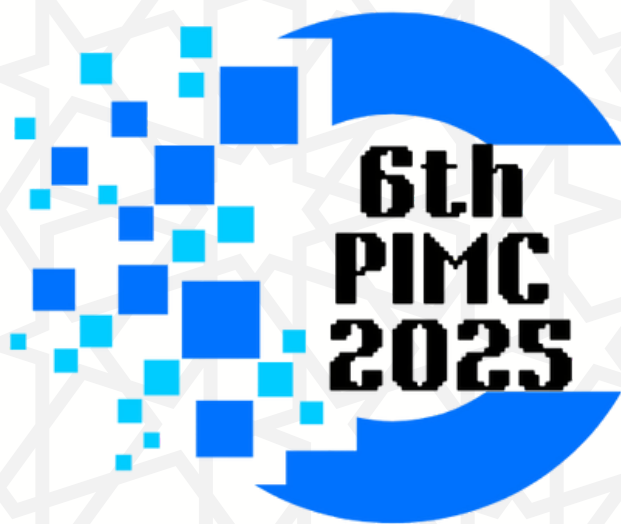
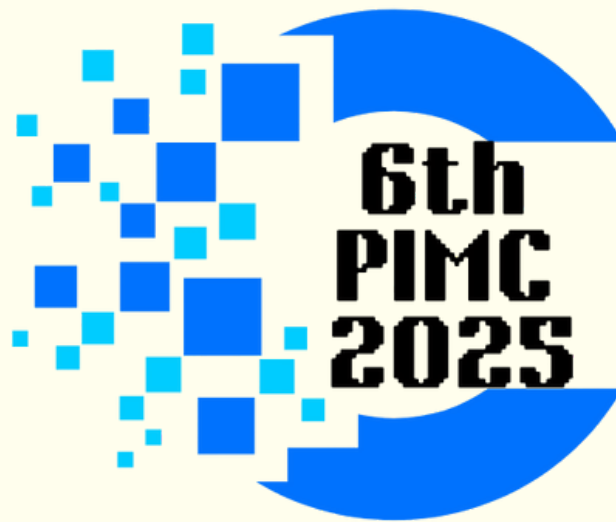




PROCEEDING:

**6TH PENANG INTERNATIONAL
MULTIDISCIPLINARY CONFERENCE
2025 (6TH PIMC 2025)**

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eISSN: 3036-0331

Published By:



GLOBAL ACADEMIC EXCELLENCE (M) SDN BHD -1257579-U
Lot 2 -11 Arked MARA Kota Bharu, Jalan Dato Pati, 15000 Kota Bharu ,Kelantan, MALAYSIA
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PREFACE

It is with great pleasure that we present the Proceedings of the 6th Penang International Multidisciplinary Conference 2025 (6th PIMC 2025). This annual conference continues to serve as a dynamic platform for scholars, researchers, industry experts, and practitioners from diverse fields to share new insights, exchange innovative ideas, and foster meaningful collaboration across disciplines.

The 6th PIMC 2025 reflects our commitment to advancing knowledge in an interconnected world, where complex challenges increasingly require integrated and multidisciplinary approaches. The papers featured in this proceeding embody the conference's central objective—to encourage rigorous research, stimulate academic dialogue, and promote impactful solutions that contribute to global and local development.

We extend our deepest appreciation to all authors for their valuable contributions, the reviewers for their careful and constructive evaluations, and the organizing committee for their unwavering dedication in making this conference a success. Our gratitude also goes to the participating institutions, partners, and sponsors whose support has made the 6th PIMC 2025 possible.

It is our hope that the research presented here will inspire further inquiry, spark new collaborations, and serve as a meaningful resource for academics, professionals, and policymakers. May this proceeding contribute to shaping a future driven by knowledge, innovation, and shared progress.

Thank you, and we wish all readers an enriching experience.

Sincerely,

Assoc. Prof. Dr. Lee Khai Loon

Chairman

6th Penang International Multidisciplinary Conference 2025 (6th PIMC 2025)

TABLE OF CONTENTS

CROSS-CULTURAL COMPARISON OF UGC COMMUNICATION FOR SINO-ITALIAN VISUAL INTANGIBLE CULTURAL HERITAGE ON INSTAGRAM: A CASE STUDY OF VENETIAN MASKS AND PEKING OPERA FACIAL MASKS	1
<i>Chuyao Wang, Nor Azura Adzharuddin, Mohamad-Noor Salehhuddin Sharipudin, Zhiyao Guo, Qingchen Dong</i>	
EMOTION REGULATION, PEER INFLUENCE, AND RELATIONAL AGGRESSION AMONG MALAY ADOLESCENTS IN SELANGOR.....	16
<i>Azimah Ahmad Zaki, Nellie Ismail, Zarinah Arshat</i>	
MANAGEMENT OF DIFFERENTIATED TEACHING AND LEARNING: AN ANALYSIS OF TEACHERS' KNOWLEDGE, SKILLS, AND ATTITUDES	29
<i>Jamelaa Bibi Abdullah</i>	
BIOMASS VALUE CHAINS AND THE EFEW NEXUS: INSIGHTS FROM MALAYSIA'S OIL PALM SECTOR STAKEHOLDERS	33
<i>Mohamad Razlan Md Radzi, Syarifah Azra Budiman, Nor Adilla Rashidi</i>	
PRESERVING ZHUANG BROCADE CULTURE THROUGH VIRTUAL EXHIBITION HALLS: A CASE STUDY IN GUANXI, CHINA	37
<i>Bao Shi Lian, Addley Bromeo Bianus</i>	
ASSESSING THE IMPACT OF TALENT MANAGEMENT PRACTICES ON THE REPUTATION OF MEDICAL LABORATORIES IN BENGHAZI, LIBYA.....	45
<i>Muhammad Abdullah Omar Ali Alferjany, Adel Rabeh Younis</i>	
TOO EMOTIONAL TO LEAD? GENDER-BASED LEADERSHIP STEREOTYPES AND THE ROAD TO SDG 5 IN MALAYSIA.....	60
<i>Niza Tan Mohd Aminuddin, Shakirah Noor Azlan</i>	
EXAMINING THE TEACHING COMPETENCIES OF ELEMENTARY TEACHERS AND THEIR RELATION TO THE MATHEMATICS PERFORMANCE OF ELEMENTARY STUDENTS.....	69
<i>Flordeliza Libiada, Peter Paul Canuto</i>	
PROJECT-BASED ROLE-PLAY AS A DRIVER FOR CHANGE: REDUCING ORAL COMMUNICATION ANXIETY IN ESL LEARNERS.....	84
<i>Nur Shafiekah Sapan</i>	
UNLOCKING DESTINATION APPEAL: A SCALE VALIDATION OF INNOVATION PRACTICES IN FOOD TOURISM CONTEXTS	97
<i>Mohd Syaifuddin Mohd Alias, Hashim Fadzil Ariffin, Zaharah Mohamed Rani</i>	
DETERMINANTS OF DESTINATION LOYALTY IN STUDENT TOURISTS	111
<i>Liu Mengyuan, Hashim Fadzil Ariffin, Anderson Ngelambong</i>	
FACTORS INFLUENCING HUMAN CAPITAL DEVELOPMENT: EXPLORING THE ROLES OF BUSINESS PARTNERSHIP WITH THE NGOs AND PRIVATE SECTORS	123
<i>Roland L. Lladoni, Elizabeth O. Recio</i>	



A STUDY ON THE SYMBOLIC MEANINGS AND CULTURAL CHARACTERISTICS OF TRADITIONAL MIAO BATIK PATTERNS	138

Lifang Nong

UNDERSTANDING SMES' DIFFICULTIES IN COMPLYING WITH SALES AND SERVICE TAX 2.0.....	151

Zainol Bidin, Hijattulah Abdul-Jabbar, Saliza Abdul Aziz

A METHODOLOGICAL FRAMEWORK FOR OPTIMIZING VOCAL RESONANCE: INTEGRATING PHARYNGEAL VOICE TRAINING AND MODERN ACOUSTICS	166

Peng Chengqiu, Tee Xiao Xi

FROM IDEALISM TO DISILLUSIONMENT: THE TENOR'S VOCAL EXPRESSION IN SHI GUANGNAN'S <i>REGRET FOR THE PAST</i>	180

Wen Sihui, Tee Xiao Xi

WORK INTEGRATED LEARNING IN DESIGN FIELD HIGHER EDUCATION: A LITERATURE REVIEW	195

Mei Yuan Law

UNDERSTANDING GEN Z TOURISTS' ENVIRONMENTAL AWARENESS, ATTITUDES, AND RESPONSIBLE BEHAVIOUR IN TAMAN NEGARA PAHANG	211

Muhammd Zulhilmi Zulkurnain, Nor Asmalina Mohd Anuar, Nurul Azniza Nadzari, Muhammad Saufi Anas

AN EXTRA PAIR OF EYES AND EARS GOES A LONG WAY: A PRELIMINARY STUDY INVESTIGATING HIGHER LEARNING INSTITUTION READINESS TOWARDS INCLUSIVITY	226

Surinder Kaur Satwant Singh, Mardziah Shamsudin

HOW THE 'PURBAYA EFFECT' INFLUENCES CONSUMER GOODS ELASTICITIES AND ACCOUNTING PROFITS	232

Nabila Sidni Paroza, Sri Maulida

BEHAVIORAL DETERMINANTS OF URBAN FARMING ADOPTION IN MALAYSIA: A QUALITATIVE STUDY USING THE THEORY OF PLANNED BEHAVIOR.....	242

Hamed Faghiri, Zulkornain Yusop, Zainal Abidin Mohamed

HUMAN RESOURCE PLANNING AMONG YOUTH WORKERS	257

Safiah Suhaimi, Aiman Iskandar Jasni, Amir Shahmi Izham, Muhammad Iqbal Noor Azman Shah, Rogis Baker

RISK-BASED PREDICTIVE MODELLING FOR HIGHWAY PROJECT DURATIONS IN NIGERIA USING MULTIPLE LINEAR REGRESSION AND ARTIFICIAL NEURAL NETWORK.....	264

Victor Imohnikhe Aligamhe, Muzani Mustapa, Ayobami Oluwaseun Idowu

EXPLORING THE INTERSECTION OF IMMERSIVE VR/AR TECHNOLOGIES AND CULTURAL IDENTITY IN CHINESE VARIETY SHOWS	279

Zhiyao Guo, Hani Salwah Yaakup, Rahimah Hamdan, Chuyao Wang

THE MODERATING ROLE OF EMOTIONAL VALUE IN THE RELATIONSHIP BETWEEN SOCIAL MOTIVATION AND SATISFACTION: AN EMPIRICAL STUDY OF CHINESE AUDIENCES OF DATING REALITY SHOWS	292

Sha Sha Zhang, Megat Imran Al Yasin, Ng Chwee Fang



EMERGING AND CONVENTIONAL APPROACHES FOR PETROCHEMICAL WASTEWATER TREATMENT: A MINI REVIEW.....	298

Azmi Ahmad

EXPLORING KNOWLEDGE AND ATTITUDES ON GENETIC TESTING FOR BREAST CANCER AMONG UNDERGRADUATE STUDENTS AT UNIVERSITI SULTAN ZAINAL ABIDIN (UNISZA).....	309

Tengku Julia Aishah Tengku Amran Shah, Nur Ismah Dalilah Mohamad, Nurul Fakhirah Samsir, Nurul Syafiqah Sabarudin, Tengku Hazirah Tengku Saifudin, Che Mohd Nasril Che Mohd Nassir, Sharifah Nany Rahayu Karmilla Syed Hassan

SUSTAINABLE LOYALTY BOOST: INFLUENCE OF SUSTAINABILITY ON ECOTOURIST LOYALTY: THE ROLE OF TOURIST EXPERIENCE AS A MEDIATOR	315

Zahir Osman, Fairul Ifnee Othman, Norjaya Mohd Yasin, Hazalina Hashim, Zorah Abu Kassim

THE MALAY KNOWLEDGE OF PTSD QUESTIONNAIRE (MKPQ): A VALIDATION STUDY AMONG MALAYSIAN ADULTS IN JOHOR	320

Rafidah Bahari, Suriyah Devi Krishnan, Nurilyani Othman, Suhaila Mohamad, Wong Tze Xin, Thung Shi Qin

THE USA AND CHINA'S AI-DRIVEN MILITARY TRANSFORMATION: STRATEGIC IMPLICATIONS AND SECURITY CHALLENGES FOR SOUTHEAST ASIA'S STABILITY	324

Herlin Anak Aman, Aini Fatimah Roslam, Tharishini Krishnan

DISCONFIRMED EXPECTATIONS IN DISRUPTION RESPONSE AMONG POTENTIAL USERS OF AIRPORT-RAIL SERVICE: AN INTEGRATION OF EXPECTANCY DISCONFIRMATION AND VISUAL APPROACH	335

Mohd Haniff Osman, Muhamad Nazri Borhan, Nur Arzilah Ismail

THE MINDSET-6 FRAMEWORK: A CURRICULUM BLUEPRINT FOR CULTIVATING INDUSTRY 6.0-READY ENTREPRENEURIAL MINDSETS IN MALAYSIAN UNDERGRADUATES.....	350

Faizan Iza Zainuddin, Farhana Ismail, Siti Haslina Hussin

ENHANCING ESL STUDENTS' ARGUMENTATIVE WRITING THROUGH TOULMIN'S MODEL	373

Farous Izwan Abdul Aziz, Seriaznita Mat Said

CONFIGURATIONAL APPROACH TO SERVICE QUALITY, AND LOYALTY IN MALAYSIAN PRIVATE HIGHER EDUCATION INSTITUTIONS	383

Muhammad Anas Mohd Bukhori, Khairul Anuar Mohd Ali, Wan Mohd Hirwani Wan Hussain

SEISMIC ANALYSIS OF STRUCTURES EQUIPPED WITH FRICTION DAMPERS UNDER VERTICAL EARTHQUAKE EFFECTS	397

Foad Karimi Ghaleh Jough

GUARDED BY THE MOON: EXPLORING THE SACRED TOMB AND DIGITAL HERITAGE DISCOURSE OF PUTERI LINDUNGAN BULAN	409

Norhanim Abdul Razak

ENGLISH INSTRUCTORS' ROLE IDENTITIES AND THEIR ABILITY TO MANAGE CLASSROOM SETBACKS: THE CASE OF KYRENIA	419

Sonia Shoar, Aylin Koyalan



ASSESSING THE KNOWLEDGE, ATTITUDE, AND PRACTICE ON WASTE MANAGEMENT IN LYCEUM OF THE PHILIPPINES UNIVERSITY CAVITE 428
Ysabel Kristine S. Lopez, Alyssa Kyle N. Cañete, Mary Abigail M. Rosline, Amber Mae Marbella, Andrea Isabel T. Lina, Krisma Joyce S. Salazar

LOGISTICAL CHALLENGES AND THEIR IMPACT ON THE OPERATIONAL PERFORMANCE OF SELECTED MEDIUM ENTERPRISES IN CAVITE 443
Aaron George Mendoza, Jioh Kang, Bianca Angela Mae Nabos, Rheanon Kenn Nave, Mary Grace Berico

THE INFLUENCE OF GOVERNMENT ACCOUNTING STANDARDS AND THE UTILIZATION OF INFORMATION TECHNOLOGY ON THE QUALITY OF FINANCIAL REPORTS AT FINANCIAL AND DEVELOPMENT SUPERVISORY AGENCY (BPKP) IN SUMATRA 455
Eva Susanti, Husnaina Mailisa Safitri, Cut Fitrika Syawalina, Agus Ariyanto

DIGITAL COMMUNICATION COMPETENCE AND EMOTIONAL RESILIENCE: A SYSTEMATIC REVIEW OF SOCIAL MEDIA LITERACY INTERVENTIONS FOR PREADOLESCENTS 463
Nur Haffiza Rahaman, Noor Azmi Mohd Zainol

MORAL REASONING AND ETHICAL BEHAVIOR IN MALAYSIA'S OIL AND GAS INDUSTRY: IMPLICATIONS FOR MANAGEMENT PRACTICE 481
Shirin Ismail

BUSINESS STRATEGY AND DIGITAL MARKETING AS DRIVERS OF COMPETITIVE ADVANTAGE IN LOCAL CAFÉS IN MALAYSIA 486
Hafinas Halid, Yusmani Mohd Yusoff, Wan Aishah Wan Mohd Nowalid, Syazwan Syah Zulkifly, Mohd Salahudin Shamsudin

RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY IN MALAYSIA 490
Suhaimi Ishak, Mohamad Naimi Mohamad Nor

BEYOND REWARDS: UNDERSTANDING THE DRIVERS OF EMPLOYEE ENGAGEMENT IN KOLEJ POLY-TECH MARA.....496
Hadziroh Ibrahim, Ummul Nisa Zahran, Md Lazim Mohd Zin

THE MOTIVATION BEHIND THE BADGE: UNCOVERING THE KEYS TO JOB SATISFACTION AMONG MALAYSIAN POLICE OFFICERS.....505
Hadziroh Ibrahim, Noraini Othman, Norasrina Johari

EKSPLORASI WARNA ALAM DALAM PENGHASILAN BATIK: KAJIAN PEWARNAAN MENGGUNAKAN *INDIGOFERA*, *KULIT BUAH JALawe* DAN *KULIT KAYU TINGI* 515
Muhamad Aeree Abu Bakar, Shaqira Nadia Mohd Shukri

MENELUSURI PENYELIDIKAN REKABENTUK PEMBANGUNAN MODEL 530
Hafizhah Zulkifli, Najdah Sanusi

