, serta mempunyai kecenderungan untuk menangguh kerja sekolah. Twenge et al. (2019) mendapati bahawa penggunaan media sosial melebihi tiga jam sehari meningkatkan risiko kemurungan, keresahan dan isolasi sosial dalam kalangan remaja. Kandungan yang tidak ditapis dan algoritma yang menyasarkan minat pengguna juga menjadikan pelajar sukar menapis maklumat sahih daripada palsu atau berunsur negatif.

Ketidaksediaan Pelajar dari Segi Emosi dan Etika

Pelajar Generasi Alpha masih dalam proses membentuk identiti dan belum cukup matang dari segi emosi. Mereka mudah terpengaruh dengan trend viral atau budaya popular yang tidak selari dengan nilai murni. Kajian oleh Malaysian Youth Council (Jufitri Joha et al., 2022) menunjukkan bahawa tekanan sosial untuk mendapatkan perhatian dalam talian, seperti 'likes' dan 'followers', boleh mengakibatkan tekanan emosi, imej sendiri yang tidak stabil dan gangguan tingkah laku.

Rangka Kerja Konseptual

Kajian ini berasaskan dua kerangka teori utama yang saling melengkapi, iaitu Model Motivasi ARCS oleh Keller (1987) dan Model TPACK oleh Mishra dan Koehler (2006). Gabungan kedua-dua model ini menyediakan asas konseptual yang mantap bagi memahami bagaimana motivasi pelajar, keupayaan pendidik, serta penggunaan teknologi berinteraksi dalam membentuk kesan penggunaan media sosial terhadap pelajar Generasi Alpha. Model ARCS

menumpukan kepada aspek motivasi pelajar dalam proses pembelajaran, manakala Model TPACK menekankan integrasi pengetahuan teknologi, pedagogi, dan kandungan dalam kalangan guru. Kerangka ini membolehkan kajian menilai bukan sahaja faktor pelajar tetapi juga peranan guru sebagai pembimbing digital dalam era pendidikan maya.

ARCS Motivation Model

Model ARCS (Attention, Relevance, Confidence, Satisfaction) dibangunkan oleh John Keller bertujuan untuk meningkatkan motivasi pelajar. Dalam konteks kajian ini, elemen-elemen ARCS digunakan untuk memahami bagaimana media sosial mempengaruhi tumpuan, minat, keyakinan diri dan tahap kepuasan pelajar dalam pembelajaran.

- **Attention (Perhatian):** Media sosial cenderung menarik perhatian pelajar dengan kandungan visual yang pantas dan menyeronokkan seperti video TikTok atau permainan mudah alih. Ini menyebabkan gangguan tumpuan dalam bilik darjah kerana pelajar terbiasa dengan rangsangan yang cepat dan berterusan (Zimmerman, 2020).
- **Relevance (Kesesuaian):** Kandungan pembelajaran sering dilihat tidak relevan jika dibandingkan dengan kandungan media sosial yang lebih menarik dan berkaitan dengan dunia sebenar. Ketidakesesuaian ini menyumbang kepada hilangnya minat terhadap pelajaran (Chen et al., 2019).
- **Confidence (Keyakinan):** Penerimaan sosial dalam talian melalui 'likes' atau 'followers' kadangkala memberi gambaran palsu tentang keyakinan diri pelajar. Namun, mereka mungkin kurang bersedia menghadapi cabaran akademik sebenar di sekolah (Valkenburg & Peter, 2011).
- **Satisfaction (Kepuasan):** Media sosial memberi ganjaran segera, menyebabkan pelajar lebih menghargai kepuasan jangka pendek berbanding usaha jangka panjang seperti belajar dan mengulang kaji (Przybylski et al., 2013).

TPACK Framework

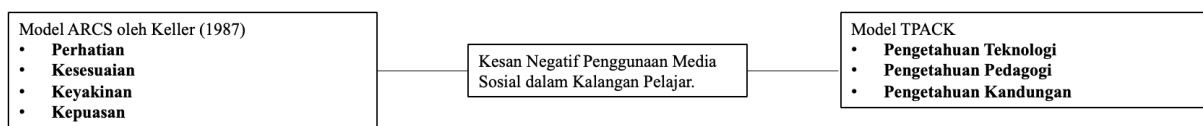
Model TPACK (Technological Pedagogical Content Knowledge) menggabungkan tiga komponen pengetahuan penting untuk pengajaran berkesan dalam era digital:

- **Technological Knowledge (TK):** Merujuk kepada kecekapan guru dalam menggunakan teknologi dan media sosial sebagai alat pembelajaran. Kekurangan pendedahan menyebabkan guru tidak dapat membimbing pelajar dengan efektif (Sulong & Sulong, 2022).
- **Pedagogical Knowledge (PK):** Melibatkan pemahaman guru terhadap kaedah dan pendekatan pengajaran yang sesuai. Pendekatan tradisional tanpa penyesuaian digital menyebabkan pelajar hilang minat dan beralih kepada kandungan luar (Koh et al., 2014).
- **Content Knowledge (CK):** Penguasaan terhadap isi kandungan membolehkan guru mengolah bahan pembelajaran dengan lebih menarik menggunakan media digital. Guru yang menguasai TPACK dapat menyampaikan pelajaran dengan cara yang kompetitif berbanding kandungan media sosial.

Konseptualisasi Rangka Kerja Kajian

Gabungan Model ARCS dan TPACK membentuk satu kerangka kerja konseptual yang menyeluruh bagi memahami kesan negatif media sosial dalam konteks pendidikan. ARCS menjelaskan pengaruh dalaman terhadap motivasi dan tingkah laku pelajar, manakala TPACK menggariskan keperluan sokongan luaran daripada guru dalam membentuk penggunaan media yang sihat dan beretika.

Kerangka ini menjadi panduan dalam pembangunan instrumen soal selidik, pengumpulan data serta analisis hubungan antara tahap penggunaan media sosial dengan prestasi akademik dan tingkah laku pelajar. Ia juga membantu dalam merumuskan cadangan intervensi yang bersifat holistik dan bersesuaian dengan realiti pendidikan masa kini.



Metodologi Kajian Reka Bentuk Kajian

Kajian ini menggunakan pendekatan **kualitatif** melalui **reka bentuk kajian kepustakaan**. Pendekatan ini dipilih kerana ia membolehkan penyelidik meneroka secara mendalam kesan negatif penggunaan media sosial dalam kalangan pelajar Generasi Alpha berdasarkan penilaian terhadap sumber-sumber literatur yang relevan dan terkini. Kajian ini tidak melibatkan sebarang manipulasi pemboleh ubah atau pengumpulan data lapangan, sebaliknya memfokuskan kepada analisis kandungan daripada dokumen ilmiah sedia ada bagi memahami isu dari pelbagai sudut seperti sosial, emosi, psikologi, dan pendidikan.

Sumber Data dan Kriteria Pemilihan

Sumber data dalam kajian ini terdiri daripada **artikel jurnal akademik, laporan penyelidikan, buku ilmiah, tesis, dan dokumen berkaitan** yang diperoleh daripada pangkalan data dalam talian seperti Google Scholar, Scopus, ResearchGate, dan laman institusi pendidikan tinggi. Kriteria pemilihan dokumen adalah berdasarkan kesesuaian dengan topik kajian, kebaruan (terbit antara tahun 2018 hingga 2024), serta tahap kesahihan dan kebolehpercayaan penerbitan. Fokus utama diberikan kepada literatur yang membincangkan hubungan antara penggunaan media sosial dan kesan terhadap pelajar, khususnya dalam kalangan Generasi Alpha.

Kaedah Analisis Data

Data dianalisis menggunakan **kaedah analisis kandungan** (content analysis) dengan pendekatan **analisis tematik**. Langkah-langkah analisis melibatkan:

- Pengumpulan dan pemilihan dokumen yang relevan berdasarkan kriteria topik, tahun penerbitan dan autoriti sumber.
- Pembacaan kritikal terhadap isi kandungan setiap sumber.



- Pengekoden maklumat penting berkaitan kesan negatif penggunaan media sosial.
- Pengenalpastian tema dan subtema utama seperti kesan terhadap emosi, tingkah laku, kesihatan mental, hubungan sosial, dan pencapaian akademik.
- Penyusunan dapatan mengikut pola dan kategori untuk menghasilkan gambaran menyeluruh.

Melalui kaedah ini, penyelidik dapat mengenal pasti pelbagai dapatan empirikal dan konseptual daripada kajian terdahulu untuk disintesis sebagai asas hujahan dalam kajian ini.

Perbincangan

Kajian ini mengenal pasti beberapa kesan negatif utama penggunaan media sosial dalam kalangan pelajar Generasi Alpha. Hasil analisis menunjukkan bahawa terdapat hubungan yang signifikan antara tahap penggunaan media sosial dengan penurunan prestasi akademik serta peningkatan gangguan tingkah laku. Pelajar yang menggunakan media sosial secara berlebihan cenderung mengalami masalah tumpuan, prestasi rendah dalam ujian, serta gangguan emosi seperti keresahan dan kemurungan.

Dalam konteks pendidikan luar bandar, kekangan teknologi dan ketidaksediaan guru serta ibu bapa untuk membimbing penggunaan media sosial secara bijak turut menyumbang kepada isu ini. Oleh itu, beberapa strategi dan cadangan penambahbaikan dicadangkan bagi menangani cabaran ini secara holistik.

Cadangan Penambahbaikan

Meningkatkan Infrastruktur Teknologi di Sekolah

Kerajaan perlu melengkapkan sekolah luar bandar dengan internet berkelajuan tinggi, makmal komputer moden, dan peranti digital terkawal. Infrastruktur ini bukan sahaja menyokong pembelajaran digital, tetapi dapat mengalihkan tumpuan pelajar daripada kandungan hiburan kepada kandungan pendidikan.

Latihan Literasi Digital untuk Guru dan Ibu Bapa

Guru perlu diberikan latihan profesional secara berkala berkaitan literasi digital dan pedagogi berasaskan teknologi. Begitu juga ibu bapa harus diberikan pendedahan tentang aplikasi media sosial serta strategi pemantauan berkesan. Program seperti bengkel keibubapaan digital dan kursus TPACK in-action disarankan.

Pelaksanaan Kurikulum Literasi Media Sosial

Pihak sekolah perlu memperkenalkan kurikulum atau modul literasi media digital untuk murid tahap 2 dan menengah rendah. Modul ini boleh merangkumi aspek seperti keselamatan siber, etika digital, dan pengurusan masa skrin.

Pendekatan Pedagogi Inovatif

Guru digalakkan menggunakan media sosial secara berpandu dalam pengajaran melalui kaedah seperti video pendek ilmiah, projek TikTok Edu atau blog pembelajaran. Kaedah ini dapat menyaingi tarikan media sosial sambil menyampaikan isi pelajaran yang bernilai.

Sokongan Komuniti dan Kempen Kesedaran

Pihak komuniti, termasuk PIBG dan NGO tempatan, boleh bekerjasama dalam menganjurkan kempen kesedaran digital, ceramah keselamatan siber dan pertandingan kreatif yang mendidik pelajar tentang penggunaan media sosial secara positif.

Cabaran	Penerangan	Cadangan Intervensi
Infrastruktur Teknologi Terhad	Akses internet perlahan dan kekurangan peranti digital di sekolah	Sediakan internet berkelajuan tinggi dan peranti digital selamat
Literasi Digital Guru dan Ibu Bapa	Kurang kemahiran dalam bimbingan dan pemantauan kandungan media sosial	Latihan TPACK dan bengkel keibubapaan digital
Pengurusan Masa dan Ketagihan Gajet	Pelajar kurang kawalan dalam penggunaan masa atas talian	Modul literasi masa skrin dan pengurusan sendiri
Gangguan Emosi dan Tingkah Laku	Tekanan sosial, keresahan, buli siber dan ketagihan validasi dalam talian	Pendidikan kesihatan mental dan etika digital
Kandungan Tidak Sesuai dan Tidak Ditapis	Pendedahan kepada kandungan lucuh, ganas, atau tidak sesuai usia	Penapisan kandungan dan pendidikan nilai moral

Perbincangan ini memperlihatkan bahawa isu penggunaan media sosial dalam kalangan pelajar bukan hanya tertumpu kepada individu, tetapi turut melibatkan ekosistem pendidikan dan sosial yang lebih luas. Oleh itu, penyelesaian haruslah melibatkan kerjasama pelbagai pihak secara bersepadu.

Kesimpulan

Kajian ini telah meneliti secara mendalam kesan negatif penggunaan media sosial dalam kalangan pelajar Generasi Alpha. Hasil dapatan menunjukkan bahawa penggunaan media sosial yang tidak terkawal memberi impak signifikan terhadap prestasi akademik dan perkembangan sahsiah pelajar. Isu seperti gangguan tumpuan, ketagihan gajet, keresahan emosi, buli siber, serta penurunan motivasi dalam pembelajaran merupakan antara implikasi utama yang dikenal pasti. Dalam masa yang sama, faktor luaran seperti kekurangan infrastruktur teknologi, ketidaksediaan guru dalam penggunaan pedagogi digital, serta pemantauan yang lemah daripada ibu bapa turut memburukkan lagi keadaan.

Melalui gabungan Model ARCS dan TPACK sebagai kerangka konseptual, kajian ini berjaya merungkai bagaimana faktor dalaman seperti motivasi dan keyakinan pelajar, serta faktor luaran seperti kecekapan guru dalam mengintegrasikan teknologi, saling mempengaruhi corak penggunaan media sosial pelajar. Model ARCS membantu menjelaskan gangguan pada aspek perhatian, kesesuaian, keyakinan dan kepuasan dalam pembelajaran, manakala Model TPACK menerangkan keperluan terhadap pengetahuan teknologi, pedagogi dan kandungan dalam kalangan guru agar dapat membimbing pelajar dengan lebih berkesan.

Kesimpulannya, penggunaan media sosial bukanlah suatu ancaman mutlak jika dikendalikan secara berhemah dan berpandukan prinsip pendidikan yang seimbang. Sebaliknya, ia boleh dimanfaatkan sebagai alat sokongan pembelajaran jika pelajar diberi bimbingan yang tepat, guru diberi latihan yang mencukupi, dan ibu bapa memainkan peranan aktif dalam pemantauan. Oleh itu, adalah menjadi tanggungjawab bersama pihak sekolah, komuniti, dan pembuat dasar untuk membina ekosistem pendidikan digital yang lebih selamat, inklusif dan beretika.

Dapatan kajian ini diharapkan dapat menyumbang kepada pembangunan dasar, program intervensi, dan kurikulum pendidikan yang lebih responsif terhadap cabaran era digital dalam kalangan generasi muda. Kajian lanjutan juga dicadangkan agar dapat meneliti aspek lain seperti kesan jangka panjang penggunaan media sosial terhadap kesihatan mental dan kesejahteraan sosial pelajar di pelbagai kawasan luar bandar di Malaysia.

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CABARAN PENGINTEGRASIAN TEKNOLOGI MAKLUMAT (IT) DALAM KALANGAN GURU JAIS

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Abstrak: Pada era digital masa kini, penggunaan Teknologi Maklumat (IT) telah merentasi pelbagai bidang termasuk pendidikan, dan menjadi satu keperluan penting dalam menyampaikan maklumat serta memudahkan urusan semua pihak. Kajian ini bertujuan untuk menganalisis cabaran dalam pengintegrasian teknologi maklumat dalam kalangan guru yang bernaung di bawah Jabatan Agama Islam Selangor (JAIS). Kajian adalah kajian kepustakaan. Hasil kajian menunjukkan bahawa pengintegrasian teknologi maklumat dalam kalangan guru JAIS masih menghadapi pelbagai kekangan yang memerlukan penambahbaikan. Cabaran-cabaran ini merangkumi faktor dalaman seperti tahap kemahiran, sikap, dan motivasi guru, serta faktor luaran seperti sokongan infrastruktur dan latihan berterusan. Dapatan kajian ini diharapkan dapat menjadi asas kepada JAIS dalam merangka strategi penambahbaikan yang komprehensif ke arah memperkasa penggunaan teknologi maklumat dalam kalangan guru, selaras dengan aspirasi Dasar Pendidikan Digital Kebangsaan demi meningkatkan mutu pendidikan Islam di Selangor.

Kata Kunci: Teknologi Maklumat, Pengintegrasian, Pendidikan, JAIS, Dasar Pendidikan.

Pendahuluan

Dalam era globalisasi, penggunaan Teknologi Maklumat (IT) dalam pendidikan telah menjadi satu keperluan untuk meningkatkan kualiti pengajaran dan pembelajaran. Guru di bawah Jabatan Agama Islam Selangor (JAIS) turut tidak terlepas daripada cabaran dalam mengintegrasikan IT dalam pengajaran mereka. Walaupun IT dapat mempertingkatkan keberkesanan penyampaian ilmu, terdapat pelbagai halangan yang perlu dihadapi oleh guru JAIS dalam mengaplikasikan teknologi ini secara menyeluruh dalam sistem pendidikan Islam. Oleh itu, kajian ini bertujuan untuk mengenal pasti cabaran utama yang dihadapi oleh guru JAIS dalam penggunaan IT serta mencadangkan penyelesaian yang sesuai.

Selain itu, integrasi teknologi maklumat memerlukan guru bukan sahaja menguasai kemahiran asas komputer, malah turut berkeupayaan memanfaatkan pelbagai aplikasi digital dalam proses pengajaran dan pembelajaran yang bersifat interaktif, kolaboratif dan berpusatkan pelajar (Yusop, 2020). Namun begitu, walaupun pelbagai latihan dan program peningkatan profesionalisme guru telah dilaksanakan, masih terdapat jurang dari segi kesediaan guru dalam memanfaatkan teknologi secara optimum, khususnya dalam kalangan guru pendidikan Islam (Norazah, 2021).

Kajian lepas mendapati bahawa antara halangan utama kepada pengintegrasian teknologi dalam kalangan guru agama termasuklah kekangan kemudahan infrastruktur, sikap dan tahap literasi digital yang rendah serta kurangnya sokongan dari pihak pengurusan sekolah atau

jabatan (Zamri et al., 2023). Tambahan pula, faktor usia, beban kerja serta persepsi bahawa IT tidak begitu relevan dalam subjek berbentuk tradisional seperti Fardhu Ain, Akidah atau al-Quran turut menghalang guru untuk berinovasi dalam pendekatan pengajaran mereka (Mokhtar & Halim, 2022).

Situasi ini memperlihatkan satu keperluan yang mendesak untuk meneliti secara mendalam cabaran sebenar yang dihadapi oleh guru di bawah pentadbiran JAIS, khususnya dalam konteks pengajaran mata pelajaran pendidikan Islam. Penyelidikan ini juga dapat menyumbang kepada pemahaman lebih menyeluruh tentang keperluan latihan, sokongan sistemik dan perubahan dasar bagi memastikan pelaksanaan teknologi secara lebih berkesan dan menyeluruh di sekolah-sekolah agama negeri Selangor.

Memandangkan JAIS memainkan peranan utama dalam menyelia pendidikan agama negeri, sebarang cabaran dalam kalangan gurunya akan memberi kesan langsung terhadap mutu pengajaran pendidikan Islam secara keseluruhan. Justeru, kajian ini penting untuk mengenal pasti dimensi cabaran tersebut secara empirik dan mencadangkan intervensi yang bersesuaian dengan konteks tempatan.

Kajian Literatur

Penggunaan IT dalam Pendidikan Islam

Pendidikan Islam semakin berkembang dengan penggunaan teknologi moden. IT digunakan dalam pelbagai aspek seperti pembelajaran dalam talian, bahan bantu mengajar digital, serta sistem pengurusan pembelajaran. Kajian oleh Roslina et al. (2022), menunjukkan bahawa penggunaan IT dapat meningkatkan minat pelajar terhadap pembelajaran agama.

Perkembangan ini pesat seiring dengan kemajuan teknologi maklumat (IT), yang telah membuka pelbagai ruang inovasi dalam kaedah penyampaian ilmu. IT kini digunakan secara meluas dalam pelbagai aspek, antaranya pembelajaran dalam talian (*online learning*), penggunaan bahan bantu mengajar digital seperti video interaktif, animasi, kuiz dalam talian serta penggunaan platform pengurusan pembelajaran seperti Google Classroom, MOOC, dan LMS yang membolehkan guru merancang, melaksanakan dan menilai pembelajaran secara sistematik dan mesra pengguna.

Menurut kajian oleh Roslina et al. (2022), penggunaan teknologi dalam pendidikan Islam mampu meningkatkan motivasi dan minat pelajar terhadap subjek agama, yang sebelum ini sering dianggap kaku dan tidak menarik. Teknologi juga dilihat mampu menghidupkan kembali suasana kelas dengan pendekatan visual, audio dan interaktif yang lebih dinamik, khususnya apabila diaplikasikan dalam pengajaran al-Quran dan Fardhu Ain. Tambahan pula, penggunaan IT dapat memudahkan guru untuk menyampaikan isi kandungan secara lebih fleksibel dan berkesan, terutamanya dalam konteks pasca-pandemik yang menuntut pengajaran jarak jauh secara digital.

Kajian oleh Mokhtar dan Halim (2022) turut mendapati bahawa apabila teknologi dimanfaatkan dengan betul, ia bukan sahaja meningkatkan kefahaman pelajar tetapi turut menyokong pembangunan sahsiah mereka melalui kandungan Islamik yang menarik dan mudah diakses. Justeru, integrasi IT dalam pendidikan Islam bukan lagi pilihan tetapi suatu

keperluan dalam memastikan kurikulum agama kekal relevan dan efektif dalam mendepani cabaran pendidikan abad ke-21.

Cabaran dalam Pengintegrasian IT

Walaupun teknologi maklumat (IT) mampu mempertingkatkan kualiti dan keberkesanan pengajaran serta pembelajaran, namun pelbagai cabaran masih membelenggu pelaksanaannya khususnya dalam konteks pendidikan Islam di bawah Jabatan Agama Islam Selangor (JAIS). Cabaran-cabaran ini wujud dalam pelbagai bentuk, melibatkan faktor kemahiran, infrastruktur, masa, dan beban kerja guru.

Pertama kekurangan kemahiran IT dalam kalangan guru merupakan antara halangan utama yang sering dilaporkan dalam kajian-kajian terdahulu. Ramai guru agama dilihat masih kurang didedahkan dengan penggunaan perisian pembelajaran, platform pembelajaran digital dan aplikasi teknologi pendidikan. Hal ini menyebabkan mereka berasa tidak yakin atau enggan untuk meneroka pendekatan pengajaran berasaskan teknologi. Kajian oleh Norazman dan Nordin (2021) mendapati bahawa ketidakcekapan guru dalam mengendalikan teknologi adalah antara sebab utama kadar penggunaan IT dalam pendidikan Islam masih rendah, meskipun kemudahan asas telah disediakan. Tambahan pula, kurangnya latihan berterusan berkaitan pedagogi digital menyumbang kepada jurang kompetensi guru dalam mendepani tuntutan pengajaran abad ke-21 (Jamil & Wahab, 2020).

Kedua keterbatasan akses terhadap peralatan dan infrastruktur IT di sekolah-sekolah agama, terutamanya yang berada di kawasan luar bandar, turut menjejaskan keberkesanan pengintegrasian teknologi. Masih terdapat sekolah yang mempunyai akses terhad kepada komputer, sambungan internet yang lemah serta kekurangan sokongan teknikal. Keadaan ini mengakibatkan guru sukar untuk melaksanakan pengajaran berasaskan teknologi walaupun mempunyai kesedaran dan kemahuan. Menurut kajian oleh Hafidz et al. (2022), sekolah agama menghadapi kesukaran untuk memperoleh peruntukan peralatan teknologi terkini berbanding sekolah aliran perdana kerana faktor kekangan kewangan dan keutamaan dasar.

Ketiga beban kerja guru yang tinggi juga dilihat sebagai faktor penghalang kepada penguasaan dan penggunaan IT secara konsisten. Guru bukan sahaja perlu mengendalikan tugas pengajaran harian, tetapi juga terlibat dengan aktiviti kokurikulum, pentadbiran serta urusan laporan. Kesibukan ini menyebabkan mereka tidak mempunyai masa yang cukup untuk mengikuti latihan teknologi atau meneroka aplikasi baharu dalam proses PdPc. Menurut Aziz dan Jalil (2021), ramai guru menyatakan bahawa walaupun mereka menyedari potensi IT dalam mempertingkatkan mutu pengajaran, tetapi kekangan masa menjadi penghalang utama kepada pelaksanaannya secara menyeluruh.

Keempat tahap motivasi dan sikap guru terhadap penggunaan teknologi turut menjadi cabaran yang signifikan. Terdapat sebahagian guru yang menunjukkan sikap pasif terhadap penggunaan teknologi dalam pengajaran dan lebih selesa menggunakan kaedah konvensional. Faktor umur, kebiasaan dengan pendekatan tradisional, serta kebimbangan terhadap kesan penggunaan teknologi terhadap peranan guru turut mempengaruhi sikap ini. Kajian oleh Zainuddin dan Abdul Aziz (2020) mendapati bahawa guru yang lebih berusia cenderung untuk menunjukkan keengganan dalam menerapkan IT dalam PdPc kerana beranggapan ia menyulitkan dan tidak mesra pengguna. Tambahan pula, persepsi bahawa teknologi hanya

sesuai digunakan dalam mata pelajaran sains atau teknikal turut menyumbang kepada keraguan terhadap keberkesanannya dalam pendidikan Islam.

Kelima kurangnya sokongan pentadbiran dan pengurusan sekolah turut menjadi faktor penghalang kepada pengintegrasian IT secara efektif. Walaupun sesetengah guru berminat dan bersedia untuk menerapkan teknologi, namun jika tidak mendapat galakan serta peruntukan masa dan sumber daripada pihak pentadbiran, usaha tersebut akan terbantut. Kajian oleh Hashim et al. (2021) menegaskan bahawa kepimpinan sekolah memainkan peranan penting dalam mempengaruhi budaya penggunaan teknologi. Kepimpinan yang tidak proaktif dalam memperkasa digitalisasi pendidikan akan menyebabkan inisiatif penggunaan IT bersifat separa dan tidak menyeluruh.

Keenam ketiadaan dasar khusus atau garis panduan yang jelas daripada pihak berautoriti agama, seperti JAIS atau KPM, dalam pelaksanaan penggunaan IT dalam pendidikan Islam juga menimbulkan kekaburan dalam kalangan guru. Ini menyebabkan guru kurang yakin untuk menggunakan teknologi secara aktif kerana bimbang tidak selari dengan garis panduan yang ditetapkan. Menurut kajian oleh Basri dan Omar (2023), ketiadaan dokumen polisi yang mengkhususkan peranan IT dalam pendidikan agama menyukarkan guru untuk merangka pendekatan PdPc digital yang sesuai. Keadaan ini berbeza dengan guru aliran perdana yang sering menerima kemaskini dasar dan latihan berkala berkaitan transformasi digital pendidikan.

Ketujuh kekangan dari sudut sumber kewangan juga memainkan peranan yang besar. Banyak sekolah agama kerajaan negeri dan sekolah swasta Islam beroperasi dengan bajet yang terhad, yang memberi kesan langsung kepada kemampuan mereka untuk menaik taraf kemudahan teknologi seperti komputer riba, projektor, capaian internet, serta pembelian perisian berlesen. Sumber kewangan yang terhad ini tidak hanya menghadkan infrastruktur, tetapi turut menghalang guru untuk menghadiri latihan atau seminar teknologi. Hal ini disokong oleh kajian Shahrir dan Mohamad (2022) yang mendapati bahawa ketidakseimbangan agihan sumber antara sekolah kerajaan dan sekolah agama negeri menyebabkan jurang digital yang semakin melebar.

Kelapan isu keselamatan data dan privasi semasa menggunakan teknologi juga menjadi kerisauan sesetengah guru, khususnya apabila melibatkan pelajar di bawah umur. Guru bimbang akan kebocoran maklumat peribadi, penyalahgunaan gambar, serta pendedahan pelajar kepada kandungan luar kawalan apabila pengajaran dijalankan secara dalam talian. Menurut Nasir dan Halim (2021), kebimbangan ini lebih ketara dalam kalangan guru agama kerana mereka berusaha menjaga adab dan etika dalam pengajaran agar selari dengan syariat Islam.

Secara keseluruhan, walaupun IT mempunyai potensi besar dalam memperkasakan pendidikan Islam, namun tanpa usaha bersepadu untuk menangani cabaran-cabaran tersebut, pengintegrasian teknologi dalam kalangan guru JAIS akan terus terbantut dan tidak mencapai impak yang optimum.

Cadangan

Sokongan dan Strategi Pengintegrasian IT

Bagi memastikan keberkesanan penggunaan Teknologi Maklumat (IT) dalam pendidikan Islam, khususnya dalam kalangan guru JAIS, beberapa strategi sokongan dan penyelesaian perlu dirancang dan dilaksanakan secara holistik. Hal ini penting supaya cabaran yang telah dikenal pasti dalam pengintegrasian IT dapat diatasi secara sistematik dan berkesan.

Pertama **latihan berterusan dan pembangunan profesionalisme guru** perlu diberi keutamaan. Latihan yang berfokus kepada kemahiran teknikal, pedagogi digital, serta penggunaan aplikasi pembelajaran moden akan meningkatkan keyakinan dan kecekapan guru dalam menggunakan IT. Latihan ini juga harus disesuaikan mengikut tahap penguasaan dan keperluan sebenar guru agar lebih berkesan. Kajian oleh Ahmad dan Yunus (2021) menunjukkan bahawa program pembangunan profesional yang berterusan mampu meningkatkan tahap kemahiran guru dalam mengintegrasikan teknologi dalam PdPc (Ahmad & Yunus, 2021). Selain itu, sistem bimbingan dan mentor digital antara guru yang berpengalaman dan kurang mahir juga boleh menjadi kaedah efektif untuk membina budaya pembelajaran teknologi secara kolaboratif.

Kedua **peningkatan dan penyediaan infrastruktur teknologi** yang memadai harus menjadi keutamaan pihak pengurusan sekolah dan jabatan pendidikan agama. Ini termasuk kemudahan capaian internet yang stabil, peralatan seperti komputer, projektor, dan perisian pembelajaran yang relevan dan terkini. Infrastruktur yang lengkap dapat memudahkan guru menggunakan pelbagai sumber digital dalam pengajaran mereka (Hashim et al., 2021). Pengurusan juga perlu menyediakan ruang khusus seperti makmal komputer atau bilik IT yang kondusif untuk latihan dan pengajaran berasaskan teknologi.

Ketiga **penglibatan dan sokongan aktif daripada pihak pentadbiran sekolah dan jabatan** adalah sangat kritikal dalam menggalakkan budaya penggunaan IT. Kepimpinan yang menyokong akan menyediakan masa yang mencukupi untuk guru menghadiri latihan dan bereksperimen dengan teknologi tanpa tekanan beban kerja yang berlebihan. Menurut Basri dan Omar (2023), kepimpinan yang berwawasan akan memberi insentif serta pengiktirafan kepada guru yang cemerlang dalam penggunaan IT, sekaligus memotivasikan yang lain untuk turut sama maju (Basri & Omar, 2023). Di samping itu, pengurusan perlu mengadakan sesi dialog dan maklum balas secara berkala bagi mengenal pasti masalah dan cabaran yang dihadapi guru dalam proses pengintegrasian teknologi.

Keempat bagi mengatasi masalah kekangan sumber kewangan, **kerjasama dengan agensi luar, sektor swasta, dan komuniti setempat** boleh dipertimbangkan. Skim pembiayaan, sumbangan peralatan, serta program tanggungjawab sosial korporat (CSR) daripada syarikat teknologi atau pihak NGO dapat membantu meningkatkan akses dan kualiti sumber IT di sekolah. Menurut Shahrir dan Mohamad (2022), pendekatan kolaboratif ini mampu menjana dana dan sumber alternatif yang membantu mengurangkan beban kewangan sekolah (Shahrir & Mohamad, 2022).

Kelima untuk mengatasi isu sikap negatif dan kurang motivasi dalam kalangan guru, **program kesedaran dan perubahan budaya digital** harus diimplementasikan. Ini boleh berbentuk seminar motivasi, perkongsian kejayaan guru lain, dan pendedahan kepada trend teknologi

pendidikan yang relevan. Kajian Nasir dan Halim (2021) menyarankan pendekatan psikososial yang menekankan faedah jangka panjang dan keperluan penyesuaian diri dalam era digital agar guru lebih terbuka dan positif terhadap perubahan (Nasir & Halim, 2021).

Keenam penyesuaian kandungan kurikulum dengan teknologi salah satu langkah penting dalam menyokong pengintegrasian teknologi dalam pendidikan Islam. Kandungan pembelajaran yang terlalu bersifat tradisional dan bersumberkan teks sahaja boleh menyukarkan integrasi IT secara berkesan. Oleh itu, bahan ajar dan sukatan pelajaran harus disusun semula bagi memberi ruang kepada penggunaan bahan multimedia, aplikasi interaktif, kuiz atas talian, serta simulasi pembelajaran. Penyesuaian ini tidak bermaksud meninggalkan prinsip tradisional dalam pendidikan Islam, sebaliknya memperkasakannya dengan teknologi yang membantu pemahaman dan minat pelajar. Menurut Mahmud dan Hashim (2021), pengemaskinian kandungan pembelajaran Islam dengan elemen digital mampu memberi impak signifikan terhadap penglibatan pelajar dalam sesi PdPc (Mahmud & Hashim, 2021). JAIS dan pihak berwajib perlu mengadakan semakan kurikulum berkala yang melibatkan pakar IT dan pendidik agama agar pengintegrasian ini bersifat harmoni dan tidak bercanggah dengan nilai-nilai Islam.