KONSEP AKOMODASI SEBAGAI PENDEKATAN SIGNIFIKAN KE ARAH PENYATUPADUAN ANTARA KAUM DI MALAYSIA 543
Khairiah Mohd Yassin

KAEDAH PENGAJARAN AL-QURAN DENGAN PENDEKATAN MULTIMEDIA INTERAKTIF 552
Fatiha Illya Mazlan, Hafizhah Zulkifli



KESAN KAEDAH FLIPPED CLASSROOM TERHADAP PEMBELAJARAN
KESUSASTERAAN KANAK-KANAK KONTEMPORARI MURID TAHUN 4 567

Surendran Sankaran, Norazlinda Saad, Nethya Manoor Garam

KEBERKESANAN PEMBELAJARAN BERASASKAN PERMAINAN SEMASA
LATIHAN UNTUK GURU 573

Surendran Sankaran, Norazlinda Saad, Jagathisvaran Selvanathan

KEPIMPINAN INSTRUKSIONAL PENGETUA DENGAN EFIKASI KENDIRI GURU
SEKOLAH MENENGAH KEBANGSAAN DI DAERAH KOTA SETAR.....580

Norazlinda Saad, Surendran Sankaran, Azwen Zuwita Hussin

HUBUNGAN ANTARA KEBOLEHSUAIAN KERJAYA DAN PRESTASI KERJA
DALAM INDUSTRI PEMBUATAN DI CHINA 587

Norazlinda Saad, Surendran Sankaran, Wang Miao

PENJAWAT AWAM DAN PENIPUAN PINDAH MILIK TANAH DI MALAYSIA: ISU
DAN SOLUSI 594

Khuzaimah Mat Salleh, Che Thalbi Md Ismail

PEMBUBARAN PERKAHWINAN: ANALISIS LAPORAN BERTULIS PEJABAT
KADHI BESUT, 1972 SEHINGGA 1978.....604

Haryati Hasan, Nafisah Ilham Hussin, Muhammad Akramin Kamarul Zaman

AUTHOR INDEX 617

CROSS-CULTURAL COMPARISON OF UGC COMMUNICATION FOR SINO-ITALIAN VISUAL INTANGIBLE CULTURAL HERITAGE ON INSTAGRAM: A CASE STUDY OF VENETIAN MASKS AND PEKING OPERA FACIAL MASKS

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Abstract: *The cross-cultural communication of visual Intangible Cultural Heritage (ICH) represents a crucial aspect of cultural sustainability in the context of globalization. Social media platforms provide rich qualitative evidence through public text materials that illuminate how cultural symbols are represented, interpreted, and circulated across different audiences. This study focuses on two emblematic cases: The Venetian mask, officially recognized as Italy's national intangible heritage in 2010, and the Peking Opera facial makeup, listed as China's national intangible heritage in 2006. Using a purely qualitative approach, the research analyzes open texts (2020–2025) from Instagram cultural reports, UNESCO monitoring archives, ministerial case studies, and peer-reviewed journals, focusing on textual interpretation and thematic coding. The findings indicate that user-generated content (UGC) related to Venetian masks primarily emphasizes craftsmanship and material authenticity through detailed depictions of manual production processes such as pulp shaping and gold-leaf application. In contrast, UGC about Peking Opera makeup often adopts symbolic simplification—retaining core color patterns such as red, white, and black—and uses pop-cultural analogies to enhance cross-cultural comprehension. However, this strategy generates an inherent tension between authenticity preservation and accessibility. These patterns are shaped by the interaction among cultural context (low versus high), creator identity (craftsmen versus youth creators), and visual-centric platform logic. By constructing an integrative “culture–creator–platform” interaction model, the study advances theoretical understanding of visual heritage dissemination in digital contexts, proposes a reproducible paradigm for open-text qualitative analysis, and offers practical insights for balancing authenticity and accessibility in globalizing high-context heritage via social media.*

Keywords: *Intangible Cultural Heritage; User-Generated Content; Cross-Cultural Communication; Venetian Masks; Peking Opera Facial Makeup*

Introduction

The digital mediation of Intangible Cultural Heritage (ICH) has profoundly reshaped its modes of transmission and representation. As visual forms of ICH reduce dependence on textual explanation, they tend to travel more easily across linguistic and cultural boundaries, assuming a prominent role in transnational cultural exchange (UNESCO, 2024). Among the various digital environments, social media platforms, particularly Instagram generate abundant public-facing visual and textual traces, such as creator posts, platform help pages, and user comments. These openly accessible materials provide a valuable empirical basis for qualitative inquiry, allowing researchers to examine how cultural symbols are selected, narrated, and contested within platformized attention economies.

While ICH has long been approached as a locus of tradition, craft, and symbolic meaning, the rise of platform-based cultural circulation introduces a new layer of mediation that demands closer scrutiny. The ways in which algorithmic systems privilege certain visual aesthetics or communicative styles inevitably shape how cultural forms are perceived and reinterpreted across audiences. Despite the increasing significance of such digital mediations, comparative research examining the interaction between cultural context and platform affordances remains limited (Li et al., 2024; Sánchez-Aguirre et al., 2025).

To address this gap, the present study focuses on two emblematic cases of visual ICH—Venetian masks and Peking Opera facial makeup—to explore divergent patterns of user-generated content (UGC) circulation on Instagram. Venetian maskmaking, with deep craft traditions dating back centuries, has been institutionally framed in Italy as a material and process-oriented heritage. Since its national recognition in 2010, its digital representations often foreground artisanal processes such as reed-pulp forming, gold-leaf application, and mold work, emphasizing material authenticity and craft lineage (Italian Ministry of Culture, 2025). By contrast, Peking Opera facial makeup, embedded within a high-context semiotic system—where red signifies loyalty and white denotes treachery—faces distinct cross-cultural challenges when detached from its traditional interpretive framework. Online creators thus negotiate intelligibility through symbol simplification or pop-cultural analogies (Chinese Ministry of Culture and Tourism, 2025).

Theoretically, this study proposes an integrative culture–creator–platform interaction model. It conceptualises the dynamics among three interrelated variables: cultural context (high- vs. low-context traditions), creator identity (artisan custodians vs. younger, often amateur digital creators), and platform logic (algorithmic preference for visually salient, low-text content). This framework positions platform logic as an active mediator rather than a neutral background condition, moving beyond culture–technology determinism. It enables analysis of how algorithmic incentives reshape semiotic practices—how creators negotiate between authenticity and intelligibility, and how audiences subsequently interpret, contest, or rework these meanings (Van Dijck, 2024; Couldry, 2022). Drawing on critical semiotics and classical debates on staged authenticity and representational power (MacCannell; Foucault), this model interprets UGC as a dynamic field of contestation where interpretive authority is continuously renegotiated.

The study assembles a curated corpus of open-source materials published between 2020 and

2025, including Instagram Creator Studio documents, UNESCO monitoring records, and national cultural ministry publications from Italy and China. These heterogeneous texts are analysed through qualitative textual analysis with systematic triangulation and transparent retrieval pathways. This methodological approach offers a low-barrier, reproducible alternative to traditional fieldwork, addressing the logistical and ethical constraints often faced in ICH research while preserving theoretical rigour.

A contemporary instance of pop-cultural fusion—such as the viral “Harry Potter × Peking Opera” performance in Beijing’s Sanlitun—illustrates the tensions at the heart of this inquiry. Such hybridization can simultaneously enhance visibility and provoke debates about superficialisation or semantic distortion, exemplifying how platform-mediated remixing both amplifies and destabilises cultural meaning.

This paper investigates how Instagram UGC practices surrounding Venetian masks (as low-context visual ICH) and Peking Opera facial makeup (as high-context visual ICH) differ in symbolic selection and textual articulation. It further examines how creators negotiate tensions between cultural authenticity and cross-cultural intelligibility under varying institutional supports, and how patterns of audience reception—ranging from recognition and appreciation to misinterpretation and contestation reveal the negotiation of authority and meaning-making in digital heritage spaces.

Literature Review

Digital Dissemination of Visual ICH

International scholarship on the digital dissemination of visual intangible cultural heritage (ICH) has converged on a core tension between grassroots creativity and platform-mediated governance. Empirical studies that examine Instagram-based case materials, such as Día de los Muertos and Mexican paper-cut traditions have shown that craft-centered user-generated content (UGC) produced by artisans frequently takes a documentary tone: visual sequences that foreground materials and step-by-step procedures tend to travel across cultural boundaries with fewer interpretive frictions, because their meaning relies on salient, visible signifiers rather than dense cultural context (Emberson, Wright & Povey, 2021). Complementary research on heritage digitization argues that such craft-documentary formats are further advantaged by platform affordances: visual integrity and processual clarity align more readily with recommendation heuristics and with audiences’ quick visual decoding (Hosagrahar, 2022).

Yet existing work also identifies important gaps. Though several studies document that platform algorithms amplify the visibility of visually salient craft content, they have paid less attention to how algorithmic preferences actively construct which cultural signs become “translatable” in global circulation—that is, how technical mediation shapes the power architecture of symbol circulation. Moreover, research that foregrounds creator strategies often stops at the descriptive level and neglects the reciprocal role of audience discourse: comments and mediated reception can themselves reconfigure creators’ semiotic choices over time. National reports and field studies further show that high-context visual ICH (where meaning is embedded in dense cultural codes) faces unique adaptation pressures: for example, government analyses of Peking Opera propagation note a pattern of “core-symbol extraction + pop-culture analogy” to boost engagement abroad, yet they also flag losses of ethical and narrative depth

when complex sign systems are simplified (China Ministry of Culture and Tourism, 2023). Taken together, the literature points to a double movement: visual craft forms find relatively straightforward cross-cultural pathways, while high-context symbolic forms confront trade-offs between intelligibility and authenticity.

Qualitative Methods and the Use of Public Texts

Purely qualitative text-based methods have become central to ICH digital research because they enable context-sensitive readings of meaning production without the ethical and logistical burdens of primary fieldwork. The methodological literature underscores three interrelated safeguards for trustworthiness in qualitative public-text studies: close contextual reading, multi-source triangulation, and researcher reflexivity. Denzin and Lincoln (2022) summarize these as a “three-dimensional validation” architecture; applied to visual ICH it requires moving from surface descriptions to interpretive coding that attends to production contexts (e.g., artisan family vs. youthful amateur), platform affordances (official creator features, recommendation mechanisms), and reception traces (commentary and shares).

Textual deep reading is thus not neutral translation of content, but a situated interpretive practice. Unlike automated keyword-frequency methods, qualitative analysis seeks the latent discourse that links a creator’s wording, the visual grammar of a post, and the social positioning of its author. For instance, close reading of artisan interviews that assert “craft is memory” must be situated against creator biography and institutional framing to avoid overgeneralized inferences (Silverman, 2020). Cross-source triangulation further mitigates the “official-filter” problem inherent in public texts: validating the claim that “Venetian mask UGC privileges craft documentation” requires corroboration from at least two heterogeneous sources platform creator interviews, regional craft-protection reports, and international monitoring records—so that practice, policy, and reception each lend evidential weight (Emberson et al., 2021).

Reflexivity is the third pillar. Researchers’ own cultural vantage points influence interpretation: familiarity with Peking Opera can produce a bias toward protecting symbolic integrity, while a more distanced readership may prioritize cross-cultural intelligibility. Reflexive mechanisms—explicit disclosure of positionality, inclusion of heterogeneous comment samples, and peer cross-checking—help to surface and correct such biases (Silverman, 2020; Li et al., 2023). Taken together, these methodological protocols form a robust blueprint for public-text qualitative studies of visual ICH.

Semiotic Contestation and Power in Cross-Cultural Symbol Translation

Cross-cultural translation of visual ICH reveals marked asymmetries in controversy and consensus that correspond to the degree of contextual dependence of the heritage sign. Low-context visual forms—those whose salient signifiers are materially grounded in technique or object—tend to generate lower controversy and higher cross-cultural consensus. By contrast, high-context visual ICH—where meaning is bound up with culturally encoded color systems, ethical signification, or ritual knowledge—more frequently precipitates tensions between “authenticity preservation” and “audience intelligibility.” Research on Peking Opera facial art finds that strict preservation of symbolic systems (e.g., color-coded moral attributes) can depress engagement among global users lacking the requisite cultural scaffolding; conversely, simplification strategies (core-color retention, pop-culture analogies) can increase reach but

provoke critique from custodial communities who view such practices as dilutive (Li et al., 2024). This tension maps onto MacCannell's (1973/2022) taxonomy of authenticity: custodians often advocate for what may be called "objective authenticity," whereas audiences and platforms are more receptive to "constructed authenticity" that privileges recognizability. At a deeper level, these dynamics reflect the interplay of cultural power and technological power: platform algorithms that prefer rapid visual recognition privilege re-codified symbols, thereby amplifying the voices and aesthetics favored by global attention economies and marginalizing complex, context-dependent sign systems (Tomlinson, 2012; Van Dijck, 2023).

Research Gaps

Despite growing interest, the literature leaves several important lacunae. Theoretically, many studies remain anchored in single-axis frameworks, either semiotics, cultural-context theory, or platform studies—without integrating creator subjectivity and algorithmic mediation into a unified account. Methodologically, most extant research provides cross-sectional snapshots rather than tracing the temporal evolution of UGC and the feedback loops through which audience response reshapes creators' representational strategies. Practically, standard protocols for conducting reproducible open-text qualitative analyses of visual ICH remain insufficiently specified: few studies provide transparent, repeatable search strategies, source-selection criteria, or rules for handling ambiguous cases (Denzin & Lincoln, 2022; Silverman, 2022). Finally, while authenticity debates are well documented, there has been limited work on institutional interventions that might mediate the cultural-platform tension (for instance, creator certification, contextualized metadata, or algorithmic diversity incentives). Addressing these gaps will require integrative conceptual models and method packages that explicitly incorporate temporal dynamics, creator incentives, audience discourse, and platform affordances into a single analytical frame.

Methodology

Data Collection

This study focuses on publicly available qualitative texts concerning user-generated content (UGC) for two national-level visual intangible cultural heritage (ICH) items : Venetian masks from Italy and Peking Opera facial masks from China on the Instagram platform. Instagram was selected as the primary data environment for several interrelated reasons. The platform's emphasis on visual expression through images and short videos corresponds directly to the representational nature of the selected ICH items. Both Venetian masks and Peking Opera facial masks convey their cultural meanings primarily through colour, form, and symbolic visual elements rather than extended textual narratives. In addition, Instagram's functions, such as the Explore feature and creator archives, preserve contextualized creator narratives and comment threads that are particularly valuable for qualitative textual analysis. UNESCO's (2022) report on ICH digitalization also recognizes Instagram as a platform with high retrieval precision and significant potential for cross-cultural comparative research. Furthermore, comparative studies of digital platforms suggest that, relative to other social networks, Instagram retains richer qualitative artifacts—including creator interviews, threaded discussions, and descriptive captions—making it especially suitable for interpretive inquiry (McMullen, 2024).

The two cases were selected through strict and replicable criteria to ensure academic authority,

thematic depth, and traceability. Both cultural practices have been officially recognized as national-level ICH in their respective countries and demonstrate distinctive semiotic systems: Venetian masks embody a materially oriented craft tradition, while Peking Opera facial masks represent a symbolically rich system of cultural signification. Their popularity and visibility on Instagram further guarantee that sufficient authentic discourse is available for analysis. The selection process was grounded in the cross-verification of official heritage registers and policy documents, such as the Italian Ministry of Culture's cultural heritage inventories and China's national ICH listings, alongside peer-reviewed literature documenting the two traditions (Ministero della Cultura, 2023; Ministry of Culture and Tourism of the PRC, 2024; Li & Wang, 2024).

The data collection covered the years 2020 to 2025 and prioritized primary, verifiable public texts. The corpus includes creator-generated Instagram posts, accompanying captions, and user comment threads that represent authentic social engagement. It also integrates official platform materials, such as creator-interview resources and guidance pages, as well as institutional reports and documents released by UNESCO and national cultural agencies to contextualize the online circulation of these ICH practices. A multidimensional selection framework emphasizing authority anchoring, thematic relevance, and retrieval transparency was adopted to minimize single-source bias. Each analytical claim in this study is supported by at least two heterogeneous source types, for instance, a creator's post or caption corroborated by official documentation or UNESCO's monitoring reports.

Academic and policy literature was retrieved through databases including Web of Science, Scopus, and CNKI for Chinese-language materials. Social media data were collected through Instagram's native search functions and Creator Studio archives, using targeted hashtags and keyword combinations such as #VenetianMask, #PekingOperaMask, "Venetian mask craft," and "京剧 脸谱." Materials were excluded if they were second-hand retellings, purely quantitative summaries lacking qualitative content, or posts focused solely on tourism without cultural or symbolic interpretation. All retained texts are documented in an appendix, detailing retrieval paths, access dates, and the specific segments used for analysis, ensuring transparency and reproducibility for future research.

Ethical and epistemological considerations were strictly observed throughout the research process. Only publicly visible materials were analyzed; private messages, closed-group posts, or content requiring special access were excluded. The study foregrounds the principle of reflexivity by acknowledging the researcher's interpretive position and potential cultural bias. Analytical interpretations were triangulated across institutional reports, platform-based sources, and user-generated discourse to reduce overreliance on any single data stream and to enhance interpretive validity (UNESCO, 2022; Li & Wang, 2024).

Data Analysis

The qualitative textual analysis followed a three-stage interpretive cycle: data retrieval, coding, and interpretive triangulation, guided by the culture-creator-platform model. This study adopts qualitative textual analysis as its core methodological approach, grounded in critical semiotics and cross-cultural communication theory. The analysis focuses on how user-generated content (UGC) related to Venetian masks and Peking Opera facial masks on Instagram is encoded, translated, and reconstructed through both visual and textual forms. In the retrieval phase, the

research delimits its temporal scope and defines its textual boundaries, including only public materials directly connected to the target heritage elements, such as creator interviews, artisan commentaries, Instagram posts and comment threads, and official entries or archives published by cultural institutions or government agencies. Data unrelated to the research focus, such as policy-based tourism statistics or purely quantitative traffic reports, were excluded. Scholarly texts were retrieved mainly from the Web of Science, Scopus, and CNKI databases, while primary institutional sources were drawn from Instagram's official Help and Creator documentation, UNESCO's archives, and the official intangible cultural heritage (ICH) registries of national ministries. This strategy ensures traceability, authority, and methodological reproducibility (Qiu & Zhang, 2021; Foroughi et al., 2023).

At the coding stage, a three-dimensional analytical framework was established, connecting symbolic selection, textual articulation, and user feedback. The first dimension, symbolic selection, differentiates between manifest signifiers, visually recognizable elements such as mask-making steps or materials and latent signified meanings that depend on cultural context, such as the ethical symbolism of color in Peking Opera masks. The second dimension, textual articulation, distinguishes between craft-oriented narratives emphasizing materials and techniques, and culture-oriented narratives that explain symbolic meanings or make cross-cultural analogies. The third dimension, user feedback, categorizes comments into identification and contestation. Identification refers to accurate understanding or positive evaluation of craftsmanship and cultural expression, while contestation includes debates over authenticity, misinterpretation, or commercialization. Operational definitions were established to enhance coding consistency and to guide the treatment of ambiguous cases. For example, when a single post simultaneously presents technical details and cultural explanations, the coding follows the dominant communicative intent. Short emotional comments without interpretive content, such as "Beautiful" or "So cool," were coded as neutral. The complete coding table is provided as an appendix to ensure transparency and replicability (Wang et al., 2025).

The textual interpretation process followed a systematic sequence of close reading, cross-comparison, and triangulation. Each selected text was repeatedly read to identify visual narratives and linguistic cues, while key excerpts—such as an artisan's statement, "My grandfather taught me that craftsmanship is culture"—were extracted to reconstruct creator discourse and practice logic. Major analytical conclusions were verified through cross-source triangulation involving at least two distinct data types. For instance, claims regarding the algorithmic visibility of Venetian mask UGC were supported by both Instagram's official documentation on recommendation mechanisms and by references to Italian national or regional ICH archives describing artisan dissemination practices, rather than relying solely on individual posts. A longitudinal analysis was also conducted to trace the causal chain linking platform algorithms, creator strategies, and symbolic presentation. By aligning temporal patterns with Instagram's publicly documented adjustments to tag weighting and visibility mechanisms, the study maps how digital affordances shape the semiotic translation of heritage expression (Yan et al., 2025).

To strengthen reliability and validity, multiple quality control measures were implemented. All cited texts were systematically documented, including their URLs or DOIs, retrieval dates, and relevant segments, ensuring research transparency and reproducibility (Zhang & Shen, 2021). Coding consistency was assessed through intercoder reliability checks: after an initial round of

coding by the primary researcher, a second round was conducted independently by a doctoral researcher specializing in intercultural communication. Disagreements such as whether the association of a red mask with “heroism and loyalty” should be classified as culture-oriented were discussed until consensus was achieved (Bernal-Pedraza & Licona-Calpe, 2024). Reflexivity was also integral to the analytical design. As the researcher comes from a Chinese cultural background with familiarity in Peking Opera semiotics, positionality and potential interpretive bias were explicitly acknowledged. To balance this positionality, comments from international audiences and materials from UNESCO or related global initiatives were incorporated to validate cultural interpretation and enhance cross-cultural objectivity (Loke, 2022).

Findings and Discussion

Textual Variations and Dynamic Evolution of UGC Representation

Venetian Masks: A Craft-Documentary Orientation with Narrative Stability

A qualitative comparison of public Instagram posts tagged #VenetianMask reveals a long-term consistency in craft-centered representation. Visual narratives predominantly focus on the artisanal process and material texture depicting papermaché molding, gold-leaf application, and mold shaping—while accompanying captions tend to be concise notes emphasizing craftsmanship or materials, with limited engagement in semiotic or symbolic interpretation. This object–process–craftsmanship narrative can be understood as a craft-documentary discourse, foregrounding authenticity and manual skill (Kress & van Leeuwen, 2020; Foroughi, de Andrade, & Pereira Roders, 2023).

Institutional and official documents, such as those from Italian heritage and cultural agencies also reinforce this orientation, highlighting artisans and production processes rather than promoting popular reinterpretations of mask symbols. This institutional alignment provides structural support for the narrative stability of Venetian mask UGC (Istituto Centrale per il Patrimonio Immateriale [ICPI], 2024). From a semiotic perspective, the predominance of manifest signifiers minimizes the risk of contextual distortion in intercultural communication. As a result, Venetian mask narratives maintain high consistency and interpretive clarity across cultural boundaries (Kress & van Leeuwen, 2020).

Peking Opera Masks: Symbolic Adaptation and Algorithmic Mediation

In contrast, UGC tagged #PekingOperaMask demonstrates a distinct trajectory of evolution over time. Earlier posts focused mainly on makeup or mask-making practices, while later content increasingly integrated cross-cultural analogies, popular culture elements, and visual filters or short-form captions, for instance, juxtaposing mask colors with Western superheroes or pop-culture icons to enhance algorithmic visibility. The platform’s recommendation mechanisms, which favor short, visually recognizable, and highly interactive content, have acted as crucial mediating forces in this evolution (Instagram Help Center, 2024; Qiu & Zhang, 2021).

Previous studies have observed that Chinese digital creators often employ cultural remixing strategies to enhance the cross-cultural appeal of traditional content, a phenomenon especially visible in Peking Opera mask UGC. Through visual tagging, pop-cultural referencing, and succinct textual framing, complex symbolic systems are compressed into visually accessible

forms for global audiences. This adaptation, however, introduces a persistent tension between authenticity and intelligibility (Qiu & Zhang, 2021; Sun, 2022).

A notable example occurred during a 2025 flash-mob and branding event in Beijing's Sanlitun district, which fused Harry Potter characters with live Peking Opera performances. The hybrid performance quickly attracted bystanders who recorded and uploaded clips to social media, amplifying visibility within hours (Global Times, 2025; i-Media, 2025). By aligning traditional opera aesthetics with globally familiar pop-cultural imagery, such as Professor Snape. The event effectively lowered entry barriers for non-Chinese audiences, yet simultaneously provoked debate over whether such symbolic hybridization diluted or resemanticized the cultural core of Peking Opera.

Creator Logic and Structural Influences

Venetian Artisans: Heritage-Priority Logic under Institutional Support

Analysis of official archives and artisan interviews indicates that the online representation of Venetian masks is predominantly led by family workshops or certified studios. These creators emphasize the continuity of craftsmanship and institutional recognition over short-term digital engagement. National and regional heritage preservation mechanisms, along with funding initiatives for artisans, provide sustainable structural support, allowing them to maintain a craft-centered storytelling strategy (ICPI, 2024; Foroughi et al., 2023). From a critical media perspective, this limited adaptation to digital metrics suggests a form of cultural autonomy that resists the platform's visibility pressures (Pereira Roders et al., 2023).

Chinese Creators: Flow-Priority Logic under Limited Institutional Support

By contrast, creators involved in Peking Opera mask UGC are largely non-professionals, including students, overseas Chinese, and cultural enthusiasts. Due to the lack of long-term institutional support, especially for non-professional creators, platform visibility and audience engagement often become primary motivators. Consequently, these creators adopt strategies such as symbolic simplification, pop-cultural referencing, and interactivity enhancement to satisfy both algorithmic and audience demands (Wang, Yang, & Shi, 2025). This creative logic reflects a structural dilemma in digital heritage dissemination: without institutional scaffolding, creators must often negotiate between cultural integrity and algorithmic visibility (Brock, 2023).

The Harry Potter × Peking Opera performance exemplifies this logic in action. By leveraging a global entertainment IP as an “attention magnet,” organizers contextualized Peking Opera gestures, movement, and facial designs in a modern setting, achieving massive online exposure. User-generated recordings and remixes subsequently reshaped the event's digital afterlife, demonstrating how audience participation and platform dynamics jointly redefine heritage narratives (Global Times, 2025; Instagram posts referenced below). These two creator logics parallel Appadurai's (1996) cultural economy of production and circulation, suggesting a tension between heritage reproduction and algorithmic adaptation.

User Feedback: Between Recognition and Contention

Venetian Masks: Craft Appreciation and Emerging Tensions of Commercialization

Comment analysis under Venetian mask UGC reveals that most users express aesthetic and craft appreciation, emphasizing handmade details, material texture, and artisanal skill. Such comments reinforce a collective discourse of craft authenticity. However, as some UGC incorporated purchase links or promotional tags, a number of users expressed concerns over the commodification of heritage. These critiques suggest that commercialization may undermine respect for intangible cultural values within the heritage field (Smith, 2022; Foroughi et al., 2023).

Peking Opera Masks: Cross-Cultural Admiration and Accuracy Debates

In contrast, comment threads under Peking Opera mask posts exhibit marked cultural stratification. International and non-Chinese-speaking users tend to praise novelty, aesthetic appeal, and creativity, while Chinese users and Peking Opera enthusiasts focus more on the symbolic accuracy of color and pattern interpretation. When traditional signifiers are juxtaposed with popular culture icons, critical voices emerge questioning the dilution of meaning. These exchanges highlight that authenticity on digital platforms is no longer institutionally dictated but negotiated through ongoing public discourse and user interaction (Harrison, 2023; Brock, 2023).

The Sanlitun Harry Potter × Peking Opera event further illustrates this dynamic. Some viewers remarked that the fusion “made it easier to appreciate Peking Opera through familiar imagery,” while traditionalists cautioned that “the essence of the art risks being simplified.” Such mixed feedback reflects the evolving public negotiation between heritage comprehension and global accessibility (Global Times, 2025; i-Media, 2025).

Conclusions

Summary of Key Findings

Through a qualitative textual and visual analysis of two types of visual Intangible Cultural Heritage (ICH)—Italy’s Venetian masks and China’s Peking Opera masks—this study integrates a three-dimensional analytical framework encompassing cultural context, creator identity, and platform logic. The findings reveal the key mechanisms and symbolic translation processes that shape the cross-cultural dissemination of digital heritage on Instagram.

The UGC representations of Venetian masks exhibit a remarkably stable narrative pattern centered on craft documentation. Creators emphasize materials, procedures, and the embodied experience of manual production, highlighting the ritualistic dimensions of craftsmanship. This dissemination mode is rooted in artisanal transmission and institutional cultural recognition rather than algorithmic logic or digital visibility. The findings echo Kress and van Leeuwen’s (2020) theory of translatability in visual grammar, suggesting that low-context cultural symbols—those with explicit and tangible signifiers—maintain high narrative consistency across cultural boundaries. They also confirm Foroughi et al.’s (2023) argument that “public voice in heritage management tends to be dominated by concrete craft representation.” In other words, when heritage symbols are characterized by manifest visual signifiers, their cross-cultural transmission achieves greater stability and integrity.

By contrast, Peking Opera mask UGC demonstrates a dynamic trajectory of evolution. As Instagram’s algorithm increasingly favors content with high visual recognizability, short

duration, and strong sensory appeal, creators have shifted from documenting craftsmanship to producing visually hybrid and pop-oriented representations. This evolution not only reflects the shaping power of platform logic but also reveals the dual tension of high-context culture in cross-cultural communication: the need to preserve cultural authenticity while simplifying symbols for global accessibility (Qiu & Zhang, 2021; Sun, 2022). Hence, this study confirms that algorithmic mechanisms have become critical mediating variables in the reproduction and reinterpretation of cultural meaning.

At the creator level, identity structures and institutional support significantly influence communicative orientation. Venetian artisans, supported by a well-established heritage preservation system and a stable market mechanism, generally adhere to a heritage-priority logic guided by cultural mission and authenticity. In contrast, Chinese creators—who face limited institutional support and intense platform competition—often adopt a flow-priority logic, emphasizing visual creativity and attention-driven engagement to sustain visibility (Wang, Yang, & Shi, 2025; Lindquist & Weltevrede, 2024). This divergence underscores the interactive tension between cultural subjects and platform structures, demonstrating that the quality of heritage dissemination is largely contingent on creators' social positions and accessible resources.

At the user level, identity recognition coexists with contextual contention. Comments under Venetian mask UGC primarily express aesthetic appreciation and reverence for craftsmanship, while showing caution or critique toward overt commercialization (Smith, 2006). In contrast, comment sections for Peking Opera mask content reveal cross-cultural divergence: international audiences admire visual creativity and theatricality, whereas Chinese audiences focus more on symbolic accuracy and the preservation of cultural context. This pattern aligns with Harrison's (2020) concept of plural aesthetics in digital participation, suggesting that cross-cultural heritage dissemination involves an ongoing negotiation between participatory aesthetics and contextual understanding.

This study demonstrates that the cross-cultural transmission of visual ICH through UGC is a complex process co-shaped by cultural context, creator identity, and platform logic. It redefines the applicability of high- and low-context cultural theories within digital environments and highlights the need to include platform logic as an independent analytical dimension in future frameworks of cultural communication. This comparative contrast demonstrates that cultural semiotics evolves from institutional fixity to algorithmic fluidity in the digital age.

Theoretical Contributions and Practical Implications

This research offers three primary theoretical contributions. First, it introduces Hall's (1976) high- and low-context cultural theory into the realm of digital platforms, empirically illustrating the dynamic transformation and recontextualization of cultural meaning under algorithmic influence. This theoretical extension expands the explanatory power of cross-cultural communication theory into digital visual spaces.

Second, by establishing the Culture–Creator–Platform interactive model, the study reveals the mediating mechanisms of symbolic translation. It shows that cultural expression is no longer a one-directional act of transmission but rather a negotiated process among multiple agents operating within algorithmic and attention-driven environments. This model bridges prior

research gaps concerning the interplay between creator logic and platform logic, while responding to emerging debates on how algorithms reshape authenticity and visibility (Lindquist & Weltevrede, 2024; Burton et al., 2023).

Third, through the lens of visual heritage, the study proposes a Symbol Simplification–Authenticity Contention–User Feedback chain mechanism, advancing critical approaches to heritage dissemination research. This framework enables cultural scholars to better observe how digital symbols are reconstructed and contested across intercultural meaning spaces.

On the practical level, the findings offer actionable implications for cultural managers, creators, and platform policymakers. For low-context, craft-based visual heritage such as Venetian masks, it is essential to sustain the craft-documentary narrative, strengthen institutional support, and empower creators while preventing over-commercialization driven by algorithmic competition. For high-context, symbol-oriented heritage such as Peking Opera masks, balancing visual adaptation and cultural annotation in global dissemination is crucial. Creators should complement visual simplification with contextual explanations, multilingual captions, and interactive Q&A formats to enhance comprehension while preserving cultural depth.

Moreover, platforms should integrate cultural diversity and contextual integrity indicators into recommendation algorithms to prevent the reduction of cultural complexity into single-dimensional engagement metrics. Finally, cultural authorities are encouraged to establish UGC certification and support mechanisms, offering training, exposure incentives, and copyright protection for heritage creators. Such measures can mitigate economic pressures that often lead to cultural simplification or symbolic misinterpretation.

Limitations and Future Directions

Despite the development of a theoretical model for cross-cultural dissemination of digital heritage, this study presents several limitations. The sample primarily focuses on Instagram, which, while representative, does not encompass short-video ecosystems such as TikTok or Douyin. Future comparative research across platforms could further clarify how different algorithmic mechanisms influence UGC forms and cultural meanings.

As a purely qualitative study, this research did not fully explore the subjective dimensions of creator motivation, emotion, and economic consideration. Future studies may incorporate semi-structured interviews or focus groups to enrich psychological and sociocultural insights beyond textual analysis.

Additionally, since this study concentrates on visual heritage, its conclusions may not fully apply to auditory or ritual forms of ICH—such as folk songs, dance, or oral storytelling. Future work could extend the framework to explore how different sensory modalities shape digital translation mechanisms.

Lastly, the study emphasizes the process of dissemination rather than its long-term consequences. Future longitudinal research could examine how digital heritage circulation influences cultural identity formation and community perception over time.

Conclusion

As digital platforms reshape the ecology of cultural communication, the dissemination of visual intangible cultural heritage has shifted from a heritage transmitter-led model to a multi-agent system co-constructed by platforms, creators, and audiences. Using Venetian masks and Peking Opera masks as cases, this study elucidates the interplay among cultural context, creator subjectivity, and platform logic, proposing an analytical framework with both theoretical and practical significance.

The findings reveal that culture is no longer a passive object of transmission but an evolving, negotiated construct continually reinterpreted at the intersection of algorithmic logic and visual grammar. This insight not only deepens our understanding of heritage dynamics under globalization but also offers viable pathways for harmonizing cultural preservation and innovation in the digital age.

Looking forward, as generative AI, immersive visual technologies, and cross-platform storytelling continue to develop, heritage communication research must remain attentive to the symbiotic relationship between digital technology and cultural semantics. Such attention is essential for achieving a truly living transmission of intangible heritage within the global digital ecosystem.

Acknowledgments

The authors would like to thank the reviewers for providing comments in helping this manuscript to completion.