Ketujuh penggunaan IT dalam pendidikan tidak seharusnya dibiarkan tanpa pemantauan. Justeru, satu mekanisme **pemantauan dan penilaian berkala terhadap pelaksanaan pengintegrasian IT** wajar diwujudkan bagi menilai tahap keberkesanan, cabaran semasa, serta keperluan penambahbaikan. Penilaian ini boleh dilaksanakan dalam bentuk audit teknologi, soal selidik keberkesanan, serta analisis terhadap prestasi pelajar dan guru. Ia juga perlu menilai aspek pematuhan etika dan keselamatan digital. Menurut Abdul Latif et al. (2020), sistem pemantauan yang sistematik akan membantu pihak pengurusan memahami dengan lebih jelas tentang pencapaian dan cabaran sebenar di lapangan, sekali gus membolehkan tindakan susulan dirancang dengan lebih berfokus (Abdul Latif et al., 2020). Ini juga dapat membentuk akauntabiliti dalam kalangan guru dan pihak pentadbiran agar tidak menggunakan teknologi secara sambil lewa atau hanya sebagai simbolik.

Kelapan satu lagi strategi penting ialah **pembangunan sumber pembelajaran digital yang berteraskan nilai dan kandungan Islam tempatan**. Majoriti sumber digital pendidikan yang tersedia di internet adalah berasaskan sistem pendidikan Barat dan tidak mengambil kira sensitiviti serta kerangka epistemologi Islam. Maka, perlunya satu usaha bersungguh-sungguh dari institusi Islam tempatan untuk menghasilkan bahan bantu mengajar digital – seperti video animasi, kuiz interaktif, e-book, dan portal pembelajaran – yang sesuai dengan kurikulum pendidikan Islam di bawah JAIS. Inisiatif ini bukan sahaja memperkaya pengalaman pembelajaran pelajar, malah memastikan bahan ajar yang digunakan adalah sahih, relevan, dan sesuai dengan budaya setempat. Kajian oleh Roslan dan Majid (2022) menunjukkan bahawa apabila guru mempunyai akses kepada bahan digital Islamik tempatan yang berkualiti, kadar penggunaan IT dalam pengajaran mereka meningkat dengan ketara (Roslan & Majid, 2022). Oleh itu, JAIS perlu berkolaborasi dengan institusi pengajian tinggi Islam, syarikat teknologi tempatan, dan agensi kerajaan dalam membangunkan repositori sumber digital Islamik yang mantap dan mudah diakses.

Akhir sekali, **penetapan dasar dan garis panduan rasmi berkaitan penggunaan IT dalam pendidikan Islam** perlu disediakan oleh JAIS dan pihak berkuasa pendidikan yang berkaitan. Dokumen polisi yang jelas dan terperinci akan memberi arah dan kejelasan kepada guru dalam

melaksanakan pengajaran berasaskan teknologi dengan cara yang selari dengan matlamat pendidikan Islam. Ini juga akan memudahkan pelaksanaan latihan, penilaian dan pengawasan secara lebih teratur (Basri & Omar, 2023).

Kesimpulan

Secara keseluruhannya, kajian ini memperincikan cabaran utama yang dihadapi dalam pengintegrasian teknologi maklumat dalam kalangan guru di bawah Jabatan Agama Islam Selangor (JAIS) berdasarkan hasil analisis literatur terdahulu. Antara cabaran ketara yang dikenal pasti termasuklah kekangan kemahiran teknologi, sikap dan motivasi yang rendah dalam kalangan guru, ketidaksediaan infrastruktur sokongan di institusi pendidikan agama, serta ketiadaan latihan berstruktur dan berterusan. Cabaran-cabaran ini dilihat sebagai penghalang utama kepada pelaksanaan pengajaran berteraskan teknologi secara menyeluruh dan berkesan dalam pendidikan Islam.

Kajian ini mencadangkan agar pihak JAIS merangka pelan strategik berfasa yang merangkumi usaha pemantapan latihan digital kepada guru, penambahbaikan infrastruktur ICT di sekolah agama, dan pembentukan dasar teknologi yang selari dengan nilai-nilai pendidikan Islam. Pelan ini perlu bersifat jangka panjang dan inklusif, dengan melibatkan guru sebagai rakan strategik dalam proses perubahan, bukan sekadar pelaksana dasar. Di samping itu, pemupukan sikap positif dan celik digital dalam kalangan guru juga perlu diberi keutamaan agar mereka mampu menjadi agen perubahan dalam dunia pendidikan yang semakin berteknologi tinggi.

Oleh kerana kajian ini bersifat konseptual, adalah disarankan agar kajian empirikal dijalankan pada masa hadapan bagi mengesahkan dapatan secara lebih mendalam melalui pengumpulan data lapangan, termasuk temubual, soal selidik, dan kajian kes. Dapatan tersebut bukan sahaja dapat memperkukuh hujah sedia ada, malah membuka ruang kepada penambahbaikan berasaskan realiti di lapangan, seterusnya menyumbang kepada pembangunan pendidikan Islam yang lebih dinamik dan lestari di negeri Selangor.

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PEMBELAJARAN ATAS TALIAN BAGI PEPERIKSAAN UPKK (UJIAN PENILAIAN KELAS KAFA) DALAM KALANGAN GURU PENDIDIKAN ISLAM

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Abstrak: Artikel ini meneliti keberkesanan pembelajaran atas talian dalam konteks pendidikan Islam peringkat rendah di Malaysia, khususnya sebagai persediaan menghadapi Ujian Penilaian Kelas KAFA (UPKK). Kajian ini berasaskan pemahaman konsep dan perbandingan kritis terhadap sistem pendidikan Islam di Malaysia dan Indonesia yang masing-masing mempunyai pendekatan tersendiri dalam mengintegrasikan teknologi digital dalam pembelajaran agama. Tumpuan diberikan kepada pelaksanaan pedagogi digital dalam pendidikan KAFA, kredibiliti tenaga pengajar, serta pelbagai cabaran infrastruktur dan sosial yang mempengaruhi keberkesanan pembelajaran dalam talian. Dapatan menunjukkan bahawa walaupun pembelajaran atas talian berpotensi memperluas akses dan memperkayakan pendekatan pembelajaran, keberkesanannya sangat bergantung kepada kualiti interaksi guru-pelajar, keupayaan teknologi, dan kandungan pembelajaran yang interaktif serta kontekstual. Selain itu, perbandingan dengan sistem pendidikan Islam di Indonesia membekalkan perspektif serantau yang berguna untuk menilai kekuatan dan kelemahan model tempatan. Metodologi yang digunakan adalah kajian kepustakaan. Artikel ini mencadangkan strategi holistik yang merangkumi pembangunan profesional guru, pelaburan dalam infrastruktur digital, serta reka bentuk kurikulum yang adaptif dan berteraskan nilai-nilai Islam. Hasil perbincangan ini diharap dapat menyumbang kepada penggubalan dasar pendidikan Islam yang lebih lestari, inklusif dan relevan dalam era pasca-pandemik.

Kata kunci: Pendidikan Islam, Ujian Penilaian Kelas KAFA (UPKK), pembelajaran atas talian, pedagogi digital, kredibiliti guru

Pengenalan

Perkembangan teknologi maklumat dan komunikasi (ICT) yang pesat pada abad ke-21 telah memberi impak yang signifikan terhadap landskap pendidikan global, termasuk pendidikan Islam di Malaysia. Dalam konteks pendidikan rendah agama, program Kelas al-Quran dan Fardu Ain (KAFA) yang dikendalikan oleh Jabatan Kemajuan Islam Malaysia (JAKIM) turut mengalami perubahan pendekatan pedagogi sejajar dengan arus digitalisasi (Ahmad & Zainal, 2022). Khususnya, pelaksanaan pembelajaran atas talian telah menjadi satu alternatif utama dalam menyampaikan kandungan kurikulum apabila berlaku gangguan terhadap sistem pembelajaran konvensional, seperti semasa pandemik COVID-19 (Ismail, 2021).

Ujian Penilaian Kelas KAFA (UPKK) merupakan satu bentuk penilaian standard yang bertujuan untuk menilai tahap penguasaan murid dalam pelbagai bidang ilmu asas Islam, termasuk amali solat, penghayatan akidah, serta adab dan akhlak Islamiah (JAIM, 2023). Justeru, keberkesanan pendekatan pembelajaran atas talian dalam mempersiapkan murid

menghadapi UPKK perlu diteliti dengan lebih mendalam khususnya dari aspek kesesuaian pedagogi, interaksi pengajaran dan pembelajaran serta tahap pencapaian murid (JAIM, 2023). Tambahan pula, aspek cabaran infrastruktur, sokongan ibu bapa serta kebolehan pencapaian teknologi turut memainkan peranan penting dalam menentukan kejayaan pendekatan ini (Ismail, 2021).

Makalah ini bertujuan untuk meneliti keberkesanan pelaksanaan pembelajaran atas talian bagi persediaan peperiksaan UPKK dari perspektif pendidikan Islam. Perbincangan akan merangkumi analisis terhadap manfaat, kekangan, serta cadangan strategik ke arah memperkukuh pelaksanaan pendidikan KAFA secara digital demi melahirkan murid yang seimbang dari segi intelek, rohani dan sahsiah selaras dengan tuntutan Falsafah Pendidikan Islam (JAIM, 2023).

Perbandingan Sistem Pendidikan Islam di Malaysia dan Indonesia

Dalam menambah baik mutu pendidikan di Malaysia, adalah menjadi satu keperluan untuk membandingkan di antara kaedah pendidikan Islam di Malaysia dengan negara-negara lain. Negara yang paling sesuai untuk dibuat perbandingan dengan Malaysia adalah Indonesia atas sebab banyak persamaan dari segi budaya kemasyarakatan dan susur galur kerakyatan.

Perbandingan pendidikan Islam di Malaysia dan Indonesia merangkumi beberapa aspek penting. Pelbagai aspek yang boleh dijadikan subjek utama perbandingan antaranya ialah sistem pendidikan, kurikulum dan juga pendekatan terhadap integrasi agama dalam pendidikan. Umum mengetahui bahawa Malaysia dan Indonesia berasal dari susur galur yang sama iaitu nusantara. Ini menjadikan terdapat persamaan dalam kerajaan masing-masing mengolah sesebuah sistem mengikut acuan negara masing-masing. Walaupun kedua-dua negara memiliki akar yang sama dalam tradisi Islam, perlaksanaannya dalam sistem pendidikan berbeza dan setiap negara mempunyai kekuatan masing-masing dalam memastikan pendidikan Islam dapat dilaksanakan dengan baik.

Perbezaan yang utama dan jelas adalah melalui struktur sistem pendidikan. Pendidikan Islam di Malaysia terdiri daripada dua aliran utama iaitu melalui sekolah agama dan juga sekolah kebangsaan. Sekolah agama di Malaysia di kawal selia dan dikendalikan oleh pihak berkuasa agama negeri seperti Jabatan Agama Islam Wilayah Persekutuan (JAWI) bagi Wilayah Persekutuan Kuala Lumpur, Jabatan Hal Ehwal Agama Islam Negeri Sembilan (JHEAINS) bagi Negeri Sembilan, Jabatan Agama Islam Johor (JAIJ) bagi negeri Johor dan juga lain-lain negeri mengikut pihak berkuasa agama negeri masing-masing. Mereka menjalankan operasi bagi bidang hal ehwal agama Islam di negeri masing-masing termasuk bidang pendidikan agama Islam melalui sekolah agama atau kelas agama. Penubuhan sekolah-sekolah agama seperti Sekolah Menengah Agama (SMA) atau Sekolah Agama Rakyat (SAR) membantu dalam menekankan pelajaran agama Islam yang lebih mendalam kepada murid-murid di negeri tersebut. Sekolah kebangsaan pula berperanan dalam menjadikan Pendidikan Islam sebagai mata pelajaran wajib bagi murid yang beragama Islam dari peringkat rendah hingga peringkat menengah. Penekanan dalam mata pelajaran pendidikan Islam diletakkan kepada peranan guru pendidikan Islam di setiap sekolah dan mereka ini perlu memastikan murid-murid beragama Islam terlibat secara langsung dengan pembelajaran pendidikan Islam di sekolah kebangsaan (Jabatan Pendidikan Islam dan Moral KPM, 2021).

Penerapan pendidikan islam di Indonesia pula sedikit berbeza berbanding Malaysia. Pembelajaran pendidikan islam di Indonesia adalah melalui dua jenis sekolah iaitu Sekolah Negeri dan Madrasah. Pendidikan Islam di sekolah negeri (sekolah umum) juga diintegrasikan sebagai mata pelajaran wajib di tingkat dasar dan menengah. Madrasah pula terdiri dari Madrasah Ibtidaiyah (MI) untuk tingkat dasar, Madrasah Tsanawiyah (MTs) untuk tingkat menengah pertama, dan Madrasah Aliyah (MA) untuk tingkat menengah atas. Sistem pendidikan islam di Indonesia lebih terintegrasi antara pendidikan agama dan umum, terutama di madrasah yang menggabungkan pendidikan agama dan juga umum ataupun sains (Kementerian Agama Republik Indonesia, 2020).

Perbandingan yang kedua adalah dari segi aspek kurikulum Pendidikan Islam yang dilaksanakan di Malaysia dan Indonesia. Kurikulum pendidikan di Malaysia dirancang oleh Jabatan Pendidikan Islam dan Moral di bawah Kementerian Pendidikan Malaysia. Bidang yang diajarkan berfokus pada Al-Qur'an, Hadis, Fiqh, Akhlak, dan Sejarah Islam, dengan penekanan pada pengembangan karakter dan moral yang baik menurut ajaran Islam (Jabatan Pendidikan Islam Dan Moral KPM, 2021). Ia berbeza dengan Indonesia kerana kurikulum pendidikan Islam di Indonesia disusun oleh Kementerian Agama bersama dengan Kementerian Pendidikan dan Kebudayaan. Kurikulum di madrasah menggabungkan pendidikan agama dengan pelajaran umum seperti Matematika, Sains, dan Bahasa Indonesia. Madrasah juga mengajarkan pelajaran agama serentak dengan pelajaran asas untuk memastikan persediaan pelajar ke peringkat lebih tinggi seperti universiti atau kolej (Kementerian Agama Republik Indonesia, 2020).

Aspek lain dalam pendidikan islam yang boleh di banding beza antara Malaysia dan Indonesia ialah melalui peranan kerajaan dalam pendidikan islam. Pendidikan Islam di Malaysia mendapat perhatian serius dari pihak kerajaan. Kerajaan menyediakan anggaran khusus untuk sekolah-sekolah agama dan memperkenalkan pelbagai program untuk memajukan pendidikan agama di Malaysia. Agama Islam adalah agama rasmi di Malaysia yang memberi kesan kepada penglibatan kerajaan dalam pendidikan negara (Hashim & Dorloh, 2024). Ia sedikit berbeza dengan Indonesia kerana Indonesia merupakan sebuah negara yang sekular. Walaupun negara Indonesia tidak menjadikan agama islam sebagai agama rasmi negara itu, perhatian besar terhadap pendidikan Islam tetap diberikan. Pendidikan agama Islam diajarkan di sekolah-sekolah umum dan madrasah, dan negara memberikan pembiayaan dan bantuan untuk madrasah melalui Kementerian Agama (Hasan, 2020).

Aspek lain yang memberikan perbezaan di antara pendidikan islam di Malaysia dengan Indonesia adalah peranan masyarakat dalam memartabatkan pendidikan islam selain daripada melalui institusi yang disediakan oleh kerajaan. Di Malaysia, terdapat banyak sekolah agama swasta dan pondok yang memberikan pendidikan Islam secara lebih mendalam. Pondok-pondok ini masih memiliki peranan penting dalam pendidikan Islam di luar sistem pendidikan formal (Kadel et.al., 2022). Manakala di Indonesia pula, ada pesantren yang menjadi lembaga pendidikan Islam tradisional. Pesantren berfokus pada pengajaran kitab kuning dan ilmu agama secara mendalam, serta memainkan peranan besar dalam pendidikan Islam di Indonesia (Kamelia, 2024).

Perbandingan yang terakhir ialah dari aspek perbezaan praktis keagamaan Islam di Malaysia dan Indonesia. Sistem pemerintahan di Malaysia mengutamakan Islam dan menjadikan Islam sebagai agama rasmi negara dengan pengaruh kuat dari pemerintah dalam menetapkan arah praktis keagamaan di Malaysia. Pengajaran agama Islam di Malaysia asasnya mengikuti

mazhab Imam Syafie dan aliran Ahli Sunnah Wal Jamaah. Pentadbir kerajaan di Malaysia cenderung terhadap praktis Islam yang sesuai dengan nilai-nilai kebangsaan dan keharmonian sosial serta menetapkan standard pendidikan agama melalui kurikulum kebangsaan. Hal ini mewujudkan keseragaman dalam praktis keagamaan di kalangan masyarakat Islam di Malaysia. Indonesia pula merupakan sebuah negara dengan populasi umat Islam terbesar di dunia dan mempunyai kefahaman praktis keagamaan yang lebih luas. Masyarakat Indonesia majoritinya beraliran Ahli Sunnah Wal Jamaah namun terdapat berbagai aliran dan organisasi Islam yang mempengaruhi praktis keagamaan seperti Nahdlatul Ulama (NU) dan Muhammadiyah. NU merupakan satu organisasi dengan lebih dari 40 juta anggota membawa pemahaman Islam Nusantara yang menekankan pada moderasi, pluralisme, dan pengakuan terhadap tradisi tempatan. Aliran Muhammadiyah pula yang mempunyai 29 juta anggota berfokus pada reformasi sosial dan pendidikan Islam moden. Pemerintah Indonesia meskipun tidak menetapkan agama rasmi untuk Indonesia, mereka mendukung pluralisme dan kebebasan beragama yang ditunjukkan dalam kepelbagaian praktis keagamaan dalam masyarakat. Namun dalam beberapa keadaan, terdapat ketegangan antara kelompok konservatif dan pertengahan dalam memahami dan menerapkan ajaran Islam.

Konsep Peperiksaan Pendidikan Islam di Malaysia

Malaysia menjalankan peperiksaan atau penilaian dalam pendidikan Islam melalui Ujian Penilaian Kelas KAFA bagi murid-murid tahun 5 di seluruh Malaysia. Tetapi ia tidak dijalankan di sekolah kebangsaan di bawah kendalian Kementerian Pendidikan Malaysia, tetapi ia dijalankan oleh pihak Jabatan Kemajuan Islam Malaysia (JAKIM) dan berlangsung secara serentak di seluruh Malaysia.

Peperiksaan UPKK (Ujian Penilaian Kelas KAFA) adalah salah satu peperiksaan penting dalam sistem pendidikan Islam di Malaysia yang khusus diadakan untuk menilai pencapaian pelajar di peringkat Kelas Al-Quran dan Fardu Ain (KAFA). Peperiksaan ini diadakan di bawah pengelolaan Jabatan Agama Islam Negeri (JAIN) dan bertujuan untuk menilai pengetahuan dan penguasaan pelajar dalam pelbagai aspek pendidikan agama Islam, terutamanya dalam bidang Al-Qur'an, hadis, akhlak, fiqh, dan Sejarah Islam. Peperiksaan Ujian Penilaian Kelas KAFA (UPKK) diadakan dengan beberapa tujuan utama. Antaranya adalah untuk menilai penguasaan pelajar dalam pengetahuan agama Islam. Ia mengukur tahap penguasaan pelajar dalam subjek-subjek yang diajar di kelas KAFA seperti ilmu fardu ain, Al-Qur'an, hadis, fiqh dan akhlak. Ini merupakan satu penilaian penting untuk menilai sejauh mana pelajar memahami asas agama Islam. Di samping itu, peperiksaan ini juga bertujuan memberi pengiktirafan rasmi terhadap pencapaian pelajar dalam pembelajaran agama. Keputusan UPKK membantu menunjukkan sejauh mana pelajar bersedia untuk melangkah ke peringkat pendidikan yang lebih tinggi. Selain menjadi satu alat penilaian, UPKK juga berperanan memupuk minat pelajar terhadap pembelajaran agama Islam serta membantu mereka menghayati ajaran Islam dalam kehidupan seharian.

Peperiksaan UPKK merangkumi beberapa subjek utama yang perlu dikuasai oleh pelajar. Antara subjek tersebut ialah Al-Qur'an, di mana pelajar diuji dalam bacaan dan hafazan, termasuk penguasaan terhadap surah-surah tertentu serta pemahaman makna ayat-ayat yang dihafal. Ujian ini turut melibatkan penilaian terhadap tajwid dan cara bacaan yang betul. Subjek hadis pula menguji pelajar tentang pemahaman terhadap hadis-hadis yang berkaitan dengan ajaran dan amalan dalam kehidupan seharian. Dalam subjek fiqh, pelajar diajar tentang hukum-

hukum Islam yang meliputi ibadah seperti solat, puasa dan zakat, serta hukum-hukum lain berkaitan kehidupan seharian. Pendidikan akhlak merupakan satu lagi komponen penting, yang menekankan adab dan tingkah laku seperti adab makan, tidur dan hubungan dengan ibu bapa. Selain itu, pelajar juga perlu menguasai subjek sejarah Islam, termasuk kisah para nabi, perkembangan tamadun Islam, serta pengajaran daripada peristiwa sejarah penting dalam Islam.

Peperiksaan UPKK biasanya diadakan sekali setahun dan merangkumi pelbagai bentuk penilaian. Antaranya ialah peperiksaan bertulis yang terdiri daripada soalan objektif dan subjektif. Soalan objektif mungkin dalam bentuk pilihan ganda, manakala soalan subjektif memerlukan pelajar memberi penjelasan secara terperinci. Selain itu, terdapat ujian hafazan, di mana pelajar perlu menghafal surah-surah tertentu daripada Al-Qur'an bagi menilai keupayaan mereka mengingati dan memahami ayat-ayat yang dihafal. Ujian bacaan Al-Qur'an pula memberi fokus kepada kelancaran bacaan, penggunaan tajwid yang betul serta kefahaman pelajar terhadap makna ayat yang dibaca. Beberapa negeri turut melaksanakan peperiksaan amali, yang menguji pelajar dalam aspek praktikal seperti solat, wudhu' dan ibadah lain yang berkaitan.

Peperiksaan UPKK dilaksanakan di seluruh Malaysia di bawah pengawasan Jabatan Agama Islam Negeri (JAIN). Ia biasanya melibatkan pelajar sekolah rendah, khususnya yang berada di tahun lima dan enam, serta mengikuti kelas KAFA. Pelaksanaan peperiksaan ini bermula dengan proses pendaftaran, di mana pelajar yang menghadiri kelas KAFA di sekolah atau pusat pengajian agama akan didaftarkan untuk menduduki peperiksaan. Peperiksaan biasanya dijalankan pada akhir tahun persekolahan atau pada tarikh yang telah ditetapkan oleh pihak berkuasa agama negeri. Selepas peperiksaan berlangsung, proses penilaian akan dijalankan dan keputusan diumumkan. Pelajar yang berjaya akan diberikan sijil atau markah sebagai pengiktirafan terhadap pencapaian mereka dalam bidang pendidikan Islam.

Peperiksaan UPKK amat penting dalam menilai kemajuan pelajar. Ia membantu guru dan ibu bapa melihat tahap penguasaan pelajar dalam ilmu agama. Penilaian ini memberi gambaran yang jelas mengenai pencapaian pelajar dalam pelbagai aspek keilmuan Islam. Selain itu, UPKK turut menilai sejauh mana nilai-nilai Islam diterapkan dalam kehidupan seharian pelajar, justeru menggalakkan mereka untuk mengamalkan apa yang telah dipelajari. Keputusan peperiksaan ini juga menyediakan asas yang kukuh untuk pelajar melanjutkan pelajaran ke institusi agama di peringkat menengah atau ke pusat pengajian agama yang lebih tinggi.

Walaupun UPKK memberi banyak manfaat, terdapat juga beberapa cabaran dan kritikan terhadap pelaksanaannya. Antaranya ialah tekanan yang mungkin dihadapi oleh pelajar. Seperti mana-mana peperiksaan lain, UPKK boleh mendatangkan tekanan, terutamanya bagi pelajar yang menghadapi kesukaran dalam hafazan atau pembelajaran agama. Oleh itu, pendekatan bijak diperlukan agar pelajar tidak terbeban. Selain itu, peperiksaan ini cenderung memberi tumpuan kepada aspek teori dan hafazan semata-mata. Ia mungkin kurang menyeluruh dalam menilai penerapan nilai-nilai agama dalam kehidupan sebenar pelajar. Oleh itu, penambahbaikan secara berterusan perlu dilakukan agar UPKK lebih menyeluruh dan berkesan dalam mendidik generasi muda Islam.

Peperiksaan UPKK memainkan peranan yang sangat penting dalam sistem pendidikan agama di Malaysia. Ia tidak hanya menjadi alat untuk menilai pencapaian pelajar dalam ilmu agama Islam tetapi juga memberi asas yang kukuh untuk pembentukan sahsiah dan penghayatan nilai Islam dalam kehidupan seharian. Walaupun terdapat beberapa cabaran, UPKK tetap menjadi satu elemen penting dalam memajukan pendidikan Islam di negara ini, dengan harapan untuk melahirkan generasi yang lebih berpengetahuan dan berakhlak mulia.

Konsep Pembelajaran Atas Talian Untuk Peperiksaan UPKK

Pembelajaran atas talian mula menjadi popular bermula ketika negara menjalan sekatan PKP ketika wabak COVID 19 melanda. Pembelajaran cara ini dijalankan di seluruh negara dengan inisiatif dan usaha dari guru-guru serta pihak kementerian yang tidak mahu pembelajaran tertangguh atas sebab penyebaran wabak ketika itu (Ahmad & Zainal, 2022). Pelbagai kekangan dan cabaran ketika itu menyebabkan pembelajaran atas talian pada ketika itu tidak mencapai tahap yang memuaskan.

Selepas 4 tahun negara bebas dari ancaman penyebaran wabak COVID 19, pembelajaran atas talian tetap berjalan dan ia menjadi salah satu platform yang digemari dikalangan ibubapa, guru, dan pelajar-pelajar yang boleh menerima kaedah ini dengan baik. Pelbagai platform digunakan seperti google meet, zoom, microsoft team dan lain-lain. Kelas tambahan atas talian juga mula menjadi popular dengan kewujudan syarikat-syarikat yang menjalankan perkhidmatan ini seperti MC+ dan lain-lain.

Pembelajaran Atas Talian untuk UPKK (Ujian Penilaian Kelas KAFA) merupakan satu pendekatan yang semakin popular dan relevan dalam pendidikan Islam di Malaysia, terutamanya setelah pandemik COVID-19 yang mengubah cara pembelajaran tradisional. Melalui pembelajaran atas talian, pelajar dapat meneruskan proses pembelajaran untuk persediaan peperiksaan UPKK secara lebih fleksibel dan efisien, tanpa terikat dengan ruang kelas fizikal (Ismail, 2021).

Pembelajaran atas talian bagi peperiksaan Ujian Penilaian Kelas KAFA (UPKK) merupakan satu inisiatif yang bertujuan memudahkan akses pelajar kepada bahan pembelajaran yang relevan dan komprehensif (JAIM, 2023). Melalui pendekatan ini, pelajar dapat memperoleh pelbagai sumber pembelajaran seperti modul, video pengajaran, soalan latihan, serta ujian amali secara dalam talian (KPM, 2022). Keupayaan pembelajaran secara fleksibel membolehkan pelajar menyesuaikan waktu dan tempat pembelajaran mengikut keselesaan masing-masing, tanpa kekangan jadual kelas konvensional. Selain itu, penggunaan teknologi multimedia seperti animasi, video interaktif dan aplikasi pembelajaran dapat meningkatkan mutu pengajaran, khususnya dalam menjelaskan konsep-konsep kompleks dalam bidang Al-Qur'an, hadis dan fiqh (KPM, 2022).

Pelbagai platform digital telah digunakan untuk menyokong proses pembelajaran atas talian bagi UPKK. Antaranya adalah Sistem Pembelajaran KAFA Digital yang telah diterapkan di beberapa negeri di Malaysia, menyediakan bahan pembelajaran interaktif yang dikendalikan oleh Jabatan Agama Islam Negeri. Selain itu, platform Google Classroom juga melibatkan guru dan pelajar dalam penyampaian bahan pembelajaran, penugasan, serta interaksi pembelajaran secara maya. YouTube juga memainkan peranan penting sebagai medium penyebaran video pembelajaran berkaitan hafazan Al-Qur'an, fiqh dan hadis yang memudahkan pelajar

memahami serta menguasai subjek tersebut. Di samping itu, aplikasi pembelajaran Islam seperti iQuran dan Muslim Pro menawarkan latihan hafazan, bacaan Al-Qur'an dan pengetahuan ibadah yang relevan dalam persediaan menghadapi peperiksaan UPKK (KPM, 2022).

Kelebihan pembelajaran atas talian ini termasuk kemudahan akses kepada bahan pembelajaran tanpa perlu hadir secara fizikal, yang membolehkan pelajar belajar secara sendiri mengikut kadar masing-masing. Pendekatan pembelajaran interaktif seperti kuiz, ujian berperingkat dan permainan pendidikan turut meningkatkan pemahaman dan daya ingatan pelajar. Penggunaan media video dan audio pula memudahkan pembelajaran bacaan Al-Qur'an dan hukum fiqh secara lebih mendalam dan efektif (Mohd Nor et.al., 2021). Selain itu, pembelajaran atas talian juga memberi penekanan kepada pengukuhan hafazan Al-Qur'an melalui kemudahan mendengar, mengulang dan menilai bacaan dengan tepat (Ali et.al., 2022). Hubungan interaktif antara guru dan pelajar dalam sesi pembelajaran secara langsung membolehkan maklum balas yang konstruktif dan tunjuk ajar individu diberikan secara berkesan.

Bagi meningkatkan keberkesanan pembelajaran atas talian UPKK, beberapa langkah perlu diambil perhatian. Antaranya ialah peningkatan infrastruktur teknologi maklumat dan komunikasi, terutamanya di kawasan luar bandar, bagi memastikan capaian internet yang stabil dan berkualiti. Penambahbaikan kandungan pembelajaran juga disarankan dengan penghasilan sumber yang lebih dinamik dan berasaskan nilai Islam melalui video interaktif, kajian kes dan projek bersepadu. Tambahan pula, pemantauan berterusan dan sokongan aktif daripada guru melalui sesi dalam talian yang terancang akan membantu memastikan pelajar mendapat bimbingan yang optimum.

Secara keseluruhan, pembelajaran atas talian bagi UPKK menawarkan potensi yang besar dalam meningkatkan akses dan kualiti pendidikan Islam di peringkat sekolah rendah. Walaupun menghadapi beberapa cabaran teknikal dan pelaksanaan, dengan penambahbaikan berterusan, model pembelajaran ini dapat dijadikan satu alat yang berkesan dalam mempersiapkan pelajar menghadapi peperiksaan UPKK (Ta'at et.al., 2022). Penggunaan teknologi secara strategik dan bersepadu diharap dapat memberikan pengalaman pembelajaran yang menyeluruh sekaligus melahirkan generasi pelajar yang berilmu dan berakhlak mulia.

Kredibiliti Guru Yang Mengajar Dalam Kelas Atas Talian

Kredibiliti guru memainkan peranan penting dalam menentukan keberkesanan pengajaran dalam talian. Menurut Fisher, Frey, dan Smith (2020), kredibiliti guru merangkumi empat komponen utama: kepercayaan (*trust*), kompetensi (*competence*), dinamik (*dynamism*), dan keakraban (*immediacy*). Komponen-komponen ini saling berkait dan memberi impak langsung terhadap persepsi pelajar terhadap guru mereka dalam persekitaran pembelajaran maya.

Kepakaran dan pengetahuan mendalam dalam bidang yang diajar adalah asas kepada kredibiliti guru. Kajian oleh Yu, Chen, dan Recker (2021) menunjukkan bahawa elemen seperti keprihatinan dan kebolehppercayaan guru mempunyai hubungan signifikan dengan prestasi akademik pelajar dalam pembelajaran bersemuka. Walaupun kajian ini tidak spesifik kepada pembelajaran dalam talian, ia menekankan pentingnya elemen-elemen tersebut dalam membina kredibiliti guru.

Kemahiran dalam penggunaan teknologi pengajaran digital juga merupakan faktor penentu dalam memastikan kelancaran pengajaran atas talian. Shin dan Shim (2020) menekankan bahawa kompetensi guru dalam pengajaran dalam talian mempunyai impak signifikan terhadap hasil pembelajaran pelajar. Guru yang mahir dalam menggunakan teknologi dapat meningkatkan kepuasan pelajar dan hasil pembelajaran mereka.

Sikap profesionalisme yang tinggi juga menyumbang kepada kredibiliti guru dalam kelas atas talian. Fisher et al. (2020) menekankan bahawa guru perlu menunjukkan sikap bertanggungjawab seperti memulakan kelas tepat pada masa, menyediakan bahan pembelajaran yang lengkap, dan memberi maklum balas yang konstruktif kepada pelajar untuk meningkatkan kredibiliti mereka.

Kemahiran komunikasi yang berkesan turut menjadi elemen kritikal dalam memperkukuh kredibiliti guru. Kajian oleh Pishghadam et al. (2021) menunjukkan bahawa kredibiliti guru mempengaruhi pelbagai hasil berkaitan pelajar seperti kesediaan untuk hadir ke kelas, pencapaian dalam bahasa asing, motivasi, pembelajaran, dan penglibatan. Ini menunjukkan bahawa komunikasi yang efektif oleh guru dapat meningkatkan kredibiliti mereka dalam kalangan pelajar.

Keupayaan guru dalam menilai pencapaian pelajar dengan adil dan memberikan bimbingan yang sesuai juga menunjukkan profesionalisme yang tinggi. Fisher et al. (2020) menekankan bahawa guru perlu mengekalkan harapan yang tinggi terhadap pelajar dan memberikan maklum balas yang jujur untuk membina kepercayaan pelajar terhadap mereka.

Kesimpulannya, kredibiliti guru dalam pengajaran kelas atas talian merupakan gabungan beberapa faktor seperti kepakaran, kemahiran teknologi, sikap profesional, komunikasi efektif, dan keupayaan membina hubungan serta menilai pelajar secara tepat. Kesemua elemen ini saling melengkapi dan menjadi tunjang utama dalam memastikan keberkesanan pengajaran serta pembelajaran dalam persekitaran digital.

Halangan Kepada Kejayaan Guru Pendidikan Islam Dalam Menjalankan Pembelajaran Atas Talian

Walaupun pembelajaran atas talian menawarkan pelbagai kelebihan seperti fleksibiliti masa dan kemudahan akses kepada sumber pembelajaran, ia turut menghadapi beberapa cabaran utama yang perlu diberi perhatian. Pertama, keterbatasan akses internet merupakan isu kritikal yang memberi impak langsung kepada keberkesanan pembelajaran. Hal ini amat ketara di kalangan pelajar yang tinggal di kawasan luar bandar atau lokasi yang tidak mempunyai sambungan internet yang stabil serta peranti yang sesuai untuk mengikuti pembelajaran secara dalam talian. Kekurangan peranti teknologi yang sesuai seperti komputer riba atau tablet juga menyukarkan mereka untuk mengikuti sesi pembelajaran secara dalam talian dengan lancar, seterusnya menyebabkan jurang digital yang boleh menjejaskan peluang pendidikan mereka. Kajian oleh Maharrani et al. (2023) menunjukkan bahawa ketidaksamaan akses kepada teknologi dan internet adalah cabaran utama dalam pembelajaran atas talian di kawasan luar bandar, yang membawa kepada ketidaksamaan dalam akses kepada pendidikan berkualiti.

Kedua, kurangnya interaksi sosial dalam pembelajaran atas talian mengakibatkan pelajar kurang berpeluang berinteraksi secara langsung dengan rakan sebaya dan guru. Kurangnya

interaksi sosial ini bukan sahaja menjejaskan aspek komunikasi dan kerjasama dalam kalangan pelajar, malah boleh menimbulkan rasa terasing dan kurang motivasi dalam proses pembelajaran. Elemen interaksi sosial yang secara semula jadi berlaku dalam kelas bersemuka memainkan peranan penting dalam membina kemahiran interpersonal serta meningkatkan pemahaman melalui perbincangan dan kolaborasi. Kajian oleh Gamage dan Whiting (2021) mendapati bahawa peserta kursus dalam talian sering merasa terasing dan tidak terhubung dengan rakan sebaya mereka, yang menimbulkan cabaran dalam membina rasa kekitaan dan interaksi bermakna dalam pembelajaran dalam talian.

Ketiga, pembelajaran secara dalam talian memerlukan tahap disiplin sendiri yang tinggi daripada pelajar. Tanpa pemantauan secara langsung oleh guru atau fasilitator, pelajar mungkin mudah terpengaruh oleh gangguan luaran seperti media sosial, persekitaran rumah yang tidak kondusif, dan kurangnya jadual pembelajaran yang teratur. Ini menyebabkan sebahagian pelajar menghadapi kesukaran untuk mengekalkan fokus dan konsistensi dalam menyelesaikan tugas serta menghadiri sesi pembelajaran secara berkala. Keadaan ini menuntut pelajar memiliki kemahiran pengurusan masa dan motivasi diri yang baik bagi memastikan kejayaan dalam pembelajaran atas talian. Kajian oleh Adam et al. (2017) menekankan bahawa pembelajaran sendiri adalah elemen penting dalam pembelajaran dalam talian, di mana pelajar perlu menetapkan matlamat, merancang, memantau, dan merefleksikan proses pembelajaran mereka untuk mencapai kejayaan akademik.

Akhir sekali, kesesuaian format pembelajaran menjadi cabaran khusus dalam konteks pengajaran subjek yang memerlukan pengalaman praktikal dan interaksi sosial secara langsung, terutamanya dalam pembelajaran agama. Aktiviti seperti solat berjemaah, amali ibadah, dan interaksi sosial dalam konteks keagamaan adalah sukar untuk disampaikan secara berkesan melalui platform dalam talian. Keperluan untuk pengalaman langsung dan suasana komuniti yang menyokong pembelajaran agama menuntut pendekatan yang lebih holistik, yang sukar dicapai hanya dengan kaedah pembelajaran digital. Oleh itu, pembelajaran atas talian perlu diperkukuh dengan strategi dan pendekatan yang dapat mengatasi cabaran ini agar keberkesanannya dapat dipertingkatkan dalam pelbagai konteks pendidikan. Kajian oleh Trinity College (2020) menekankan bahawa pembelajaran agama dalam talian menghadapi cabaran dalam mengekalkan komuniti dan persekutuan keagamaan, serta ketidaksamaan dalam akses teknologi, yang memerlukan pendekatan yang bijaksana untuk memastikan semua pelajar dapat mengakses pendidikan agama secara inklusif.

Kesimpulan

Kajian ini telah meneliti pelaksanaan pembelajaran atas talian dalam persediaan menghadapi Ujian Penilaian Kelas KAFA (UPKK) serta membandingkan sistem pendidikan Islam antara Malaysia dan Indonesia sebagai asas pemahaman terhadap pendekatan pedagogi serantau. Pembelajaran atas talian, meskipun bukan suatu pendekatan baharu, telah mendapat perhatian yang signifikan pasca pandemik COVID-19 sebagai medium alternatif yang berkesan dalam menyampaikan kandungan pendidikan Islam di peringkat rendah. Pelaksanaan pembelajaran digital ini menunjukkan potensi besar dalam memudahkan akses, meningkatkan fleksibiliti, dan mempelbagaikan pendekatan pembelajaran bagi murid KAFA.

Namun begitu, kajian turut mengenal pasti beberapa kekangan kritikal seperti keterbatasan capaian internet, kekurangan peranti digital, kurangnya interaksi sosial, serta cabaran dalam

menyampaikan komponen amali pendidikan Islam secara dalam talian. Keberkesanan pembelajaran ini juga sangat bergantung kepada kredibiliti guru, termasuk kecekapan teknologi, sikap profesionalisme, dan keupayaan membina komunikasi yang berkesan dalam talian.

Perbandingan antara Malaysia dan Indonesia memperlihatkan perbezaan dalam struktur sistem pendidikan, kurikulum, dan penglibatan kerajaan, namun kedua-dua negara berkongsi aspirasi yang sama dalam memperkukuh pendidikan Islam. Maka, pelaksanaan pembelajaran atas talian bagi UPKK perlu disokong oleh dasar yang bersifat inklusif dan strategik, penambahbaikan kandungan digital yang bersifat interaktif serta pembangunan keupayaan guru secara berterusan agar objektif pendidikan Islam dapat dicapai dengan lebih holistik dan berkesan.

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SEJARAH PENUBUHAN ZAINE TEXTILE

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Abstrak: Kertas kerja ini mengenai sejarah penubuhan Zaine Textile sebagai pemborong kain di Kota Bharu, Kelantan. Syarikat Zaine Textile ditubuhkan pada tahun 1994 dan sepanjang tempoh 30 tahun syarikat ini masih terus beroperasi. Perbincangan memperkatakan mengenai latar belakang pemilik Zaine Textile seperti latar belakang peribadi dan latar belakang syarikat, faktor kejayaan dan permasalahan serta cabaran. Maklumat diperolehi melalui temubual dengan pemilik syarikat berkenaan iaitu Nik Yuzaine bin Nik Yusoff dan bonda beliau Hajjah Rohani@Zainab binti Ismail. Hasil penyelidikan ini mempunyai kepentingan kepada Zaine Textile selaku penaja kepada kajian ini khasnya dan masyarakat Kelantan amnya. Penyelidikan ini menjadi titik tolak dalam pengumpulan data untuk mengesan kalangan Alumni pemborong textile sejak 30 tahun lalu dalam kerangka mengesan pencapaian bagi menyuntik semangat dalam kalangan generasi muda menceburi lapangan perniagaan textile. Selain itu, permasalahan yang dihadapi oleh kalangan pemborong textile perlu ditangani terutama berkaitan dengan peranan kerajaan.

Keywords: Zaine Textile, latar belakang, sejarah, penubuhan, syarikat.

Pendahuluan

Kedai Zaine Textile Pemborong Kain menjual pelbagai jenis kain yang bermutu dan terkini secara borong dan runcit. Kedai tersebut beralamat di no.6040-A, Jalan Sultan Ibrahim, 15050, Kota Bharu Kelantan (Sebelah stesyen minyak petron KB Mall). Pemilik bagi kedai Zaine Textile ialah Nik Yuzaine bin Nik Yusoff yang merupakan alumni UNITAR. Syarikat ini mempunyai kekuatan yang tersendiri kerana mampu bertahan lebih 30 tahun. Hal ini dapat dikaitkan dengan dengan kepribadian pemiliknya yang patut dijadikan contoh oleh kalangan anak muda melalui ciri-ciri usahawan dan kompetensi keusahawanannya.

Kajian Literatur

Terdapat banyak kajian mengenai Tekstil. Di Alam Melayu, sejarah silam mempunyai perkaitan dengan aktiviti masyarakat khususnya dalam penghasilan tekstil. Haziya Hussin di dalam artikel beliau yang bertajuk “Aktiviti seni dan budaya lampau: penghasilan dan penggunaan tekstil di Alam Melayu dari sudut sejarah silam” menunjukkan penghasilan tekstil di Alam Melayu banyak dipengaruhi oleh tekstil luar. Kain cindai dipercayai dipengaruhi oleh kain patola dari India. Inspirasi seni khususnya tekstil telah berkembang hasil daripada pertembungan budaya luar seperti Cina, Arab dan India. (Haziya Hussin, 2006). Menurut beliau lagi aktiviti penghasilan tekstil merupakan satu aktiviti penduduk tempatan, namun keadaan telah berubah, modenisasi yang dibawa barat telah memberi alternatif kepada penghasilan tekstil tempatan.

Kajian awal mengenai perkembangan tekstil di Tanah Melayu ialah “Perkembangan kegiatan perniagaan tekstil di Kuala Lumpur, 1880-1941”. (Shapiza Sharif dan Arba’iyah Mohd Noor,

2022). Artikel tersebut mengetengahkan perkembangan perniagaan tekstil dari sudut kepentingannya dalam memenuhi keperluan penduduk tempatan dalam konteks pembangunan di Kuala Lumpur. Kajian yang meneliti tempoh amsa 1880 sehingga 1941 itu menunjukkan pentadbiran British telah memberi galakan kepada kemunculan perniagaan berasaskan tekstil seperti menjahit pakaian. Ruang tersebut telah digunakan oleh syarikat seperti John Little dan Robinson dari Singapura untuk menembusi pasaran di Kuala Lumpur dengan membekalkan pakaian kepada penduduk. Dengan adanya syarikat luar menjadi asas kepada perkembangan kegiatan perniagaan berkaitan tekstil di Kuala Lumpur.

Selain itu, pada tempoh masa 1900 sehingga 1941 terdapat sebuah lagi karya mengenai perkembangan kegiatan perusahaan tekstil. Kajian tersebut membincangkan tentang “Perkembangan kegiatan perusahaan tekstil dalam kalangan masyarakat Melayu di Terengganu, 1900-1941”. (Norazilawati Abd Wahab dan Arba’iyah Mohd Noor, 2013). Artikel tersebut memperkatakan mengenai kegiatan perusahaan tekstil pada abad ke-20. Intipati penting mengenai peranan pendidikan dalam memajukan kegiatan perusahaan tekstil, dasar kerajaan dalam memajukan kegiatan perusahaan tekstil dan penubuhan kilang tekstil.

Kelantan terkenal dengan pelbagai perusahaan salah satu daripadanya ialah perusahaan batik. Terdapat sebuah penyelidikan bertajuk “Seni tradisional batik sebagai tunjang warisan negeri Kelantan”. Penyelidikan tersebut cuba mengangkat batik sebagai tunjang warisan negeri Kelantan. Penyelidikan yang dihasilkan oleh Universiti Teknologi MARA (UiTM) Cawangan Kelantan yang terdiri dalam kalangan penulis (Noor Arina Md Arifin, Siti Aishah Mokhtar, Syahrill Norizan Ahmad Fauzi dan Wan Nur Nabila Nordin, 2024) menyatakan batik merupakan lambang seni warisan kreatif yang mempunyai sejarah tersendiri. Menurut tulisan tersebut lagi batik juga diiktiraf sebagai warisan negara yang bernilai tinggi serta salah satu kraftangan yang terkenal pada peringkat global. Di dalam kajian tersebut, mereka melihat pengusaha batik memainkan peranan penting dalam memastikan seni batik negara dapat dimertabatkan dan mencapai zaman kegemilangannya.

Berbeza dengan kajian terdahulu, terdapat artikel yang membincangkan mengenai penglibatan wanita dalam perniagaan tekstil. Siti Noridayu Abd. Nasir dan Hazlina Abdul Halim di dalam artikelnya yang bertajuk “Ujaran lisan oleh wanita Kelantan dalam perniagaan tekstil di Pasar Besar Siti Khadijah” (Siti Noridayu Abd. Nasir dan Hazlina Abdul Halim, 2022) menyampaikan beberapa idea antaranya interaksi ujaran peniaga wanita yang digunakan di Pasar Besar Siti Khadijah. Mereka mengenal pasti dialek dengan tujuan menarik pelanggan membeli produk jualan mereka. Selain itu penulis membincangkan jenis produk tekstil yang menjadi pilihan barangan jualan di Pasar Besar Siti Khadijah.

Kajian mengenai penglibatan wanita turut diperkatakan di dalam karya (Nor Hanim Awang @ Mohd Noor, Norfatiha Othman, Nor Hayati Sa’at dan Roslina Ismail, 2021). Artikel berkenaan bertajuk “Dorongan kelangsungan usahawan wanita dalam perusahaan batik dan songket”. Hasil kajian menunjukkan dorongan kepada pembentukan usahawan batik dan songket wanita asasnya adalah pengaruh keluarga yang terdiri daripada proses sosialisasi keluarga, kemahiran keluarga, minat dan sumbangan kepada keluarga. Oleh itu, dorongan mereka dalam keusahawanan batik dan songket dapat dikaitkan dengan asuhan dan pendedahan berterusan daripada keluarga bagi membentuk usahawanan wanita. Berbalik kepada asuhan keluarga turut dapat diperhatikan daripada penubuhan syarikat Zaine Textile Pemborong Kain. Temubual pengkaji dengan pemilik Zaine Textile menunjukkan beliau mula berjinak dalam kegiatan

perniagaan sejak beliau berada di tingkatan empat. Menurutnya lagi beliau sering mengikuti ibunya yang ketika itu telah aktif dalam perniagaan batik di pasar. (Temubual Nik Yuzaine bin Nik Yusoff, 2025).

Latar Belakang Pemilik Zaine Textile

Latar Belakang Peribadi

Pemilik Zaine Textile Pemborong Kain bernama Nik Yuzaine Bin Nik Yusoff atau lebih dikenali sebagai Zaine. (Temubual Nik Yuzaine Bin Nik Yusoff, 2025). Beliau dilahirkan pada tahun 1971 di Sungai Keladi Kota Bharu, Kelantan. Beliau merupakan anak sulung daripada tiga orang adik beradik kepada pasangan Haji Nik Yusoff bin Nik Mustapha dan Hajjah Rohani@Zainab binti Ismail. Zaine menerima pendidikan awal di sekolah Rendah Kebangsaan Islah dan seterusnya pendidikan menengah di Maktab Sultan Ismail. Seterusnya beliau menyambung pendidikan di UNITAR pada peringkat Diploma dalam bidang pengurusan pemasaran dan menyambung pada peringkat diploma lanjutan dalam bidang yang sama. Zaine telah mendirikan rumahtangga dengan Hazila binti Hashim Bani dan daripada perkahwinan tersebut beliau dikurniakan tiga orang cahayamata yang terdiri daripada seorang lelaki dan dua orang perempuan. Pada masa lapang beliau banyak menghabiskan masa bersama keluarga dan bermain badminton. Pada masa kini beliau menetap di Taman Pulong, Kubang Kerian, Kota Bharu, Kelantan. Beliau menceburi bidang perniagaan kerana minat yang mendalam dan melihat perniagaan sebagai membuka peluang yang sangat luas.

Latar Belakang Syarikat

Zaine Textile merupakan syarikat yang menyediakan pelbagai jenis kain ela, batik, pelikat, sarung dan pakaian siap yang berkualiti dan terkini. Operasi perniagaan dibuka setiap hari dari jam 9.00 pagi sehingga 6.00 petang. Perniagaan turut mengiklankan produk mereka melalui Facebook, Tik Tok dan Instagram. Zaine Textile ditubuhkan sejak 2003. Kedai tersebut terletak strategik di tengah bandar Kota Bharu, Kelantan. Nama Zaine Textile telah diilhamkan oleh nama pemiliknya sendiri iaitu Nik Yuzaine. Beliau merupakan pemilik tunggal yang membangunkan perniagaan sendiri dari awal sehingga ia menjadi seperti hari ini. Berdasarkan kepada temu bual dengan usahawan syarikat ini menjalankan perniagaan mereka secara borong dan runcit dengan menawarkan pelbagai jenis kain yang berkualiti tinggi dan pakaian siap pada harga mampu milik.

Zaine Textile ialah perniagaan kedai tunggal yang bebas, yakni ia tidak mempunyai cawangan lain. Terdapat seramai lima orang pekerja yang terdiri dalam kalangan ahli keluarga seperti bapa saudara. Ibu beliau turut membantu urusan jual beli serta kelancaran operasi syarikat sekiranya Zaine menjalankan urusan di luar dari Kelantan. Jumlah pekerja yang kecil tidak menghalang syarikat tersebut untuk berkembang maju ini kerana mereka masih mampu bersaing dengan syarikat lain yang menjual produk yang sama. Zaine Textile masih berjaya memperolehi jualan yang tinggi kerana memberikan perkhidmatan yang terbaik kepada pelanggan, menjual barangan berkualiti dengan harga yang murah dan menyediakan penghantaran yang cepat untuk pelanggan dan membuka *drop shit* dan *affiliate*. Strategi ini telah banyak membantu mereka untuk bersaing dalam perniagaan.

Faktor Kejayaan***Peranan Ibu dan Isteri***

Kejayaan syarikat Zaine Textile pada hari ini ditentukan oleh banyak faktor yang saling berkaitan. Antara yang mendasarinya kerana mendapat sokongan moral daripada kalangan keluarga. Beliau bernasib baik kerana mempunyai dua orang wanita yang menjadi tonggak kekuatan bukan sahaja dalam soal kerjayanya sebaliknya dalam kehidupan seharian. Ibu beliau merupakan inspirasinya sedari kecil, beliau mempelajari selok belok dan mendepani pelbagai cabaran melalui pengalaman yang dikutip sejak berada pada peringkat sekolah yakni semasa di tingkatan empat. Menurut Zaine beliau mengikuti ibunya iaitu Hajjah Rohani@Zainab binti Ismail berniaga di pasar Majlis Perbandaran Kota Bharu (MPKB). Ibu beliau sebagaimana wanita Kelantan yang lain sudah terkenal sebagai peniaga yang rajin dan komited. Beliau memulakan aktiviti perniagaan di rumah dengan menjahit pelbagai tempahan seperti baju, cadar, dan tudung. Seterusnya beliau mengembangkan usaha dengan berniaga di pasar MPKB dan seterusnya di bazar Tok Guru. Dalam usianya yang mencecah 77 tahun beliau masih aktif membantu di syarikat Zaine Textile. Beliau bukan sahaja sebagai seorang ibu bahkan boleh diibaratkan seperti pembantu peribadi yang menguruskan segala keperluan di Zaine Textile. (Temubual Hajjah Rohani@Zainab binti Ismail, 2025). Bakat berniaga diwarisi dari ibunya kepada Zaine dan adik perempuan beliau Nik Rosmawati. Ibarat kata pepatah “ke mana tumpah kuah, kalau tidak ke nasi”.

Zaine juga merupakan insan yang bernasib baik kerana teman hidupnya iaitu Hazila binti Hashim Bani merupakan seorang yang sangat saportif serta begitu sabar menemani suaminya kala susah dan senang. Mereka berkahwin dalam usia yang muda dan Hazila mengorbankan masa mudanya dengan menjadi seorang ibu yang baik kepada ketiga-tiga anak mereka yang mana dua orang daripadanya telah bekerja dan yang sulung telah berumah tangga. Sementara seorang lagi masih meneruskan pengajian di universiti Malaya. Kehadiran dua orang wanita dalam kehidupan Zaine merupakan anugerah Ilahi yang tidak ternilai. Benarlah kata pepatah “Di sebalik kejayaan seorang lelaki, ada wanita di belakangnya”.

Keperibadian Zaine

Zaine merupakan sosok yang sederhana daripada sudut penampilan diri dan gaya hidup. Beliau tidak suka menonjolkan diri ke publik. Sekiranya mempunyai masa terluang beliau lebih senang menghabiskan masa bersama keluarga terutama dengan kedua-dua anak perempuannya di Kuala Lumpur. Namun begitu beliau tidak menafikan turut mempunyai hobi seperti bermain badminton. Dalam bidang perniagaan pula beliau menyatakan “biasa-biasa” sahaja. Namun, pada pandangan penulis bukan biasa tetapi luar biasa. Ini kerana dengan banyaknya syarikat yang gulung tikar terutama semasa zaman Perintah Kawalan Pergerakan (PKP)- COVID-19 Malaysia, namun syarikat Textile Zaine masih beroperasi sehingga kini. Apa yang penulis kagum, beliau masih mengekalkan sikap rendah diri, sungguhpun beliau mampu untuk mendabik dada. Beliau mampu memenuhi keperluan hidup seperti menyediakan tempat tinggal, makan-minum dan keperluan asas yang lain dan apa lagi anak-anak yang berjaya. Anak lelaki sulung beliau sudah bekerja sebagai akauntan dan anak kedua beliau juga sudah bekerja sebagai analisis perniagaan dan anak ketiga beliau masih belajar di Universiti Malaya. Ketika membicarakan mengenai anak-anak beliau nampak berkaca matanya mungkin rasa terharu dan gembira seperti katanya secara spontan kepada penulis “Dengan berniaga kecil-kecilan macam ini dapat juga membela dan menyara serta memberi pendidikan kepada anak-anak”.

Permasalahan dan Cabaran

Sepanjang 30 tahun beroperasi Syarikat Zaine Textile, turut berdepan dengan pelbagai cabaran. Namun, beliau menganggap perkara tersebut sebagai asam garam dalam dunia perniagaan. Beliau tidak menafikan terdapat beberapa perkara yang sedikit sebanyak mengganggu kelancaran pengoperasian syarikat beliau. Antaranya beliau berdepan dengan persaingan on line terutama pembekal dari luar negeri seperti Indonesia dan China telah memasuki pasaran Malaysia amnya dan Kelantan khasnya. Ini menjejaskan perniagaan yakni daripada sudut penjualan mulai merosot. Berbanding 10 tahun dahulu keadaan ini semakin ketara. Bagi mengatasi masalah tersebut, syarikat mengambil inisiatif mengikut perkembangan semasa dengan menjual secara on line.

Selain itu, sewaktu memulakan perniagaan permintaan ke atas batik adalah tinggi. Namun pada tempoh masa sekarang batik lukis mempunyai masalah kerana kekurangan tenaga kerja pelukis (penyanting). Ini menyebabkan batik lukis hampir pupus sebaliknya diganti oleh *printed batik* atau batik bercetak. Masalah batik bercetak ialah isu ketulinan dan mudah diciplak. Selain itu identiti seni batik terutama batik lukis tangan Kelantan mulai hampir pupus.

Selain itu juga, bekalan produk seperti material kain putih kosong amat berkurangan disebabkan kilang di Indonesia mengalami masalah. Sebenarnya syarikat ini masih mampu mengatasinya. Ini kerana Zaine Textile memfokuskan kepada kain ela yang boleh diperolehi bukan sahaja di Indonesia bahkan boleh diimport dari negara China dan Vietnam.

Walau pun terdapat permasalahan beliau tidak bercadang membuka cawangan baharu di dalam atau di luar Kelantan. Ini kerana menurut beliau permintaan dalam kalangan pelanggan boleh di hantar ke semua tempat dengan menggunakan pelbagai saluran media sosial. Sungguh pun Zaine Textile pengasasnya tidak begitu mahir dalam pengendalian on line namun beliau sentiasa mengikuti perkembangan semasa dan segala urusan yang berkaitan secara on line dikendali oleh para pekerja. Menurut beliau lagi, Zaine Textile bernasib baik kerana terletak di lokasi yang strategik serta kurang berlaku persaingan di kawasan tersebut.

Kesimpulan

Konklusinya, hasil laporan awal penyelidikan ini menunjukkan bahawa tahap amalan usahawan terhadap pengurusan kewangan syarikat adalah baik, sementara tahap amalan usahawan terhadap pengurusan sumber manusia dan pengurusan pemasaran pula adalah pada tahap yang sederhana dan tahap amalan usahawan terhadap penggunaan teknologi adalah pada tahap yang lemah. Namun, begitu secara keseluruhan pencapaian syarikat Zaine Textile masih boleh dibanggakan sebagai pemilik kaum Melayu yang masih bertahan dengan pelbagai cabaran semasa, terutama pada era Perintah Kawalan Pergerakan (PKP) dan pasca PKP sehingga kini.

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MENEROKA GAMIFIKASI DALAM PENDIDIKAN ISLAM SEBAGAI PENDEKATAN PEMBELAJARAN ABAD KE-21

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Abstrak: Pembelajaran abad ke-21 menuntut pendekatan pengajaran yang lebih kreatif, interaktif dan berpusatkan pelajar secara menyeluruh. Dalam konteks ini, gamifikasi muncul sebagai satu pendekatan pedagogi inovatif yang berpotensi tinggi dalam meningkatkan penglibatan pelajar, merangsang minat serta memperkukuh kefahaman terhadap kandungan pembelajaran, termasuk dalam mata pelajaran Pendidikan Islam. Selaras dengan Anjakan Ketujuh Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013–2025 yang menekankan pemanfaatan teknologi digital, guru Pendidikan Islam perlu bersedia meneroka pendekatan pengajaran yang mengintegrasikan teknologi secara berkesan dan sistematik bagi menyokong keperluan pembelajaran semasa yang bersifat dinamik dan pelbagai. Kertas ini membincangkan potensi gamifikasi sebagai pendekatan alternatif dalam pengajaran dan pembelajaran Pendidikan Islam, berasaskan teori pembelajaran konstruktivisme dan behaviorisme, serta disokong oleh Model Motivasi ARCS (Attention, Relevance, Confidence, Satisfaction). Elemen gamifikasi seperti sistem mata (points), lencana (badges) dan papan kedudukan (leaderboards) melalui platform digital seperti Quizizz turut dianalisis. Dari sudut metodologi, kertas ini mengaplikasikan pendekatan kualitatif menerusi kajian literatur yang merangkumi analisis terhadap kajian-kajian terdahulu, artikel jurnal, dan laporan penyelidikan yang berkaitan dengan penggunaan gamifikasi dalam Pendidikan Islam. Analisis ini bertujuan mengenal pasti kelebihan, cabaran serta potensi penambahbaikan dalam pelaksanaan pendekatan tersebut di bilik darjah. Hasil dapatan menunjukkan bahawa gamifikasi mampu menjadikan proses pembelajaran lebih menyeronokkan, interaktif dan berkesan, di samping membantu meningkatkan motivasi serta komitmen pelajar. Implikasinya, pelaksanaan gamifikasi dalam pengajaran Pendidikan Islam wajar diperluas melalui kajian tindakan, penyelidikan berterusan dan latihan profesional agar dapat dimanfaatkan secara mampan dan berimpak tinggi dalam sistem pendidikan negara.

Kata kunci: Gamifikasi, Pendidikan Islam, Pembelajaran abad ke-21, Model Motivasi ARCS, Quizizz.

Pengenalan

Dalam era globalisasi dan Revolusi Industri 4.0, pendekatan pedagogi yang inovatif seperti gamifikasi semakin mendapat tempat dalam sistem pendidikan global. Gamifikasi, iaitu penggunaan elemen permainan dalam konteks pembelajaran, bukan sahaja menjadikan proses pembelajaran lebih menyeronokkan tetapi turut menggalakkan pemikiran kritis, penyelesaian masalah, dan kolaborasi dalam kalangan pelajar. Negara-negara maju seperti Finland, Korea Selatan, dan Amerika Syarikat telah membuktikan keberkesanan pendekatan ini dalam meningkatkan penglibatan pelajar dan pencapaian akademik mereka melalui pelbagai elemen seperti ganjaran digital, papan kedudukan, dan lencana pencapaian.

Negara-negara Asia seperti Jepun dan Singapura turut menjadikan gamifikasi sebagai sebahagian daripada strategi pendidikan digital kebangsaan. Di Jepun, gamifikasi diterapkan dalam program literasi digital dan pendidikan sosial, manakala di Singapura, platform pembelajaran maya berasaskan gamifikasi digunakan untuk subjek teras di sekolah. Pelaksanaan ini telah menunjukkan kesan positif terhadap motivasi pelajar dan kefahaman konsep pembelajaran jangka panjang, membuktikan bahawa gamifikasi berkesan dalam konteks pelbagai budaya dan sistem pendidikan.

Di Malaysia, integrasi gamifikasi semakin berkembang khususnya selepas pelaksanaan Pelan Pembangunan Pendidikan Malaysia 2013–2025 yang menggalakkan penggunaan teknologi dan kaedah inovatif dalam bilik darjah. Platform seperti Quizizz, Kahoot! dan Classcraft telah memperkayakan pengajaran subjek seperti Sains, Matematik, dan Bahasa Inggeris. Dalam Pendidikan Islam, gamifikasi berpotensi untuk menjadikan pembelajaran lebih interaktif dan berkesan dengan penggunaan kuiz digital, simulasi, dan cabaran yang menyampaikan nilai-nilai Islam secara kreatif dan bermakna.

Namun begitu, terdapat pelbagai cabaran dalam pelaksanaan gamifikasi dalam Pendidikan Islam seperti kekurangan kemudahan teknologi, tahap literasi digital guru yang tidak seimbang, kekangan masa, serta sensitiviti kandungan agama. Oleh itu, kajian ini dijalankan bagi mengenal pasti cabaran-cabaran tersebut dan mencadangkan strategi penyelesaian yang sesuai dengan konteks tempatan. Kajian ini diharapkan dapat membantu memperkukuh amalan pedagogi Pendidikan Islam dan menjadi asas kepada pembangunan model gamifikasi yang lebih sistematik serta sesuai digunakan oleh guru-guru di Malaysia.

Sorotan Literatur

Gamifikasi Dalam Pendidikan : Definisi Dan Konteks

Gamifikasi dalam pendidikan merujuk kepada penggunaan elemen permainan seperti ganjaran, papan kedudukan, dan cabaran interaktif dalam konteks pembelajaran bukan permainan bagi meningkatkan motivasi, penglibatan, dan hasil pembelajaran pelajar. Menurut Norazah dan Ramlee (2022), penggunaan gamifikasi dalam Pendidikan Islam berupaya meningkatkan minat serta penglibatan pelajar, khususnya dalam pembelajaran konsep abstrak seperti Fiqh dan Tauhid. Melalui pendekatan ini, pelajar belajar secara aktif dan interaktif dalam suasana yang lebih menyeronokkan dan mencabar.

Kajian oleh Zainuddin et al. (2021) menunjukkan bahawa platform seperti Kahoot! dan Quizizz memberi impak positif terhadap keterlibatan serta pencapaian pelajar dalam kursus teknologi pendidikan. Elemen interaktif seperti papan kedudukan dan kuiz masa nyata membolehkan pelajar menguji kefahaman mereka secara serta-merta, sekaligus memupuk daya saing sihat. Penemuan ini turut disokong oleh Khalil dan Azeez (2023), yang melaporkan bahawa guru Pendidikan Islam di Malaysia dan Indonesia menunjukkan kecenderungan positif terhadap penggunaan gamifikasi kerana ia memudahkan penyampaian isi kandungan yang kompleks dengan lebih efektif.

Abdul Wahab dan Khairuddin (2022) mendapati bahawa elemen gamifikasi dalam pembelajaran Fiqh meningkatkan motivasi dan pemahaman pelajar secara signifikan, terutamanya apabila disertai dengan sistem ganjaran seperti lencana digital dan sijil penghargaan. Kajian ini menegaskan keperluan sistem ganjaran yang sistematik dan konsisten

bagi memastikan impak positif kekal dalam jangka panjang. Mustapa dan Johari (2021) pula menambah bahawa gamifikasi bukan sahaja meningkatkan penglibatan pelajar di sekolah agama tetapi juga membina ketahanan mental dan emosi melalui cabaran berperingkat.

Selain meningkatkan minat dan motivasi, Mustapa dan Johari (2021) turut mendapati bahawa gamifikasi berpotensi memperkukuh disiplin diri pelajar. Sistem markah dan tahap pencapaian mendorong pelajar hadir ke kelas secara konsisten dan melengkapkan tugas, sekali gus memberi kesan positif terhadap pembelajaran dan pembentukan sahsiah diri. Elemen visual yang menarik, audio yang sesuai, serta cabaran berperingkat memudahkan pelajar memahami topik-topik Pendidikan Islam seperti ibadah dan sirah dengan lebih sistematik dan menyeronokkan.

Akhir sekali, integrasi gamifikasi dalam Pendidikan Islam turut memberi manfaat kepada guru. Hassan, Rahim dan Abdullah (2022) melaporkan bahawa guru yang mengaplikasikan gamifikasi menunjukkan tahap kreativiti dan inovasi yang lebih tinggi dalam merancang aktiviti pengajaran. Guru juga melaporkan kepuasan kerja yang lebih baik apabila pelajar menunjukkan peningkatan dari segi motivasi dan pencapaian pembelajaran. Secara keseluruhan, gamifikasi dilihat sebagai pendekatan yang relevan dan efektif dalam memenuhi keperluan pembelajaran abad ke-21 dalam konteks Pendidikan Islam.