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EMOTION REGULATION, PEER INFLUENCE, AND RELATIONAL AGGRESSION AMONG MALAY ADOLESCENTS IN SELANGOR

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Abstract: *Aggression that aims to harm social relationships, known as relational aggression, interferes with adolescent social development—a developmental priority during this critical life stage. Such conduct not only undermines positive peer relationships but also puts youths' emotional and interpersonal development at risk, which has long-term effects on their adjustment and general well-being. Despite rising concern about aggression or bullying in school settings, research focusing solely on relational aggression in the Malaysian context remains limited. Emotion regulation and peer influence have been identified as key risk factors influencing adolescents' relational aggression; however, greater clarity is needed to understand specific aspects shaping the behaviour. Therefore, the study examined the relationship between emotion regulation, peer influence and relational aggression in Malay adolescents. A total of 403 Malay respondents were randomly selected from public secondary students in Selangor. Data analysis was conducted using R, with multiple imputation via the mice package applied to handle missing data. Due to outliers and violations of normality assumptions, both Pearson and Spearman correlation analyses were conducted to assess associations between variables. Results for peer influence showed a significant positive correlation with relational aggression across both correlation methods. However, analyses on both methods were not significant for emotion regulation strategy. This indicates that peer influence but not emotion regulation plays a substantial role in relational aggression among Malay adolescents. The findings underscore the important role of peer-focused intervention strategies and school-based initiatives that strengthen positive social interactions in reducing relational aggression among adolescents. This study contributes to the body of research within the Malaysian context by focusing specifically on a form of aggression that targets and damages social relationships. In addition, methodological rigour was presented through the application of multiple imputation and dual-correlation analytical techniques, providing comparative and robust results.*

Keywords: *Relational Aggression; Emotion Regulation; Peer Influence; Malay Adolescents; Multiple Imputation*

Introduction

Adolescence is a pivotal developmental stage characterised by rapid changes across physiological, cognitive, emotional, behavioural, and social domains, which collectively increase susceptibility to maladaptive social behaviours such as relational aggression (Smetana, Campione-Barr, & Metzger, 2006). Defined as a form of aggression that inflicts harm on social interactions and positions (Crick & Grotpeter, 1995), relational aggression—

manifested through manipulation, exclusion, rumour spreading, and social rejection—is particularly potent as it exploits social bonds and status during a stage where social belonging is highly valued (Voulgaridou & Kokkinos, 2015).

Based on the Developmental Theory of Aggressive Strategies (Björkqvist, Österman, & Kaukiainen, 1992), relational aggression is purposed to emerge in early adolescents (stage three) due to higher verbal and social developments and the realisation that other forms of discrete harm/aggression exist. The covert and strategic nature of relational aggression poses a significant threat, particularly when it's hard to detect, unlike physical aggression (Voulgaridou & Kokkinos, 2015). Moreover, literature frequently reports co-occurrence of both forms of aggression and perpetrator-victim roles (Ettetal & Ladd, 2020; Monopoli, Evans, & Himawan, 2022).

The prevalence of this issue highlights a clear public health and educational concern. Statistics show that 22% of adolescents aged 12 to 18 face aggression, with relational aggression most commonly reported (U.S. Department of Education, National Center for Education Statistics, 2021). Notably, past studies suggest that collectivist countries reported a moderately higher incidence of relational aggression (Kokkinos, Algiovanoglou, & Voulgaridou, 2019; Kokkinos, Voulgaridou, & Despoti, 2021; Li, Huang, Jiang, Ma, & Ma, 2023; Rasyid, Maimanah, Nuqul, Rahayu, & Ridho, 2023) compared to individualistic counterparts (Aizpitarte, Atherton, Zheng, Alonso-Arbiol, & Robins 2019; Byon, 2019; Goldstein et al., 2020; Pirc, Pecjak, Podlesek, & Štirn, 2023). Malaysian data support this trend: a national survey highlights that relational and verbal aggression are the main forms among youths, especially in Form One and Form Two students (Ministry of Education Malaysia [MOE], United Nations Children's Fund [UNICEF], & Pertubuhan Pembangunan Kendiri Wanita dan Gadis [WOMEN:girls], 2018). Local studies confirm a higher rate of indirect or relational aggression than direct aggression among Form 4 students (Saibon & Zulkafli, 2021). Likewise, of the 64.2% who reported engaging in cyberbullying, nearly 40% engaged in cyber exclusion (Sivabalan et al., 2020).

These concerning trends, together with the behaviour's long-lasting impacts on social functioning, mental health, and school adjustment (Aizpitarte, Atherton, & Robins, 2017; Gunn & Goldstein, 2016), highlight the urgent need to further examine the underlying risk factors that drive the behaviour. Understanding these factors is crucial for developing effective prevention and intervention strategies. Among the noticeable risk factors influencing adolescents' relational aggression are emotion regulation and peer influence.

The study results are expected to contribute to theoretical advancement and practical inferences. This research offers cultural insights into the development of aggression within the Malay context by investigating the relationship between emotion regulation and peer influence in relational aggression. The findings will directly inform and aid in the creation of targeted preventative and intervention programmes, particularly school-based initiatives focused on the development of emotional skills and support for prosocial norms and behaviour. Additionally, this study enhances methodological rigour in aggression research by applying multiple imputation and dual-correlation methods.

Emotion Regulation and Relational Aggression

Emotion regulation is defined as the process of managing the expression, experience, and timing of own emotions (Gross, 1998), which can be conscious or automated, intrinsic or extrinsic (Gross & Jazaieri, 2014; Gross & John, 2003). Gross's (1998) Process Model of Emotion (1998) suggests that regulation takes place at either earlier steps, termed 'antecedent-focused emotion regulation', or at the output, known as 'response-focused emotion regulation'. In the antecedent-focused strategy, individuals evaluate and adaptively produce emotions through cognitive reappraisal, while the response-focused strategy delays or inhibits emotions through expressive suppression (Gross, 1998; Gross & John, 2003). Gross (1998) conceptualises the latter as an attempt to hide current emotion and reappraisal as an attempt not to feel the emotion; however, suppression may lead to poorer psychological well-being, less positive affect, and cognitive strain.

Emotion regulation has been assessed in various ways in past studies. Anger regulation, emotion management and control are significantly and positively associated with higher relational bullying or aggression (Kokkinos et al., 2021; Pirc et al., 2023; Qian et al., 2022). Likewise, difficulties in regulating emotions are linked to increases in relational aggression or verbal aggression (Ettekal & Ladd, 2019; Monopoli et al., 2022; Safdar & Khan, 2019). Despite the dominant focus on poor emotion regulation, only two studies adopted Gross's (1998) emotion regulation strategies. For example, Kokkinos et al.'s (2019) research on functions of relational aggression displayed a significant positive relationship between expressive suppression and reactive relational aggression, but not between expressive suppression and cognitive reappraisal with proactive relational aggression. In contrast, Li et al. (2023) demonstrated an inverse significant correlation between cognitive reappraisal and relational aggression.

In terms of the rate of emotion regulation, studies show that individualist countries applied moderate to high emotion regulation, while low in collectivist contexts (Arató, Zsidó, Lénárd, & Lábadi, 2020; Pirc et al., 2023; Rasyid et al., 2023; Violenta et al., 2022). This limited and contradictory application of emotion regulation strategies highlights the need for further examination. Moreover, demographic trends, such as girls and older adolescents adopting higher rates of cognitive reappraisal while boys exhibit higher expressive suppression (Li et al., 2023), indicate that a focused study on this theoretical framework is required to confirm the mechanisms linking emotion regulation strategies to relational aggression perpetration.

Peer Influence and Relational Aggression

During adolescence, peer interaction becomes increasingly complex (Brown, 2004). Peer groups commonly form based on similarities that contribute to self-identity (Busching & Krahé, 2015) and adoption of individual and group norms (Shin, 2017) that either follow or deviate from conventional norms (Vanden Abeele, Van Cleemput, & Vandebosch, 2017). This deviation then creates peer pressure to conform to achieve membership or status attainment (Smokowski et al., 2016). Adolescents are highly aware of the strong peer influence and the pressure to commit to norm-breaking behaviour, even go against own values and morals (Azad et al., 2018). Moreover, peer pressure is often reciprocal, where mutual pressure will pressure or trigger one another into committing norm-breaking behaviour.

Most empirical studies on peer influence focused on deviant peer affiliation, typically measured by occurrence or number of deviant peers (Aizpitarte et al., 2019; Hsiao et al., 2019). Affiliation with best friends or peers that exhibit relational aggression correlated positively with adolescents' relational aggression but not overt aggression (Wang et al., 2020a). Whereas Goldstein et al. (2020) examined the relationship between susceptibility to peer influence and relational aggression demonstrated a significant correlation across early to middle adolescents. As for frequency of peer influence, both individualist and collectivist cultures reported low to medium scores (Aizpitarte et al., 2019; Lin et al., 2022; Walters, 2020; Yang et al., 2024). Boys are more likely to be associated with deviant peers (Fenny & Falola, 2020), but girls are more susceptible to peer influence (Goldstein et al., 2020). Though this confirmed that association with deviant peers does indeed influence relational aggression, it provides limited insight into the mechanism of influence.

The Present Study

The primary aim of the present study is to investigate whether emotion regulation and peer influence are associated with relational aggression among Malay adolescents. Based on the review of past studies, this study addresses several key research gaps. First, emotion regulation has been extensively explored in relation to bullying or aggression, but very few have focused specifically on relational aggression and even fewer on specific strategies like cognitive reappraisal and expressive suppression. This was confirmed in a systematic literature review by Zaki et al. (2024). As suggested by Gross (1998) regarding the negative effect of expressive suppression, this sub-scale was selected to represent emotion regulation. Similarly, studies on peer influence usually assessed the unidimensionality of peer influence, typically in relation to deviant peers, overlooking the multidimensional nature of the construct. Studies that include multidimensional peer influence have been explored in individualist settings, but very few in collectivist contexts. Although peer pressure for fighting primarily measures peer pressure to engage in physical aggression, empirical evidence of the co-occurrence of relational aggression and physical aggression (Ettekal & Ladd, 2020; Monopoli et al., 2022) justified its inclusion with covert aggression. Therefore, this study addresses these gaps by examining the relationship between emotion regulation strategies (expressive suppression) and dimensions of peer influence (peer pressure for fighting) in relation to relational aggression among Malay adolescents in Malaysia. Based on the Developmental Theory of Aggressive Strategies (Björkqvist et al., 1992) and the Social Cognitive Theory (Bandura, 1986), the following research questions were formed:

1. Is there any statistical correlation between emotion regulation and relational aggression in Malay adolescents?
2. Is there any statistical correlation between peer influence and relational aggression in Malay adolescents?

Method

Sample and Procedure

A total of 403 Malay adolescents (40% boys; 60% girls) were recruited from daily public secondary schools in Selangor, Malaysia. A three-stage multistage sampling technique was employed. First, three districts in Selangor were randomly selected, followed by six schools selected in stage two. The final samples were randomly selected from two classes within three

Forms: Form 1 (20.6%), Form 2 (37.2%), and Form 4 (42.2%). The inclusion of adolescents aligns with the Developmental Theory of Aggressive Strategies (Björkqvist et al., 1992), which suggests that relational aggression emerges prominently during this period, particularly during early adolescence. Selangor was selected as the area of focus due to being the most populated state in Malaysia and high rates of adolescent misconduct (Mohd, 2017).

Demographically, slightly over half of the respondents reside in rural areas (57.3%), while 173 live in urban areas (42.7%). In terms of family monthly income, the majority (59.8%) fell into the Bottom 40% (B40) category, while the remainder belonged to the Middle 40% (M40) or Top 20% (T20) categories (Department of Statistics Malaysia, 2022). Parental ages ranged from 29 to 76, and most were married (83.9%), and the rest were divorced or deceased. As for parents' education levels, nearly half possesses a primary or secondary education, while the rest report higher education.

Before data collection, ethical consent was attained from the university's institutional ethics committee (Jawatankuasa Etika Universiti untuk Penyelidikan melibatkan Manusia) [JKEUPM]. Subsequent endorsements were then obtained from the Ministry of Education, the Selangor State Education Department, and the respective principals of five participating secondary schools, with one school dropping from the study due to one school declining participation. The instruments were translated into Bahasa Melayu using the back-translation method to ensure validity and reliability. A pilot study was conducted at a public secondary school in Gombak, with the results helping to achieved suitability for targeted respondents. The instruments were administered via Google Forms and hardcopy depending on the request from each school, containing instructions, researcher contact numbers, and two sections for information on personal background and the instruments. Teachers in charge distributed informed consent and Google Forms or hardcopies to parents and students. Consented respondents were given two weeks to complete the questionnaires and, upon completion, were debriefed and given a token of appreciation.

Measures

Relational Aggression

The Children's Social Behavior Scale—Self-Report (CSBS-S; Crick, 1991; Crick & Grotpeter, 1995), which measures frequency of engaging in aggressive and prosocial behaviour, was utilised to measure the relational aggression subscale. The five items were rated using a 5-point Likert scale ranging from 1 (never) to 5 (all the time). The scores were totalled, with high scores mean respondent exhibiting high relational aggression. The satisfactory rate of Cronbach's alpha reported for this measurement is $\alpha = .73$.

Emotion Regulation

The Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003) measures two strategies of emotion regulation: cognitive reappraisal and expressive suppression. Only the four items of expressive suppression were included in the study to measure adolescents' emotion regulation, with responses rated on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Scores were summed, with high scores indicating high application of emotion regulation using expressive suppression. The internal consistency rate of the subscale was adequate ($\alpha = .72$).

Peer Influence

Peer influence was measured using the domains of peer influence (Farrell et al., 2017), which assesses multiple peer influence domains, including delinquent peers, prosocial peers, support for violence or non-violence, and peer pressure. The peer pressure sub-domain contains five items and was used to present peer influence with 6-point scale responses ranging from 1 (Never) to 6 (20 or more times). Following the author's suggestion, responses 4 to 6 were collapsed into response 4, making the scale 4-point responses. The items were totalled with high scores demonstrating high peer influences via peer pressure. The measurement coefficient alpha was acceptable ($\alpha = .87$).

Data Analysis

Data collected were analysed using R (version 4.5.1; R Core Team, 2025). Prior to further analyses, data were cleaned and screened for assumptions of data normality (missingness, outliers, multicollinearity, and normality). Apart from multicollinearity, all assumptions were not met with 3.6% of data with missing values. Missing data was handled with multiple imputation via the package multivariate imputation by chained equations (MICE) in R (van Buuren, 2018). This method avoids removing incomplete datasets, increasing statistical power and enabling valid inferences (Woods et al., 2021). A total of five auxiliary variables were added to the model with the method specified according to variable types (Hardt, Herke, & Leonhart, 2012; van Buuren, 2018). MICE was run with 20 imputations ($m = 20$) and 50 iterations ($maxit = 50$) ($seed = 1234$). Convergence inspected via plots and convergence diagnostics validated the imputed data, which resemble the original data (van Buuren, 2018). Analysis was pooled results across 20 imputed data based on Rubin's Rules to account for uncertainty (Rubin, 1987; van Buuren, 2018). Given that the data had outliers and normality violations, no cases were deleted to qualify using parametric analysis as proposed by Iacobucci Román, Moon, and Rouziès (2025), Leys, Ley, Klein, Bernard, and Licata (2013), and van Buuren (2018). The bivariate correlation between the study variables was analysed using the Pearson product-moment correlation coefficient, as the main method, and the Spearman rank order correlation coefficient suitable for non-normally distributed data (Thabane et al., 2013), as a sensitivity analysis, following Rovetta's (2020) suggestions. The analysis was calculated using the package mitml (Grund et al., 2019), which is suitable to handle multiple imputed data. According to Rovetta (2020), results are considered valid when both methods present similar values.

Results

Table 1 shows the descriptive statistics (mean, standard deviation, median, interquartile range, and reliability) for relational aggression, emotion regulation (expressive suppression), and peer influence (peer pressure for fighting). The results showed that the mean score for relational aggression was observed to be low ($M = 8.07$, $SD = 2.83$, range = 5-19). This suggests that Malay adolescents engaged in less relationally aggressive behaviour. In contrast, the mean score for emotion regulation ($M = 20.38$, $SD = 4.76$) was relatively high (range = 5-28), indicating frequent use of expressive suppression. Finally, scores for peer influence were fairly low ($M = 8.33$, $SD = 3.75$, range = 5-20), which implies less engagement in peer influence for fighting. All instruments achieved acceptable to satisfactory internal consistency reliability ($\alpha = .72 - .87$).

Table 1: Descriptive Statistics of Emotion Regulation, Peer Influence, and Relational Aggression (N=403)

Variable	Mean	(SD)	Median (IQR)	Range	Reliability
Relational Aggression	8.07	2.83	7(4)	5-19	.73
Emotion Regulation	20.38	4.76	21(7)	5-28	.72
Peer Influence	8.33	3.75	7(5)	5-20	.87

* IQR = Interquartile range, SD = Standard deviation

The results of the bivariate analysis for the pooled data are presented in Table 2, including the Pearson correlation coefficient (r), Spearman correlation (ρ), standard errors (SE), and 95% confidence intervals (CI), calculated using Rubin's Rules, which estimate variability across imputed data (Rubin, 1987). The analysis showed relatively similar results for the Pearson and Spearman correlation coefficients, with a slightly higher coefficient observed for the Spearman analysis, thus validating the use of the parametric analysis (Rovetta, 2020).

For the first analysis, emotion regulation (expressive suppression) was not statistically correlated with relational aggression using both Pearson correlation ($r = .053$, $p = .285$, $SE = .05$, 95% CI = $[-.045, .15]$) and Spearman correlation ($\rho = .009$, $p = .850$, $SE = .05$, 95% CI = $[-.088, .107]$). Hence, the hypothesis was accepted, which indicates that there was no link between emotion regulation and relational aggression for this sample.

Conversely, the results for peer influence (peer pressure for fighting) and relational aggression were statistically and positively significant for both methods ($p < .001$). The Spearman coefficient ($\rho = .331$, $SE = .05$, 95% CI = $[.241, .415]$) was slightly higher than the Pearson coefficient ($r = .229$, $SE = .05$, 95% CI = $[.207, .385]$). Thus, hypothesis two was rejected, which means that high peer influence increases relational aggression.

Table 2: Pooled Pearson and Spearman Correlations Matrix for All Study Variables (N= 480)

Variable	1	2	3
	(SE)[95%CI]	(SE)[95%CI]	(SE)[95%CI]
1. Relational Aggression	—	.053 (.05) [-.045, .15]	.299*** (.05) [.207, .385]
2. Emotion Regulation	.009 (.05) [-.088, .107]	—	.144*** (.05) [.047, .238]
3. Peer Influence	.331*** (.05) [.241, .415]	.125** (.05) [.028, .22]	—

Note. Pearson correlation coefficient (r) above the diagonal and Spearman correlation coefficient (ρ) below diagonal, SE = Standard errors, 95% CI = 95% confidence interval.

** $p < .01$, *** $p < .001$.

Discussions

This study aimed to examine the individual and social factors that influence relational aggression. Specifically, the prevalence and relationship between emotion regulation, peer influence, and relational aggression among Malay adolescents in Selangor were explored. Overall, Malay adolescents in this study rated low engagement in both relational aggression and peer influence but moderate to high utilisation of emotion regulation strategies. The results for relational aggression align with findings from collectivist cultures (Kokkinos et al., 2019; Kokkinos et al., 2021; Li et al., 2023; Qian et al., 2022). The relatively high emotion regulation corresponds to findings from Kokkinos et al. (2019) and Kokkinos et al. (2021). Moreover, Malay culture, which has grown up with religious and cultural teachings that emphasize ethics, respect, and self-control (Ali et al., 2022), may prefer emotion regulation strategies like expressive suppression.

The findings between emotion regulation and relational aggression demonstrated no significant association, suggesting that emotion regulation strategies, particularly expressive suppression, did not have any influence on relationally aggressive behaviour for this sample. This contrasts with findings by Kokkinos et al. (2019) that demonstrate a significant positive relationship between expressive suppression and reactive relational aggression. However, the result did parallel the authors' result between expressive suppression and proactive relational aggression. This may indicate that emotion regulation strategies operate differently or effectively depending on the functions of relational aggression. Those exhibiting reactive relational aggression may be more prone to suppressing emotion compared to proactive relational aggressors.

In contrast, peer influence demonstrated a significant and positive relationship with relational aggression. The results were robust across both parametric and non-parametric methods. This indicates that there is a good probability that adolescents who experienced higher peer pressure for fighting are more likely to be involved in, or tolerate, relationally aggressive behaviours. The result is similar to Goldstein et al. (2020), whereby high susceptibility to peer influence increases engagement in relational aggression. Moreover, the association was significant despite the variable relate to pressure for fighting shows that physical; aggression can influence relational aggression.

The results provide several important theoretical, practical, and methodological implications. The absence of a significant association between emotion regulation and relational aggression suggests that future models should incorporate culturally specific emotion management strategies and include functions of relational aggression. Additionally, the research underscores the importance of peer influence, advocating for school-based interventions such as prosocial training and initiatives that promote positive peer interactions to mitigate relational aggression. Involving peers in intervention designs is deemed crucial for shifting social norms among students. In terms of methodological implications, methods to handle missing values should be considered to improve estimations. Lastly, incorporating both parametric and non-parametric methods in analyses may be beneficial to validate results even for data that violate the normality assumption or outliers.

This study has some limitations despite its contributions. First, this is cross-sectional research, which limits the ability to make causal inferences or developmental trajectories; thus, a

longitudinal study is necessary. Second, although the application of multiple imputation improved the robustness of estimates, these are self-report measures that may include social desirability bias, especially for sensitive variables like violence and rule-breaking. Incorporating multi-informant approaches (e.g., peer and teacher reports) may provide a more thorough evaluation. Third, the study focused on Malay adolescents in Selangor. This may restrict its generalisability to other Malaysian ethnic groups or geographical areas, which future studies should include to strengthen cross-cultural understanding within the Malaysian context.

In conclusion, this study contributes to the scarce body of knowledge on relational aggression among Malay adolescents by examining the strategies of emotion regulation and peer influence. The results demonstrate that although emotion regulation does not seem to correlate with relational aggression, peer influence significantly shapes relational aggression. The results highlight the necessity of addressing adolescent peer dynamics in collectivist societies and underscore the significance of culturally responsive frameworks when assessing emotional and social risk factors for aggression. Together, the study adds empirical evidence for Malaysian literature and lays the groundwork for intervention initiatives on relational aggression among adolescents.

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MANAGEMENT OF DIFFERENTIATED TEACHING AND LEARNING: AN ANALYSIS OF TEACHERS' KNOWLEDGE, SKILLS, AND ATTITUDES

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Introduction

Differentiated teaching and learning has become a key strategy in advancing educational equity within the Malaysian context. Aligned with the Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013–2025, teachers are expected to cater to students' diverse readiness, interests, and learning profiles. Differentiation is not only a pedagogical act but also a leadership function that aligns curriculum, assessment, and instructional processes toward personalized and inclusive learning. Tomlinson (2014) argues that differentiation provides learners with multiple pathways to access content, process information, and demonstrate understanding.

For Malaysian schools, the POLC model (planning, organizing, leading, controlling) provides a structure for teachers to translate differentiated instruction into practice. Teachers, as both implementers and pedagogical leaders, must navigate these stages to design and deliver responsive lessons. Understanding their levels of knowledge, skills, and attitudes is vital for sustaining learner-centred pedagogies at scale.

This study examines teachers' competencies across three domains—(a) Knowledge, (b) Skills within the PDCA (Plan–Do–Check–Act) cycle, and (c) Attitudes toward differentiated instruction. With mean scores ranging from 3.60 to 4.04, the findings reveal overall high competency with specific areas requiring enhancement. This paper discusses these results through theoretical perspectives and proposes implications for leadership and policy.

Conceptual and Theoretical Framework

Differentiated instruction is grounded in the belief that learners vary significantly and therefore require tailored learning experiences (Tomlinson, 2014). Teachers adjust content, process, and product to accommodate varying readiness levels and interests. Hall, Strangman, and Meyer (2003) extend this concept through the Universal Design for Learning (UDL), emphasizing accessibility and flexibility.

Management Lens: POLC and PDCA

The POLC model provides a management structure for differentiation:

- **Planning** involves identifying outcomes and designing tiered tasks.
- **Organizing** focuses on resources, grouping strategies, and learning environments.
- **Leading** centers on motivating learners and modelling best practices.
- **Controlling** involves monitoring progress and refining instruction.

The PDCA cycle complements POLC by framing differentiation as continuous improvement—design (Plan), implement (Do), assess (Check), and revise (Act).

Assessment and Professional Learning

Formative assessment is critical for differentiation. Black and Wiliam (2009) argue that ongoing feedback enhances learning effectiveness. Teachers' ability to link assessment with instructional decisions is therefore pivotal.

Adult learning theory (Knowles, 1984), coaching models such as Knight's Impact Cycle (2018), and Marzano's (2012) framework emphasize reflective, practice-based teacher development. Applied to differentiation, these theories suggest that teacher learning should mirror personalized instructional approaches.

Thus, the management of differentiated instruction is a pedagogical and organizational process requiring thoughtful planning, responsive teaching, and evidence-based reflection—consistent with Malaysia's Digital Education Policy.

Methodology

A descriptive quantitative design was employed, involving teachers across school levels and subjects. Data were collected through a structured questionnaire aligned with three domains:

1. Knowledge and Understanding
2. Skills and Practices (PDCA)
3. Attitude and Belief

A four-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree) was used. Mean scores were interpreted as follows:

- 1.00–2.49 = Low
- 2.50–3.49 = Moderate
- 3.50–4.00 = High

Descriptive statistics generated composite means, while reliability was supported by internal consistency and expert validation from instructional leadership specialists.

Findings and Discussion

Knowledge and Understanding (Mean = 3.83)

Teachers demonstrated strong conceptual understanding of differentiated instruction, with means ranging from 3.79 to 3.87. They showed clear comprehension of differentiation principles and were able to identify appropriate strategies for varying student profiles.

However, the slightly lower mean (3.79) for articulating the relationship between differentiation and formative assessment indicates a conceptual-practical gap. Many teachers understand differentiation theoretically but apply assessment more summatively than

formatively. This matches Wiliam's (2018) findings on teachers' tendency to use assessment for validation rather than ongoing improvement.

Policy-related clarity (mean = 3.81) is adequate but calls for stronger connections between the DSKP, PPPM, and classroom differentiation. These results mirror Sulaiman and Nor (2021), who observed strong awareness but inconsistent implementation.

Skills and Practices (PDCA) (Mean = 3.80)

Teachers showed high skill levels in planning and organizing differentiated lessons. The highest means (3.96) were found for:

- Designing differentiated lesson plans (multi-level activities)
- Managing flexible groupings

These strengths reflect solid planning and implementation phases of PDCA.

However, two key gaps emerged:

- Technology integration (mean = 3.60)
- Differentiated assessment practices (mean = 3.68)

Both indicate challenges in the "Check" and "Act" phases. Teachers generally apply differentiation but less consistently use digital tools or formative data to personalize learning. This echoes Almekhlafi and Almeqdadi (2010), who attribute digital limitations to confidence, infrastructure, and training gaps.

Attitude and Belief (Mean = 3.93)

Attitude emerged as the strongest domain, showing teachers' strong commitment to differentiation. The highest-rated item was the belief that differentiated pedagogy enhances student achievement (4.04). Teachers also expressed readiness to invest additional time and pursue training (3.85–3.89).

From Ajzen's (1991) behavioural theory, positive attitudes significantly influence willingness to adopt new practices. With a highly motivated workforce, targeted skill-building can lead to rapid improvement—provided systemic support exists. PLCs, coaching, and recognition systems are therefore crucial.

Synthesis of Results

The overall mean of 3.85 indicates high competency. The ranking—Attitude (3.93), Knowledge (3.83), Skills (3.80)—shows that teachers are committed and conceptually prepared but still developing consistent practice, especially in technology use and assessment.

These findings align with national and international literature (Darling-Hammond, 2020; Tomlinson, 2014; Hallinger, 2020), which emphasize that effective differentiation requires institutional support, coaching, and leadership alignment.

Implications and Recommendations

Implications for Instructional Leadership

Principals and head teachers must act as instructional leaders who facilitate—not merely supervise—differentiation efforts. Leadership should:

- Integrate differentiation indicators in supervision tools
- Provide time for collaborative planning and peer observation
- Model technology integration and differentiated practices

Leadership development at Institut Aminuddin Baki should continue prioritizing differentiation within instructional leadership training.

Implications for Teacher Professional Learning

Given teachers' strong attitudes, professional learning should shift toward practice-based models using the PDCA cycle:

- **Plan:** Set differentiation goals
- **Do:** Implement tiered and technology-supported lessons
- **Check:** Analyse formative assessment data
- **Act:** Revise lessons within PLCs

Hands-on coaching frameworks such as Knight's Impact Cycle can strengthen classroom application.

Policy Recommendations

To institutionalize differentiation, the Ministry of Education should:

- Include differentiated instruction competency in teacher standards
- Create digital repositories of differentiated lesson exemplars
- Incentivize innovation through awards and recognition
- Embed formative assessment literacy in teacher training institutions

These align with Malaysia's data-driven aspirations under the Digital Education Policy.

Conclusion

This study demonstrates that Malaysian teachers possess high levels of knowledge, skills, and attitudes toward differentiated teaching and learning. While strong belief and solid planning skills are evident, challenges remain in digital integration and formative assessment. Addressing these gaps requires continuous professional development, coaching, and strong instructional leadership.

With sustained support and structured frameworks such as Information–Sharing–Evaluation (I–SH–E), differentiated instruction can evolve from promising practice to institutional norm—advancing Malaysia's vision of a personalised, equitable, and future-ready education ecosystem.

BIOMASS VALUE CHAINS AND THE EFEW NEXUS: INSIGHTS FROM MALAYSIA'S OIL PALM SECTOR STAKEHOLDERS

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Keywords: *Oil Palm Biomass, Sustainability, EFEW Nexus*

Extended Abstract

Malaysia's rising energy demand highlights the urgent need to transition toward cleaner, renewable energy sources. Palm oil biomass, particularly palm kernel shells (PKS), empty fruit bunches (EFB), and palm oil mill effluent (POME), offers vast potential due to its abundance and renewable nature. As one of the world's largest palm oil producers, Malaysia generates a substantial portion of its national biomass from this sector, positioning the country to advance multiple Sustainable Development Goals (SDGs) and lead in biomass-based energy transitions (Su et al., 2023). However, several challenges persist. Environmental concerns such as deforestation, peatland degradation, and emissions from transportation and processing remain significant (Behera et al., 2025). In addition, technological dependency on imported systems, high financial costs, and fragmented regulations hinder large-scale deployment. Although Malaysia's renewable energy strategies provide a general framework, the integration of the Energy–Food–Environment–Water (EFEW) nexus remains limited (Mai, Inoue, & Uenishi, 2025). This study examines the drivers of biomass value chain (BVC) effectiveness in Malaysia's oil palm sector through the EFEW lens. It identifies key institutional, financial, and technical enablers and barriers while highlighting stakeholder perspectives that can give policy recommendations for a sustainable and circular biomass sector. Understanding how industry players, policymakers, researchers, and NGOs perceive the sustainability and challenges of the BVC is crucial to bridging the gap between policy ambitions and ground realities. Their insights help reveal operational constraints such as feedstock variability, limited infrastructure, and weak incentives for smallholders while emphasizing opportunities in technology innovation, investment, and policy reform.

To initiate the study, a purposive sampling approach was employed to identify stakeholders directly involved in biomass production, policymaking, and research. The target groups included (1) industry players from plantations, processors, suppliers, and logistics, (2) government agencies from policy and regulatory bodies, and (3) academia and NGOs, ensuring a wide representation of perspectives across the biomass value chain. An online bilingual

survey in Malay and English was distributed via official emails and messaging platforms. Participants provided demographic and institutional information to validate relevance. The survey employed a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) and consisted of six main sections: (1) oil palm biomass industry dynamics; (2) biomass value chain (BVC) processes and sustainability; (3) implementation challenges; (4) interlinkages with the EFEW nexus; (5) role of government policy and regulation; and (6) role of the private sector in technology and investment. This framework enabled a comprehensive evaluation of the BVC's sustainability performance, governance, and developmental gaps.

Based on the survey, around 90% respondents acknowledged Malaysia's continued reliance on oil and gas for energy generation but recognized biomass as a sustainable alternative contributing to national energy security. However, scepticism remains regarding biomass quality, waste management practices, and biodiesel competitiveness (Aghamohammadi et al., 2016). The findings emphasize a need for improved awareness, stronger data transparency, and supportive policies to enhance trust and adoption of biomass energy (van Dijk, Goedegebure, & Nap, 2024). Stakeholders largely view the BVC as sustainable and resource-efficient but note its limited optimization. While 70–80% agreed the chain covers plantation harvesting, processing, storage, and transport, concerns over feedstock supply shortages, high pre-treatment energy use, and non-carbon-neutral storage systems were emphasized. Respondents stressed the need for better technology and process integration to enhance efficiency and minimize environmental impact (Abogunrin-Olafisoye, Adeyi, Adeyi, & Oke, 2024; Saleh & Hassan, 2024). About 90–100% agreed that BVC implementation faces significant challenges. Weather variability, feedstock inconsistency, and market price fluctuations were seen as major constraints. High infrastructure costs, insufficient investment in technology, and weak financial services further hinder development. While public–private collaboration is viewed as essential, policy uncertainty and dependence on imported technologies limit progress. Addressing these through stable regulations, investment incentives, and local R&D capacity is critical (Chowdhury, Mahi, Yeassin, Chowdhury, & Farrok, 2025).

Respondents also widely agreed that oil palm BVC contributes positively to environmental sustainability but expressed mixed views on its broader EFEW interactions. Concerns include land-use competition with food crops, fertilizer runoff leading to water pollution, and high-water consumption in plantations and mills. Although utilizing POME for biogas was recognized as a key mitigation strategy, stakeholders stressed the need for better transport optimization to reduce emissions and environmental footprint (Naidu & Moorthy, 2021). Integrating EFEW principles can strengthen systemic efficiency and resource circularity.

While about 70% agreed that government agencies prioritize environmental sustainability, many respondents questioned the adequacy of training programs, market competitiveness, and smallholder support. Although the National Biomass Action Plan 2023–2030 was seen as an important policy framework, limited financial incentives and inconsistent implementation were identified as weaknesses. Enhanced coordination, clearer regulatory mechanisms, and targeted support for smallholders could reinforce national biomass strategies.

The private sector was recognized for investing in technology and providing training and financing, but concerns remain about profit-driven priorities, dependency on foreign capital, and preference for land expansion over innovation. Stakeholders emphasized that aligning

private investments with sustainability objectives and enhancing accountability can foster a more responsible and competitive biomass industry.

As a conclusion, Malaysia's oil palm biomass value chain offers significant potential for sustainable energy transition and circular bioeconomy growth. Nonetheless, key barriers, including feedstock variability, logistical inefficiencies, technological dependence, and limited infrastructure, continue to constrain scalability. Although stakeholders acknowledge the sector's environmental and socio-economic promise, persistent challenges such as land-use conflicts, water consumption, and policy fragmentation demand coordinated action. Strengthening institutional cooperation under the National Biomass Action Plan 2023–2030, improving policy coherence, and providing financial incentives for smallholders can enhance inclusivity and feedstock stability. Simultaneously, fostering innovation through public–private partnerships and research collaboration will advance green technologies, improve waste-to-energy conversion efficiency, and support Malaysia's broader climate commitments. Incorporating the EFEW nexus within the biomass framework will enable more holistic resource management, reduce environmental trade-offs, and improve overall system resilience. By integrating technological advancement, policy reform, and stakeholder engagement, Malaysia can position its oil palm biomass sector as a cornerstone of sustainable bioresource management, contributing meaningfully to national energy security and the United Nations Sustainable Development Goals (SDGs).