Teori Konstruktivisme Dan Behaviorisme Dalam Gamifikasi

Dalam kerangka teori pembelajaran, gamifikasi dalam Pendidikan Islam berkait rapat dengan dua teori utama, iaitu teori konstruktivisme dan teori behaviorisme. Kedua-dua teori ini menyediakan asas konseptual yang kukuh dalam memahami bagaimana gamifikasi boleh digunakan untuk memperkukuh proses pengajaran dan pembelajaran. Menurut Piaget (1976), konstruktivisme menekankan bahawa pembelajaran berlaku secara aktif apabila pelajar berinteraksi dengan persekitaran mereka. Dalam konteks ini, elemen-elemen gamifikasi seperti cabaran, ganjaran, dan penyelesaian masalah berfungsi sebagai alat yang mendorong pelajar untuk membina pengetahuan secara sendiri dan bukan semata-mata menerima maklumat secara pasif daripada guru.

Kajian oleh Zainuddin et al. (2021) menyokong pandangan ini apabila mereka mendapati bahawa penggunaan platform gamifikasi seperti Kahoot! dan Quizizz dalam Pendidikan Islam telah meningkatkan pembelajaran aktif dalam kalangan pelajar. Melalui elemen cabaran dan penyelesaian masalah yang ditawarkan oleh platform ini, pelajar berpeluang untuk menguji kefahaman mereka sendiri dan memperbaiki kelemahan secara sendiri. Contohnya, apabila pelajar diberikan kuiz tentang hukum-hukum Fiqh, mereka perlu menggunakan pengetahuan yang sedia ada untuk menjawab soalan dengan betul. Proses ini selari dengan prinsip konstruktivisme yang memfokuskan kepada pembelajaran berpusatkan pelajar, di mana pelajar bertindak sebagai individu yang membina sendiri pemahaman melalui pengalaman dan interaksi langsung.

Di samping itu, elemen ganjaran seperti lencana digital, papan kedudukan, dan sistem tahap dalam gamifikasi juga memainkan peranan penting dari sudut konstruktivisme. Ganjaran tersebut bukan sahaja berfungsi sebagai motivasi luaran, tetapi turut membantu pelajar mengenal pasti kemajuan pembelajaran mereka sendiri. Pelajar yang menerima ganjaran selepas berjaya menyelesaikan cabaran tertentu akan lebih terdorong untuk terus meningkatkan

prestasi mereka. Hal ini memperkuat konsep self-directed learning yang menjadi salah satu teras utama dalam teori konstruktivisme, di mana pelajar belajar secara proaktif berdasarkan maklum balas dan pengalaman mereka sendiri.

Dari perspektif behaviorisme pula, yang dikemukakan oleh Skinner (1953), penggunaan ganjaran dan pengukuhan positif adalah unsur penting dalam membentuk tingkah laku pembelajaran yang diinginkan. Dalam konteks gamifikasi, sistem ganjaran yang disusun secara sistematik dapat bertindak sebagai pengukuh yang mendorong pelajar untuk mengulangi tingkah laku positif seperti menyertai kuiz, menjawab soalan dengan betul, dan menyelesaikan tugas tepat pada masanya. Abdul Wahab dan Khairuddin (2022) mendapati bahawa sistem ganjaran seperti mata, lencana, dan sijil digital memainkan peranan sebagai pengukuh tingkah laku positif dalam pembelajaran Pendidikan Islam. Dengan adanya ganjaran ini, pelajar lebih bermotivasi untuk terus berusaha mencapai tahap pembelajaran yang lebih tinggi, sekaligus meningkatkan konsistensi dan disiplin diri.

Teori behaviorisme juga menjelaskan bagaimana pengulangan tingkah laku yang diberi ganjaran akan membentuk kebiasaan dan akhirnya menjadi sebahagian daripada rutin pembelajaran pelajar. Sebagai contoh, apabila pelajar diberi penghargaan setiap kali mereka berjaya menjawab soalan berkaitan Tauhid atau Sirah dengan betul, tingkah laku tersebut akan diperkuatkan dan menjadi tabiat positif. Ini membuktikan bahawa gamifikasi bukan sahaja meningkatkan motivasi jangka pendek, tetapi turut membentuk tingkah laku pembelajaran yang berterusan dan lestari. Behaviorisme menekankan aspek ini dengan jelas melalui konsep reinforcement, di mana tingkah laku yang diperkuatkan secara konsisten akan terus berulang.

Akhir sekali, integrasi kedua-dua teori ini dalam gamifikasi memberikan keseimbangan yang penting antara motivasi intrinsik dan ekstrinsik dalam pembelajaran Pendidikan Islam. Konstruktivisme menekankan pembangunan pengetahuan sendiri dan pembelajaran berpusatkan pelajar, manakala behaviorisme memfokuskan kepada pembentukan tingkah laku melalui ganjaran dan pengukuhan. Gabungan kedua-dua pendekatan ini menjadikan gamifikasi sebagai strategi pedagogi yang holistik dan berkesan, mampu memenuhi keperluan pembelajaran abad ke-21. Dengan merancang elemen-elemen permainan yang sesuai berdasarkan prinsip konstruktivisme dan behaviorisme, guru dapat memastikan bahawa gamifikasi bukan sahaja menyeronokkan, tetapi juga membawa impak positif terhadap pembelajaran yang berkualiti dalam subjek Pendidikan Islam.

Model Motivasi ARCS

Model ARCS yang diperkenalkan oleh John M. Keller (1987) merupakan satu kerangka motivasi yang berfungsi untuk meningkatkan daya tarikan dan keefektifan pembelajaran melalui empat komponen utama, iaitu **Attention (Perhatian)**, **Relevance (Kerelevanan)**, **Confidence (Keyakinan)**, dan **Satisfaction (Kepuasan)**. Model ini digunakan secara meluas dalam reka bentuk pengajaran untuk mengekalkan motivasi pelajar sepanjang proses pembelajaran. Dalam konteks Pendidikan Islam, aplikasi model ARCS dapat membantu guru merancang strategi yang lebih bersifat pelajar-pusat dan interaktif, khususnya melalui pendekatan gamifikasi yang menggabungkan elemen permainan dalam pembelajaran formal.

Komponen pertama, iaitu **Attention**, merujuk kepada keupayaan untuk menarik dan mengekalkan perhatian pelajar. Dalam gamifikasi, penggunaan visual interaktif seperti avatar, animasi, warna terang, dan bunyi latar telah terbukti mampu menarik perhatian pelajar terhadap kandungan pembelajaran. Norazah dan Ramlee (2022) mendapati bahawa permainan berbentuk kuiz interaktif, seperti menggunakan platform Quizizz atau Kahoot!, membantu meningkatkan tumpuan pelajar terhadap pelajaran Pendidikan Islam. Unsur persaingan sihat dan masa terhad yang diberikan dalam permainan turut menggalakkan pelajar untuk kekal fokus dan lebih peka terhadap tugas yang diberikan.

Komponen kedua, **Relevance**, menekankan kepada sejauh mana kandungan pembelajaran berkait rapat dengan kehidupan pelajar. Gamifikasi berkesan apabila ia menghubungkan kandungan subjek dengan konteks kehidupan sebenar pelajar. Khalil dan Azeez (2023) menunjukkan bahawa apabila aktiviti gamifikasi merangkumi senario atau contoh yang mencerminkan pengalaman seharian pelajar Muslim, seperti adab dalam masjid atau peristiwa dalam sirah Nabi, pelajar menunjukkan minat yang lebih mendalam. Hubungan yang jelas antara pelajaran dan nilai kehidupan menjadikan pembelajaran lebih bermakna dan membantu pelajar memahami relevansi ilmu agama dalam kehidupan harian mereka.

Seterusnya, **Confidence** merujuk kepada tahap keyakinan pelajar terhadap kebolehan mereka untuk mencapai kejayaan dalam pembelajaran. Gamifikasi dapat meningkatkan keyakinan ini melalui sistem penanda aras seperti tahap atau 'level', ganjaran pencapaian, dan maklum balas segera. Mustapa dan Johari (2021) dalam kajian mereka mendapati bahawa pelajar sekolah agama menunjukkan peningkatan keyakinan diri setelah beberapa sesi menggunakan pendekatan gamifikasi. Pelajar lebih yakin apabila mereka dapat melihat kemajuan mereka secara visual dan menerima pengiktirafan, seperti lencana atau mata ganjaran, atas pencapaian tertentu. Ini sekaligus membantu mengurangkan rasa takut terhadap kegagalan atau kesilapan dalam pembelajaran.

Komponen terakhir ialah **Satisfaction**, yang menilai sejauh mana pelajar berasa puas dan berbaloi dengan usaha mereka dalam pembelajaran. Dalam konteks gamifikasi, kepuasan ini dapat dicapai apabila pelajar memperoleh ganjaran secara adil, mencapai objektif pembelajaran, dan menikmati proses pembelajaran itu sendiri. Norazah dan Ramlee (2022) menyatakan bahawa pelajar lebih gembira dan bersemangat apabila tugas disampaikan dalam bentuk permainan, kerana mereka dapat belajar sambil bermain. Kepuasan ini penting untuk mengekalkan motivasi intrinsik pelajar, terutamanya dalam subjek seperti Pendidikan Islam yang sering dianggap mencabar dan memerlukan pemahaman yang mendalam.

Keseluruhannya, model ARCS terbukti sebagai satu kerangka yang praktikal dan berkesan dalam meningkatkan keberkesanan gamifikasi dalam Pendidikan Islam. Keempat-empat komponen tersebut saling melengkapi dalam memastikan pelajar bukan sahaja tertarik kepada bahan pembelajaran, tetapi juga berupaya membina keyakinan, memahami relevansi ilmu, dan merasa puas dengan pengalaman pembelajaran mereka. Oleh itu, integrasi ARCS dalam reka bentuk pengajaran berasaskan gamifikasi harus diberi perhatian oleh guru-guru Pendidikan Islam, agar pendekatan ini bukan sahaja menarik secara luaran, tetapi juga membina motivasi yang berkekalan dan menyeluruh.

Metodologi Kajian

Kajian ini menggunakan reka bentuk kajian kualitatif dengan pendekatan kajian literatur untuk memahami penggunaan gamifikasi dalam Pendidikan Islam. Kaedah ini dipilih kerana ia membolehkan pengkaji mendapatkan gambaran menyeluruh mengenai topik kajian melalui analisis sumber data sekunder yang telah diterbitkan. Menurut Creswell (2014), pendekatan kajian literatur dalam penyelidikan kualitatif membolehkan peneliti memahami pola, konsep, serta penemuan terdahulu secara mendalam sebelum mengemukakan sintesis baharu. Oleh itu, kajian ini memfokuskan kepada pengumpulan dan penilaian dokumen seperti artikel jurnal, laporan penyelidikan, serta kertas kerja persidangan yang berkaitan dengan topik gamifikasi dalam konteks bilik darjah Pendidikan Islam.

Dalam kajian ini, analisis kandungan digunakan sebagai teknik utama untuk menganalisis data. Teknik ini membolehkan pengkaji mengenal pasti tema-tema utama yang berkaitan dengan kelebihan, cabaran, serta potensi penambahbaikan dalam pelaksanaan gamifikasi dalam bilik darjah Pendidikan Islam. Seperti yang dinyatakan oleh Krippendorff (2018), analisis kandungan merupakan pendekatan sistematik dalam mengkaji dokumen untuk mengenal pasti corak makna dan tafsiran. Proses ini melibatkan pengekodan maklumat, pengelompokan tema, dan penilaian kritis terhadap setiap isu yang dikenal pasti, sekali gus menghasilkan dapatan yang bersifat sintesis dan menyeluruh.

Tambahan pula, kajian ini tidak melibatkan sebarang pengumpulan data lapangan seperti temu bual atau pemerhatian, sebaliknya memberi tumpuan sepenuhnya kepada data sekunder yang telah diterbitkan. Pendekatan ini bersesuaian dengan saranan Booth, Sutton, dan Papaioannou (2016) yang menjelaskan bahawa kajian literatur mampu menyediakan kerangka teori dan empirik yang kukuh, terutamanya apabila sumber data primer sukar diperoleh atau kajian bersifat eksploratori. Hal ini juga memastikan bahawa dapatan kajian ini berdasarkan bukti sedia ada yang telah diuji kesahihannya dalam kajian-kajian terdahulu.

Secara keseluruhannya, reka bentuk kajian ini berupaya menyumbang kepada pengayaan literatur berkaitan penggunaan gamifikasi dalam Pendidikan Islam dengan menonjolkan tema-tema utama yang diperoleh daripada analisis dokumen. Hasil kajian ini diharap dapat memberi panduan kepada pendidik dan pembuat dasar dalam merangka strategi pengajaran yang lebih berkesan dan sesuai dengan keperluan semasa. Seperti yang dinyatakan oleh Hamari et al. (2014), gamifikasi mempunyai potensi besar dalam meningkatkan motivasi dan penglibatan pelajar, namun cabaran pelaksanaannya perlu diteliti secara kritis agar manfaatnya dapat dioptimumkan dalam konteks pendidikan.

Perbincangan Dan Cadangan Penambahbaikan

Berdasarkan analisis literatur yang telah dikaji, didapati bahawa gamifikasi berpotensi memberikan impak yang signifikan terhadap penglibatan, motivasi dan pencapaian pelajar dalam konteks Pendidikan Islam. Pendekatan pedagogi ini semakin mendapat tempat dalam kalangan pendidik kerana keupayaannya menggabungkan elemen keseronokan dengan pembelajaran bermakna. Kajian oleh Norazah dan Ramlee (2022) serta Zainuddin et al. (2021) menunjukkan bahawa pelajar lebih cenderung untuk terlibat secara aktif apabila aktiviti pembelajaran disusun dengan menggunakan elemen permainan seperti sistem ganjaran, papan kedudukan dan kuiz interaktif. Persekitaran yang menyeronokkan ini tidak hanya memberi

kesan kepada motivasi, tetapi turut mendorong perkembangan kemahiran sosial seperti kerjasama dan komunikasi.

Di samping itu, dapatan kajian juga menunjukkan bahawa gamifikasi berpotensi memperkuat sikap positif pelajar terhadap proses pembelajaran. Sifat kompetitif yang wujud dalam elemen permainan boleh memupuk daya saing sihat dalam kalangan pelajar, manakala struktur ganjaran pula dapat membina disiplin diri dan ketekunan untuk mencapai matlamat pembelajaran. Pelajar juga didapati lebih bersedia untuk mengulang kandungan pelajaran dalam bentuk gamifikasi berbanding kaedah tradisional seperti ceramah atau latihan bertulis semata-mata. Ini menunjukkan bahawa gamifikasi boleh menjadi alat yang efektif untuk mengekalkan perhatian dan penglibatan pelajar dalam tempoh masa yang lebih lama.

Walau bagaimanapun, pelaksanaan gamifikasi dalam Pendidikan Islam tidak terlepas daripada beberapa isu dan cabaran. Salah satu cabaran utama ialah kekangan teknologi yang masih dihadapi oleh sebahagian besar sekolah, khususnya di kawasan luar bandar. Menurut Hassan, Rahim dan Abdullah (2022), sekolah-sekolah di kawasan pedalaman sering kali tidak mempunyai kelengkapan ICT yang mencukupi seperti komputer, tablet atau sambungan internet yang stabil. Keadaan ini menyebabkan pelajar di kawasan tersebut tidak dapat menikmati pengalaman pembelajaran berasaskan gamifikasi secara menyeluruh, sekali gus menimbulkan isu ketidaksamaan dalam akses pendidikan digital.

Kekangan teknologi ini bukan sahaja terhad kepada infrastruktur fizikal, malah turut melibatkan aspek penyelenggaraan dan sokongan teknikal. Tanpa kemudahan yang mencukupi dan bantuan teknikal yang berkesan, guru menghadapi kesukaran untuk melaksanakan aktiviti gamifikasi yang memerlukan penggunaan peranti atau platform digital. Oleh itu, adalah penting agar pihak Kementerian Pendidikan Malaysia mengambil langkah strategik untuk menyediakan peruntukan khusus dalam memperkuat prasarana teknologi pendidikan di sekolah-sekolah yang kurang berkemampuan. Penyediaan kemudahan ini harus merangkumi semua jenis sekolah agar tiada pelajar yang tercicir daripada arus pembelajaran digital yang semakin berkembang pesat.

Selain isu prasarana, kekurangan latihan profesional dalam kalangan guru Pendidikan Islam turut menjadi cabaran besar yang menjejaskan keberkesanan pelaksanaan gamifikasi. Ramai guru masih belum diberikan pendedahan formal tentang penggunaan platform seperti Kahoot!, Quizizz atau Wordwall dalam konteks pengajaran subjek agama. Hal ini membawa kepada kekurangan keyakinan dalam merancang aktiviti interaktif yang bersifat permainan. Malah, sebilangan guru masih beranggapan bahawa gamifikasi hanya sesuai untuk subjek sains dan teknologi, dan tidak relevan dalam pengajaran topik-topik seperti akidah, ibadah atau akhlak.

Justeru, adalah dicadangkan agar program latihan profesional guru diperkasakan dengan memberi tumpuan khusus kepada pedagogi gamifikasi dalam Pendidikan Islam. Latihan ini bukan sahaja perlu bersifat teknikal, tetapi juga harus menekankan kefahaman terhadap falsafah dan prinsip gamifikasi dalam konteks nilai-nilai Islam. Guru perlu dibimbing untuk membina aktiviti permainan yang bukan sahaja menarik, tetapi juga menyampaikan mesej keagamaan dengan berkesan. Latihan boleh dilaksanakan melalui bengkel bersemuka, kursus dalam talian bersijil, serta pembangunan modul bersifat amali yang sesuai dengan peringkat umur dan tahap kebolehan pelajar.

Satu lagi cabaran yang sering diabaikan ialah ketidakseimbangan antara elemen hiburan dan objektif pembelajaran. Sekiranya gamifikasi dilaksanakan secara tidak terancang, pelajar mungkin terlalu terarah kepada ganjaran luaran seperti mata, lencana atau kemenangan, dan mengabaikan isi kandungan yang sebenarnya ingin disampaikan. Abdul Wahab dan Khairuddin (2022) menyatakan bahawa struktur ganjaran dalam gamifikasi perlu dikaitkan rapat dengan hasil pembelajaran agar aktiviti yang dijalankan tetap relevan dan bermakna. Ini penting bagi memastikan bahawa pembelajaran tidak berlaku secara superfisial atau sekadar untuk mencapai skor tertinggi.

Sebagai penyelesaian, pihak perancang kurikulum perlu mempertimbangkan penstrukturan semula kandungan mata pelajaran Pendidikan Islam supaya lebih fleksibel dalam menyokong pendekatan gamifikasi. Ini termasuk memberikan ruang kepada guru untuk merancang masa pembelajaran yang melibatkan aktiviti interaktif dan bukannya hanya tertumpu kepada penyampaian fakta. Penyesuaian kurikulum yang lebih inklusif ini membolehkan gamifikasi diintegrasikan secara sistematik dan tidak dianggap sebagai aktiviti sampingan semata-mata. Dengan pendekatan sebegini, pelajar bukan sahaja dapat menguasai kandungan secara menyeluruh, tetapi juga lebih bersedia untuk mengaplikasikannya dalam kehidupan seharian.

Dari sudut penilaian, kebanyakan kajian yang dilakukan setakat ini lebih tertumpu kepada aspek kualitatif seperti motivasi dan keterlibatan pelajar, manakala pengukuran kesan terhadap pencapaian akademik masih kurang diberi perhatian. Ini menyukarkan guru dan pentadbir sekolah untuk menilai sejauh mana keberkesanan gamifikasi secara objektif. Oleh itu, pembangunan instrumen penilaian yang lebih mantap dan sahih adalah sangat penting agar guru dapat mengukur impak sebenar gamifikasi terhadap perkembangan pelajar dalam aspek kognitif, afektif dan psikomotor.

Instrumen yang dibangunkan boleh merangkumi soal selidik yang standard, rubrik penilaian serta sistem analitik digital yang membolehkan guru menjejaki perkembangan pelajar secara masa nyata. Dengan adanya instrumen ini, guru bukan sahaja dapat membuat penilaian secara berterusan, tetapi juga dapat menyesuaikan strategi pengajaran mengikut keperluan individu pelajar. Ini sejajar dengan prinsip pembelajaran berpusatkan pelajar yang menjadi tunjang dalam pendidikan abad ke-21. Tambahan pula, data penilaian yang sistematik ini boleh digunakan oleh pihak pembuat dasar untuk merangka strategi pendidikan digital yang lebih berkesan dan bersasar.

Bagi memastikan kelestarian pelaksanaan gamifikasi, kerjasama strategik antara pihak sekolah, kementerian dan syarikat pembangun teknologi pendidikan juga amat diperlukan. Pendekatan ini akan membuka ruang kepada pembangunan platform digital tempatan yang khusus untuk Pendidikan Islam, sekaligus menjamin kesesuaian kandungan dengan konteks budaya dan nilai masyarakat Malaysia. Dengan wujudnya platform ini, guru tidak perlu bergantung sepenuhnya kepada aplikasi antarabangsa yang mungkin tidak sesuai dari segi nilai dan kandungan. Malah, pelajar akan lebih mudah mengaitkan pembelajaran dengan realiti kehidupan mereka sebagai seorang Muslim.

Sebagai contoh, satu platform interaktif tempatan boleh dibangunkan dengan menggabungkan elemen permainan yang berdasarkan kisah sirah, hukum-hakam fiqh, dan adab Islam. Platform seperti ini bukan sahaja menjadikan pembelajaran lebih menarik, tetapi juga boleh berfungsi sebagai alat dakwah yang menyampaikan nilai-nilai Islam secara kreatif dan tidak

konvensional. Pelajar boleh diberikan avatar Islamik, ganjaran berbentuk pahala maya atau misi yang memerlukan mereka menyelesaikan cabaran berdasarkan kisah para sahabat atau tokoh-tokoh Islam yang memberi inspirasi.

Kesimpulannya, walaupun gamifikasi terbukti membawa banyak manfaat dalam meningkatkan penglibatan dan pencapaian pelajar, kejayaannya amat bergantung kepada pelaksanaan yang strategik dan menyeluruh. Beberapa faktor seperti prasarana teknologi, kemahiran guru, penyesuaian kurikulum, sistem penilaian dan sokongan institusi perlu ditangani secara holistik agar pendekatan ini tidak menjadi trend sementara semata-mata. Komitmen semua pihak yang terlibat amat diperlukan bagi menjadikan gamifikasi sebagai satu bentuk inovasi pendidikan yang mampan dan inklusif.

Dengan menggabungkan keperluan asas pendidikan Islam dan pendekatan teknologi yang sesuai, gamifikasi berpotensi besar untuk menjadi medium pembelajaran yang lebih relevan, menarik dan berkesan. Usaha ini bukan sahaja akan memanfaatkan pelajar dari segi kognitif dan afektif, tetapi juga membantu membentuk generasi Muslim yang celik teknologi, berakhlak mulia dan mempunyai semangat cintakan ilmu. Perancangan yang teliti dan pelaksanaan yang sistematik akan menjadi penentu utama dalam memastikan kejayaan transformasi pedagogi melalui gamifikasi dalam sistem pendidikan Islam di Malaysia.

Jangkaan Dapatan / Implikasi

Dengan pelaksanaan strategi penambahbaikan yang telah dicadangkan, gamifikasi berpotensi untuk diintegrasikan secara sistematik dalam pengajaran Pendidikan Islam di peringkat sekolah rendah dan menengah. Kajian menunjukkan bahawa pelajar lebih bermotivasi, terlibat secara aktif, dan mencapai prestasi yang lebih baik apabila elemen permainan seperti ganjaran digital, papan kedudukan, dan kuiz interaktif digunakan secara konsisten. Pengajaran yang menyeronokkan ini turut membantu membentuk sahsiah dan disiplin diri pelajar. Di samping itu, guru juga berpeluang meningkatkan kualiti pengajaran melalui pendekatan yang lebih kreatif dan inovatif, seterusnya meningkatkan kepuasan kerja dan keterlibatan profesional mereka.

Dalam konteks yang lebih luas, gamifikasi dapat mewujudkan persekitaran pembelajaran Pendidikan Islam yang lebih menarik dan bermakna, terutama bagi generasi muda yang terdedah kepada teknologi. Konsep-konsep agama seperti Fiqh, Tauhid, dan Sirah dapat disampaikan secara interaktif, menjadikan pembelajaran lebih mudah difahami dan diaplikasikan dalam kehidupan harian. Dari sudut dasar pendidikan, dapatan kajian ini memberikan sumbangan penting kepada Kementerian Pendidikan Malaysia (KPM) dalam merangka dasar pendidikan digital yang inklusif, dengan mengiktiraf kepentingan gamifikasi dalam subjek bukan STEM seperti Pendidikan Islam. Penekanan terhadap aspek bajet, infrastruktur, latihan guru, dan pembangunan kurikulum perlu diperkukuh agar transformasi ini benar-benar menyeluruh.

Selain itu, kajian ini membuka ruang kepada penyelidikan lanjutan yang dapat menilai keberkesanan elemen permainan tertentu terhadap pelbagai dimensi pembelajaran. Kajian tindakan dan eksperimen lapangan boleh dijalankan bagi membina amalan terbaik dalam pengajaran Pendidikan Islam berasaskan gamifikasi. Implikasi sosial juga dapat dilihat melalui integrasi nilai-nilai murni dalam aktiviti permainan yang dirancang berasaskan kandungan

agama. Kuiz atau permainan yang mengetengahkan adab dan akhlak, misalnya, boleh membantu pelajar menghayati nilai tersebut secara mendalam. Secara keseluruhan, dapatan kajian ini diharapkan dapat menjadi panduan kepada guru, pembuat dasar, dan penyelidik dalam memperkasakan Pendidikan Islam yang lebih relevan, menyeronokkan, dan berkesan dalam menghadapi cabaran abad ke-21.

Kesimpulan

Secara keseluruhannya, gamifikasi merupakan pendekatan pedagogi yang berpotensi besar dalam memperkukuh pengajaran dan pembelajaran Pendidikan Islam abad ke-21. Penggunaan elemen permainan seperti ganjaran, papan kedudukan, dan cabaran interaktif telah terbukti mampu meningkatkan minat, motivasi serta pemahaman pelajar. Walaupun pendekatan ini menunjukkan keberkesanan, pelaksanaannya perlu ditangani secara strategik memandangkan wujud cabaran seperti kekangan teknologi, kurangnya latihan profesional guru, dan ketidakselarasan dengan objektif pembelajaran. Oleh itu, penambahbaikan seperti penyediaan infrastruktur yang mencukupi, latihan berterusan dan penyusunan semula kurikulum perlu diberi perhatian serius oleh pihak berkepentingan.

Pelaksanaan gamifikasi tidak seharusnya dianggap sebagai trend sementara, sebaliknya perlu disokong oleh penyelidikan yang berterusan bagi memastikan keberkesanannya dalam konteks tempatan. Kajian lanjutan perlu meneliti elemen gamifikasi yang paling sesuai dengan nilai dan budaya Pendidikan Islam di Malaysia. Dengan sokongan data empirikal yang kukuh, pelaksanaan dasar dan garis panduan yang lebih relevan dapat dirangka. Gamifikasi yang dirancang teliti mampu memupuk minat dan disiplin pelajar serta membantu guru melaksanakan pengajaran yang lebih kreatif, menjadikan pendekatan ini sebagai strategi penting dalam memperkasakan Pendidikan Islam masa kini dan akan datang.

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CABARAN PENGGUNAAN “CANVA” DALAM KALANGAN GURU PENDIDIKAN ISLAM

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Abstrak: Kajian ini bertujuan untuk mengenal pasti potensi cabaran yang mungkin dihadapi oleh guru Pendidikan Islam dalam penggunaan aplikasi “Canva” sebagai alat bantu mengajar dalam proses pengajaran dan pembelajaran (PdP). “Canva” merupakan sebuah platform reka bentuk grafik yang menarik dan interaktif yang diyakini dapat meningkatkan keberkesanan penyampaian isi kandungan. Namun begitu, penggunaan teknologi ini berkemungkinan berdepan dengan pelbagai kekangan, khususnya dalam kalangan guru Pendidikan Islam. Antara cabaran yang dijangka akan diterokai termasuklah kekangan kemahiran teknologi, kekurangan latihan formal berkaitan penggunaan Canva, kekangan masa untuk menyediakan bahan pengajaran, serta isu capaian internet dan peranti di sekolah. Selain itu, aspek sikap sesetengah guru yang kurang berminat untuk meneroka teknologi baharu dalam PdP turut akan diberikan perhatian. Kajian ini diharap dapat mencadangkan perlunya latihan berkala dan sokongan teknikal yang berterusan kepada guru, di samping usaha pihak sekolah dalam menyediakan kemudahan ICT yang mencukupi. Dapatan dari kajian kepustakaan ini diharapkan dapat membantu pihak berkepentingan seperti Kementerian Pendidikan Malaysia dan pihak pentadbir sekolah dalam merancang intervensi yang bersesuaian bagi memperkasakan penggunaan Canva dalam kalangan guru Pendidikan Islam ke arah PdP yang lebih kreatif dan berkesan.

Kata kunci: Canva, Pendidikan Islam, Guru, Cabaran, Teknologi dalam PdP.

Pengenalan

Dalam era digital masa kini, penggunaan teknologi dalam pendidikan semakin meluas, termasuk dalam bidang Pendidikan Islam. Inovasi seperti aplikasi “canva” yang kini berasaskan kecerdasan buatan (AI) membuka ruang baharu dalam memperkayakan proses pengajaran dan pembelajaran. Kajian ini bertujuan meneroka bagaimana aplikasi ini dimanfaatkan oleh guru Pendidikan Islam dalam menyampaikan isi kandungan yang lebih menarik, interaktif dan efektif. Pendidikan Islam memainkan peranan penting dalam membentuk sahsiah dan kefahaman agama dalam kalangan pelajar. Seiring dengan perkembangan teknologi, integrasi kecerdasan buatan dalam pengajaran dapat memberikan pendekatan yang lebih kreatif dan interaktif. Canva, sebagai aplikasi reka bentuk yang mesra pengguna, telah memperkenalkan fungsi AI yang membolehkan guru menghasilkan bahan pengajaran secara lebih efisien. Kajian ini akan mengkaji bagaimana Canva dapat membantu guru Pendidikan Islam dalam menyediakan bahan pembelajaran yang lebih menarik dan mudah difahami oleh pelajar.

Dalam era globalisasi yang sarat dengan perkembangan teknologi maklumat dan komunikasi, bidang pendidikan turut mengalami transformasi yang signifikan. Kaedah pengajaran

konvensional yang berasaskan buku teks dan ceramah kini berdepan dengan pelbagai cabaran untuk kekal relevan dan berkesan (Saili & Taat, 2023). Pendidikan Islam sebagai satu bidang ilmu yang holistik merangkumi aspek akidah, ibadah, akhlak dan sirah memerlukan pendekatan pengajaran yang bukan sahaja informatif tetapi juga mampu menyentuh emosi dan spiritual pelajar (Herwati, 2024). Namun begitu, terdapat kekangan dalam memastikan bahawa penyampaian isi kandungan itu menarik dan relevan, terutamanya apabila pelajar lebih terdedah kepada media visual dan teknologi interaktif dalam kehidupan seharian. Dalam konteks ini, aplikasi seperti *Canva* yang mempunyai pelbagai templat, grafik dan integrasi AI boleh menjadi pemangkin kepada inovasi dalam pengajaran Pendidikan Islam. Penggunaan *Canva* dapat membantu guru menghasilkan bahan bantu mengajar yang lebih menarik, interaktif dan mudah difahami oleh pelajar (Afianti, 2024). Maka timbul persoalan sejauh mana aplikasi ini digunakan oleh guru Pendidikan Islam dalam pengajaran mereka.

Meskipun *Canva* digunakan secara meluas oleh pelajar dan guru untuk tugas dan persembahan, penggunaan aplikasinya dalam subjek Pendidikan Islam masih kurang dikaji secara menyeluruh. Terdapat persepsi bahawa aplikasi seperti ini lebih sesuai untuk subjek yang bersifat seni atau visual, seperti Pendidikan Seni Visual atau Reka Bentuk Komunikasi Visual. Hal ini menyebabkan sebahagian guru Pendidikan Islam tidak memanfaatkan sepenuhnya potensi *Canva* dalam pengajaran mereka. Tambahan pula, ramai guru beranggapan bahawa aplikasi seperti *Canva* memerlukan kemahiran teknikal atau kreatif yang tinggi. Oleh itu, kajian ini penting untuk meneroka sejauh mana kefahaman, penerimaan dan penggunaan sebenar *Canva* berasaskan AI oleh guru Pendidikan Islam di sekolah.

Sorotan Literatur.

Canva merupakan aplikasi berasaskan web yang membolehkan pengguna mereka bentuk pelbagai bahan visual seperti poster, slaid dan infografik. Dalam konteks pendidikan, *Canva* berperanan penting dalam meningkatkan keberkesanan penyampaian guru dan menjadikan bahan pengajaran lebih menarik (Nasir et al., 2022). Penggunaan *Canva* juga didapati mampu menyokong pendekatan pembelajaran visual dan interaktif dalam bilik darjah (Rashid & Abdul Rahman, 2021).

Namun begitu, penggunaan *Canva* dalam pengajaran subjek Pendidikan Islam masih belum menyeluruh. Kajian oleh Zakaria dan Mohamad (2023) mendapati bahawa guru Pendidikan Islam menghadapi beberapa kekangan seperti kekurangan latihan khusus, kekangan masa serta kesukaran mencari kandungan yang sesuai dengan nilai-nilai Islam dalam *Canva*. Tambahan pula, guru di sekolah luar bandar turut berdepan dengan isu capaian internet yang terhad serta kekurangan peralatan digital (Azman & Khalid, 2020). Hal ini menunjukkan wujudnya jurang digital yang menjejaskan pelaksanaan pengajaran berasaskan teknologi.

Di samping itu, tahap kemahiran guru terhadap penggunaan aplikasi digital seperti *Canva* juga memainkan peranan penting. Guru yang tidak celik teknologi berasa sukar untuk menyesuaikan diri dengan keperluan PdP berasaskan visual (Jamil, 2021). Walaupun terdapat pelbagai bengkel dan kursus berkaitan penggunaan teknologi dalam pendidikan, kajian menunjukkan bahawa kursus-kursus tersebut masih belum menjurus secara khusus kepada aplikasi seperti *Canva* dalam konteks subjek Pendidikan Islam.

Sorotan literatur ini menunjukkan bahawa terdapat keperluan mendesak untuk meneroka cabaran sebenar yang dihadapi oleh guru Pendidikan Islam dalam menggunakan Canva, serta mencadangkan strategi praktikal bagi membantu guru memanfaatkan sepenuhnya aplikasi ini dalam PdP mereka.

Cabaran Penggunaan Canva Dalam Kalangan Guru Pendidikan Islam

Penggunaan teknologi kecerdasan buatan (AI) dalam pendidikan, termasuk aplikasi seperti Canva AI, menawarkan pelbagai kelebihan kepada guru dan pelajar. Namun begitu, ia turut mengundang beberapa cabaran yang perlu diberi perhatian agar penerapan teknologi ini tidak menimbulkan masalah kepada proses pengajaran dan pembelajaran terutamanya dalam konteks subjek Pendidikan Islam yang menekankan nilai-nilai spiritual, etika dan sensitiviti keagamaan. Cabaran- cabaran ini merangkumi aspek kemahiran guru, kebergantungan terhadap teknologi, sensitiviti kandungan serta isu etika dan infrastruktur.

Salah satu cabaran utama adalah tahap kemahiran digital guru yang berbeza-beza. Tidak semua guru Pendidikan Islam mempunyai latar belakang atau latihan formal dalam menggunakan aplikasi berasaskan AI. Menurut (Azman, Md Zabit, & Megat Khalis, 2024) Majoriti guru pelatih tidak menggunakan teknologi dalam sesi PdP bagi tujuan merangsang pembelajaran digital di dalam kelas. Walaupun Canva bersifat mesra pengguna, sebahagian guru mungkin berasa tidak yakin atau kurang terbiasa dengan penggunaan ciri seperti magic Write atau Text-to- Image. Kekurangan pengetahuan ini boleh menjejaskan keberkesanan pengajaran, kerana guru mungkin tidak memanfaatkan sepenuhnya potensi teknologi yang ada.

Selain itu, wujud isu kebergantungan berlebihan terhadap teknologi, yang boleh membawa kepada pengurangan interaksi manusia dalam bilik darjah. Jika guru terlalu bergantung pada persembahan visual yang dihasilkan AI tanpa memahami konteks kandungan, maka pengajaran boleh menjadimkering dan kurang nilai pedagogi sebenar. Pendidikan Islam menekankan hubungan antara guru dan murid sebagai wasilah dalam penyampaian nilai murni dan pemahaman Rohani sesuatu yang tidak boleh digantikan sepenuhnya oleh teknologi.

Dalam konteks subjek Pendidikan Islam, terdapat juga kebimbangan terhadap sensitiviti kandungan. AI dalam Canva beroperasi berdasarkan data dan algoritma terbuka, yang kadangkala boleh menghasilkan maklumat atau imej yang tidak sesuai atau bertentangan dengan ajaran Islam. Guru perlu berhati-hati dalam memilih reka bentuk, Imej atau teks yang dijana secara automatik agar tidak berlaku penyampaian kandungan yang tidak sah atau berunsur syubhah. Ini menuntut tahap penapisan yang tinggi serta kepekaan terhadap isu-isu akidah dan adab.

Kurangnya Kemahiran Digital Dalam Kalangan Guru

Salah satu cabaran utama dalam penggunaan Canva berasaskan AI oleh guru Pendidikan Islam ialah kekangan dari segi kemahiran teknologi. Tidak semua guru mempunyai tahap penguasaan teknologi yang sama. Ramai guru yang sudah berkhidmat lebih daripada 15 atau 20 tahun masih terbiasa dengan kaedah pengajaran tradisional seperti menggunakan buku teks, papan putih dan helaian kerja bercetak. Apabila mereka diperkenalkan dengan aplikasi moden seperti Canva, lebih-lebih lagi versi yang melibatkan kecerdasan buatan (AI), ramai yang berasa kekak dan kurang yakin. Mereka mungkin tahu cara membuka aplikasi, tetapi tidak pasti bagaimana

untuk menghasilkan bahan mengajar yang sesuai, menarik dan berkesan mengikut topik dalam Pendidikan Islam.

Contohnya, ada guru yang keliru dengan ciri-ciri AI dalam Canva seperti “Magic Write”, “Text to Image”, atau “Brand Hub”, yang semuanya kelihatan rumit pada pandangan pertama. Tanpa latihan atau bimbingan yang cukup, guru mudah berasa kecewa dan memilih untuk tidak menggunakannya langsung. Bahkan, ada juga yang risau mereka akan membuat kesilapan ketika menyediakan bahan pengajaran, lalu bahan tersebut tidak dapat digunakan atau menimbulkan kekeliruan dalam kalangan pelajar. Ini menyebabkan mereka mengambil sikap berhati-hati atau mengelak daripada menggunakan alat seperti Canva, walaupun mereka tahu ia berpotensi membantu pengajaran dengan lebih menarik dan moden.

Kekangan ini bukan berpunca daripada sikap guru semata-mata, tetapi lebih kepada kekurangan pendedahan dan sokongan berterusan dari pihak pengurusan sekolah atau jabatan pendidikan. Jika guru-guru diberikan latihan berkala atau bengkel praktikal dalam menggunakan Canva, terutamanya yang menekankan penggunaan ciri AI, ramai yang pasti akan lebih yakin dan bersedia untuk menggunakannya dalam bilik darjah. Guru bukan tidak mahu berubah, tetapi mereka memerlukan bimbingan yang sesuai mengikut tahap keperluan mereka. Oleh itu, jika isu kemahiran teknologi ini dapat ditangani dengan cara yang mesra dan bersesuaian, ia pasti dapat membuka ruang kepada penggunaan teknologi yang lebih meluas dan berkesan dalam pengajaran Pendidikan Islam.

Masalah Capaian Internet dan Kekurangan Peralatan Digital

Salah satu cabaran ketara yang dihadapi oleh guru dalam penggunaan Canva berasaskan AI ialah masalah capaian internet yang tidak stabil atau terlalu perlahan. Ini berlaku khususnya di sekolah-sekolah luar bandar, pedalaman atau kawasan yang liputan internetnya tidak menyeluruh (Jamaludin, 2021). Canva sebagai aplikasi berasaskan web memerlukan sambungan internet yang baik untuk memuat naik gambar, menggunakan templat, dan menghasilkan reka bentuk secara langsung. Jika sambungan terganggu, guru akan mengambil masa yang lama untuk menyiapkan bahan, atau lebih teruk, tidak dapat mengakses Canva langsung. Situasi ini menyebabkan ramai guru berasa kecewa dan akhirnya memilih untuk tidak bergantung pada aplikasi digital ketika mengajar.

Selain itu, kekurangan peralatan digital turut menjadi penghalang utama. Tidak semua sekolah dilengkapi dengan makmal komputer atau peranti seperti tablet dan projektor untuk membolehkan guru menggunakan Canva dengan selesa (Kamarudin, 2018). Dalam sesetengah kes, guru hanya mempunyai satu komputer riba yang perlu dikongsi bersama guru lain, atau terpaksa menggunakan telefon pintar mereka sendiri untuk menyediakan bahan. Hal ini menyukarkan mereka untuk menghasilkan bahan pengajaran yang berkualiti tinggi, terutama apabila perlu memasukkan elemen grafik dan animasi. Bagi pelajar pula, ramai yang tidak mempunyai peranti sendiri untuk melihat bahan tersebut, apatah lagi untuk melibatkan diri secara aktif dalam aktiviti reka bentuk menggunakan Canva.

Masalah ini menggambarkan ketidakseimbangan antara keperluan teknologi dalam pengajaran dan kemudahan sebenar yang tersedia di peringkat sekolah. Ia bukan sekadar isu teknikal, tetapi turut melibatkan soal keadilan dan kesamarataan dalam peluang untuk mengakses teknologi pendidikan. Sekiranya masalah capaian internet dan kekurangan peralatan ini tidak diatasi,

maka hasrat untuk mengintegrasikan Canva berasaskan AI dalam pengajaran hanya akan menjadi ideal yang sukar dicapai. Maka, perlu ada sokongan yang lebih menyeluruh dari pihak berwajib, termasuk penyediaan infrastruktur dan bantuan teknologi agar semua guru, tanpa mengira lokasi, dapat memanfaatkan teknologi ini dengan sepenuhnya.

Kekangan Masa Untuk Menghasilkan Bahan Pengajaran

Kekangan masa merupakan satu lagi cabaran besar yang sering dihadapi oleh guru dalam usaha untuk menggunakan Canva, khususnya versi berasaskan AI, dalam proses pengajaran. Tugas harian seorang guru bukan sahaja tertumpu kepada mengajar di dalam bilik darjah, tetapi juga melibatkan pelbagai tanggungjawab lain seperti menyediakan rancangan pengajaran harian (RPH), melaksanakan pentaksiran bilik darjah, mengurus fail panitia dan menghadiri mesyuarat atau bengkel (F.C Lim, Abdul Jalil, & Omar, 2024). Dalam kesibukan rutin ini, untuk meluangkan masa mempelajari ciri-ciri baharu dalam Canva atau menyediakan bahan grafik yang menarik bukanlah sesuatu yang mudah. Apatah lagi jika guru tersebut belum begitu mahir dalam penggunaan teknologi, proses penyediaan bahan akan menjadi lebih lama dan melelahkan.

Walaupun Canva menyediakan pelbagai templat sedia guna dan fungsi automatik seperti cadangan reka letak dan teks, penggunaannya masih memerlukan sedikit masa untuk merancang kandungan yang sesuai dengan topik pengajaran. Sebagai contoh, jika seorang guru ingin menghasilkan bahan untuk pengajaran topik Akidah, dia perlu memilih grafik yang bersesuaian, memasukkan ayat atau definisi yang betul serta memastikan reka bentuk tersebut mesra pelajar. Ini memerlukan masa tambahan di luar waktu pengajaran biasa. Jika tidak mempunyai perancangan yang baik, guru cenderung untuk kembali kepada kaedah lama yang lebih cepat dan mudah walaupun kurang menarik atau tidak berasaskan teknologi.

Tambahan pula, tidak semua guru diberikan masa kerja yang fleksibel untuk bereksperimen dengan aplikasi baharu. Banyak inisiatif teknologi dalam pendidikan gagal di peringkat pelaksanaan kerana tidak mengambil kira beban masa yang ditanggung oleh guru. Oleh itu, untuk menggalakkan penggunaan Canva berasaskan AI secara lebih meluas, perlulah ada pendekatan yang lebih praktikal seperti menyediakan waktu khas untuk guru menyediakan dan mencuba bahan, atau mewujudkan sokongan teknikal yang boleh membantu mempercepat proses penyediaan bahan. Jika kekangan masa ini dapat diatasi, pastinya lebih ramai guru akan berasa selesa dan yakin untuk menggunakan Canva dalam meningkatkan kualiti pengajaran Pendidikan Islam.

Cadangan Penyelesaian

Bagi menangani cabaran penggunaan Canva dalam kalangan guru Pendidikan Islam, beberapa langkah proaktif perlu dilaksanakan. Antara cadangan utama ialah penganjuran latihan dan bengkel teknologi secara khusus, terutamanya yang memberi fokus kepada penggunaan Canva dalam konteks subjek Pendidikan Islam. Latihan ini bukan sahaja perlu memperkenalkan fungsi asas Canva, malah perlu memperincikan cara penggunaannya untuk menghasilkan bahan PdP yang beretika, berlandaskan nilai Islam, dan sesuai untuk keperluan pelajar. Kursus seumpama ini juga perlu dijalankan secara berkala agar guru sentiasa peka dengan kemas kini teknologi serta memperoleh bimbingan secara berterusan (Nasir et al., 2022; Zakaria & Mohamad, 2023).

Seterusnya, pembangunan sumber pendidikan Islamik perlu diberi perhatian oleh pihak berkepentingan. Hal ini merangkumi penyediaan templat, ikon, grafik, dan ilustrasi yang sesuai dengan prinsip dan nilai Islam. Dengan adanya sumber ini, guru tidak perlu bimbang tentang kandungan grafik yang tidak selari dengan ajaran agama. Usaha ini bukan sahaja membantu guru menjimatkan masa dalam memilih bahan, malah memastikan kandungan yang dihasilkan lebih sahih, beretika dan mendidik. Pihak kementerian atau organisasi Islamik juga boleh bekerjasama dengan pembangun kandungan digital untuk menghasilkan koleksi sumber ini secara profesional (Jamil, 2021).

Di samping itu, pengurusan masa yang lebih efektif dalam kalangan guru turut menjadi keperluan mendesak. Guru sering terbeban dengan pelbagai tugas pentadbiran dan pengajaran, menyebabkan masa untuk menyediakan bahan menggunakan Canva menjadi terhad. Oleh itu, galakan penggunaan templat sedia ada dalam Canva boleh membantu mempercepatkan proses penyediaan bahan. Templat yang telah direka bentuk secara profesional membolehkan guru menumpukan perhatian kepada kandungan tanpa perlu memikirkan aspek reka bentuk yang rumit (Rashid & Abdul Rahman, 2021).

Satu lagi aspek penting ialah penambahbaikan akses kepada teknologi. Keberkesanan penggunaan Canva sangat bergantung kepada penyediaan peranti digital seperti komputer riba, projektor, serta sambungan internet yang stabil. Oleh itu, pihak sekolah terutamanya di kawasan luar bandar perlu diberi keutamaan dari segi peruntukan infrastruktur digital. Pihak pentadbiran dan Kementerian Pendidikan Malaysia perlu memastikan setiap sekolah mempunyai akses teknologi yang setara, bagi menjamin keadilan dalam peluang mengaplikasikan inovasi dalam PdP (Azman & Khalid, 2020).

Akhir sekali, perlu diwujudkan penyediaan sokongan teknikal yang kukuh di peringkat sekolah atau daerah. Pasukan sokongan teknologi yang terdiri daripada guru pakar ICT atau juruteknik pendidikan perlu ditugaskan untuk membantu guru menyelesaikan isu teknikal ketika menggunakan Canva. Bantuan seperti ini dapat meningkatkan keyakinan guru untuk mencuba pendekatan baharu dalam pengajaran, tanpa risau tentang kemungkinan masalah teknikal yang timbul. Sokongan secara bersemuka atau dalam talian amat penting bagi memastikan kesinambungan penggunaan teknologi yang konsisten dan berkesan (Zakaria & Mohamad, 2023).

Kesimpulan

Secara keseluruhannya, penggunaan Canva memberikan pelbagai manfaat kepada guru Pendidikan Islam dalam usaha memperkasa kaedah penyampaian ilmu secara lebih menarik, visual dan kontemporari. Aplikasi ini bukan sahaja mampu meningkatkan tumpuan pelajar, malah dapat membantu guru menghasilkan bahan PdP yang lebih kreatif dan bersesuaian dengan keperluan abad ke-21. Walau bagaimanapun, masih terdapat pelbagai cabaran yang membantutkan penggunaan Canva secara menyeluruh dalam kalangan guru, terutamanya melibatkan kekangan kemahiran digital, masa, infrastruktur serta kekurangan sumber Islamik yang sesuai.

Oleh itu, usaha menangani cabaran-cabaran ini harus dilaksanakan secara menyeluruh dan bersepadu. Pihak sekolah, Kementerian Pendidikan, institusi latihan perguruan dan pembangun teknologi pendidikan perlu bekerjasama dalam menyediakan latihan, sumber, dan kemudahan

yang mencukupi untuk para guru. Cadangan seperti latihan khusus, pembangunan templat Islamik, penambahbaikan akses teknologi serta sokongan teknikal yang mampan adalah antara langkah strategik yang wajar dipertimbangkan.

Dengan pelaksanaan intervensi yang tepat, para guru Pendidikan Islam bukan sahaja dapat menguasai penggunaan Canva dengan lebih yakin, malah mampu menjadi ejen perubahan dalam membina persekitaran pembelajaran yang lebih berkesan dan bermakna. Justeru, penggunaan Canva dalam pengajaran Pendidikan Islam wajar diperkukuhkan agar manfaat teknologi ini dapat dirasai secara menyeluruh dalam sistem pendidikan negara.

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PENGGUNAAN PEDAGOGI HIKMAH DALAM MENINGKATKAN KEMAHIRAN MEMBACA

**Inas Tasnim Roslan
Hafizhah Zulkifli
Mohd Kaziman Ab Wahab**

Abstrak: *Pedagogi Hikmah merupakan satu kaedah pengajaran yang berasaskan falsafah inkuiri dan boleh digunakan di dalam bilik darjah. Pedagogi hikmah ini membuka ruang dan peluang kepada pelajar dalam membantu meningkatkan kemahiran kognitif, non kognitif dan sebagainya. Dengan itu, tujuan kajian ini adalah untuk meneroka kebolehgunaan pendekatan pedagogi hikmah dalam meningkatkan kemahiran membaca murid pemulihan khas di Sekolah Kebangsaan. Kajian ini menggunakan pendekatan kualitatif dengan pengumpulan data secara triangulasi melalui temu bual peserta kajian, analisis dokumen dan senarai semak pemerhatian. Dapatan kajian menunjukkan bahawa pendekatan ini dapat meningkatkan keyakinan diri murid dalam membaca, memperbaiki kemahiran membaca mereka dari segi kelancaran, pemahaman dan sebutan serta meningkatkan minat dan motivasi untuk membaca. Kesimpulannya pendekatan pedagogi hikmah memberikan impak yang signifikan terhadap perkembangan kemahiran membaca murid pemulihan khas di sekolah kebangsaan.*

Pendahuluan

Program Pemulihan Khas telah dilaksanakan oleh Kementerian Pelajaran Malaysia semenjak tahun 1960-an lagi bagi membantu pelajar sekolah rendah yang menghadapi masalah khusus 3M dalam pembelajaran (Roslan Chin, 2017). 3M merangkumi kemahiran asas membaca, menulis dan mengira. Menurut Farah Zurah (2022), kemahiran yang paling penting yang perlu dikuasai oleh murid Program Pemulihan Khas ini adalah kemahiran membaca. Hal ini demikian kerana membaca merupakan satu sumber pengetahuan asas dalam pembelajaran seorang murid. Keupayaan membaca dengan lancar dan memahami teks adalah kunci kepada kejayaan akademik dan perkembangan intelektual seorang murid. Bagi murid yang menghadapi cabaran pembelajaran seperti murid pemulihan khas, kemahiran membaca sering kali menjadi satu masalah utama yang mempengaruhi pencapaian mereka dalam mata pelajaran lain (Zamri Mahamod, 2018).

Terdapat pelbagai faktor mengganggu murid-murid pemulihan khas terhadap kesukaran membaca. Antaranya ialah masalah pembelajaran, gangguan perkembangan, kesulitan bahasa dan lain (Jumiyah Binti Ahmad, 2014). Tambahnya lagi, masalah seperti kesukaran dalam mengenali perkataan, kesulitan dalam menyusun ayat dan memahami konteks bacaan akan menjejaskan daya saing murid dalam pembelajaran mereka. Oleh itu, strategi pembelajaran yang berkesan perlu dilaksanakan untuk membantu murid-murid ini mengatasi cabaran tersebut.

Di dalam konteks Pendidikan Pemulihan Khas, strategi pengajaran yang berkesan perlu diubah suai dan disesuaikan dengan keperluan murid (Nurahimah Yusuf, 2017). Rafah Zuhail (2022)

berpendapat bahawa guru guru perlulah melaksanakan kaedah membaca yang menarik dan berkesan untuk menarik minat murid supaya terus membaca. Oleh itu, salah satu pendekatan yang boleh digunakan untuk membantu murid Program Pemulihan Khas ini ialah melalui pendekatan Pedagogi Hikmah.

Pedagogi Hikmah merupakan satu kaedah mengajar yang diadaptasi daripada Mathew Lipman iaitu seorang professor di sebuah universiti di Amerika Syarikat. Lipman memperkenalkan kaedah inkuiri falsafah yang dinamakan Philosophy for Children. Kaedah ini diaplikasikan di dalam kelas murid pemulihan khas kerana terdapat beberapa kelompangan daripada kajian lepas mengenai Pedagogi Hikmah ini di mana mendapati pedagogi Hikmah ini kurang diaplikasikan kepada murid pemulihan khas. Selain itu, walaupun terdapat kajian mengenai Pedagogi Hikmah dijalankan, namun kajian Pedagogi Hikmah yang spesifik kepada bahan rangsangan teks cerita kepada murid pemulihan khas masih belum dikaji secara meluas.

Walhasil, kajian ini diharapkan dapat membantu murid-murid membaca dengan lancar di dalam kelas pemulihan khas dan seterusnya dapat menarik minat membaca.

Refleksi Amalan Lalu

Sebagai seorang guru, pengkaji sangat mengambil perhatian terhadap pencapaian kemahiran murid, terutama dalam kemahiran membaca. Hal ini kerana, jika tidak tahu membaca, maka tidak dapat menggunakan buku teks dengan baik dan tidak dapat menjawab soalan dengan baik. Daripada pemerhatian pengkaji mendapati murid lemah dalam membaca. Pelbagai usaha telah pengkaji lakukan untuk membantu pelajar membaca dengan lancar.

Keupayaan membaca dengan lancar dan memahami teks cerita menjadi satu kemahiran asas yang sangat penting dalam pembelajaran murid terutamanya di peringkat pendidikan sekolah rendah (Zamri Mahamod et. al, 2021). Ia adalah kunci kepada kejayaan akademik dan perkembangan intelektual seorang murid. Namun begitu, bagi murid yang menghadapi cabaran pembelajaran seperti murid pemulihan khas, kemahiran membaca sering menjadi satu masalah utama yang mempengaruhi pencapaian mereka dalam mata pelajaran lain.

Terdapat pelbagai faktor yang mengganggu murid-murid pemulihan khas terhadap kesukaran membaca. Antaranya ialah masalah pembelajaran, kesulitan bahasa, kurang motivasi (Jumiyah Binti Ahmad, 2014) dan sebagainya. Kemahiran membaca yang lemah akan memberi kesan negatif terhadap pencapaian akademik mereka. Sehubungan dengan itu, salah satu pendekatan yang boleh digunakan untuk membantu murid-murid pemulihan khas ini adalah dengan menggunakan teks cerita pedagogi hikmah dalam PdPc. Dengan penggunaan teks cerita Pedagogi Hikmah, diharapkan ia dapat menarik minat murid-murid ini untuk membaca sekaligus meningkatkan kemahiran membaca mereka.

Kemahiran membaca merupakan salah satu kemahiran literasi yang dikira sebagai kemahiran yang paling penting dalam kehidupan. Hal ini kerana ia menghubungkan kemahiran lisan dan menulis (Low Jie Ying, 2024). Namun begitu, pada tahun 2023, Berita Harian (Faida 2023), serta laporan Tahunan Pelan Pembangunan Pendidikan Malaysia (2022) melaporkan bahawa seramai 175,304 (13%) murid di Malaysia tidak menguasai kemahiran membaca. Sebahagian daripadanya ialah melibatkan murid di pedalaman Sabah dan Sarawak dengan jumlah sebanyak 6.61% (Che Zamariah, et.al, 2023).

Terdapat dua isu yang ingin diketengahkan dalam kajian ini. Isu yang pertama ialah kesukaran murid-murid etnik Bidayuh untuk membaca dan memahami frasa Bahasa Melayu. Di Malaysia, keperluan untuk menguasai bahasa Melayu sebagai bahasa pengantar utama dalam pendidikan sangat penting, khususnya dalam kalangan murid-murid yang mengikuti sistem pendidikan kebangsaan. Namun bagi murid-murid komuniti etnik yang menggunakan bahasa ibunda yang berlainan seperti masyarakat Bidayuh, penguasaan Bahasa Melayu sering menjadi cabaran besar. Masyarakat Bidayuh, yang kebanyakannya masih mengekalkan penggunaan bahasa ibunda mereka dalam kehidupan seharian sering menghadapi kesukaran dalam berkomunikasi dan memahami Bahasa Melayu, terutamanya dalam konteks akademik.

Menurut Yahya Othman et.al (2020), penggunaan bahasa Bidayuh sebagai bahasa komunikasi utama di rumah dan dalam komuniti menyebabkan murid-murid kurang terdedah dengan penggunaan bahasa Melayu. Oleh itu, sebahagian daripada murid-murid ini menghadapi kesukaran untuk menyebut, membaca dan memahami teks Bahasa Melayu dengan baik. Hal ini menyebabkan mereka mengalami kesulitan untuk menterjemahkan makna perkataan dan frasa bahasa melayu dan menghubungkaitkan isi bacaan mereka. Hal ini menyebabkan minat dan motivasi mereka terhadap membaca semakin menurun (Nor Habsah Aali, 2023).

Isu yang kedua adalah berkenaan dengan kesukaran murid pemulihan khas untuk mengikuti pembelajaran dalam mata pelajaran yang lain terutamanya Bahasa Melayu (Farah Zurah Binti Yusuf, 2022). Menurut Zamri (2014), kelemahan murid untuk membaca akan menyebabkan murid tidak dapat menguasai kemahiran menulis. Hal ini kerana, mereka akan mengalami kesulitan untuk mengeja dan tidak dapat menyampaikan idea mereka melalui penulisan. Sarawak menunjukkan penurunan sebanyak 5.37 pada tahun 2020 kepada 5.61 pada tahun 2022. Data yang dikutip oleh Farah zurah Binti Yusuf (2022) menunjukkan kemerosotan pencapaian mata pelajaran Bahasa Melayu dan bahasa Inggeris dalam kalangan murid yang majoritinya etnik Bidayuh, Melanau dan Iban.

Menurut Nor Habsah Aali (2023), kegagalan dan kemerosotan murid dalam pembelajaran akan menyebabkan murid menjadi pasif dan mudah menjadi malas kerana mereka kurangnya motivasi dalam diri. Hal ini akan menyebabkan pretasi akademik mereka akan semakin merosot dari masa ke masa.

Justeru itu, kajian ini berhasrat untuk meneliti peningkatan kemahiran membaca melalui pendekatan Pedagogi hikmah dalam kalangan murid pemulihan Khas di Sekolah Kebangsaan. Dapatan kajian ini juga boleh menjadi rujukan kepada pihak guru Pemulihan Khas untuk membantu meningkatkan kemahiran membaca murid Program Pemulihan Khas.

Kajian literatur

Pedagogi Hikmah merupakan salah satu kaedah pengajaran yang menggunakan pendekatan inkuiri falsafah. Ia akan menggalakkan pelajar untuk berfikir secara kritis berdasarkan bahan rangsangan yang disediakan oleh guru. (Rosnani et.al, 2014). Salah satu bahan rangsangan yang sering digunakan dalam Pendekatan Pedagogi Hikmah ialah teks cerita pendek. Murid-murid akan diminta untuk membaca dan mendengar bacaan teks cerita tersebut dari rakan-rakannya secara bergilir-gilir (Hafizhah Zulkifli, 2020) Melalui teknik ini, murid dapat belajar

untuk mengeja, menyebut dan memahami frasa frasa teks cerita tersebut dengan lebih teliti dan rasional serta dapat membincangkan rumusan cerita dengan betul.

Low Jie Ying et.al (2024) mendapati bahawa guru lebih suka menggunakan strategi bersoal jawab, pengalaman sedia ada, membaca secara mekanis dan menggunakan kamus untuk membantu murid meningkatkan kemahiran membaca terutamanya bagi kalangan murid yang menggunakan Bahasa Melayu sebagai bahasa kedua.

Dapatan kajian Ira Sariyah Hidayati et.al (2020) dari Indonesia pula menunjukkan bahawa strategi menghubungkan-kaitkan pengalaman sedia ada dengan teks terpilih, iaitu teks yang berkaitan dengan murid akan menyebabkan murid berasa ingin tahu dan bermotivasi untuk membaca. Seterusnya, teknik ini sangat bertepatan dengan pendekatan Pedagogi Hikmah yang menekankan murid untuk membaca teks pendek yang berkaitan dengan kehidupan seharian bagi membantu meningkatkan motivasi mereka untuk membaca. Teknik pendekatan ini selaras dengan kajian yang dibuat oleh Audina Auldrey et.al (2020) yang mendapati bahawa strategi *Directed Reading Activity* membolehkan murid untuk membaca dan mengukuhkan pemahaman mereka.

Kajian yang dilakukan oleh Maharani Dyah dan Budiasih (2021) yang mendapati bahawa teknik Skimming and Scanning, Strategi L-R-D (Listen-Read-Discuss) sangat membantu murid-murid yang kurang mahir membaca untuk menganalisis dan memahami kosa kata dengan baik.

Seterusnya, setiap murid yang mempelajari bahasa mempunyai tahap yang berbeza ketika proses mentafsir dan proses pemikiran kognitif (Mohamed Amin et.al 2010). Proses kognitif yang dialami oleh seorang murid ketika mempelajari sesuatu bahasa dipanggil sebagai strategi pembelajaran bahasa. Oleh itu, Mohamad Amin (2000) berpendapat bahawa jika seorang murid dapat menerangkan dan mengingat semula sesuatu perkataan yang baru dipelajarinya, maka murid itu telah dapat menguasai sesuatu bahasa dengan baik. Strategi pembelajaran bahasa ini sangat bertepatan dengan kaedah pendekatan pedagogi hikmah yang dapat menilai kemahiran membaca murid ketika sesi pembelajaran.

Dalam konteks pembelajaran murid Pemulihan Khas di negara ini, peranan guru amat penting untuk membantu murid-muridnya menguasai bahasa dengan cepat dan berkesan terutamanya Bahasa Melayu (Nurahimah Yusuf, 2023). Hall (1997) menyatakan guru perlulah mengenal pasti keupayaan murid dan membimbingnya untuk menguasai kemahiran membaca dengan lancar kerana tanpa kemahiran membaca dan menaakul, murid tidak akan mampu bersaing dengan dunia pendidikan yang semakin mencabar.

Sehubungan dengan itu, pembelajaran dan pengajaran kemahiran membaca amatlah memerlukan strategi kemahiran membaca yang tertentu dan efektif untuk meningkatkan penguasaan kemahiran membaca dengan lancar. Maka penyelidikan ini cuba untuk menyelidiki sejauhmanakah peningkatan kemahiran membaca murid Program Pemulihan Khas melalui pendekatan Pedagogi Hikmah.

Fokus dan Objektif Kajian

Kajian ini bertujuan untuk menilai keberkesanan pendekatan Pedagogi Hikmah terhadap peningkatan kemahiran membaca murid Pemulihan Khas Sekolah Kebangsaan dan

menentukan kesan pendekatan Pedagogi hikmah terhadap minat dan motivasi murid Pemulihan Khas untuk membaca.

Objektif yang ingin dicapai dalam kajian ini ialah untuk:

1. Menilai kebolegunaan pendekatan Pedagogi Hikmah terhadap peningkatan kemahiran membaca murid Pemulihan Khas SK

Persoalan Kajian dan Kumpulan Sasaran

Persoalan kajian yang ingin dijawab dalam kajian ini ialah:

1. Adakah pendekatan Pedagogi Hikmah dapat meningkatkan kemahiran membaca murid Pemulihan Khas SK.

Kajian ini dijalankan di Sekolah Kebangsaan di Sarawak khususnya melibatkan 3 orang pemulihan khas yang menghadapi kesukaran dalam kemahiran membaca.

Tinjauan Awal

Tinjauan awal bagi pelaksanaan pendekatan Pedagogi Hikmah untuk meningkatkan kemahiran membaca dalam kalangan murid pemulihan khas di Sekolah Kebangsaan memerlukan beberapa langkah persediaan. Perkara ini dapat membantu pengkaji untuk melakukan kajian mengikut fasa-fasa yang telah dirancang. Pendekatan ini bertujuan untuk meningkatkan kemahiran membaca murid-murid pemulihan khas dengan mengutamakan nilai kefahaman dan kebijaksanaan Ketika mengikuti program Pedagogi Hikmah. Berikut adalah perincian setiap fasa dalam pelaksanaan pendekatan ini.

Pelaksanaan Tindakan Pedagogi Hikmah

Perancangan

Fasa perancangan adalah langkah awal yang penting dalam pelaksanaan kajian ini. Perancangan yang teliti sangat diperlukan untuk memastikan keberkesanan pendekatan Pedagogi Hikmah dalam membantu murid pemulihan khas di Sekolah Kebangsaan . Antara perancangan utama yang dilakukan oleh pengkaji ialah:

1. Penetapan matlamat

Pengkaji telah menentukan matlamat jangka pendek dan jangka panjang untuk peningkatan kemahiran membaca murid serta objektif pembelajaran yang jelas. Berikut adalah matlamat jangka panjang dan jangka pendek yang ingin dicapai oleh pengkaji sepanjang kajian ini dijalankan:

Matlamat Jangka Pendek:

- a. Peningkatan Pemahaman Membaca: Hal ini bertujuan untuk meningkatkan pemahaman membaca murid terhadap teks-teks yang mudah. Pengkaji telah mengukur peningkatan ini melalui aktiviti membaca berulang kali dan ujian pemahaman selepas sesi bacaan.
- b. Peningkatan kemahiran Menyebut: Hal ini bertujuan untuk memberi fokus kepada penambahbaikan teknik sebutan dan kelancaran membaca frasa- frasa Bahasa Melayu

dengan betul. Pengkaji menggunakan teknik membaca bersama rakan dan guru serta latihan menyebut perkataan dengan betul.