Acknowledgement

The author greatly acknowledges Yayasan Universiti Teknologi PETRONAS (YUTP) for the grant 015LC0-525 to fund this research

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PRESERVING ZHUANG BROCADE CULTURE THROUGH VIRTUAL EXHIBITION HALLS: A CASE STUDY IN GUANXI, CHINA

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Abstract: Zhuang Brocade, a distinguished intangible cultural heritage of the Zhuang ethnic group in China, represents a confluence of artistic craftsmanship and cultural symbolism. Originating in the Song Dynasty, this traditional textile art is renowned for its vibrant colors, intricate patterns, and rich thematic diversity, including floral, animal, and mythical motifs. Despite its historical and cultural significance, Zhuang Brocade faces challenges such as declining artisan participation, lack of practical applications, and limited digital representation, leading to its gradual disappearance. This study explores approaches to preserving and revitalizing Zhuang Brocade through conducting in-site semi-structured interviews and virtual design process. This study utilised AI technology to create an online virtual exhibition hall for Zhuang Brocade, allowing audiences worldwide to view different Chinese Zhuang Brocade patterns by clicking on a link. By integrating design science methodologies, the study aims to enhance the accessibility and usability of Zhuang Brocade in modern contexts, fostering cultural appreciation while creating sustainable economic opportunities for the Zhuang community. This initiative underscores the transformative potential of digital innovation in safeguarding cultural legacies and enables precious Zhuang Brocade to earn a longer lifespan.

Keywords: Zhuang Brocade, Virtual Exhibition Hall, Culture Preservation

Introduction and Literature Review

Zhuang Brocade stands as the longest-preserved and most culturally significant handicraft in the evolution of Zhuang ethnic attire (Xu, 2016). Legend has it that Zhuang Brocade originated during China's Song Dynasty, characterized by vibrant colors and lively patterns that embody ethnic characteristics (Xu, 2016). Typically crafted from cotton or silk, Zhuang Brocade can be used for clothing, decorations, and bedding, carrying strong ethnic symbolism (Zhou, 2018). In "Research on the Early Qing Dynasty Huang Robe," it is mentioned that Zhuang Brocade was even utilized in the making of imperial garments (Chai et al., 2021). Further confirmation of this speculation is found in "Structure Analysis and Protection and Restoration of Sihe Ruyi Yuncun Python-pattern Golden Zhuanghua Satin in the Early Qing Dynasty," which identifies Zhuang Brocade as a type of court attire (Chai et al., 2021). Zhuang Brocade patterns often feature themes of flowers, insects, animals, mythology, and nature, including sunflowers, chrysanthemums, osmanthus flowers, lotus flowers, octagonal flowers, birds, chickens, butterflies, tigers, horses, deer, sheep, frogs, phoenixes, dragons, suns, spirals, squares, diamonds, cloud-thunder patterns, and water-wave patterns (Yuhua, 2023) (Figure 1.1). Different themes and occasions imbue Zhuang Brocade with rich symbolism.

The Guangxi Zhuang Brocade Pattern technique is perilously close to extinction. As early as 2014, reports on Zhuang Brocade patterns had sounded the alarm about the crisis in its

inheritance, highlighting the unresolved issue of protecting this intangible cultural heritage (Culture.ifeng.com, 2014). Due to insufficient financial support from local governments and less policy backing from various departments, the Zhuang Brocade industry has struggled to generate significant profits, making it challenging for artisans to sustain themselves (Culture.ifeng.com, 2014). This sentiment has been corroborated in other reports and studies. Founder of Jin Zhuang Brocade Company, He Ka, expressed that the weaving process of Zhuang Brocade is complex, time-consuming, and lacks enjoyment and companionship (Wu, 2018). As a result, the vast majority of young people refuse to be part of that group. Young people are not willing to spend a lot of time learning Zhuang Brocade skills (Wu, 2018). The departure of young people has elevated the average age of existing Zhuang Brocade artisans to 50-60 years old, often requiring over a month to complete a single piece, significantly increasing the risk of Zhuang Brocade disappearing (Wu, 2018). Similarly, this inefficient production has exacerbated the income problem of Zhuang Brocade and increased the number of people who stay away from Zhuang Brocade. Another issue in the Chinese market pertains to the usage of Zhuang Brocade, as it is not practical for people to wear ethnic minority clothing in their daily lives and work. Vang (2010) suggests that elaborate clothing implies the visual identification of an alien race. Just as described by Craig (2012), Chinese ethnic minorities in the United States are quickly pigeonholed into stereotypes of anti-modernity and exoticism. Therefore, another pressing issue lies in unlocking the value of Zhuang Brocade (Wu, 2018). People need to clarify what Zhuang Brocade can be used for and improve the situation of Zhuang Brocade by expanding its practicality. It is imperative to explore methods to ensure the preservation and sustainability of this cultural heritage. Ensuring the sustainability of Zhuang Brocade heritage remains a critical challenge that demands urgent attention.

Meinv Village (literally “Beautiful Woman Village”) is a traditional settlement that requires preservation, even in a culturally rich country like China. Unfortunately, a unique phenomenon in China points towards the sinicization of ethnic minorities, where they increasingly use Mandarin, Chinese characters, digital technology, wear mainstream clothing, and blend into their surroundings, especially among those living in urban areas and those far from their hometowns (Jamel & Lena, 2021). Consequently, the cultural inheritance of China's ethnic minorities has become a new challenge. Research on art is gradually shifting from creating art to preserving art. Regarding Zhuang Brocade, people are undergoing a new transformative discussion.

Data Collection and Analysis

Both closed-ended and open-ended questions were used in the semi-structured interviews used in this research. There are a total of 15 respondents (see Table1) including 6 average members of the Zhuang community, 8 officials who work in the village and town committees of Longzhou Township, Xincheng Township, and 3 practitioners of Zhuang Brocade. The nearest settlement to the Longzhou township and Xincheng Township administration was Meinv Village, where the first author resided. The first author visited four villages respectively were Meinv Village, Guangman Village, Banhe Village, TangTai Village. Only participants who met the selection criteria were included in the analysis, which employed a purposeful sampling strategy, which allowed the researcher to fully comprehend the phenomenon they had chosen (Creswell & Creswell, 2005). The particular criteria for selecting responses include 1) local heads, officials and culturally relevant practitioners who master more ethnic knowledge than

average aboriginals, 2) young locals with rich experiences with Zhuang culture, to ensure the reliability of the collected data.

Providing "a comprehensive and accurate descriptive conclusion of participants' point of view" is the goal of semi-structured data analysis, according to McIntosh and Morse (2015). To arrive at conclusions, this research utilises thematic analysis, which takes an inductive method. The sessions were audio-recorded with the participants' permission so the researcher could create transcripts, code the replies, and do thematic analysis.

Table 1: Demographic information of the respondents

No	Name	Age	Education	Job
1	Laigui Li	41	Bachelor	Official in Meinv Village
2	Shuang Li	29	Tertiary	Official in Meinv Village
3	Dongcheng He	42	High School	Official in Guangman Village
4	Hengfu Liu	32	Bachelor	Official in Guangman Village
5	Shilong Lan	45	High School	Headman of Banhe Village
6	Qing Wei	37	Bachelor	Official in Banhe Village
7	Riguana Lan	40	High School	Official in TangTai Village
8	Fu Sun	33	Tertiary	Official in TangTai Village
9	Chuan Li	31	Tertiary	Average member in Meinv Village
10	Fugui Wei	28	Technical school	Average member in Guangman Village
11	Xuju Fang	27	Technical school	Average member in Banhe Village
12	Ru Lin	39	Tertiary	Average member in TangTai Village
13	Zhongcheng Chen	36	Tertiary	Average person in the Zhuang community
14	Xianlan Li	25	Middle School	Average member in Tantou Village
15	Rujun Meng	68	Middle School	Heir of Zhuang Brocade (Xincheng Township)
16	Suying Li	48	High School	Heir of Zhuang Brocade (Longzhou Township)
17	Dongmei Li	39	High School	Heir of Zhuang Brocade (Meinv Village Longzhou Township)

Findings and the Discussion

The importance to develop 3D interactive design for the Zhuang Brocade patterns

Individual semi-structured interviews exploring the importance of developing product design that embodies patterns of Zhuang Brocade. For this research, two aspects of this subject must be investigated in the field: first, the significance of preserving Zhuang Brocade culture; second, the significance of constructing a virtual exhibition hall for Zhuang Brocade Patterns. Individual interviews were interspersed with thematic analysis, transcript analysis and

synthesis cycles to reveal themes. The qualitative analysis's main themes and sub-themes are shown in the table below.

Table 2: Summary of Major Themes and Sub-themes of the Qualitative Analysis.

Culture dimension	Themes	Sub-themes
Disseminate dimension	Dying reasons	Policy Lack of economic incentives Asymmetry between modern and past needs
	Whether or not give importance of culture & why	Culture meritocracy Nostalgia Uniqueness
	Whether or not wish culture to be better-preserved and revived & why	Positive Neutral
	Whether or not to support the presentation of Zhuang Brocade through virtual exhibition halls & why	A high-efficient shortcut to longer cultural lifespan Potential economic benefit
	Whether or not virtual exhibition halls, as a new form of communication, are significant for Zhuang Brocade culture & why	Internality Externality Both internality and externality

The findings identified multiple factors contributing to the decline of Zhuang Brocade culture, including sinicization, limited economic incentives, political interventions, poor cultural inheritance practices and the inadaptability between past and modern societal needs. Just as stated by Shilong Lan who is the Headman of Banhe Village:

‘Artisans of Zhuang Brocade face an uphill battle in keeping their craft alive. The economic reality is grim, as their handwoven creations struggle to compete against the flood of mass-produced textiles. Traditional designs, while rich in cultural heritage, see limited market demand, and the lack of financial backing from local governments only deepens the challenge. For many artisans, the craft has become an unsustainable livelihood, they cannot to support their families, leaving them with little choice but to abandon it. With incomes dwindling, fewer individuals feel inspired to carry on this cherished tradition, putting its future at risk.’

The engine of disappearance is the great asymmetry between modern and past societal productivity and desire, which were pointed out by both Rujun Meng and Suying Li, who are officially designated heirs of the intangible Zhuang Brocade,

‘Traditional Zhuang Brocade struggles to compete with modern industrialized textiles' efficiency and low cost. Its intricate weaving techniques, requiring months of skilled, meticulous labor, have discouraged younger generations, leading to a decline in artisans.

Meanwhile, the rise of cheap alternatives mass-produced by machines has further diminished demand for handmade products, placing this cultural craft at risk of fading away.’

‘The younger Zhuang generation is shifting towards mainstream clothing and modern lifestyles, distancing themselves from traditional customs and attire. Zhuang Brocade, with its traditional aesthetic and limited practicality for modern fashion, is often seen as outdated, further discouraging both consumers and aspiring artisans.’

On the other hand, the traditional applications of Zhuang Brocade—such as ceremonial attire, bedding, and decorative items—are increasingly misaligned with the practical needs and preferences of modern consumers. Its intricate patterns and designs are often perceived as unsuitable for daily use or contemporary home décor, diminishing its relevance in today’s lifestyles. Compounding this issue is the age structure of the artisans: most remaining practitioners of Zhuang Brocade are between 50 and 60 years old, with minimal interest from younger generations in preserving the craft. This generational gap poses a significant threat to the transmission of the skills and knowledge necessary to sustain the tradition. In terms of governmental actions, although Zhuang Brocade has been recognized as an important element of cultural heritage, policy-driven initiatives to address its decline remain insufficient. Limited funding and a lack of programs aimed at supporting artisans and promoting Zhuang Brocade in broader markets have left the craft without a robust support system. The findings align partially with previous studies, which indicate that the Zhuang Brocade industry faces significant challenges due to inadequate financial support from local governments and limited policy backing from various departments. These factors have hindered the industry’s ability to generate substantial profits, making it difficult for artisans to sustain their livelihoods (Culture.ifeng.com, 2014). This perspective is further supported by additional reports and studies. For instance, He Ka, the founder of Jin Zhuang Brocade Company, highlighted that the weaving process of Zhuang Brocade is intricate, time-consuming, and lacks enjoyment or social engagement (Wu, 2018). Consequently, a majority of young people are unwilling to join the craft, as they are reluctant to dedicate significant time to mastering Zhuang Brocade skills (Wu, 2018).

As regards the aspect of the Zhuang community’s members’ attitudes toward their own culture, the findings revealed a strong sense of cultural value and nostalgia for Zhuang Brocade. Most of participants expressed a desire to preserve their unique precious culture. Laigui Li, who is the official of Meinv Village Committee once said,

‘Zhuang Brocade is the precious cultural accumulation of our ethnicity. The patterns on Zhuang Brocade are wonderful and unparalleled. But lagging areas like ours have few technicians who can being able to disseminate Zhuang Brocade patterns through virtual exhibition halls, thereby making more people know about them and develop an interest in them...if someone can help us make it, we would feel grateful.’

Riguana Lan, who is the official of TangTai Village expressed the shared expectation of Zhuang people,

‘Traditional Zhuang Brocade patterns have long been confined to clothing and bedding, but their potential for display extends far beyond these applications. Imagine if these exquisite patterns were all extracted and showcased in a dedicated Zhuang Brocade exhibition hall,

allowing even visitors thousands of miles away to appreciate them. Digital virtual galleries further enhance the presence of traditional culture in modern society. Through this approach, the cultural significance of Zhuang Brocade patterns can be preserved, preventing them from being gradually forgotten. These uniquely designed galleries can also serve as an online promotional tool for local tourist attractions, offering visitors from both domestic and international regions the opportunity to connect with Zhuang culture.'

Besides building upon the context of modernization, this study investigated the potential significance of the development of an online virtual exhibition for the Zhuang Brocade. The findings unmasked that the Zhuang aboriginals overwhelmingly supported the construction of an online virtual exhibition for the Zhuang Brocade, citing benefits such as cultural preservation, attracting more outsiders, and enriching tourists' experiences to enhance opportunities to generate income in tourism.

Online Interactive Design and Virtual Exhibition for Zhuang Brocade

The first author used a Yuanju Technology platform to create a large online virtual exhibition hall, comprising five smaller exhibition halls (see Fig.1) (please find website by Google at <https://ve.mvpmeta.com/new/preview/#/?id=25769&secret=MjU3Njk=&ratio=256>). Every image is based on the first author's firsthand data, capturing samples from the homes of local museums, exhibition halls, experts and villagers to ensure authenticity.

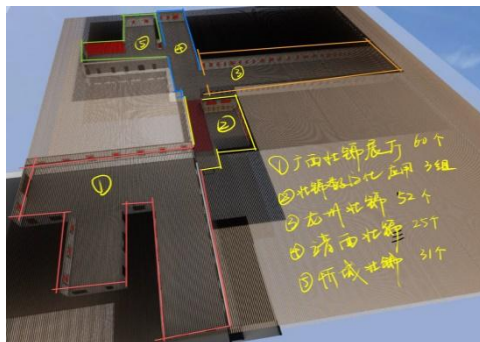


Figure 1. Spatial layouts for virtual exhibition halls

Within this virtual exhibition hall, visitors can access the platform via PC (desktop or laptop computers) and mobile devices (smartphones and tablets). On PCs, navigation is controlled using the WASD keys on the keyboard, while on mobile devices, users can freely explore the exhibition through the directional control panel on the left. Importantly, each image in the exhibition is clickable for enlargement and is accompanied by detailed textual descriptions, including the region, historical period, pattern category, pattern name, and specific collection location. (see Fig.5 Fig.6). In This article only showcases two of the five exhibition halls (the Longzhou Hall and the Xincheng Hall); below are selected images from the virtual exhibition hall. (see Fig.3 Fig.4):



Figure 3. Interactive Scene Display 1

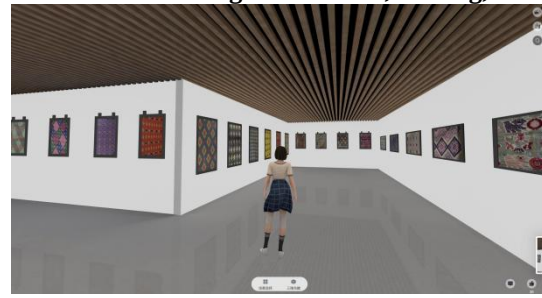


Figure 4. Interactive Scene Display 2

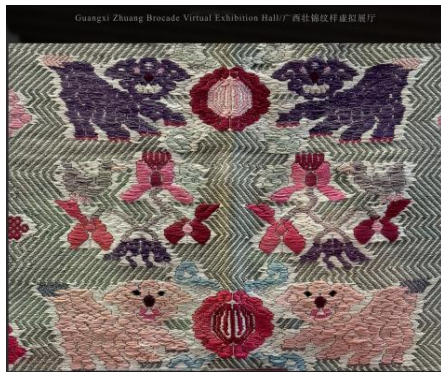


Figure 5. Enlarging effect display

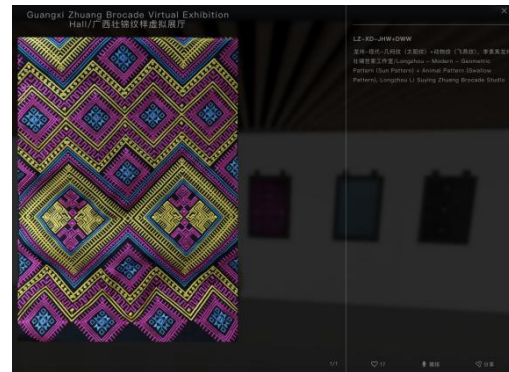


Figure 6. Accompanied with textual descriptions

Ultimately, all of the authentic Zhuang Brocade patterns collected on-site by the first author have been included in this virtual exhibition hall. Unlike traditional methods, with the help of the internet and AI technology, Zhuang Brocade culture can now be learned about and even become familiar to people without leaving their homes. This cross-regional cultural dissemination method allows tourists from all over the world to easily appreciate such exquisite Zhuang Brocade patterns without spending money on travel or admission fees.

Conclusion

Due to the Zhuang Brocade culture's specialty, rarity, and irreproducibility, it should be better preserved. This study used interview research to assess why it is important to create culturally specific 3D interactive product for the Zhuang Brocade community.

Thematic analysis was used in the interview research to record cultural facts that are disappearing, the real causes behind them, and the attitudes that Zhuang community members have towards their own Zhuang Brocade culture and culturally specific products.

Most of the reasons why these Zhuang Brocade cultures are in danger of becoming extinct are evident throughout the descriptive process of studying the causes of dying civilizations, with the remaining percentage attributable to the asymmetry between modern and past needs and the lack of economic incentives. This research discovered that Margaret Mead's "Prefigurative culture" refers to insufficient cultural inheritance work. The Zhuang community's artistic legacy, especially the Zhuang Brocade culture, was typically inverted; this is the current state of the Zhuang culture. They are on the brink of forming a new kind of culture specifically because of the change to a Prefigurative culture, which is future-oriented, and cultural

transmission is primarily from the young to their elders (Mead 1970) (referring to those modern cultures), while the ancient and precious culture is not being passed down to the younger generation, which deviates from culture preservation.

In addition, the theme analysis demonstrates that in light of the realities of vanishing cultures, Zhuang community members' hopes for culturally specific products go beyond just preserving their cultures and are more inclined toward the financial benefits it brings. Simply put, the research also reveals four key functions of culturally specific products of Zhuang Brocade patterns as a trustworthy method that can be used to achieve better cultural sustainability and dissemination, foster outsiders' positive perceptions of a location, and enrich local tourism. It can be seen that this research first created products for Zhuang Brocade culture in response to supportive commands from Zhuang aboriginals' willingness.

Ultimately, findings that detail the current state of Zhuang Brocade culture within the Zhuang community, provide an in-depth exploration of the causes of cultural extinction, suggest a more creative measure for cultural preservation in indigenous areas, and offer an overall evaluation of the cultural awareness of Zhuang locals would greatly benefit future relevant research.

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ASSESSING THE IMPACT OF TALENT MANAGEMENT PRACTICES ON THE REPUTATION OF MEDICAL LABORATORIES IN BENGHAZI, LIBYA

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Abstract: *This research investigates how talent management (TM) practices influence the reputation of medical laboratories in Benghazi, Libya. The study utilized a custom-designed questionnaire comprising 52 items based on a five-point Likert scale. Employing a descriptive-analytical method and multiple regression analysis, the research gathered responses from a stratified random sample of 255 participants, achieving a 90.16% response rate. The results indicate a strong application of both talent management and organizational reputation variables. A significant positive impact of TM on organizational reputation was observed ($\beta = 0.720$). Based on these findings, the study recommends enhancing talent management strategies, including developing structured plans for attracting and retaining skilled professionals, fostering innovation, and ensuring the availability of modern technologies to strengthen service quality and institutional reputation.*

Keywords: *Talent Attraction (TA), Talent Retention (TR), Talent development (TD), Social Responsibility (SR), Innovation (INN), Service Quality (SQ), medical Laboratories.*

Introduction

Talent management (TM) is increasingly recognized as a critical success factor in organizational development, particularly in service-oriented sectors. With growing competition for skilled individuals and the limited availability of highly qualified talent, organizations are compelled to adopt effective strategies for identifying and nurturing exceptional employees. The future competitiveness of organizations relies heavily on their ability to foster innovation and support creative thinking, especially through empowering talented individuals (Mahroof et al., 2025).

Organizational reputation (OR), as an intangible asset, has gained heightened attention in recent years. Managers and employees alike have acknowledged its significance in providing long-term sustainability, enhancing customer and employee loyalty, and maintaining profitability. A strong reputation can influence consumer perceptions of service quality, enabling organizations to expand their customer base, improve revenue streams, and retain skilled talent (Jacobs & Liebrecht, 2025).

Also, the good reputation of the organization helps the consumer perception of the quality of the products, which enables the organization opportunities to increase sales and thus increase profits, retain talented employees in the organization, and raise the morale of the workers which in turn reflects on the productivity of the organization, the protection of the organization by

reducing risks and identifying potential crises, and contributing to international expansion and strategic alliances.

To enhance both its reputation and overall performance, an organization must implement strategic measures to attract innovative and skilled individuals. This approach helps safeguard valuable expertise from being acquired by competitors and enables the organization to systematically develop these talents through well-structured, evidence-based practices. Such efforts can strengthen its competitive edge in the market (Mitosis, Lamnisos & Talias, 2021). In light of this, the present study aims to explore the following central question: *To what extent do talent management practices—specifically talent attraction, retention, and development—affect the organizational reputation in terms of creativity, social responsibility, and service quality within medical laboratories in Benghazi?* From this overarching question, several sub-questions have been formulated.

The first sub-question: Is there an effect of talent management on creativity in medical Laboratories in the city of Benghazi?

Second sub-question: Is there an effect of talent management on social responsibility in medical Laboratories in the city of Benghazi?

The third sub-question: Is there an effect of talent management on the quality of service in medical Laboratories in the city of Benghazi?

Literature review

Talent management refers to the process of identifying talented individuals, attracting them to join the organization, integrating them effectively, nurturing their growth, motivating them, and ensuring their retention. Practically, it involves sourcing highly skilled talent, selecting the most capable and innovative candidates, and fostering their development and retention within the organization (Banerjee & Sharma, 2025). It also includes comprehensive strategies and systems aimed at boosting productivity by refining methods to attract, retain, develop, and utilize skilled personnel who possess the necessary abilities to fulfill both present and future organizational demands (Alferjany et al., 2022).

These definitions highlight that talent management covers several key elements such as recruitment, retention, motivation, development, and succession planning. While these components clarify the main responsibilities and activities involved in talent management, they do not specify the exact approaches for implementing them. Talent management is a broad concept encompassing various actions and dimensions related to how an organization engages with its talented workforce. As illustrated in Table 1, researchers have offered multiple interpretations of these aspects. This study focuses primarily on three dimensions of talent management: attracting talent, retaining talent, and developing talent.

Table 1: Talent Management Practices

Author	TM Practices
Gabrel, 2020	Talent Attraction, Talent Retention, Talent Development
Atheer, Baig & Raj, 2019	Talent Attraction, Talent Retention, Talent Development

Froidevaux, Alterman & Wang, 2020	Talent attraction, retention, learning and development, and career management.
Järvi & Khoreva, 2020	Identify talent, develop talent, deploy talent and retain talent.
Meyers et al., 2018	Recruitment and selection, retention, succession planning, development approach.
Mani, 2020	Attracting, selecting, engaging, developing, and retaining employees
Sparrow et al, 2019	Attracting, retaining, motivating and developing the talented employees
Kiragu, 2020	succession planning, training, career management, coaching and mentoring
Dayel et, al. 2020	Developing strategy, attracting and retaining, motivating and developing, deploying and managing, connecting and enabling

Organizational reputation reflects customers' reactions to the organization's past activities, operations, and actions, as well as their views of intangible assets. Practically, it can be defined as how stakeholders perceive the image of the organization that reflects the procedures and operations of the various activities of the organization (Rosa et al., 2025). The time accumulation of the organization results in the internal and external environments in a way that fosters customer loyalty and affiliation (Pedersen et al., 2025).

As a valuable intangible asset, the organizational reputation contributes to achieving returns and an added value to the organization, so it must be managed in an optimal manner, which leads to maximizing the value (Bustos, 2021). A good organizational reputation preserves the current client and attracts other through what known as "word of mouth"; thus, the organization achieves the desired profit and success (Burlea & Balan, 2021).

Methodology

This study employed a descriptive-analytical approach to explore the relationships between the primary and secondary variables, with data collected from the target population. In order to address the research questions and test the hypotheses, the researcher utilized frequencies and percentages to summarize the demographic characteristics of the sample. To assess the relative significance of the study variables, means and standard deviations were calculated. Lastly, to examine the influence of the independent variable on multiple dependent variables, the researcher applied multiple regression analysis.

Population & Sample Technique

The study targeted upper and middle management personnel across five medical laboratories in Benghazi. The total population included 149 senior managers and 608 middle managers, resulting in a combined population of 760 individuals. Using a stratified random sampling technique, the researcher selected a sample of 255 managers from both management levels, based on the total population size (Sekaran & Bougie, 2016). Accordingly, 255 questionnaires were distributed to the selected sample, and 230 were returned, representing a response rate of

90.16%. Upon review, 19 of the returned questionnaires were deemed invalid, leaving 211 valid responses for analysis constituting 81% of the total distributed questionnaires.

Conceptual Framework and Hypothesis Development

The conceptual framework of this study encompasses the key variables under investigation, with talent management identified as the independent variable and organizational reputation as the dependent variable. Drawing upon insights from the literature review, the researcher developed the conceptual framework presented in Figure 1.

H₀: Talent management practices affect the organizational reputation of medical Laboratories in Benghazi.

H₀₁: Talent management practices affect the creativity in medical Laboratories in Benghazi.

H₀₂: Talent management practices affect the social responsibility of medical Laboratories in Benghazi.

H₀₃: Talent management practices affect service quality in medical Laboratories in Benghazi.

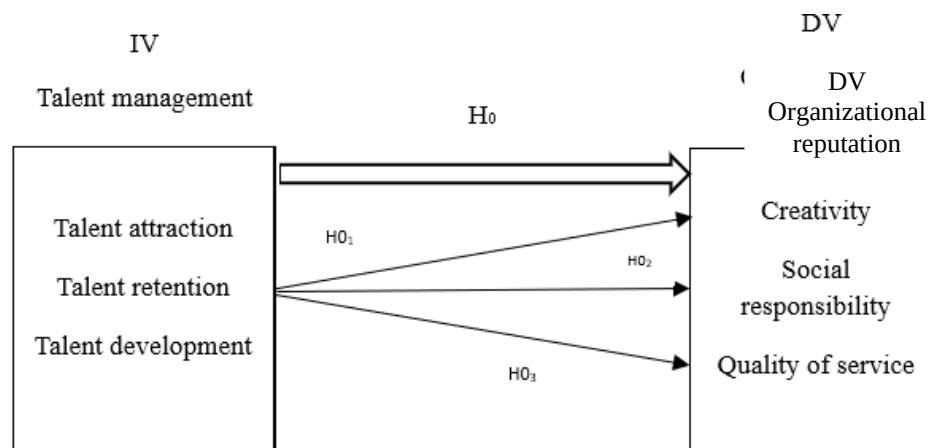


Figure 1: Theoretical Framework

Note. IV Talent management practices are adopted from (Alferjany et al., 2022; Atheer, Baig & Raj, 2019). DV Organizational reputation adopted from (Sala, 2013; Rosa et al., 2025).

Data Analysis and Discussion

Table 2 displays the respondents' demographic and professional attributes, including gender, age, academic qualifications, job position, years of experience in their current role, and duration of service in their present laboratory.

Table 2: Personal and Functional Characteristics of the Respondents

Variable	Category	Frequency	Percentage %
Gender	male	148	70.14
	female	63	29.86
Age	30 or less	17	8.05
	30-40	47	22.28
	41-50	105	49.77
	More than 50	42	19.90
	Bachelor's or less	107	50.71

Educational qualification	Master	67	31.75
	Doctorate	37	17.54
occupational level	Upper	42	19.90
	Middle	169	80.10
work experience in the current job	Less than 5 years	16	7.58
	5 - 10	54	25.59
	11 - 20	113	53.56
	More than 20 years	28	13.27
work experience in the current laboratory	Less than 5 years	13	6.16
	5 - 10	49	23.22
	11 - 20	108	51.19
	More than 20 years	41	19.43
Total		211	100

The Stability of the Study Tool:

To assess the reliability of the instrument, the researcher employed Cronbach's Alpha to test internal consistency. The final version of the study tool was administered to a reliability sample composed of 11 individuals who were not part of the main study sample. As shown in Table 3, the reliability coefficients for the main variables indicate that the instrument demonstrates a high level of stability, confirming its suitability for achieving the study's objectives (Sekaran & Bougie, 2016).

Table 3: The Stability Values of the Main Study Variables (Cronbach Alpha)

Variable	Number of Items	(α)
Talent Management	20	0.866
Talent Attraction	7	0.745
Talent Retention	7	0.746
Talent Development	6	0.718
Organizational Reputation	22	0.835
Innovation	7	0.737
Social Responsibility	8	0.785
Quality of Service	7	0.764

Statistical Analysis Results

To explore the actual implementation of the study variables and their respective dimensions namely talent management and organizational reputation within medical laboratories in Benghazi, the researcher employed means and standard deviations as statistical tools.

Table 4 presents the answers of the respondents about the expressions related to attracting talents in medical Laboratories in the city of Benghazi, where the arithmetic averages ranged between (3.82 - 4.28) with a total average of (4.04) on the five-point Likert scale, which indicates the high reality of attracting talents in medical Laboratories in the city of Benghazi.

Table 4: Arithmetic Means and Standard Deviations for Talent Attraction in Medical Laboratories in Benghazi

Talent Retention	M	S.D	Importance of item
The laboratory conducts regular predictive studies to determine its talent needs	4.18	0.770	2
The laboratory relies on modern methods to search for talents	4.03	0.752	4
Future business needs are determined in light of current and future requirements	4.05	0.869	3
The laboratory conducts a gap analysis to determine its talent needs	3.94	0.921	6
The laboratory clearly plans to attract talented staff	3.82	0.892	7
There is a specialized department in the process of attracting talents	3.96	0.852	5
Different sources are used to attract talent	4.28	0.758	1
The overall mean and standard deviation of talent retention	4.04	0.524	

The results in Table 4 show that the statement *"Different sources are used to attract talent"* ranked first, with a mean score of 4.28, which is above the overall average of 4.04, and a standard deviation of 0.758. In contrast, the statement *"The laboratory clearly plans to attract talented staff"* was ranked seventh, with a mean of 3.82—below the general average—and a standard deviation of 0.892. The relatively low standard deviations indicate limited variability in respondents' answers, suggesting a strong consensus regarding the current practices of talent attraction in medical laboratories in Benghazi. Furthermore, the convergence of mean values supports the conclusion that the overall perception of talent attraction among respondents was high.

Similarly, Table 5 presents the respondents' views on talent retention practices. The arithmetic means for talent retention statements ranged from 3.82 to 4.23, with an overall mean of 3.98 on the five-point Likert scale, indicating a generally high perception of talent retention in the medical laboratories surveyed. The statement *"The laboratory deals with talented employees as partners more than they are employees"* received the highest mean score (4.23), exceeding the overall average, with a standard deviation of 0.772. Conversely, the statement *"The laboratory uses qualitative methods to determine its needs from talents"* ranked lowest, with a mean of 3.82 and a standard deviation of 0.794. As with talent attraction, the responses related to talent retention displayed low dispersion, reflecting a high degree of agreement among participants. The consistency in the arithmetic means further affirms that respondents generally perceived talent retention in these laboratories to be at a high level.

Table 5: Arithmetic Means and Standard Deviations for Talent Retention in Medical Laboratories in Benghazi

Talent Retention	M	S.D	Importance of item
The laboratory makes great efforts to utilize internal talents before announcing any vacancy	4.01	0.842	3
The laboratory regularly evaluates existing talents	3.90	0.783	6
Qualitative methods are used to determine talent needs	3.82	0.794	7
The laboratory offers salaries and incentives suit the talented employees	4.06	0.857	2
Talented staff are respected and valued appropriately	3.95	0.869	4
Talented employees are treated as partners more than employees	4.23	0.772	1
Talented employees are given fair promotion opportunities	3.92	0.830	5
The overall mean and standard deviation of talent retention	3.98	0.497	

Table 6 illustrates the responses of participants regarding statements related to talent development in medical laboratories across Benghazi. The mean scores for talent development items ranged from 3.89 to 4.01, with an overall average of 3.95 on a five-point Likert scale. This reflects a high level of talent development practices as perceived by the respondents. The statement *"The laboratory seeks to improve the knowledge of talented employees through seminars"* ranked first, with a mean of 4.01—slightly above the overall average—and a standard deviation of 0.825. On the other hand, the statement *"The laboratory has policies that encourage career development"* was ranked sixth, with a mean score of 3.89, which falls below the total average, and a standard deviation of 0.829. These findings suggest a generally positive evaluation of talent development efforts, accompanied by a relatively low variation in responses, indicating agreement among the participants.