Matlamat Jangka Panjang:

- a. Mewujudkan Kemahiran Membaca yang Mantap: Pada akhir kajian, pengkaji berharap murid-murid dapat membaca teks cerita dengan lancar dan memahami teks yang lebih kompleks.
- b. Melahirkan Minat dan Motivasi Murid: Salah satu matlamat penting bagi kajian ini adalah untuk memastikan murid-murid ini semakin bermotivasi untuk membaca serta dapat mengintegrasikan nilai-nilai murni yang diperolehi dari hasil pembacaan dalam kehidupan seharian mereka.

2. Pemilihan Bahan Bacaan

Pengkaji telah menyediakan bahan bacaan yang menarik, relevan dan sesuai dengan tahap kebolehan murid Pemulihan Khas. Bahan bacaan ini mengandungi unsur-unsur moral dan budaya setempat untuk menarik minat murid untuk membaca. Selain itu, ia juga mengandungi nilai-nilai moral yang boleh membantu murid-murid ini untuk membina karakter mulia dan menyemai kebijaksanaan dalam pembelajaran. Oleh itu, bagi memastikan objektif kajian tercapai, pengkaji telah memilih beberapa bahan bacaan yang mengandungi kriteria-kriteria tersebut.

- a. Teks Cerita Ringkas: Bahan bacaan yang dipilih mestilah sesuai dengan tahap kebolehan murid Pemulihan Khas. Oleh itu, pengkaji telah memilih teks cerita yang ringkas, berulang dan mempunyai perkataan yang mudah disebut dan difahami oleh murid. Antara teks cerita yang digunakan oleh Pengkaji ialah:
- b. Mengandungi Unsur Hikmah dan Nilai Murni: Dalam pendekatan Pedagogi Hikmah, bahan bacaan perlu mengandungi unsur-unsur pemikiran yang mendalam dan pengajaran. Oleh itu, pengkaji banyak mendedahkan murid-murid ini dengan kisah teladan dari Sirah Para Nabi dan Rasul.

3. Reka Bentuk Aktiviti Pembelajaran

Pengkaji telah merancang aktiviti yang bersifat multisensori dan interaktif untuk memupuk minat murid untuk membaca dan membantu mereka untuk memahami teks cerita yang dibaca. Antara aktiviti yang telah dilakukan ialah:

- a. Membaca bersama: Dalam aktiviti ini, murid akan membaca bersama-sama dengan rakan-rakan yang lain di bawah bimbingan guru. Guru akan memberikan tunjuk ajar mengenai sebutan perkataan dan cara membaca dengan lancar. Aktiviti ini membolehkan murid belajar cara untuk membaca cerita yang sama dengan rakan-rakan yang lain terutamanya apabila melibatkan intonasi bacaan, ekspresi wajah dan cara sebutan yang betul.
- b. Perbincangan Berasaskan Teks: Selepas sesi bacaan, murid dan guru akan membincangkan beberapa nilai-nilai murni yang terdapat dalam cerita tersebut. Guru akan memulakan perbincangan dengan soalan “Apa yang kamu pelajari daripada sikap watak tersebut”.

- c. Aktiviti Praktikal yang menggunakan Kreativiti: Pengkaji telah melakukan aktiviti menghasilkan semula cerita yang telah dibaca dalam bentuk lukisan dan *role-play* untuk membantu murid memahami kandungan teks dengan lebih baik. Murid-murid dikehendaki untuk melakonkan semula dan melukis berdasarkan nilai-nilai yang telah dibincangkan.

Tindakan

Masa yang diperuntukkan adalah 60 minit setiap kali kajian dijalankan. Masa yang ditetapkan ini adalah untuk aktiviti bacaan, perbincangan dan latihan pengukuhan. Walau bagaimanapun, berikutan situasi murid yang kurang mahir membaca, pelaksanaan tempoh masa kajian terpaksa ditambah berikutan murid mengambil masa sekurang-ukurangnya 40 -45 minit bagi menghabiskan satu teks bacaan. Oleh itu, masa peruntukan kajian adalah tidak tetap dan tidak konsisten kerana bergantung kepada tahap pencapaian murid. Pengkaji memaklumkan kepada peserta kajian bahawa jarak kajian pertama dan kajian seterusnya adalah dua minggu.

Semasa kajian dijalankan, pengkaji menerangkan cara dan menunjukkan demonstrasi cara untuk membaca teks cerita Pedagogi Hikmah dengan betul. Pengkaji juga melaksanakan aktiviti membaca bersama yang melibatkan bacaan berulang dan penekanan kepada sebutan frasa dan kosa kata yang betul. Ini memberi peluang kepada murid untuk berinteraksi dengan aktif. Selain itu, murid-murid juga akan didedahkan dengan nilai-nilai murni setiap kali aktiviti pembincangan dilakukan. Pengkaji akan menekankan pengajaran yang boleh diambil daripada cerita tersebut dan menggalakkan murid untuk mengaplikasikannya dalam kehidupan seharian.

Setelah semua peserta kajian menjalankan aktiviti pembacaan dan perbincangan, pengkaji akan menjalankan aktiviti pengukuhan untuk memastikan semua peserta kajian dapat memahami kandungan teks cerita dengan baik. Terdapat dua kaedah yang dilakukan oleh pengkaji untuk mengenalpasti tahap kefahaman murid iaitu melalui soalan-soalan pengukuhan dan aktiviti aktiviti lain seperti lakonan, melukis dan penceritaan semula.

Pemerhatian

Pada peringkat ini, pengkaji telah menjalankan pemerhatian terhadap peserta kajian semasa sesi pembelajaran berlangsung. Pengkaji menggunakan senarai semak pemerhatian untuk melihat penguasaan peserta kajian dalam membaca dan memahami teks cerita Pedagogi Hikmah semasa kajian dilaksanakan. Pengkaji mengumpul data kajian ini melalui lembaran kerja yang dijawab oleh peserta kajian dan latihan susulan yang lain. Selain itu, pengkaji juga mengumpul maklumat melalui senarai semak pemerhatian. Kedua-dua instrumen ini digunakan setelah tiga kali pelaksanaan kajian. Manakala sesi temu bual pula dilaksanakan pada akhir pelaksanaan kajian iaitu pada kali kelima. Pengkaji menganalisis dapatan kajian yang dikumpul dan mengenalpasti sama ada objektif kajian sudah tercapai ataupun tidak.

Refleksi

Semasa proses membuat refleksi, pengkaji merujuk kembali rakaman video yang telah disimpan dan membuat refleksi terhadap pelaksanaan kaedah Pedagogi Hikmah yang telah dijalankan. Pengkaji menilai kekuatan dan kelemahan penggunaan kaedah Pedagogi Hikmah dalam membantu meningkatkan kemahiran membaca murid pemulihan khas.

Pendekatan pedagogi hikmah dapat membantu murid dari segi kelancaran membaca. Murid dilihat lebih mampu untuk mengatasi halangan membaca dengan lebih berkesan. Manakala dari aspek pemahaman pula, murid dilihat telah menunjukkan peningkatan yang positif kerana mereka diberi peluang untuk memahami makna teks yang dibaca tanpa perlu mengejar kecepatan membaca untuk memahami teks tersebut secara keseluruhannya.

Proses pengumpulan data bagi kaedah temu bual analisis dokumen dan senarai semak pemerhatian dijalankan setelah kajian berakhir. Berdasarkan data-data tersebut, pengkaji dapat melihat sejauh mana peningkatan kemahiran membaca melalui pendekatan pedagogi hikmah dalam kalangan murid pemulihan khas.

Penilaian

Data dianalisis secara triangulasi di mana data temu bual akan disokong dengan data pemerhatian dan analisis dokumen (lembaran kerja murid). Hasil dapatan kajian mendapati bahawa kesemua peserta kajian mengalami kesukaran dalam membaca dan memahami teks bacaan tersebut. Antara kesukaran yang dihadapi oleh mereka ialah tidak memahami makna perkataan dan frasa Bahasa Melayu, susah untuk memahami keseluruhan cerita dan kesukaran untuk mengeja perkataan Bahasa Melayu dengan betul. Walaupun begitu, selepas kaedah ini dijalankan, dapatan kajian mendapati bahawa kaedah membaca Pedagogi Hikmah ini dapat membantu murid-murid ini untuk meningkatkan kefahaman dan kemahiran membaca mereka dengan lebih baik.

Terdapat tiga tema yang muncul hasil dari temu bual, pemerhatian dan analisis dokumen. Tema tema yang telah dikenal pasti ialah keyakinan diri untuk membaca dan pengajaran yang lembut dan tidak menghukum.

PERSOALAN KAJIAN 1: “Bagaimana pendekatan Pedagogi Hikmah dapat meningkatkan kemahiran membaca kamu?

1. Peningkatan Keyakinan Diri Ketika Membaca

Hasil daripada temu bual. Pengkaji mendapati bahawa pelaksanaan kajian tindakan menggunakan kaedah Pedagogi Hikmah ini mendapat respon yang positif daripada peserta kajian. peserta kajian 2 dan 3 menyatakan bahawa mereka berasa semakin yakin untuk membaca tanpa perlu rasa takut atau malu walaupun pernah menghadapi kesukaran untuk membaca sebelum ini. Contoh petikan temu bual yang menyokong tema di atas ialah:

“Dulu saya malu nak baca, sebab selalu lupa perkataan dan tak pandai eja. Tapi sekarang saya dah tak malu nak baca sebab cikgu selalu ajar saya cara nak sebut perkataan dengan betul”

(Temu Bual PK2)

“Saya dulu susah nak baca. Tapi cikgu selalu ajar saya baca slow-slow. Bila cikgu bagi buku cerita, saya cuba baca satu-satu. Kalau saya tak pandai sebut, cikgu tolong...”

(Temu Bual PK 3)

2. Pengajaran Lembut dan Tidak Menghukum

Selain itu, peserta kajian 1 pula menyatakan bahawa teknik membaca pedagogi hikmah ini adalah satu teknik pengajaran yang lembut dan tidak menghukum. Peserta kajian 1 merasakan dia lebih bermotivasi untuk membaca kerana guru tidak memarahi mereka Ketika membuat kesalahan dan sentiasa memberi masa untuk mereka membaca secara perlahan lahan walaupun masa yang diambil sangat lama. Berikut adalah petikan temu bual yang menyokong tema di atas:

“... Sebelum ni saya selalu nak baca cepat cepat dan selalu salah sebut perkataan. Tapi bila cikgu bagi masa untuk saya baca, saya jadi lebih pandai baca buku. Kadang-kadang saya tak pandai eja, cikgu tak marah. Jadi saya seronok”
(Temu Bual PK 1)

Hasil temu bual ini turut disokong dengan analisis dokumen iaitu lembaran kerja yang telah dijawab oleh peserta kajian. Hasil analisis tersebut mendapati bahawa terdapat peningkatan markah latihan berdasarkan dua fasa pengumpulan data. Data yang dikumpul telah dianalisis berdasarkan bilangan soalan yang betul dijawab oleh peserta kajian. Instrumen tersebut mengandungi 5 soalan berkaitan dengan teks cerita yang dibaca. Jadual 1 di bawah menunjukkan peningkatan markah latihan bagi ketiga-tiga peserta kajian:

Jadual 1: Perbandingan Dapatan Markah Latihan Sebelum dan Selepas Peserta Kajian

Pencapaian (Markah Latihan)	Sebelum kajian	Fasa 1	Fasa 2
PK 1	1/5	3/5	4/5
PK 2	1/5	2/5	5/5
PK3	0/5	0/5	2/5

Berdasarkan Jadual 1, kesemua markah latihan peserta kajian menunjukkan peningkatan dan mendapat markah yang lebih baik pada akhir kajian sebelum kajian dijalankan. Analisis dokumen tersebut menguji kefahaman peserta kajian terhadap teks cerita yang dibaca oleh mereka.

Refleksi Kajian

Pendekatan pedagogi Hikmah yang diterapkan dalam kalangan murid pemulihan khas ternyata sangat mencabar bagi pengkaji. Namun begitu, ia terbukti memberikan impak positif terhadap kemahiran membaca murid-murid ini. Melalui dapatan temu bual dan pemerhatian yang telah dilakukan, terdapat tiga tema yang telah dikenal pasti iaitu peningkatan keyakinan diri dalam membaca, pengajaran yang lembut dan tidak menghukum serta peningkatan minat dan motivasi untuk membaca. Hal ini dengan jelas menggambarkan bagaimana pendekatan ini menyokong perkembangan kognitif dan emosi murid terutamanya bagi pemulihan khas.

Pada awal peringkat kajian dilakukan, pengkaji mendapati bahawa murid merasa tidak yakin dan takut membuat kesilapan dalam membaca kini dapat membaca dengan lebih lancar dan berani. Pendekatan Pedagogi Hikmah yang memberi ruang kepada murid untuk membaca tanpa tekanan sangat membantu untuk meningkatkan keyakinan diri mereka. Kajian oleh Dewey (1983) menyatakan bahawa murid yang mendapat sokongan psikologi dan penghargaan

cenderung lebih yakin dengan kemampuan mereka. Hal ini juga disokong oleh Bandura (1997) dalam teori Self- Efficacy menunjukkan bahawa individu yang pandai membaca akan lebih yakin dengan kebolehan diri mereka.

Tema kedua yang sangat jelas adalah pengajaran yang lembut dan tidak menghukum. Dalam sesi temu bual, murid menunjukkan bahawa mereka merasa lebih dihargai dan lebih bersemangat untuk belajar kerana guru tidak memarahi mereka ketika mereka melakukan kesilapan ketika membaca. Sebaliknya guru memberikan pujian dan galakan untuk mereka meneruskan pembacaan tersebut. Skinner (1953) menyatakan bahawa pengukuhan positif seperti penggunaan penghargaan dan pujian dapat memperkuat lagi tingkah laku yang diinginkan.

Akhir sekali, pengkaji mendapati pada awal kajian, kesemua peserta kajian ini kurang minat membaca kerana kesulitan yang dihadapi oleh mereka. Hal ini juga menyebabkan mereka merasa rendah diri kerana sering mendapat tempat tercorot dalam ujian kerana tidak dapat menjawab soalan disebabkan dari kekangan membaca. Namun setelah pendekatan ini dijalankan, peserta kajian menunjukkan peningkatan yang sangat memberangsangkan dan menjadikan mereka lebih bermotivasi untuk terus belajar. Deci dan Ryan (1995) dalam Self Determination Theory (SDT) menunjukkan bahawa motivasi intrinsik dalam diri murid sangat diperlukan supaya mereka merasa mempunyai autonomi dalam pembelajaran mereka. Dalam konteks ini, pendekatan pedagogi Hikmah telah memberi ruang kepada mereka untuk mengawal proses pembelajaran mereka dengan cara yang lebih menyeronokkan.

Kesimpulan

Sebagai intinya Pedagogi Hikmah yang diaplikasikan di sekolah terutamanya dalam kelas pemulihan khas dapat membantu meningkatkan bacaan murid daripada tidak dapat membaca secara sederhana. Sekiranya Pedagogi Hikmah ini diaplikasikan lagi dalam jangka masa yang panjang, Insya Allah para pelajar pemulihan khas dapat membaca dengan baik. Berdasarkan kajian yang telah dijalankan, terdapat beberapa cadangan kajian lanjutan yang dikemukakan seperti kajian tentang keberkesanan Pendekatan Pedagogi Hikmah terhadap pelbagai kelompok murid (Aliran Perdana dan Aliran Pemulihan Khas) dan kajian tentang pengaruh penglibatan Ibu Bapa dalam pendekatan pedagogi hikmah terhadap kemahiran membaca murid pemulihan khas.

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PERANAN AL-QUR'AN DALAM MEMBENTUK MINDA INTELEKTUAL MUDA: SATU ANALISIS KRITIKAL

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Abstrak: *Al-Qur'an merupakan sumber utama dalam pembentukan sahsiah dan intelektual umat Islam. Dalam konteks pembangunan minda generasi muda, al-Qur'an memainkan peranan penting dalam membentuk daya fikir kritis, pemikiran yang seimbang serta panduan nilai yang mantap. Artikel ini bertujuan menganalisis peranan al-Qur'an dalam pembentukan minda intelektual muda menerusi pendekatan kajian kualitatif berbentuk kepustakaan. Data dikumpul daripada sumber-sumber utama seperti tafsir al-Qur'an, hadis, dan tulisan ulama klasik serta kontemporari. Hasil kajian menunjukkan bahawa al-Qur'an menyentuh pelbagai aspek yang merangsang pemikiran muda, termasuk penekanan terhadap ilmu, perbahasan falsafah ketuhanan dan penciptaan, serta pendekatan hujah yang rasional. Selain itu, nilai-nilai seperti amanah, tanggungjawab, dan disiplin yang ditanamkan melalui ayat-ayat al-Qur'an dilihat mampu membentuk jati diri intelektual yang berakhlak. Kajian ini merumuskan bahawa pemeraksanaan pendidikan al-Qur'an dalam kalangan generasi muda secara sistematik dan kontekstual adalah asas penting bagi melahirkan intelektual Muslim yang unggul dan relevan dengan cabaran semasa.*

Kata Kunci: *al-Qur'an; Intelektual; Minda Muda; Pendidikan Islam*

Pendahuluan

Al-Qur'an diturunkan bukan sekadar sebagai kitab suci untuk dibaca dan dihafaz, malah berperanan sebagai panduan hidup yang menyeluruh kepada umat manusia sepanjang zaman (Al-Za'balawi, 1984; Al-Barr, 1984). Dalam menghadapi era globalisasi dan ledakan maklumat, golongan muda merupakan kelompok yang paling terkesan dengan pelbagai pengaruh pemikiran, budaya, dan ideologi asing yang adakalanya bercanggah dengan nilai Islam (Ali, 1996). Oleh itu, pembentukan minda intelektual dalam kalangan generasi muda merupakan satu keperluan mendesak demi memastikan kelangsungan ummah yang berpaksikan wahyu dan berpandukan akal yang sejahtera (Abdul Jalil, Md Yusoff & Ismail, 2016).

Minda intelektual muda yang dibentuk berdasarkan al-Qur'an bukan sahaja menjurus kepada aspek keilmuan semata-mata, bahkan meliputi kematangan emosi, kepekaan sosial, dan kesedaran spiritual (Abdul Karim & Abdul Manas, 2017). Al-Qur'an menyajikan pelbagai pendekatan dalam mendidik akal dan jiwa, antaranya melalui kisah-kisah teladan, logik pemikiran, dan nilai-nilai moral yang tinggi (Al-Bukhārī, 1422H; Abū Dāwūd, 2009). Justeru, dalam menghadapi cabaran kontemporari seperti krisis identiti, keruntuhan moral, dan keclaruan maklumat, al-Qur'an muncul sebagai solusi yang mapan untuk membina generasi

intelektual yang bukan sahaja cerdas, tetapi juga berintegriti dan berakhlak mulia (Al-Din, 1986; Wood, t.th).

Makalah ini akan membincangkan secara analitikal peranan al-Qur'an, hadis, dan tulisan ulama klasik serta kontemporari dalam membentuk minda intelektual muda, dengan tumpuan kepada ayat-ayat yang merangsang pemikiran kritis, menggalakkan pencarian ilmu, serta membentuk jati diri Muslim yang unggul. Perbincangan ini diharap dapat membuka ruang kepada pelaksanaan kurikulum pendidikan Islam yang lebih berkesan dalam mencorak generasi muda berteraskan nilai wahyu (Ibrahim, 2014; Hashim & Langgulung, 2008; Al-Attas, 1991).

Skop dan Metodologi Kajian

Skop kajian ini tertumpu kepada peranan al-Qur'an sebagai sumber utama dalam membentuk pemikiran dan jati diri intelektual generasi muda Muslim. Kajian ini meneliti ayat-ayat al-Qur'an yang berkaitan dengan galakan terhadap penggunaan akal, pencarian ilmu, pembangunan potensi diri, serta pembentukan nilai-nilai akhlak dan kepemimpinan. Fokus kajian merangkumi golongan muda berumur antara 15 hingga 30 tahun, dalam konteks masyarakat Muslim kontemporari khususnya di Malaysia, yang berdepan cabaran pemikiran liberal, hedonisme, dan keruntuhan moral (Mohd Shukri et al., 2020; Mohd Roslan, 2016; Mohd Izani & Azhar, 2019).

Metodologi kajian ini menggunakan pendekatan kualitatif berbentuk kajian kepustakaan dengan menggunakan kaedah analisis kritikal (Jasmi, 2012). Data dikumpulkan melalui analisis teks al-Qur'an yang ditafsirkan oleh para mufassir muktabar seperti al-Ṭabarī, al-Qurṭubī, dan Ibn Kathīr, serta disokong dengan literatur ilmiah moden berkaitan pendidikan dan pembentukan minda. Kajian ini turut mengambil kira pandangan ulama kontemporari dan hasil kajian akademik terdahulu yang berkaitan dengan pendidikan Islam dan pembangunan intelektual remaja. Pendekatan tematik digunakan dalam menganalisis kandungan ayat-ayat al-Qur'an (Nasir et al., 2023) yang berkaitan secara langsung atau tidak langsung dengan aspek pembangunan minda muda, seperti ayat-ayat berkaitan tafakkur, ta'aqqul, tadabbur, dan hikmah.

Dengan kaedah ini, kajian ini diharap dapat membuktikan bahawa al-Qur'an bukan sahaja relevan sebagai sumber spiritual, tetapi juga sebagai asas epistemologi yang membentuk daya intelektual dan kebijaksanaan golongan muda dalam berdepan cabaran zaman.

Topik 1: Konsep Intelektual Muda dalam Islam

Konsep intelektual dalam Islam bukan sekadar merujuk kepada kecerdasan akal semata-mata, tetapi merangkumi keterpaduan antara kekuatan berfikir, kesedaran rohani, nilai moral dan kemampuan sosial (Al-Attas, 1991; Nasr, 2002; Wan Mohd Nor, 1995). Dalam kerangka ini, **intelektual muda Islam** ialah individu yang berada pada usia kematangan awal – remaja dan dewasa muda – yang memiliki keupayaan untuk berfikir secara kritis, menilai secara objektif, dan membuat keputusan yang berpandukan wahyu, bukan semata-mata rasional sempit.

Al-Qur'an sebagai sumber wahyu utama Islam, memberikan perhatian yang besar terhadap pembangunan akal dan minda. Perkataan seperti *ta'aqqul* (memahami dengan akal), *tafakkur* (merenung), *tadabbur* (menghayati dengan mendalam), dan *hikmah* (kebijaksanaan) disebut

berulang kali dalam pelbagai konteks yang mencerminkan penghargaan terhadap peranan akal dalam kehidupan manusia. Firman Allah SWT:

يُؤْتِي الْحِكْمَةَ مَنْ يَشَاءُ ۚ وَمَنْ يُؤْتَ الْحِكْمَةَ فَقَدْ أُوتِيَ خَيْرًا كَثِيرًا ۚ وَمَا يَذَّكَّرُ إِلَّا أُولُو الْأَلْبَابِ

"Allah memberikan hikmah kepada sesiapa yang dikehendaki-Nya; dan sesiapa yang diberikan hikmah itu, maka sesungguhnya dia telah diberikan kebaikan yang banyak. Dan tiadalah yang dapat mengambil pengajaran melainkan orang-orang yang berakal."

(Surah al-Baqarah, 2:269)

Ini menunjukkan bahawa hikmah atau kebijaksanaan intelektual adalah anugerah besar daripada Allah kepada manusia yang memanfaatkan akalnya secara benar.

Intelektual muda yang dibentuk menurut Islam bukan sahaja memiliki kapasiti akademik, tetapi juga kesedaran ketuhanan (*God-consciousness*), tanggungjawab sosial, dan daya tahan moral. Mereka mampu menjadi agen perubahan, menyumbang kepada pembinaan tamadun, serta menjadi benteng kepada kerosakan pemikiran yang menyerang umat Islam hari ini (Al-Attas, 1991; Wan Mohd Nor, 1995; Mohd Fauzi, 2013).

Asas Pembentukan Intelektual Muda dalam al-Qur'an

Pembentukan intelektual muda menurut al-Qur'an berasaskan tiga rukun utama: **tauhid, ilmu, dan hikmah**. Tauhid adalah dasar kefahaman bahawa setiap aspek kehidupan mesti kembali kepada Allah sebagai Pencipta dan Pemilik mutlak ilmu. Ilmu pula dilihat sebagai jambatan antara akal dan wahyu, manakala hikmah ialah keupayaan mengaplikasikan ilmu dengan bijaksana (Al-Attas, 1980; Wan Mohd Nor, 1998; Osman Bakar, 1992).

Al-Qur'an menyeru manusia untuk menggunakan akal dalam menilai, merenung dan memahami hakikat kehidupan. Frasa seperti "*afala ta'qilun*" (apakah kamu tidak berakal), "*afala tatafakkarun*" (apakah kamu tidak berfikir) digunakan untuk membangkitkan kesedaran dalam kalangan manusia, khususnya golongan muda yang berada pada fasa aktif berfikir dan mencabar autoriti maklumat (Nasr, 2002; Izutsu, 2002; Abdul Karim, 2017).

Sebagai contoh, dalam Surah Āli 'Imrān ayat 190–191, Allah menggambarkan ciri-ciri golongan *ulū al-albāb* (orang yang berakal) sebagai mereka yang mengingati Allah dalam pelbagai keadaan dan **berfikir mendalam tentang penciptaan langit dan bumi**, lalu mereka membuat kesimpulan bahawa penciptaan ini bukan sia-sia. Ini menunjukkan bahawa pemikiran intelektual yang seimbang dalam Islam ialah hasil kombinasi antara renungan intelektual dan kesedaran spiritual (Ibn Kathir, 2000; Al-Ghazali, 2005; Yusof & Ismail, 2019).

Ciri-Ciri Minda Intelektual Muda Menurut Perspektif al-Qur'an

Al-Qur'an menggariskan beberapa ciri penting yang mesti ada dalam minda intelektual muda Muslim:

1. Daya Tafakkur dan Tadabbur

Pemuda intelektual menurut al-Qur'an mesti aktif merenung dan menghayati ciptaan Allah, ayat-ayat al-Qur'an dan hakikat kehidupan. Mereka tidak bersikap reaktif atau ikut-ikutan, sebaliknya membuat pertimbangan berdasarkan analisis dan renungan mendalam.

2. **Ketelusan dalam Menerima Kebenaran**

Intelektual sejati tidak terikat dengan kepentingan peribadi atau tekanan kelompok. Mereka sanggup menerima kebenaran walaupun ia pahit atau datang daripada pihak yang mereka tidak sukai.

3. **Keberanian Moral**

Al-Qur'an menceritakan kisah **Ashab al-Kahfi** (al-Kahf, 18:13–14) yang mewakili golongan muda berprinsip dan berani menentang arus kezaliman. Mereka memilih untuk mempertahankan tauhid walaupun terpaksa meninggalkan masyarakat dan keselamatan diri.

4. **Semangat Menuntut Ilmu**

Ayat pertama diturunkan, "*Iqra'*", ialah simbolik kepada pentingnya ilmu dalam pembentukan intelektual. Surah al-Mujādilah (58:11) pula menyebut bahawa Allah meninggikan darjat orang yang berilmu beberapa darjat – satu pengiktirafan kepada pencapaian intelektual dalam Islam.

5. **Keteguhan Iman dan Kepercayaan Diri**

Nabi Ibrahim A.S. dalam Surah al-An'ām (6:76–79) menunjukkan bagaimana seorang pemuda menggunakan akal untuk menolak kepercayaan karut dan akhirnya mencapai keyakinan terhadap Allah yang Esa. Ini menunjukkan gabungan antara rasionaliti dan keteguhan iman sebagai ciri intelektual unggul.

i) Intelektualisme Berteraskan Wahyu

Intelektualisme dalam Islam berbeza dengan kerangka pemikiran sekular yang meletakkan akal sebagai autoriti mutlak. Dalam Islam, akal adalah anugerah yang besar tetapi fungsinya terikat dengan **bimbingan wahyu**. Al-Qur'an menjadi asas epistemologi yang membezakan antara kebenaran hakiki dengan kebatilan yang dihiasi oleh hawa nafsu atau spekulasi semata-mata (Al-Attas, 1991; Nasr, 1993; Wan Mohd Nor, 2011).

Ayat-ayat yang menyeru penggunaan akal dalam al-Qur'an tidak berdiri sendiri, bahkan sering disertai dengan nilai seperti takwa, syukur, dan kesedaran akhirat. Ini menunjukkan bahawa akal perlu dikawal oleh nilai spiritual dan petunjuk wahyu agar tidak tersasar (Izutsu, 2002; Al-Ghazali, 2005; Yusof & Ismail, 2019). Pemuda yang membina pemikiran atas asas ini akan mampu menilai sesuatu isu secara objektif dan berpandukan kebenaran mutlak, bukan sekadar pendapat majoriti atau pengaruh media.

ii) Kritikan terhadap Intelektualisme Sekular

Pemikiran sekular moden cenderung memisahkan agama daripada akal, serta menjadikan logik dan rasionalisme sebagai ukuran tunggal kebenaran. Aliran ini, yang lahir daripada konteks sejarah Barat, menjadikan manusia sebagai pusat segala-galanya (*human-centric*) dan menghapuskan kebergantungan kepada Tuhan (Nasr, 1993; Al-Attas, 1995; Mohd Kamal Hassan, 2010).

Al-Qur'an mengkritik pendekatan ini melalui pelbagai ayat yang menunjukkan bahawa penggunaan akal tanpa petunjuk boleh membawa kepada kesesatan. Firman Allah:

أَفَرَأَيْتَ مَنْ أَخَذَ إِلَهَهُ هَوَاهُ وَأَضَلَّهُ اللَّهُ عَلَى عِلْمٍ وَخَتَمَ عَلَى سَمْعِهِ وَقَلْبِهِ وَجَعَلَ عَلَى بَصَرِهِ غِشَاةً فَمَنْ يَهْدِيهِ مِنْ بَعْدِ اللَّهِ ۖ أَفَلَا تَذَكَّرُونَ

"Maka pernahkah kamu melihat orang yang menjadikan hawa nafsunya sebagai tuhan dan Allah membiarkannya sesat berdasarkan ilmu yang dimilikinya, dan Allah telah mengunci pendengaran dan hatinya serta meletakkan penutup pada penglihatannya? Maka siapakah yang dapat memberinya petunjuk selain daripada Allah? Maka apakah kamu tidak mengambil pengajaran?"

(Surah al-Jāthiyah, 45:23)

Ini membuktikan bahawa akal, jika digunakan tanpa batasan nilai dan wahyu, boleh digunakan untuk menghalalkan yang haram, mengelirukan masyarakat, dan mencetuskan ideologi yang menyesatkan.

Maka, al-Qur'an menolak pendekatan intelektualisme bebas nilai. Islam menawarkan pendekatan bersepadu antara akal dan wahyu yang mampu melahirkan pemuda intelektual yang bukan sahaja cerdas minda, tetapi juga suci hati dan mulia akhlakunya. Inilah asas kepada pembangunan tamadun Islam yang sebenar.

Dalil-Dalil al-Qur'an dan Hadith Berkaitan Pembentukan Minda Intelektual Muda

Dalam Islam, pembentukan intelektual bukan semata-mata hasil aktiviti kognitif bebas, tetapi merupakan satu proses yang berakar dari ajaran wahyu (Al-Attas, 1991; Wan Mohd Nor, 1998; Hashim & Langgulung, 2008). Al-Qur'an dan hadis bukan sahaja menyentuh aspek kerohanian dan ibadah, malah turut memberikan panduan jelas mengenai pembangunan akal dan keperibadian, khususnya dalam kalangan generasi muda (Al-Ghazali, 2005; Mohd Shukri et al., 2020; Yusof & Ismail, 2019). Justeru, pendekatan pendidikan al-Qur'an perlu dirujuk sebagai panduan utama dalam membentuk pemikiran generasi ini.

Generasi muda hari ini berdepan cabaran pemikiran seperti materialisme, relativisme moral, liberalisme dan kebebasan tanpa batas (Mohd Roslan, 2016; Kamal Hassan, 2010; Mohd Izani & Azhar, 2019). Dalam menghadapi fenomena ini, peranan al-Qur'an dan hadis sebagai sumber bimbingan sangat penting. Kedua-dua sumber ini bukan sahaja menyeru kepada keimanan, tetapi juga menggalakkan pemikiran kritikal, pencarian ilmu, kesedaran sendiri dan kebijaksanaan dalam membuat keputusan. Pemuda Muslim yang berorientasikan wahyu memiliki daya tahan dalam menghadapi kekeliruan ideologi serta mampu menjadi pencetus perubahan masyarakat secara positif.

Ayat al-Qur'an dan Terjemahan

Firman Allah SWT:

إِنَّ فِي خَلْقِ السَّمَاوَاتِ وَالْأَرْضِ وَاجْتِلاَفِ اللَّيْلِ وَالنَّهَارِ لَآيَاتٍ لِأُولِي الْأَلْبَابِ (190)
الَّذِينَ يَذْكُرُونَ اللَّهَ قِيَامًا وَقُعُودًا وَعَلَىٰ جُنُوبِهِمْ وَيَتَفَكَّرُونَ فِي خَلْقِ السَّمَاوَاتِ وَالْأَرْضِ رَبَّنَا مَا خَلَقْتَ هَذَا بَاطِلًا
مُبْحَانَكَ فَقِنَا عَذَابَ النَّارِ (191)

Terjemahan:

Sesungguhnya pada kejadian langit dan bumi, dan pada pertukaran malam dan siang, ada tanda-tanda (kebesaran Allah) bagi orang-orang yang berakal. (Iaitu) orang-orang yang mengingati Allah semasa mereka berdiri dan duduk dan semasa mereka berbaring mengiring, serta mereka memikirkan tentang kejadian langit dan bumi (sambil berkata): “Wahai Tuhan kami! Tidaklah Engkau menjadikan semua ini dengan sia-sia. Maha Suci Engkau, maka peliharalah kami dari azab neraka.”
(Surah Āli ‘Imrān, 3:190-191)

Ayat ini merupakan antara dalil yang paling jelas dalam mengaitkan antara kekuatan akal dan keimanan dalam Islam. Penggunaan akal (tafakkur) yang disebut dalam ayat ini adalah jenis pemikiran reflektif yang mendalam, bukan sekadar logik permukaan. Generasi muda yang diasuh untuk bertafakkur tentang ciptaan Allah akan terdidik menjadi insan yang menyedari tujuan hidup, memahami tanggungjawab sebagai hamba, dan menolak konsep kebendaan semata-mata. Ayat ini juga menekankan kesedaran spiritual sebagai hasil daripada pemikiran kritikal yang berakar dari wahyu.

Teks Hadith, Terjemahan dan Sumber

Anas bin Mālik RA meriwayatkan:

كُنَّا عِنْدَ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ، فَقَالَ: يَطْلُبُ الْعِلْمَ النَّاسُ حَتَّى يَذْهَبُوا إِلَى الْمَغْرِبِ

(Kami pernah bersama Nabi SAW, lalu baginda bersabda: “Manusia akan menuntut ilmu sehingga mereka mengembara ke arah barat.”)

(Riwayat al-Ṭabarānī dalam al-Muʿjam al-Kabīr, no. 2907 – Dinilai ḥasan oleh al-Albānī)

Hadis ini menegaskan bahawa menuntut ilmu adalah satu proses tanpa sempadan geografi atau budaya. Konsep ini sangat relevan dalam dunia moden yang mengutamakan keterbukaan ilmu dan kemajuan teknologi. Dalam konteks pembangunan intelektual muda, hadis ini menjadi dorongan agar golongan muda sentiasa proaktif mencari ilmu di mana sahaja, selagi mana ia membawa manfaat dan tidak bertentangan dengan syarak. Ia juga menunjukkan bahawa Islam menganjurkan keterbukaan terhadap ilmu luar, selagi ia ditapis dengan neraca wahyu.

Kaedah Penulisan Jadual berdasarkan Analisis Kritikal

Dalam kajian ini, penulis mengumpulkan beberapa tema utama yang terkandung dalam al-Qur’an dan hadis yang berkaitan secara langsung dengan pembentukan minda intelektual muda melalui kaedah analisis kritikal. Analisis kritikal dalam kajian ini bermaksud proses menilai dan meneliti sesuatu maklumat atau ayat-ayat al-Quran serta hadis secara mendalam dengan mempertimbangkan kekuatan serta implikasi yang berkaitan. Ia melibatkan pemikiran reflektif dan objektif untuk memahami serta menilai kesahihan dan relevansi sesuatu idea atau hasil penyelidikan (Yusuf, 2013; Mohd Aderi et al., 2018; Wan Mohd Nor, 1995). Kajian ini menggunakan kaedah tematik (Braun & Clarke, 2016) iaitu merangkumi aspek penggunaan akal, tuntutan terhadap ilmu, keberanian moral, keazaman dalam pembelajaran, dan pembentukan nilai kebijaksanaan. Jadual berikut memaparkan ringkasan dalil dan nilai utama yang terkandung dalam setiap tema:

Jadual 1: Tema dan Dalil Berkaitan Pembentukan Minda Intellektual Muda

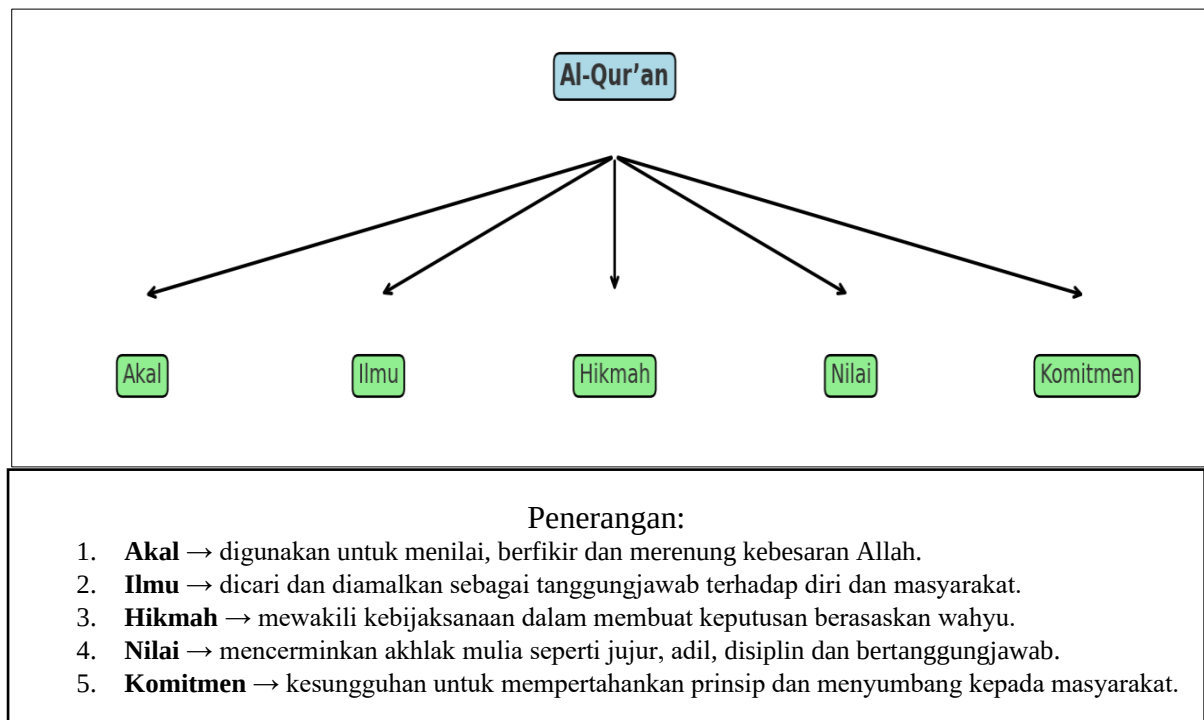
No.	Tema Intellektual	Ayat/Hadith Rujukan	Nilai Utama
1	Penggunaan Akal	Āli ‘Imrān 3:190–191	Tafakkur, Tadabbur
2	Tuntutan Ilmu	Hadith Ṭabarānī (no. 2907)	Semangat Inkuiri
3	Keberanian Menegakkan Kebenaran	Al-Anbiyā’ 21:51–56 (kisah Nabi Ibrahim)	Ketegasan, Berprinsip
4	Ketekunan dalam Pembelajaran	al-Mujādilah 58:11	Disiplin, Keutamaan Ilmu
5	Hikmah dan Kebijaksanaan	Luqmān 31:12	Rasional, Seimbang

Sumber: Himpunan ayat dan hadith sahih berkaitan pendidikan al-Qur’an.

Melalui jadual ini, dapat dilihat bahawa setiap aspek pembangunan intelektual yang ditekankan dalam Islam adalah seimbang antara tuntutan akal, emosi dan spiritual. Ini membuktikan bahawa al-Qur’an bukan sekadar kitab ibadah, tetapi juga asas kepada pembangunan pemikiran umat.

Kaedah Penulisan Rajah

Rajah berikut menghuraikan hubungan antara elemen-elemen utama dalam pembentukan minda intelektual muda menurut perspektif al-Qur’an seperti yang telah ditunjukkan dalam Jadual 1. Elemen ini bukan entiti yang terpisah, tetapi saling berkait dalam membentuk insan berilmu dan berintegriti. Melalui dapatan analisis kajian ini, pengkaji-pengkaji telah merekabentuk Struktur Minda Intellektual Muda Berteraskan al-Qur’an berdasarkan seperti yang dinyatakan dalam Rajah 1.



Rajah 1: Struktur Minda Intellektual Muda Berteraskan al-Qur’an

Kelima-lima komponen ini saling menyokong antara satu sama lain dan membentuk acuan pemikiran intelektual yang kukuh. Tanpa salah satu daripadanya, keseimbangan intelektual akan terganggu. Oleh itu, pendidikan berteraskan al-Qur'an perlu memberi perhatian terhadap pembinaan semua elemen ini secara bersepadu.

Kesimpulan

Makalah ini merumuskan bahawa al-Qur'an memainkan peranan penting dan menyeluruh dalam membentuk minda intelektual generasi muda Muslim. Ayat-ayat al-Qur'an tidak hanya mengandungi seruan kepada keimanan dan ibadah, tetapi turut mendorong penggunaan akal, pencarian ilmu, dan pembinaan nilai-nilai akhlak yang tinggi. Generasi muda yang dibentuk melalui pendekatan al-Qur'an akan memiliki keseimbangan antara kekuatan intelektual, kestabilan emosi dan keteguhan spiritual.

Kajian ini juga menegaskan bahawa al-Qur'an menyediakan asas epistemologi yang unggul dan relevan dalam menghadapi cabaran zaman moden, seperti kecelaruan ideologi, krisis identiti dan keruntuhan nilai. Melalui kisah-kisah, perintah langsung serta pendekatan hujah rasional yang terkandung dalam al-Qur'an, generasi muda mampu membina jati diri yang kuat dan berwibawa.

Oleh yang demikian, pendekatan pendidikan Islam masa kini perlu memberi penekanan yang lebih besar terhadap pemahaman al-Qur'an secara mendalam dan kontekstual, agar minda intelektual muda dapat dibina berteraskan wahyu, bukan semata-mata logik akal. Ini penting untuk melahirkan intelektual Muslim yang bukan sahaja cemerlang dari segi akademik, tetapi juga teguh dari segi prinsip, nilai dan pegangan akidah.

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KEBAIKAN DAN KEBURUKAN TIKTOK SEBAGAI MEDIUM DAKWAH MASA KINI BERDASARKAN ANALISIS SWOT

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Abstrak: Dakwah merupakan suatu pekerjaan yang mulia di sisi Islam kerana ia telah menjadi tugas utama para nabi dan rasul yang diutuskan oleh Allah SWT. Secara umum, dakwah membawa maksud mengajak manusia kepada kebaikan serta menjauhi perkara yang dilarang. Pada masa kini, aktiviti dakwah dilaksanakan dengan lebih meluas melalui pelbagai kaedah, termasuk penggunaan media sosial. Salah satu platform yang sering digunakan ialah aplikasi TikTok. Justeru, kajian ini dijalankan dengan dua objektif utama, iaitu mengenal pasti kebaikan serta keburukan dakwah melalui aplikasi TikTok. Bagi mencapai objektif tersebut, kajian ini menggunakan pendekatan kualitatif melalui kaedah pemerhatian dan kajian perpustakaan, serta dibincangkan dengan menggunakan analisis SWOT. Hasil kajian menunjukkan bahawa dakwah di TikTok mempunyai beberapa kelebihan, antaranya dapat menjimatkan masa dan mudah disampaikan kepada khalayak yang luas. Namun demikian, antara kelemahannya ialah maklumat yang disampaikan sering kali tidak menyeluruh sehingga boleh menimbulkan salah faham dalam kalangan masyarakat. Oleh itu, para pendakwah yang menggunakan platform moden seperti TikTok perlu memastikan kandungan dakwah yang disampaikan bersifat tepat, benar, dan berlandaskan sumber yang sahih agar tidak menimbulkan kekeliruan kepada masyarakat.

Kata Kunci: Dakwah, TikTok, Media Sosial, Analisis SWOT, Remaja, Kualitatif

Pengenalan

Dakwah merupakan satu pekerjaan yang mulia disisi agama Islam. Hal ini kerana perkerjaan ini adalah pekerjaan yang mengajak kepada melakukan perkara yang baik dan meninggalkan perkara yang dilarang. Menurut kamus dewan, dakwah membawa maksud kegiatan yang menyeru dan meyakinkan orang lain supaya menerima sesuatu kepercayaan. Menurut Abd Hadi Borham, (2018) dakwah adalah suatu usaha dalam menyebarkan Islam sebagai agama yang benar kepada seluruh umat manusia.

Selain itu, menurut Hikmawati & Farida, (2021) dakwah adalah satu usaha yang dilakukan oleh manusia dalam keadaan sedar untuk memberi peringatan tentang perkara-perkara baik dengan kaedah yang bijaksana atau dengan erti lain tujuan dakwah adalah menyeru kepada perkara ma'aruf dan mencegah kemungkaran (Faradillah Iqmar et al., 2015). Dalam hal ini, apa yang dapat difahami adalah dakwah merupakan kegiatan mengajak manusia untuk mengenal agama

Islam disamping mengajak umat manusia melakukan perbuatan baik dan meninggalkan perbuatan yang mungkar.

Pada awal kedatangan Islam, rasulullah saw diutuskan kepada umat manusia untuk berdakwah. Menurut Mokhtar & Hassan, (2019) tujuan utama baginda diutuskan adalah untuk mengubah sikap dan tingkah laku manusia pada ketika itu. Baginda saw diutuskan kepada umat manusia dengan kesempurnaan akhlak. Hal ini telah dijelaskan oleh baginda sebagaimana sabdanya

إِنَّمَا بُعِثْتُ لِأَتَمِّمَ صَالِحَ الْأَخْلَاقِ

Bermaksud

Sesungguhnya aku diutuskan untuk menyempurnakan akhlak yang baik

(Musnad Ahmad, 8952)

Oleh demikian itu, tujuan utama penyebaran dakwah adalah untuk mengajak dan menyeru umat manusia untuk mengenal dan mentauhidkan Allah swt. Hal ini sebagaimana penyebaran dakwah yang dilakukan oleh para nabi dan rasul. Dalam usaha dakwah ini, terdapat pelbagai rintangan dan halangan yang dihadapi oleh para nabi dan rasul dalam menyebarkan syiar Islam kepada umat mereka sehingga ada yang mendapat ancaman bunuh jika meneruskan penyebaran dakwah ini. Oleh itu, penyebaran dakwah pada peringkat ini adalah pekerjaan yang tinggi nilainya disisi Islam kerana nyawa menjadi taruhan.

Selain itu, fungsi penyebaran dakwah adalah untuk menjadikan motivasi, pembimbing dan mendidik manusia untuk sentiasa beribadah kepada Allah swt serta berakhlak yang baik (Fatriadi, 2020). Hal ini kerana penyebaran dakwah tidak terikat kepada umat Islam sahaja malah ia menjadi wadah atau jalan untuk memberi penjelasan kepada masyarakat yang bukan Islam tentang keindahan dan kemuliaan agama Islam sekaligus membuka pemikiran tentang Islam dan menghapuskan tanggapan masyarakat bukan Islam terhadap Islamophobia (Palupi et al., 2021). Oleh itu, bagi memberi pendedahan kepada seluruh masyarakat Islam mahupun bukan Islam, penyebaran dakwah melalui media sosial dilihat satu jalan yang sesuai untuk digunakan pada masa kini.

Penyebaran dakwah di media sosial dilihat begitu efektif kerana media sosial berupaya menyebarkan maklumat dan dakwah dengan lebih pantas dan cepat (Palupi et al., 2021). Selain itu, media sosial sebagai medium dakwah mempunyai peranan dan elemen penting dalam memberi kesan yang besar kepada manusia. Hal ini kerana kandungan yang kreatif dan gaya penyampaian yang baik serta kualiti video yang tinggi akan menarik minat masyarakat dalam mengikuti kandungan dakwah tersebut (Mokhtar & Hassan, 2019).

Menurut Rohman, (2019) terdapat beberapa faktor untuk menjadikan media sosial sebagai medium dakwah yang efektif dan menarik antaranya faktor interaksi sosial dan faktor ethos atau daya tarikan. Dengan menerapkan faktor ini, ia akan mampu menarik perhatian masyarakat seperti yang dilakukan oleh sesetengah pendakwah antaranya Ustaz Abdul Somad dan Ustaz Azhar Idrus. Oleh demikian itu, setiap pendakwah seharusnya menggunakan media sosial sebagai medium penyebaran dakwah dengan lebih kreatif dalam menghasilkan sesuatu kandungan yang berunsur dakwah (Wahab et al., 2019)

Selain itu, media sosial satu medium yang mudah mempengaruhi pemikiran masyarakat khususnya kepada golongan remaja (Mokhtar & Hassan, 2019). Disamping itu, menurut (Nafa

et al., 2021) media sosial mempunyai unsur estetika iaitu keindahan dan citarasa yang menjadikan pengaruh yang besar untuk menarik minat masyarakat. Oleh kerana itu, media sosial dilihat amat sesuai digunakan dalam menjalankan aktiviti dakwah kepada seluruh masyarakat kerana ia merangkumi skop yang amat luas terutama dalam menarik audien dan penonton (Palupi et al., 2021). Oleh demikian itu, setiap pendakwah seharusnya menceburi bidang dakwah melalui media sosial selari dengan kepesatan teknologi (Mokhtar & Hassan, 2019). Terdapat pelbagai media sosial dalam kehidupan masyarakat dan salah satunya adalah aplikasi TikTok. Menurut Adawiyah, (2020) TikTok satu aplikasi yang digemari dan diminati di seluruh dunia. Oleh demikian itu, TikTok menjadi satu alat yang efektif untuk digunakan dalam penyebaran dakwah (Palupi et al., 2021).

Justeru itu, penulisan ini menumpukan kepada satu analisis yang telah diperkenalkan oleh Albert Humphrey pada tahun 1960. Pada mulanya analisis ini dikenali dengan nama "SOFT Analisis" namun pada tahun 1970 analisis ini dikenali dengan analisis SWOT. SWOT merupakan akranim bagi "Strengths, Weaknesses, Opportunities dan treats". Analisis ini adalah bertujuan untuk menjadi alat bantuan dalam mengambil keputusan, pendidikan dan organisasi. Terdapat beberapa kajian telah menggunakan analisis ini antaranya kajian (Nurjannah, 2020) yang menggunakan analisis ini untuk mendapatkan hasil tentang strategi meningkatkan daya saing Pada PT. Bank Riau Kepri Unit Usaha Syariah Pekanbaru. Begitu juga Suriono, (2021) yang menggunakan analisis SWOT untuk mendapatkan hasil bagi meningkatkan mutu pendidikan.

Oleh demikian itu, tujuan penulisan ini dijalankan adalah untuk melihat dan menilai sejauhmana aplikasi TikTok dapat menjadi salah satu medium penyebaran dakwah pada zaman yang penuh dengan kecanggihan teknologi. Hal ini kerana kecanggihan teknologi mampu memberi impak dalam pelbagai bentuk terutama kepada impak positif dan juga impak negatif. Disamping itu, penulisan ini juga dapat menghuraikan kekuatan, kelemahan, peluang dan ancaman yang terdapat ketika menggunakan aplikasi TikTok sebagai medium penyebaran dakwah.

Permasalahan Kajian

Kehidupan pada era teknologi canggih merupakan satu cabaran yang besar kepada manusia. Hal ini kerana kehidupan pada masa kini mampu memperoleh segala bentuk maklumat dan berita dengan begitu pantas dan mudah. Perkara ini ditambah dengan kehadiran pelbagai media sosial dalam kehidupan manusia menjadikan cabaran yang lebih besar dan sukar untuk dikawal. Dengan kemunculan pelbagai media sosial terutama aplikasi TikTok yang menjadi semakin diminati dan digemari oleh masyarakat, ia merupakan satu jalan yang dilihat begitu relevan dalam menyebarkan maklumat dan berita. Hal ini kerana kandungan yang terdapat di aplikasi TikTok tidak ada sekatan dan tapisan yang ketat. Selain itu, aplikasi TikTok merupakan satu wadah dalam menyebarkan dakwah kepada umat manusia.

Namun begitu, permasalahan yang sering timbul daripada penggunaan aplikasi ini adalah dengan penyebaran berita palsu atau maklumat yang tidak tepat. Menurut (Shahidah et al., 2020), penyalahgunaan aplikasi sosial seperti penyebaran maklumat dan berita palsu kepada masyarakat akan memberi kesan yang negatif. Antara maklumat dan berita palsu yang sering terdapat di aplikasi sosial adalah melibatkan unsur penipuan, memfitnah dan membakar api perkauman. Aplikasi sosial juga digunakan oleh sesetengah pihak untuk menyebarkan

maklumat-maklumat yang salah dan tidak tepat serta tempat penyebaran fitnah (Mohamad Rafiudin Mohd Azmi et al., 2019).

Selain itu, kandungan yang terdapat di aplikasi sosial khususnya aplikasi TikTok adalah kandungan yang berunsur kontroversi (Palupi et al., 2021). Hal ini berlaku dalam kandungan yang berunsur dakwah terutama dalam penyampaian ceramah. Terdapat segelintir individu yang tidak bertanggungjawab dengan menyebarkan kandungan dakwah yang tidak lengkap dan huraian yang tidak jelas kepada masyarakat umum. Hal ini akan menjadikan kekeliruan terhadap diri mereka kerana kandungan dakwah yang disampaikan tidak jelas dan tidak lengkap akan isi yang disampaikan serta menyebabkan berlaku perbalahan dan perpecahan umat Islam (Kosanke, 2019).

Oleh demikian, setiap pendakwah seharusnya mengenalpasti setiap kandungan yang ingin disampaikan. Hal ini supaya mesej dakwah yang ingin disampaikan tidak menjadi kekeliruan kepada umat Islam dalam menerima kandungan yang berunsur agama Islam. Isi kandungan dakwah seharusnya jelas dan tepat supaya umat Islam mudah memahami konsep serta hukum yang disampaikan. Disamping itu, setiap pendakwah perlu bersedia dengan segala kemungkinan yang akan berlaku dalam menggunakan media sosial khususnya aplikasi TikTok sebagai medium penyebaran dakwah pada masa kini.

Metodologi Kajian

Bagi menyelesaikan penulisan yang dijalankan, pengkaji menggunakan pendekatan kualitatif dengan menggunakan dua kaedah iaitu kaedah pemerhatian dan juga kajian perpustakaan. Kajian perpustakaan dijalankan bagi memperolehi maklumat-maklumat dan data-data yang telah diperolehi daripada kajian-kajian lepas. Hasil yang diperolehi akan diuraikan mengikut setiap tema yang terdapat dalam analisis SWOT iaitu tema kekuatan, kelemahan, peluang dan ancaman.

Hasil Dan Perbincangan

Hasil kajian mendapati terdapat kebaikan dan keburukkan dalam menjalankan aktiviti dakwah di aplikasi TikTok. Dapatan kajian juga dibincangkan berdasarkan kepada tema yang telah ditetapkan iaitu kekuatan, kelemahan, peluang dan ancaman. Hasil dari analisis adalah seperti berikut:

1. Kekuatan

- a. Dapat menghasilkan kandungan dakwah yang kreatif dan menarik

Salah satu kekuatan yang boleh digunakan dalam penyebaran dakwah di aplikasi TikTok adalah dengan menghasilkan kandungan dakwah yang kreatif dan menarik. Menurut (Fatriadi, 2020) TikTok merupakan satu aplikasi yang memberikan penggunaanya efek special yang unik dan menarik. Dengan ketersediaan kandungan yang menarik, ia mampu menarik minat pengguna untuk menghayati dan melayani kandungan dakwah yang dihasilkan. Hal ini kerana kandungan yang menarik akan menjadikan sesuatu kandungan dakwah yang dihasilkan tidak bosan untuk dihayati (Nafa et al., 2021).

Oleh demikian itu, penghasilan kandungan dakwah yang menarik dilihat amat penting kerana ia mampu menarik pengguna untuk menonton dan menghayati kandungan tersebut. Dengan terhasilnya kandungan dakwah yang menarik dan unik, ia mampu mempengaruhi diri penggunanya sehingga dapat merubah sikap dan tingkah laku seseorang. Hal ini juga sesuai kerana pengguna aplikasi TikTok tidak terbatas kepada golongan umur tertentu dan ia juga tidak terbatas kepada jantina dan pangkat. Selain itu juga, dengan ketersediaan pelbagai filter, emoji dan muzik latar menjadikan lagi kekuatan dalam penyebaran dakwah pada era globalisasi. Justeru itu, setiap pendakwah seharusnya mengetahui asas-asas tertentu yang perlu digunakan bagi menghasilkan isi kandungan dakwah yang menarik dan berhikmah (Wahab et al., 2019).

b. Mudah digunakan

Selain itu, antara kekuatan lain berdakwah di TikTok adalah ia mudah digunakan (Fatriadi, 2020). Selain mudah digunakan, ia juga mudah diperolehi dengan hanya memuat turun dari google play bagi pengguna android dan ios bagi pengguna iphone. Penggunaannya juga perlu diakses dengan menggunakan internet yang mana rata-rata masyarakat pada masa kini mempunyai internet sendiri atau boleh diperolehi secara percuma di kawasan-kawasan tertentu yang telah disediakan. Disamping itu, penggunaan bahasa yang terkini akan memudahkan pengguna untuk memahami akan maksud dakwah yang disampaikan (Nurrahmi & Farabuana, 2020)

Selain itu, faktor yang menjadi kekuatan terhadap penyebaran dakwah di TikTok adalah ia boleh digunakan pada bila-bila masa dan dimana sahaja. Oleh kerana aplikasi ini terdapat dalam telefon pintar yang mudah dibawa dan senang digunakan, pengguna akan sentiasa terdedah dengan kandungan dakwah di aplikasi ini yang sentiasa keluar dilayar telefon pintar setiap pengguna tanpa dicari. Hal ini kerana setiap kandungan yang ditonton dan dikongsi akan sentiasa muncul. Semakin ramai yang menonton kandungan tersebut semakin kerap kandungan dakwah yang disebarkan akan keluar untuk tontonan setiap pengguna.

c. Kandungan dapat disimpan untuk dijadikan rujukan

Selari dengan sifat TikTok, menurut Firamadhina & Krisnani, (2021) aplikasi ini boleh menghasilkan video yang berdurasi 15 hingga 60 saat dan ia juga boleh ditonton berulang-ulang oleh penggunanya. Hal ini menjadikan salah satu kekuatan untuk digunakan sebagai medium dakwah pada masa kini. Setiap video yang dihasilkan dan dimuat naik ke aplikasi TikTok dapat disimpan oleh setiap pengguna aplikasi ini. Perkara ini penting kerana setiap kandungan yang bermanfaat dapat ditonton berulang kali apatah lagi kandungan tersebut adalah kandungan yang menjawab kemusykilan tentang permasalahan dalam agama Islam. Perkara ini dapat dirujuk dengan pantas pada bila-bila masa sekiranya terdapat kemusykilan berkaitan dengan agama.

2. Kelemahan

a. Bersaing dengan kandungan berunsur hiburan

Oleh kerana TikTok aplikasi sosial yang terkandung pelbagai bentuk kandungan, maka salah satu kelemahannya adalah ia perlu bersaing dengan kandungan sosial yang berbentuk hiburan seperti video tarian, nyanyian, lakonan dan perniagaan. Menurut Utami et al., (2021) dan Chotijah, (2021), TikTok menjadi media hiburan masyarakat pada masa kini. Oleh itu, perkara ini menjadi antara kelemahan kepada kandungan dakwah kerana ia terpaksa bersaing dengan kandungan-kandungan hiburan lain. Hal ini kerana sifat manusia lebih kepada mencari hiburan dan keseronokkan semata-mata sebagaimana yang dinyatakan oleh Adawiyah, (2020) remaja menyukai media sosial kerana dapat menghiburkan diri dan mengisi masa lapang.

b. Menjadi kekeliruan dalam masyarakat

Selain dari terdapat kandungan hiburan di aplikasi TikTok, penyebaran dakwah yang tidak jelas kepada masyarakat akan menimbulkan kekeliruan. Perkara ini juga terjadi disebabkan media sosial sering memaparkan maklumat yang tidak sahih atau palsu dengan tujuan mendapatkan perhatian dan pengaruh (Ayub et al., 2019). Hal ini akan membangkitkan salah faham akan sesuatu kandungan dakwah yang disebarkan tanpa menerangkan maksud penuh yang ingin disampaikan. Oleh kerana itu, setiap pendakwah harus mengetahui kepada siapa kandungan dakwah itu hendak disampaikan agar pengguna yang menonton dapat memahami dengan jelas akan mesej yang ingin disampaikan. Penyebaran berita dan maklumat palsu perlu dielakkan bagi mengekang salah faham kepada masyarakat yang akhirnya akan membuat kekeliruan kepada mereka.

c. Ditonton oleh mereka yang minat tentang agama sahaja

Seterusnya kelemahan yang boleh diperkatakan terhadap penyebaran dakwah di aplikasi TikTok adalah kandungan yang disampaikan hanya ditonton dan dicari oleh mereka yang hanya minat dan sukakan kandungan agama dan dakwah. Perkara ini amat jelas kerana kandungan yang terdapat di aplikasi ini kebanyakan adalah berbentuk hiburan yang membawa kepada keseronokkan dunia semata-mata. Ditambah pula dengan kandungan-kandungan yang memaparkan golongan perempuan yang berpakaian seksi dan bergoyang lentuk menjadikan lagi keasyikkan kepada pengguna khususnya kepada golongan remaja lelaki dalam menikmati setiap inci kandungan yang tersedia.

d. Mampu memecah belah masyarakat

Penyebaran dakwah melalui aplikasi TikTok mampu memecah belah masyarakat dan perkara ini harus dipandang serius oleh semua pihak. Hal ini kerana perpecahan yang terjadi melalui penyebaran dakwah adalah dengan adanya sifat ketaksuban kepada sesetengah pendakwah. Masyarakat akan berpegang dengan pendakwah yang menyokong tindakan mereka dan akan mengecam kepada pendakwah yang bertentangan dengan pandangan mereka. Perkara ini amat bertentangan dengan ajaran Islam. Islam mengajar umatnya untuk berlapang dada dalam sesuatu permasalahan asalkan ia tidak melibatkan kepada persoalan yang membawa kepada masalah akidah Islam.

e. Ketandusan idea

Dalam menjayakan sesuatu kandungan dakwah, idea yang kreatif dan bernas memainkan peranan utama dalam hal tersebut. Namun apakah idea kreatif sentiasa ada dalam peikiran setiap pendakwah? Menurut Framing et al., (2021) para pendakwah atau TikToker perlu memerah otak bagi memperolehi idea yang kreatif serta mengumpulkan bahan-bahan untuk dijadikan suatu kandungan yang boleh memberi manfaat kepada masyarakat. Hal ini kerana kandungan yang bijak dan menarik amat diperlukan di platform media sosial khususnya di aplikasi TikTok untuk mengambil perhatian daripada pengguna. Selain itu, setiap pendakwah seharusnya berani dalam menggunakan media sosial sebagai platform berdakwah di era globalisasi ini. Hal ini kerana terdapat segelintir pendakwah yang takut untuk menggunakan media sosial kerana tidak mahir dan tidak kreatif (Mokhtar & Hassan, 2019)

3. Peluang

a. Perkenalkan nilai agama Islam keseluruhannya

Penyebaran dakwah melalui media sosial terutamanya TikTok telah membuka peluang yang besar kepada seluruh masyarakat untuk mendalami, memahami dan mengenali agama Islam. Menurut Palupi et al., (2021), kandungan dakwah di TikTok tidak sahaja untuk masyarakat muslim akan tetapi ia juga digunakan oleh seluruh masyarakat pelbagai agama dan bangsa. Hal ini menjadi peluang kepada pendakwah bagi membuka pemikiran golongan non muslim tentang keindahan yang ada pada Islam sekaligus dapat menghapus Islamophobia dalam diri mereka.

Oleh itu, peluang ini perlu dimanfaatkan dengan sebaiknya oleh setiap pendakwah kerana pengguna TikTok di Malaysia melebihi 4 juta pengguna yang terdiri dari pelbagai kategori umur, jantina, bangsa dan agama. Dengan kehadiran kandungan dakwah yang menarik ia dilihat menjadi satu peluang untuk menarik dan mempengaruhi pemikiran masyarakat walaupun pengaruh tersebut tidaklah besar akan tetapi kesan yang dapat mampu mengubah sikap dan gaya hidup masyarakat ke arah yang lebih baik. Hal ini kerana media sosial merupakan satu platform yang mudah mempengaruhi pemikiran masyarakat terutama golongan remaja (Mokhtar & Hassan, 2019).

b. Menarik minat masyarakat

Menurut Wahab et al., (2019) Setiap pendakwah harus kreatif dalam menyampaikan dakwah di media sosial khususnya aplikasi TikTok kerana ia merupakan salah satu peluang dalam menarik minat masyarakat untuk terus mendalami setiap kandungan dakwah yang disediakan. Peluang ini tidak harus dilepaskan kerana aplikasi ini banyak digunakan oleh golongan remaja. Dengan kandungan dakwah yang menarik ia mampu menarik minat golongan ini untuk terus mendekati dunia dakwah yang terdapat dalam aplikasi TikTok.

c. Dapat meningkatkan pengetahuan agama kepada masyarakat

Dengan penyebaran dakwah melalui aplikasi TikTok, ia dilihat telah memberi peluang kepada seluruh masyarakat khususnya umat Islam dalam meningkatkan tahap pengetahuan agama dalam diri mereka. Hal ini kerana kandungan dakwah bukan sahaja kepada golongan bukan Islam malah ia menjadi satu wadah atau jalan baru untuk memberi pemahaman tentang Islam kepada masyarakat muslim (Abd Hadi Borham, 2018). Hal ini kerana terdapat kandungan dakwah yang berbentuk ceramah dan majlis ilmu disampaikan melalui aplikasi ini. Kandungan seperti ini dapat dimanfaatkan oleh segelintir umat Islam yang sibuk dengan urusan kerja akan tetapi tidak mempunyai masa untuk menghadiri majlis tersebut. Peluang seperti ini perlu digunakan sebaiknya oleh mereka dalam memberi makanan rohani kepada diri mereka agar tidak ketinggalan dengan kehidupan dunia semata-mata. Hal ini kerana ilmu agama penting dan menjadi bekalan dalam mendapat kesejahteraan hidup didunia dan juga diakhirat.

4. Ancaman

Walaupun TikTok menjadi antara medium penyebaran dakwah kepada masyarakat, namun disebalik peluang yang ada, penyebaran dakwah di TikTok dilihat mampu menjadi ancaman kepada masyarakat. Terdapat beberapa ancaman yang boleh berlaku dalam menggunakan TikTok sebagai medium penyebaran dakwah antaranya:

a. Penyebaran fahaman yang bertentangan dengan ajaran Islam (ajaran sesat)

Ancaman yang paling dikhuatiri dan perlu diberi perhatian oleh semua pihak terutamanya kepada golongan pendakwah yang menggunakan aplikasi TikTok sebagai medium dakwah adalah tidak menyebarkan segala bentuk fahaman atau ajaran yang bertentangan dengan apa yang telah ditetapkan oleh agama Islam. apa yang lebih tepat adalah penyeabran ajaran sesat. Hal ini kerana ajaran sesat sering dikaitkan dengan penyebaran agama Islam akan tetapi ia tidak selari dan sering bercanggah dengan ajaran Islam yang sebenarnya. Menurut Jusidin & Mohd Kusrin, (2018) hal ini berlaku akibat dari penyebaran segala bentuk informasi di media sosial tiada sempadan.

Oleh itu, penyebaran ajaran sesat atau ajaran yang bercanggah dengan Islam berlaku secara meluas di media sosial. oleh demikian itu, segala bentuk fahaman baharu yang bertentangan dengan ajaran Islam perlu ditapis dan disekat agar tidak mengelirukan tanggapan masyarakat dalam menjalani kehidupan sebagai seorang Islam. Hal ini sering berlaku kerana tiada sebarang sekatan dikenakan oleh TikTok terhadap segala bentuk kandungan yang tersedia melainkan ia akan disekat jika terdapat laporan tentang sesuatu kandungan yang bertentangan. Perkara ini perlu dipandang serius oleh semua pihak kerana umat nabi Muhammad SAW akan berpecah kepada 73 kumpulan dan hanya satu kumpulan sahaja yang benar. Hal ini sebagaimana sabda baginda SAW

وَالَّذِي نَفْسُ مُحَمَّدٍ بِيَدِهِ لَتَفْتَرِقَنَّ أُمَّتِي عَلَى ثَلَاثٍ وَسَبْعِينَ فِرْقَةً، وَاحِدَةٌ فِي الْجَنَّةِ، وَثِنْتَانِ وَسَبْعُونَ فِي النَّارِ، قِيلَ: يَا رَسُولَ اللَّهِ مَنْ هُمْ؟ قَالَ: الْجَمَاعَةُ

Bermaksudnya: “Dan demi jiwa Muhammad berada di tangan-Nya, akan berpecah umatku kepada 73 golongan kumpulan. Satu kumpulan sahaja yang akan ke syurga dan

72 kumpulan lagi akan dimasukkan ke dalam neraka. Sahabat bertanya: Wahai Rasulullah SAW, siapakah mereka? Nabi SAW menjawab: al-Jamaah.”

Riwayat Ibn Majah (3992)

b. Perpecahan dalam masyarakat

Perpecahan dalam masyarakat mampu berlaku kerana terdapat kandungan dakwah yang bertentangan sehingga berlakunya fitnah. Hal ini kerana berlaku ketaksuban dalam masyarakat kepada pendakwah tertentu sehingga mengfitnah golongan yang bertentangan dari fahaman mereka sebagai sesat dan tidak betul sedangkan Islam menyeru umatnya untuk menyemak akan kesahihan apa yang telah disebarkan dan Islam juga menyeru umatnya untuk berlapang dada dalam sesuatu perkara.

Selain itu, perbalahan diantara segelintir pendakwah-pendakwah di negara ini merupakan antara ancaman yang paling bahaya kepada masyarakat kerana ia mampu menjadi pergaduhan terutama dalam media sosial. Istilah seperti kafir mengkafir, sesat menyesatkan, memaki manusia dengan perkataan yang tidak sepatutnya menjadi perkara biasa di media sosial. Hal ini terjadi kerana sikap ketaksuban yang ada dalam masyarakat itu sendiri yang membuatkan perpecahan sesama umat Islam.

c. Berlaku salah faham terhadap sesuatu isu dakwah

Oleh kerana kandungan video di TikTok mempunyai batas waktu untuk menghasilkan sesuatu video, setiap kandungan yang disediakan perlu di beri penjelasan yang jelas terhadap mesej dakwah yang ingin disampaikan. Hal ini penting kerana dikhuatiri berlaku salah faham dalam masyarakat sehingga mampu menimbulkan keraguan dalam diri mereka. Oleh demikian, setiap pendakwah perlu merancang dengan jelas dan terperinci akan kandungan yang ingin dihasil dan ditampilkan kepada pengguna TikTok supaya pengguna dapat memahami dan mengambil manfaat dari apa yang telah dihasilkan.

Kesimpulan

Dakwah merupakan satu pekerjaan yang paling mulia disisi Allah swt kerana pekerjaan ini mengajak manusia kearah kebaikan dan meninggalkan perkara yang dilarang. Disamping itu, penyebaran dakwah mempunyai pelbagai halangan dan cabaran yang perlu ditempuh sehingga ada yang mengancam nyawa. Pekerjaan dakwah bukanlah satu pekerjaan yang mudah dan ia perlukan kesabaran yang tinggi bagi memperolehi hasil yang baik. Setiap pendakwah perlu menghasilkan kandungan dakwah yang menarik dan mengikut fakta yang tepat. Berdakwah mestilah menggunakan hujah yang berlandaskan al-quran dan as-sunnah kerana itu merupakan sumber rujukan utama dalam Islam. Selari dengan peredaran masa, kaedah dakwah tidak sahaja disampaikan di masjid dan disurau malah ia juga disampaikan melalui pelbagai platform media sosial khususnya aplikasi TikTok.

Justeru itu, setiap pendakwah yang menggunakan media sosial dalam menyampaikan dakwah seharusnya membuat kajian dan pemerhatian akan kebaikan dan keburukan yang boleh berlaku dalam usaha dakwah di media sosial. Hal ini kerana kandungan dakwah yang tidak jelas dan terlalu umum akan menimbulkan kekeliruan dan salah faham dalam kalangan pengguna untuk memahami maksud yang ingin disampaikan. Oleh demikian itu, pendakwah yang

menggunakan media sosial perlu peka dengan keadaan ini supaya tidak berlaku perkara yang boleh merosakkan pemahaman umat terhadap agama Islam.

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PENGUNAAN KAEDAH BOSUFA (BOARD GAME SURAH AL-FALAQ) MENINGKATKAN HAFAZAN SURAH AL-FALAQ

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Abstrak: Tujuan kajian ini adalah untuk meningkatkan hafazan surah al-Falaq oleh murid tahun 2 di Sekolah Kebangsaan Seafeld melalui penggunaan kaedah baharu yang dikenali sebagai BOSUFA, permainan board game surah Al-Falaq. Kajian tindakan ini dijalankan dengan tujuan untuk meningkatkan teknik pengajaran guru dan mengenal pasti tahap kebolegunaan dan kepuasan murid terhadap kaedah ini. Seramai 40 murid kelas dua Metana telah terlibat dalam kajian; lima daripada mereka telah dipilih sebagai peserta utama berdasarkan tahap penguasaan hafazan mereka yang rendah. Temu bual, pemerhatian, ujian tasmik, analisis dokumen dan soal selidik adalah beberapa kaedah pengumpulan data. Intervensi telah dirancang, dilaksanakan, dipantau dan difikirkan menggunakan model kajian tindakan Kurt Lewin. Hasil kajian menunjukkan bahawa kaedah BOSUFA berkesan dalam meningkatkan pencapaian hafazan murid kerana ia menggalakkan penyertaan aktif dan pengulangan terkawal. Ia juga menggalakkan mereka dengan menggunakan permainan dan ganjaran. Selain itu, keputusan menunjukkan bahawa murid memberikan maklum balas yang positif tentang kebolegunaan teknik ini; mereka mendapat skor yang tinggi untuk kepuasan dan mempunyai kefahaman yang tinggi tentang soal selidik yang dianalisis secara deskriptif dan inferensi menggunakan SPSS. Kajian ini mencadangkan kaedah BOSUFA sebagai alternatif untuk pengajaran hafazan al-Quran di sekolah rendah yang praktikal, menarik dan mudah digunakan.

Kata Kunci: Kaedah BOSUFA, hafazan al-Quran, surah al-Falaq, permainan pendidikan, kajian tindakan, murid Tahun 2

Refleksi Pengajaran Dan Pembelajaran

Sebagai guru Pendidikan Islam sejak 2019, pengalaman mengajar kelas 2 Metana pada tahun 2024/2025 menimbulkan cabaran yang berbeza. Murid-murid yang dianggap berkebolehan menghadapi kesukaran dalam menguasai Al-Quran, terutamanya dalam bidang hafazan. Ketika sesi PdP berlangsung, pemerhatian menunjukkan bahawa murid tidak berminat, pasif dan menghadapi kesukaran untuk memberi tumpuan. Metodologi tradisional, seperti talaqqi musyafahah yang berpusatkan guru, gagal menarik perhatian murid dan memerlukan masa yang lama. Hasil pentaksiran menunjukkan bahawa hanya 15 daripada 40 murid dapat menghafaz surah al-Falaq dengan baik. Baki jumlah murid yang lain masih lemah dalam bacaan dan hafazan. Pendekatan yang tidak sesuai dengan kebolehan kognitif murid serta kekurangan variasi dalam kaedah pengajaran adalah punca isu ini.

Pendekatan baharu diperlukan untuk menjadikan pembelajaran lebih menarik, interaktif dan sesuai dengan keperluan murid untuk mengatasi masalah ini. Oleh itu,

permainan papan Surah Al-Falaq (BOSUFA) telah diperkenalkan. Ia adalah kaedah baharu yang disesuaikan untuk hafazan dan diambil daripada permainan papan. Berdasarkan teori peneguhan dari BF Skinner, kaedah ini bertujuan untuk meningkatkan penglibatan murid secara aktif dengan mewujudkan persaingan yang sihat dan menggunakan ganjaran dalam bentuk token sebagai motivasi. Diharapkan pendekatan ini dapat meningkatkan proses pengajaran dan pembelajaran hafazan Al-Quran dengan cara yang lebih menyeronokkan dan berkesan.

Fokus Kajian

Kajian ini bertujuan untuk meningkatkan cara guru mengajar hafazan al-Quran, terutamanya surah al-Falaq, dengan menggunakan kaedah baharu yang dipanggil BOSUFA. Dalam kajian ini, murid kelas 2 Metana di SK Seafield didapati mempunyai pencapaian hafazan al-Quran yang sederhana dan rendah. Terlepas daripada fakta bahawa surah al-Falaq adalah surah biasa yang sering dibaca setiap hari, murid menghafaznya dengan susah payah dan tidak menunjukkan minat yang mendalam dalam pengajaran tentang bidang al-Quran.

Terdapat bukti bahawa pendekatan talaqqi musyafahah sahaja tidak mencukupi untuk memenuhi keperluan semua murid. Sebuah kajian oleh Sulaiman et al. (2021) mendapati bahawa strategi talaqqi musyafahah, penilaian berkala, kaedah ganjaran (sistem ganjaran), dan persekitaran pembelajaran yang menyenangkan adalah semua faktor penting dalam mendorong murid untuk mengekalkan ingatannya. Oleh itu, dalam usaha untuk mewujudkan persekitaran pembelajaran yang lebih menyeronokkan dan interaktif, kajian tindakan ini memperkenalkan pendekatan BOSUFA berbentuk permainan papan. Dengan menggunakan token bintang sebagai ganjaran untuk mendorong murid untuk melakukan aktiviti yang berkaitan dengan hafazan, pendekatan ini juga berasaskan teori peneguhan Skinner.

BOSUFA menggabungkan elemen sosial (tasmik berpasukan), elemen visual (papan permainan berwarna) dan elemen kinestetik (pergerakan token dan balingan dadu). Selain itu, kaedah ini membolehkan guru menilai penguasaan hafazan individu dan kumpulan, serta memberi peluang kepada murid mengulangi hafazan secara berperingkat. Dalam keadaan ini, pengulangan murid dan pentaksiran guru akan meningkatkan hafazan murid (Ismail et al., 2023)

Fokus utama dalam menggunakan teknik ini adalah untuk mengetahui sama ada pendekatan BOSUFA berkesan dalam meningkatkan pencapaian hafazan murid, menentukan tahap kebolegunaan dan kepuasan teknik tersebut, dan mengetahui sama ada terdapat perbezaan yang ketara antara jantina dalam hal kebolegunaan dan kepuasan. Akhir sekali, kajian ini mencadangkan pendekatan BOSUFA sebagai satu inovasi yang mudah digunakan yang boleh digunakan oleh guru pendidikan Islam untuk meningkatkan pembelajaran hafazan di sekolah rendah.

Objektif Kajian

Objektif :

- a) Meningkatkan tahap hafazan murid dalam menghafaz surah Al-Falaq menggunakan kaedah Bosufa.

- b) Mengenalpasti tahap pengetahuan murid terhadap kebolehgunaan dan kepuasan kaedah BOSUFA (Board Game Surah Al-Falaq)?
- c) Mengenalpasti perbezaan tahap pengetahuan terhadap kebolehgunaan dan kepuasan kaedah BOSUFA (Board Game Surah Al-Falaq) berdasarkan jantina.

Kumpulan Sasaran

Kajian ini melibatkan satu kelas daripada keseluruhan murid Tahun 2 di SK Seafield. Setiap tahun atau darjah terdiri daripada 3 kelas dan purata jumlah murid bagi setiap tahun adalah seramai 120 orang secara purata. Kelas yang dipilih adalah kelas 2 Metana yang terdiri daripada 40 orang murid. Peserta kajian ini dipilih berdasarkan pemerhatian, analisis dokumen dan temu bual bersama guru Pendidikan Islam yang mengajar kelas berkenaan. Selain itu, pemilihan ini juga mengambil kira tahap penguasaan pembelajaran di dalam kelas, keputusan ujian bulanan dan tumpuan semasa proses pengajaran dan pembelajaran berlangsung di dalam kelas.

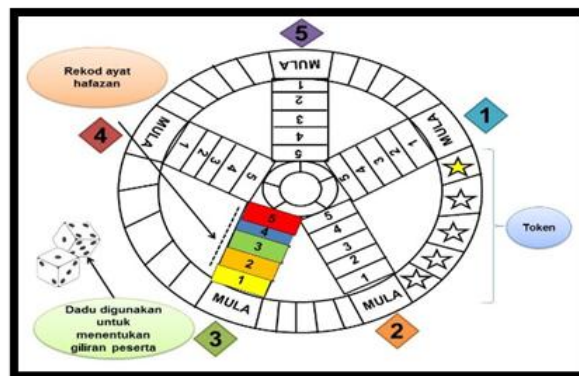
Tinjauan Awal

Kajian awal telah dijalankan oleh pengkaji untuk menentukan tahap motivasi dan prestasi murid Tahun 2 Metana, SK Seafield untuk menghafaz surah Al-Falaq. Maklumat yang berkaitan telah diperoleh melalui pemerhatian tidak formal, soal selidik dan analisis ujian. Hasil awal menunjukkan bahawa sebahagian besar murid menghadapi kesukaran untuk menghafaz surah berkenaan dengan lancar dan kurang berminat semasa sesi hafazan. Dipercayai bahawa pendekatan pengajaran yang konvensional, bahan bantu mengajar yang tidak menarik, dan persekitaran pembelajaran yang tidak interaktif adalah punca masalah ini.

Menurut soal selidik yang diedarkan, murid tidak berasa seronok atau bermotivasi semasa proses hafazan. Skor ujian awal juga menunjukkan bahawa tahap hafazan murid masih pada tahap yang lemah dan hanya sebilangan kecil mampu menghafaz dengan sebutan dan tajwid yang betul. Hasil ini mengukuhkan bahawa suatu intervensi yang lebih menarik dan berkesan diperlukan untuk meningkatkan minat dan prestasi hafazan murid.

Pelaksanaan Intervensi

Pelaksanaan intervensi dalam kajian ini bertujuan untuk meningkatkan kemahiran hafazan surah al-Falaq dalam kalangan murid Tahun 2 serta menilai kebolehgunaan dan kepuasan terhadap kaedah inovatif BOSUFA (Board Game Surah al-Falaq). Intervensi ini dijalankan selama tiga minggu yang merangkumi enam fasa utama, bermula dengan ujian awal, amali bacaan, pengenalan dan pelaksanaan kaedah BOSUFA, ujian akhir, refleksi pengajaran, serta pengumpulan data soal selidik. Jalur masa pelaksanaan dirancang secara sistematik dan dilaksanakan terhadap 40 orang murid kelas 2 Metana.



Rajah 1: Papan Bosufa

Pengumpulan Data

Temu bual, pemerhatian, analisis dokumen dan soal selidik adalah kaedah yang digunakan bagi mengumpulkan data dalam kajian ini. Tingkah laku, kefahaman dan penguasaan hafazan murid dikesan melalui penggunaan borang senarai semak berstruktur untuk merekodkan pemerhatian. Bagi mendapatkan maklumat lanjut tentang pengalaman dan perasaan peserta terhadap kaedah BOSUFA, temu bual berstruktur digunakan. Ujian bertulis dan ujian tasmik pula digunakan untuk menilai perbezaan penguasaan sebelum dan selepas intervensi. Selain itu, untuk menilai kebolegunaan dan kepuasan murid terhadap kaedah yang diperkenalkan, instrumen soal selidik dengan skala Likert lima mata digunakan.

Analisis Data

Analisis data dijalankan secara kualitatif dan kuantitatif. Pemerhatian dan temu bual dianalisis secara deskriptif manakala data soal selidik dianalisis menggunakan SPSS 27.0 melalui teknik deskriptif (frekuensi, min, sisihan piawai) dan inferensi (ujian-T). Kaedah triangulasi digunakan untuk menyemak kebolehpercayaan dapatan bagi persoalan kajian pertama. Instrumen temu bual, pemerhatian dan ujian bertulis disepadukan dalam triangulasi kaedah. Bagi persoalan kedua dan ketiga, analisis soal selidik dan ujian-T digunakan untuk menilai perbezaan jantina dalam persepsi murid terhadap kebolegunaan BOSUFA.

Penilaian

Kajian ini memberi tumpuan kepada keberkesanan kaedah BOSUFA (Board Game Surah Al-Falaq) dalam meningkatkan hafazan murid. Ia juga menilai tahap pengetahuan dan kepuasan murid dengan kaedah yang digunakan. Tiga persoalan kajian utama adalah asas penilaian ini.

Soalan Kajian 1: Bagaimanakah Kaedah Bosufa Dapat Membantu Meningkatkan Tahap Hafazan Murid Dalam Menghafaz Surah Al-Falaq ?

Melalui kajian ini, pengkaji telah mendapati bahawa penggunaan kaedah *Bosufa* mampu membantu murid menghafaz surah Al-Falaq dengan lebih baik. Dapatan ini dibuktikan melalui analisis yang dibuat terhadap instrumen pemerhatian dari aspek lisan. Hasil analisis pemerhatian mendapati kesemua peserta kajian menunjukkan perkembangan yang positif

melalui proses menghafaz dan hasilnya. Jadual di bawah merupakan keputusan analisis temu bual beberapa orang murid dari aspek lisan.

Jadual 1: Soalan Temu Bual

Apakah perasaan kamu setelah menggunakan kaedah Bosufa ?	
PK 1	"...Seronok ustaz. Senang nak hafaz"
PK 2	"...Nak main lagi. Seronok je nak hafaz"
PK 3	"...Sangat best ustaz"
PK 4	"...Bestnya , ustaz"
PK 5	"...Ermmm..best ah ustaz.Seronok"

Dapatan daripada analisis temu bual menunjukkan respon positif daripada peserta kajian. Proses menghafaz dan pembelajaran dilaksanakan berkonsepkan unsur tkrar iaitu pengulangan kerana banyak membantu mereka menghafaz surah Al-Falaq. Peserta kajian turut merasakan bahawa kaedah *Bosufa* ini adalah satu kaedah inovasi yang mesra murid dan menyeronokkan. Dalam temu bual 1, "*Apakah perasaan kamu setelah menggunakan kaedah Bosufa?*" antara jawapan yang saya peroleh adalah "...Seronok ustaz. Senang nak hafaz" (PK 1) dan "...Sangat best ustaz" (PK 3). Respon ini menunjukkan mereka dapat menghafaz dalam keadaan gembira dan menyeronokkan dengan berkonsepkan menghafaz sambil bermain.

Peserta kajian iaitu murid kelas 2 Metana pada asalnya sebahagian besar daripada mereka tidak boleh menghafaz surah Al-Falaq semasa pengkaji melakukan semakan ujian awal. Namun, setelah menggunakan kaedah *Bosufa*, dalam ujian akhir menunjukkan hasil akhir yang memberangsangkan dan sangat baik. Majoriti menunjukkan perubahan yang positif dengan dapat menguasai hafazan surah Al-Falaq.

Jadual 2: Prestasi Hafazan Peserta Kajian Yang Terpilih Selepas Menggunakan Kaedah Bosufa

Peserta Kajian	Ayat 1	Ayat 2	Ayat 3	Ayat 4	Ayat 5
PK 1	/	/	/	/	/
PK 2	/	/	/	/	/
PK 3	/	/	/	/	/
PK 4	/	/	/	/	/
PK 5	/	/	/	X	X

Berdasarkan jadual di atas, majoriti peserta kajian dapat menghafaz surah Al-Falaq dengan baik kecuali PK 5 yang hanya dapat menghafaz ayat 1-3. Hal ini kerana PK 5 adalah seorang murid yang agak lemah namun kegigihan beliau untuk menghafaz menunjukkan kelemahannya tidak dijadikan alasan untuk menghafaz. Walaupun mereka tidak dapat melancarkan bacaan mereka dengan baik dan lancar, mereka masih dapat menguasai ayat tersebut secara melalui ujian bertulis yang telah dijalankan.

Soalan Kajian 2 : Apakah Tahap Pengetahuan Murid Terhadap Kebolegunaan Kaedah Dan Kepuasan Kaedah BOSUFA (Board Game Surah Al-Falaq)?

Dapatan bagi persoalan kajian yang kedua dikumpul dengan menggunakan kaedah pengisian borang soal selidik. Borang soal selidik telah diedarkan kepada murid tahun 2 Metana dan diberikan masa selama 60 minit untuk memberi respon kepada kajian. Pengkaji memberikan taklimat terlebih dahulu sebelum murid mengisi borang soal selidik. Justeru, dapatan kajian menunjukkan jumlah murid bagi kelas 2 Metana seramai 40 orang daripada jumlah keseluruhan 109 orang mencatatkan 36.70% yang terlibat menjawab soal selidik.

Jadual 3: Analisis Deskriptif Tahap Pengetahuan Murid Terhadap Kebolegunaan Kaedah Bosufa

Item Soalan	STS	TS	TP	S	SS	Min
B1- Kaedah ini boleh difahami dengan mudah	0	5.0	5.0	67.5	27.5	4.13
B2- Kaedah ini jelas menerangkan ayat hafazan surah Al-Falaq	0	2.5	2.5	65.0	30.0	4.25
B3- Kaedah ni bersifat interaktif	0	5.0	2.5	57.5	35.0	4.27
B4- Kaedah ini mesra pengguna	2.5	0	2.5	62.5	32.5	4.27
B5- Kaedah ini adalah fleksibel	2.5	0	15.0	52.5	30.0	4.13
B6- Kaedah ini dapat dipelajari dengan cepat	2.5	0	10.0	42.5	45.0	4.32
B7- Kaedah ini sesuai dipraktikkan di dalam pengajaran dan pembelajaran Pendidikan Islam	0	0	2.5	77.5	20.0	4.18
B8- Kaedah ini menjimatkan masa saya untuk menghafaz surah Al-Falaq.	5.0	0	17.5	47.5	30.0	4.08
B9- Kaedah ini membantu saya untuk menghafaz surah Al-Falaq	5.0	0	0	40.0	55.0	4.50
B10- Kaedah ini menepati keperluan murid untuk bermain ketika belajar	0	0	0	27.5	72.5	4.73
Min Keseluruhan						4.24

Jadual 3 menunjukkan taburan responden terhadap tahap pengetahuan murid terhadap kebolegunaan kaedah Bosufa. Didapati bahawa min tertinggi iaitu 4.73 menunjukkan kesemua murid kelas 2 Metana mempunyai pengetahuan bahawa kaedah Bosufa menepati keperluan murid untuk bermain ketika belajar dan tiada murid yang memilih item tidak pasti, tidak setuju dan sangat tidak setuju. Hal ini menunjukkan, murid kelas 2 Metana rata-rata bersetuju perlunya ada elemen bermain ketika sesi pengajaran dan pembelajaran. Dapatan ini disokong dengan dapatan kajian oleh Hairul Aysa dan Rohana (2010), iaitu markah murid untuk kemahiran membaca perkataan dua suku kata meningkat semasa bermain dam ular. Proses ini menunjukkan cara pembelajaran murid memindahkan pengetahuan dan kecekapan.

Dapatan kajian menunjukkan tahap skor min yang tinggi bagi tahap pengetahuan murid terhadap kebolegunaan kaedah Bosufa. Dapatan kajian ini selari dengan dapatan kajian Nazrina, Haslinda dan Nouraisyah. (2019) yang turut mendapat skor min yang tinggi iaitu (4.3) persepsi murid terhadap kebolegunaan Kebaboom dalam pembelajaran dari aspek prosedur penggunaan

Jadual 4: Analisis Deskriptif Tahap Pengetahuan Murid Terhadap Kepuasan Kaedah Bosufa

Item Soalan	STS	TS	TP	S	SS	Min
B1- Kandungan BOSUFA ini ringkas	0	0	0	40.0	60.0	4.60
B2- Kandungan BOSUFA ini padat	0	0	0	60.0	40.0	4.40
B3- BOSUFA ini memberi semangat untuk menghafaz surah Al-Falaq	0	0	2.5	22.5	75.0	4.72
B4- BOSUFA menambah pengetahuan terhadap ayat hafazan surah Al-Falaq	0	0	5.0	65.0	30.0	4.25
B5- Kaedah BOSUFA ini adalah sesuai dengan perkembangan terkini	0	0	0	75.0	25.0	4.25
B6- Kandungan BOSUFA ini senang diikuti	0	0	0	32.5	67.5	4.68
B7- BOSUFA membantu untuk memberi tumpuan dalam pembelajaran	0	0	0	77.5	22.5	4.22
B8- BOSUFA melibatkan murid dengan aktif dalam sesi PdP	0	0	0	90.0	10.0	4.10
B9- BOSUFA membantu dalam menyiapkan tugas dalam bilik darjah	2.5	0	0	77.5	20.0	4.13
B10- Berpuas hati menggunakan kaedah BOSUFA dalam sesi pengajaran dan pembelajaran	0	0	0	45.0	55.0	4.55
Min Keseluruhan						4.39

Berdasarkan interpretasi skor min skala likert lima mata yang digunakan, dapatan kajian dalam jadual 4 menunjukkan bahawa min tertinggi ialah 4.72 dimana sebanyak 97.5% murid kelas 2 Metana beranggapan bahawa kaedah Bosufa memberi semangat kepada murid untuk menghafaz surah Al-Falaq. Ini menunjukkan responden gemar menggunakan kaedah Bosufa dalam sesi pengajaran dan pembelajaran. Tambahan pula, min keseluruhan dalam tahap pengetahuan murid terhadap kepuasan kaedah Bosufa ialah 4.39 yang bermaksud berada pada tahap tinggi dan baik.

Selanjutnya, dapatan kajian ini juga menunjukkan bahawa tahap skor pengetahuan murid tinggi terhadap penggunaan Bosufa dalam sesi pengajaran dan pembelajaran. Dapatan kajian ini selari dengan kajian Nurul Aina et. al. (2022) yang mendapatkan skor (3.40) bagi kepuasan pengguna dalam membangunkan permainan maya berunsur pendidikan Tamadun Abbasiyah.

Soalan Kajian 3: Adakah Terdapat Perbezaan Signifikan Tahap Pengetahuan Terhadap Kebolehgunaan Dan Kepuasan Kaedah BOSUFA (Board Game Surah Al-Falaq) Antara Murid Lelaki Dan Perempuan?

1) Tahap Pengetahuan Murid Terhadap Kebolehgunaan Kaedah Bosufa

H₀₁: Tiada perbezaan signifikan tahap pengetahuan murid terhadap kebolehgunaan kaedah BOSUFA (Board Game Surah Al-Falaq) antara murid lelaki dan perempuan.

Jadual 5: Keputusan Ujian-T

Jantina	N	Min	SP	Nilai-T	Tahap Signifikan
Lelaki	18	4.3167	0.355	1.062	0.295
Perempuan	22	4.1773	0.456		

Berdasarkan Jadual 5, didapati nilai-T bagi perbandingan tahap pengetahuan murid terhadap kebolehgunaan kaedah BOSUFA (Board Game Surah Al-Falaq) antara murid lelaki dan perempuan ialah $t=-1.062$ dan tahap signifikan $p=0.295$. Menurut Coakes et. al. dalam Ghazali & Sufian (2016) jika ($p > 0.05$), maka hipotesis nul diterima.

2) Tahap Pengetahuan Murid Terhadap Kepuasan Kaedah Bosufa

H_{02} : Tiada perbezaan signifikan tahap pengetahuan murid terhadap kepuasan kaedah BOSUFA (Board Game Surah Al-Falaq) antara murid lelaki dan perempuan.

Jadual 6: Keputusan Ujian-T

Jantina	N	Min	SP	Nilai-T	Tahap Signifikan
Lelaki	18	4.4167	0.311	0.589	0.560
Perempuan	22	4.3682	0.208		

Berdasarkan Jadual 6, didapati nilai-T bagi p tahap pengetahuan murid terhadap kepuasan kaedah BOSUFA (Board Game Surah Al-Falaq) antara murid lelaki dan perempuan ialah $t=-0.589$ dan tahap signifikan $p=0.560$. Menurut Coakes et. al. dalam Ghazali & Sufian (2016) jika ($p > 0.05$), maka hipotesis nul diterima.

Tahap signifikan kedua-dua aspek lebih besar daripada 0.05 dengan ($p>0.05$). Maka, hipotesis nul (H_{01}) dan (H_{02}) diterima dimana menunjukkan tidak terdapat perbezaan signifikan tahap pengetahuan terhadap kebolehgunaan dan kepuasan kaedah BOSUFA (Board Game Surah Al-Falaq) antara murid lelaki dan perempuan.

Dapatan kajian menunjukkan tiada perbezaan yang signifikan tahap pengetahuan murid berdasarkan jantina. Hal ini menunjukkan bahawa kaedah Bosufa membantu murid lelaki dan perempuan dalam menghafaz surah Al-Falaq. Murid bersetuju dalam kebolehgunaan Bosufa dan berpuas hati ketika menggunakan kaedah Bosufa dalam sesi pengajaran dan pembelajaran. Menurut kajian Sreerambhatla (2010), kepuasan pelanggan akan meningkat apabila bahan yang dihasilkan memenuhi keperluan.

Refleksi

Dapatan kajian menunjukkan bahawa penggunaan kaedah BOSUFA (Board Game Surah Al-Falaq) berkesan dalam meningkatkan keupayaan murid Tahun 2 menghafaz surah Al-Falaq serta menambah baik amalan pedagogi guru. Pengumpulan data awal mendedahkan wujudnya permasalahan dalam penguasaan hafazan al-Quran yang, sekiranya tidak ditangani, berpotensi menjadi isu berpanjangan. Selari dengan pandangan S.H. Nasr (1988), Pendidikan Islam tidak hanya menekankan aspek kognitif (ta'lim) tetapi turut membentuk peribadi dan akhlak (tarbiyah). Peranan guru sebagai murabbi menuntut kreativiti dalam merancang dan melaksanakan pengajaran yang dapat menarik minat murid serta mengatasi kebosanan (Hasnida Ibrahim, 2011).

Pelaksanaan BOSUFA telah mewujudkan suasana pembelajaran yang menyeronokkan, sekali gus meningkatkan motivasi murid. Murid menunjukkan tumpuan yang lebih baik, mengurangkan tingkah laku negatif, dan berjaya menghafaz kesemua ayat surah dengan tepat. Penggunaan konsep permainan dalam kaedah ini turut merangsang kemahiran psikomotor dan

membina persepsi positif terhadap proses hafazan. Peningkatan prestasi murid melalui penilaian lembaran kerja membuktikan keberkesanan intervensi yang dilaksanakan. Seperti yang ditegaskan oleh Chapman (2002), pengajaran yang berkesan memerlukan bakat, kemahiran, dan kesediaan guru mencari alternatif terbaik. Oleh itu, guru perlu proaktif dalam menangani masalah pembelajaran al-Quran agar murid tidak ketinggalan dan dapat mengamalkan surah-surah lazim dalam kehidupan harian (Yasin et al., 2024).

Cadangan Tindakan Susulan

Bagi kajian seterusnya, saya mencadangkan agar kaedah ini :

- i. Digunakan untuk menghafaz surah Al-Ikhlâs dan An-Nas pula supaya lengkap hafazan bacaan surah Al-Muawwizat oleh peserta kajian dan secara tidak langsung menepati apa yang telah ditetapkan oleh Kementerian Pendidikan Malaysia melalui kurikulum Pendidikan Islam KSSR Tahun 2.
- ii. Diperluaskan penggunaannya kepada topik lain di dalam subjek Pendidikan Islam seperti menghafaz bacaan dalam solat, doa harian dan sebagainya.
- iii. Diaplikasikan kepada subjek yang lain seperti subjek Sains, Sejarah, Bahasa Inggeris dan juga subjek-subjek yang lain.
- iv. Dijadikan sebagai satu terapi permainan untuk kanak-kanak pendidikan khas supaya murid pendidikan khas juga tidak terkecuali dalam arus perdana pendidikan nasional negara.

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