Table 6: Arithmetic Means and Standard Deviations for Talent Development in Medical Laboratories in Benghazi

Talent development	M	S.D	Importance of item
The laboratory has an effective reward system for talented employees	3.96	0.904	3
There are effective training programs to develop the capabilities of talented employees	3.92	0.815	5
The laboratory seeks to improve the knowledge of talented employees through seminars	4.01	0.825	1
The laboratory creates a positive environment that helps improve knowledge sharing among talented employees	4.00	0.876	2
The laboratory has policies that encourage career development	3.89	0.829	6
The laboratory provides development opportunities for talented employees	3.95	0.776	4

The overall mean and standard deviation of talent development	3.95	0.523

Table 6 also demonstrates a low level of response dispersion concerning talent development in medical laboratories in Benghazi. This indicates a strong alignment in respondents' perceptions regarding the current state of talent development. The consistency in the arithmetic mean values further supports the notion of a shared perspective among participants. Overall, the findings suggest that the level of talent development, as perceived by the respondents, is high.

Table 7 displays the participants' responses to items related to creativity within medical laboratories in Benghazi. The mean scores for creativity-related statements ranged from 3.67 to 4.04, with an overall mean of 3.94 on the five-point Likert scale, reflecting a high level of perceived creativity. The statement "*Rules and instructions are applied to suit the creators' requirements*" received the highest rating, with a mean of 4.04 above the overall average and a standard deviation of 0.935. In contrast, the statement "*Laboratory administration encourages innovation and creativity*" was ranked seventh, with a mean of 3.67, below the overall average, and a standard deviation of 0.996. Table 7 also indicates a low degree of variability in responses, suggesting a general agreement among respondents about the state of creativity in these laboratories. The close values of the arithmetic means further support this consensus. In general, creativity in medical laboratories in Benghazi was perceived as being at a high level by the study participants.

Table 7: Arithmetic means and standard deviations for creativity in medical Laboratories in Benghazi

Creativity	M	S.D	Importance of item
The laboratory has the skills to convince stakeholders in order to achieve the objectives	3.96	0.856	5
There is an interest in presenting new ideas for work, even if they were not previously applied	3.86	0.839	6
The laboratory is keen to suggest new ways to perform work	4.00	0.831	3
The laboratory seeks ideas that contribute to solving work problems	4.00	0.913	3
The laboratory seeks to provide an atmosphere that encourages employees to innovate and excel	4.02	0.836	2
Rules and instructions are applied to suit the creators' requirements	4.04	0.935	1
laboratory administration encourages innovation and creativity	3.67	0.996	7
The overall mean and standard deviation of creativity	3.94	0.538	

Table 8 presents the responses of the study participants to statements concerning social responsibility in medical laboratories located in Benghazi. The mean scores for the items ranged from 3.79 to 4.13, with an overall average of 3.95 on the five-point Likert scale. These results indicate a high level of perceived social responsibility in the laboratories. The statement "*Social responsibility expresses the personal behaviors and values of department managers in the laboratory*" ranked first, with a mean of 4.13—above the total average—and a standard

deviation of 0.809. Conversely, the statement “*The laboratory is keen to provide services that meet the needs of the community*” was ranked eighth, with a mean score of 3.79—below the overall average and a standard deviation of 0.893.

Moreover, the data in Table 8 show a low level of response variability, suggesting a strong degree of agreement among participants regarding the state of social responsibility. The closeness of the mean values further confirms this consistency. Overall, the findings reveal that the perception of social responsibility in medical laboratories in Benghazi is notably high from the viewpoint of the study sample.

Table 8: Arithmetic means and standard deviations for social responsibility in medical Laboratories in Benghazi

Social Responsibility	M	S.D	Importance of item
The laboratory is keen to provide services that meet community needs	3.79	0.893	8
social responsibility expresses the personal behaviors and values of department managers in the laboratory	4.13	0.809	1
Officials implement decisions based on good morals and values	3.95	0.794	3
Managers have a sense of responsibility which is the biggest motivator for achieving goals	4.02	0.774	2
The laboratory considers employees’ opinions and suggestions about activities and services	3.87	0.904	6
The laboratory incubates and develops projects adopted by community organizations	3.84	0.863	7
The laboratory participates in conferences and seminars in cooperation with community organizations	3.91	0.893	5
The laboratory refrains from doing any activity that contradicts the values and morals of society	3.92	0.850	4
The overall mean and standard deviation of social responsibility	3.95	0.524	

Table 9 summarizes the responses of the participants regarding statements related to service quality in medical laboratories in Benghazi. The mean scores for service quality items ranged from 3.33 to 4.17, with an overall average of 3.87 on the five-point Likert scale, indicating a generally high perception of service quality in these laboratories. The statement “*The laboratory is committed to providing its best services to achieve its objectives*” ranked highest, with a mean of 4.17—exceeding the overall average—and a standard deviation of 0.784. In contrast, the statement “*The laboratory provides all the technical requirements for developing services*” was ranked seventh, with the lowest mean score of 3.33 and a standard deviation of 1.006.

Additionally, Table 9 reveals a low level of variability in responses, reflecting a strong consensus among participants regarding the current state of service quality. The close alignment of mean values further supports this convergence of opinion. Overall, the findings suggest that the study sample perceives the quality of service in medical laboratories in Benghazi as high.

Table 9: Arithmetic means and standard deviations for quality of service in medical Laboratories in Benghazi

Quality of Service	M	S.D	Importance of item
Senior management undertakes planning to improve service quality	4.12	0.819	3
The laboratory is committed to the quality of service in accordance with well-thought-out plans and programs	4.00	0.851	4
The laboratory interested in providing its best services in order to achieve its objectives	4.17	0.784	1
The laboratory strives to provide all necessary supplies for the staff	4.14	0.798	2
The laboratory has a high level of efficiency in providing health services	3.72	0.949	6
The laboratory contributes new ideas and suggestions that improve the quality of provided service	3.73	0.950	5
The laboratory provides all the technical requirements for developing services	3.33	1.006	7
The overall mean and standard deviation of quality of service	3.87	0.502	

Hypotheses Testing

H₀: Talent management practices affect the organizational reputation of medical Laboratories in Benghazi.

To examine the impact of talent management practices—specifically talent attraction, talent retention, and talent development—on organizational reputation within medical laboratories in Benghazi, multiple regression analysis was conducted. Table 10 displays the results of this analysis. The findings reveal that talent management practices have a statistically significant effect on organizational reputation at the 0.05 significance level ($\alpha \leq 0.05$). The correlation coefficient (R) was 0.722, indicating a strong positive relationship, while the coefficient of determination (R^2) was 0.511. This suggests that approximately 51.1% of the variance in organizational reputation can be explained by changes in talent management practices. Additionally, the adjusted R^2 value of 0.515 indicates the proportion of variance in organizational reputation accounted for by talent management after adjusting for standard errors.

Further analysis of the regression coefficients showed that the beta (β) value for talent attraction was 0.301 and was statistically significant ($t = 4.667, p \leq 0.05$). Similarly, the beta coefficient for talent retention was also 0.301, with a corresponding t-value of 4.546, indicating significance. The beta coefficient for talent development was 0.235, supported by a t-value of 3.515, confirming its significant influence.

These results imply that a one-unit increase in each dimension of talent management corresponds to an increase in organizational reputation by 0.301 for talent attraction, 0.301 for talent retention, and 0.235 for talent development. The overall model's significance is

supported by an F-value of 75.294 ($p \leq 0.05$), confirming the acceptance of the main hypothesis.

Table 10: Multiple regression analysis test results for the effect of talent management on organizational reputation in medical Laboratories in Benghazi

D. V	Model summary			ANOVA			Coefficients			
	R	R ²	Adjusted R ²	F	DF	Sig*	β	T	Sig*	
OR	0.72	0.52	0.515	75.294	regression	3	T	0.30	4.66	0.00
	2	2			n		A	1	7	0
					The rest	20	T	0.30	4.54	0.00
						7	R	1	6	1
					Total	21	T	0.23	3.51	0.00
						0	D	5	5	0

To examine the influence of talent management practices—namely talent attraction, talent retention, and talent development—on various dimensions of organizational reputation, the primary hypothesis was divided into three sub-hypotheses. The first sub-hypothesis is as follows:

H01: Talent management practices have a significant effect on creativity in medical laboratories in Benghazi.

To test this hypothesis, multiple regression analysis was applied to assess the impact of talent management components on creativity. Table 11 presents the results of this analysis. The findings indicate a statistically significant relationship between talent management and creativity at the 0.05 significance level ($\alpha \leq 0.05$). The correlation coefficient (R) was found to be 0.586, while the coefficient of determination (R²) was 0.343, suggesting that approximately 34.3% of the variation in creativity can be explained by changes in talent management practices. The adjusted R² value of 0.333 reflects the net explanatory power of talent management after accounting for standard errors. Regarding the individual predictors, the beta (β) coefficient for talent attraction was 0.279 and statistically significant ($t = 3.689$, $p \leq 0.05$). The beta for talent retention was 0.214, also significant ($t = 2.760$, $p \leq 0.05$), while talent development had a beta coefficient of 0.185 with a corresponding t-value of 2.358, indicating significance at the same level.

These results imply that a one-unit increase in talent attraction, retention, or development is associated with increases in creativity by 0.279, 0.214, and 0.185 units, respectively. The overall model significance was confirmed by an F-value of 36.018 ($p \leq 0.05$), supporting the acceptance of the first sub-hypothesis, which asserts that talent management significantly affects creativity in medical laboratories in Benghazi.

Table 11: Multiple regression analysis test results for the effect of talent management on creativity in medical Laboratories in Benghazi

D. V	Model summary			ANOVA			Coefficients				
	R	R ²	Adjusted R ²	F	DF	Sig*	β	T	Sig*		
IN	0.58	0.34	0.333	36.018	regression	3	0.000	T	0.27	3.68	0.00
N	6	3			n			A	9	9	0
					The rest	207		T	0.21	2.76	0.00
								R	4	0	6
				Total	210	T	0.18	2.35	0.01		
						D	5	8	9		

H₀₂: Talent management practices affect the social responsibility of medical Laboratories in Benghazi.

To assess the impact of talent management practices—including talent attraction, retention, and development—on social responsibility, multiple regression analysis was employed. Table 12 summarizes the effect of these talent management dimensions on social responsibility within medical laboratories in Benghazi. The results revealed a statistically significant influence at the 0.05 significance level ($\alpha \leq 0.05$), with a correlation coefficient (R) of 0.636. The coefficient of determination (R²) was 0.405, indicating that 40.5% of the variance in social responsibility can be attributed to changes in talent management practices. The adjusted R² value of 0.396 further reflects the model's explanatory power after adjusting for error variance.

Analysis of the regression coefficients showed that talent attraction had a beta (β) coefficient of 0.216, which was statistically significant ($t = 3.003$, $p \leq 0.05$). Talent retention also had a significant effect, with $\beta = 0.183$ and $t = 4.467$ ($p \leq 0.05$). Talent development demonstrated the strongest influence, with a beta coefficient of 0.334 and a corresponding t-value of 2.358, confirming its significance at the same level.

These findings suggest that a one-unit increase in the focus on talent attraction, retention, and development corresponds to increases in social responsibility by 0.216, 0.183, and 0.334 units, respectively. The overall model was confirmed to be significant by an F-value of 46.870 ($p \leq 0.05$), thereby supporting the acceptance of the second sub-hypothesis. This sub-hypothesis states that talent management practices significantly affect social responsibility in medical laboratories in Benghazi.

Table 12: Multiple regression analysis test results for the effect of talent management on social responsibility in medical Laboratories in Benghazi

Social Responsibility in Medical Laboratories in Benghazi											
D.	Model summary			ANOVA			Coefficients				
V	R	R ²	Adjusted R ²	F	DF	Sig*	β	T	Sig*		
SR	0.636	0.405	0.396	46.870	regression	3	0.000	T	0.21	3.00	0.00
					The rest	207		A	0.06	0.33	0.00
								T	0.18	2.47	0.01
								R	0.03	0.03	0.01

Total	21	T	0.33	4.46	0.00
	0	D	4	7	0

H₀₃: Talent management practices affect service quality of medical Laboratories in Benghazi.

To examine the influence of talent management practices—specifically talent attraction and talent retention—on service quality, multiple regression analysis was utilized. Table 13 summarizes the impact of these dimensions of talent management on service quality in medical laboratories in Benghazi. The analysis revealed a statistically significant relationship at the 0.05 significance level ($\alpha \leq 0.05$), with a correlation coefficient (R) of 0.594. The coefficient of determination (R^2) was 0.353, indicating that 35.3% of the variation in service quality can be explained by changes in talent management practices. The adjusted R^2 value of 0.343 confirms the model's explanatory strength after accounting for error variance.

The regression coefficients indicated that talent attraction had a beta (β) coefficient of 0.258, which was statistically significant ($t = 3.431$, $p \leq 0.05$). Talent retention exhibited an even stronger effect, with $\beta = 0.361$ and a t-value of 4.680 ($p \leq 0.05$). These findings suggest that a one-unit increase in talent attraction and retention corresponds to increases in service quality by 0.258 and 0.361 units, respectively. The overall model significance was supported by an F-value of 37.613 ($p \leq 0.05$), thereby validating the third sub-hypothesis, which states that talent management (talent attraction and retention) significantly influences service quality in medical laboratories in Benghazi.

Table 13: Multiple regression analysis test results for the effect of talent management on service quality in medical Laboratories in Benghazi

Service quality in medical laboratories in Benghazi											
D.	Model summary			ANOVA				Coefficients			
V	R	R ²	Adjusted R ²	F	DF	Sig*		β	T	Sig*	
SQ	0.59	0.35	0.343		regression	3		T	0.25	3.43	0.00
	4	3		37.61	n		0.00	A	8	1	1
				3	The rest	20	0	T	0.36	4.68	0.00
						7		R	1	0	0
					Total	21		T	0.05	0.70	0.48
						0		D	5	4	2

Recommendations and Future Directions

Drawing from the results of this study, the following recommendations are proposed. These suggestions target two groups: the management teams of the surveyed medical laboratories and researchers or students specializing in business administration.

Practical Recommendations for Laboratory Management

1. Prioritize Talent Management: Recognize the critical role that effective talent management plays in strengthening the laboratory's reputation and enhancing its public image among key stakeholders.

2. Develop Strategic Talent Acquisition Plans: Design and implement comprehensive strategies for attracting skilled and creative professionals, thereby positioning the laboratory competitively and minimizing the risk of losing valuable talent to rival institutions.
3. Implement Career Development Policies: Establish policies that support continuous professional growth and career advancement to nurture talents systematically and align their skills with the laboratory's evolving needs.
4. Assess and Align Human Capital: Regularly evaluate existing staff competencies to ensure alignment with both current operations and future demands. Offer equitable opportunities for advancement based on merit and demonstrated capabilities.
5. Foster Employee Support and Trust: Promote a supportive work environment that safeguards employee rights and provides assistance as needed. Strengthening this trust is essential, especially given the moderate levels found in these areas within the study.
6. Encourage Innovation and Creativity: Cultivate a workplace atmosphere that values new ideas and innovative thinking. This approach will not only enhance service quality but also boost employee motivation.
7. Enhance Community-Centered Services: Ensure that service offerings reflect the diverse needs of the community, thereby reinforcing the laboratory's commitment to social responsibility.
8. Upgrade Technical Infrastructure: Invest in advanced technology and continuously update service systems to improve efficiency, elevate customer satisfaction, and solidify the laboratory's reputation.

Suggestions for Future Research

In light of the growing emphasis on organizational reputation as a strategic asset for sustainability and competitive edge, further studies could explore:

1. Reputation Management Practices: Investigate how organizations manage their reputations, examining the effects on overall performance, sustainability efforts, and talent retention strategies.
2. Role of Marketing and Communication: Analyze the influence of marketing initiatives and internal/external communication on enhancing organizational reputation.

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TOO EMOTIONAL TO LEAD? GENDER-BASED LEADERSHIP STEREOTYPES AND THE ROAD TO SDG 5 IN MALAYSIA

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Abstract: This empirical study investigates the impact of gender-based leadership stereotypes, particularly the perception that women are "too emotional to lead," on Malaysia's progress toward Sustainable Development Goal 5 (SDG 5), which aims to achieve gender equality and empower women by 2030. Despite advancements in women's workforce participation (38.2% in 2022), women hold only 24.7% of senior management roles and 17.9% of corporate board seats in Malaysia, reflecting systemic barriers rooted in cultural and organizational biases. Using a mixed-methods approach, the study surveyed 300 professionals (150 men, 150 women) from urban centers and conducted 20 semi-structured interviews with managers to explore how emotionality stereotypes affect women's leadership opportunities. Quantitative findings revealed a significant negative correlation between perceived emotionality and leadership suitability for women ($\beta = -0.39$, $p < 0.01$), but not for men, with 71% of respondents viewing women as more emotional and 57% believing this reduces their leadership credibility. Qualitative data identified cultural norms, influenced by Malaysia's collectivist and patriarchal values, organizational biases in promotion criteria, and women's internalized self-censorship as key barriers. Despite 74% of respondents valuing emotional intelligence in leadership, its association with femininity creates a double bind, penalizing women for emotional displays deemed acceptable in men. These findings highlight impediments to SDG 5's targets of ending discrimination (5.1) and ensuring leadership participation (5.5). The study proposes diversity training, mentorship programs, policy enforcement (e.g., 30% board quotas), and reframing emotionality as a leadership asset to align Malaysia with SDG 5. By addressing cultural, organizational, and internalized stereotypes, Malaysia can foster gender-equitable leadership, contributing to inclusive development. Future research should explore rural perspectives and longitudinal interventions to complement the urban focus and address potential self-report biases.

Keywords: Gender Stereotypes, Emotionality, Leadership, SDG 5, Malaysia

Introduction

The United Nations' Sustainable Development Goal 5 (SDG 5) aims to achieve gender equality and empower women and girls by 2030, focusing on eliminating discrimination, ensuring equal leadership participation, and adopting supportive policies. In Malaysia, a nation shaped by a rich tapestry of Malay, Chinese, Indian, and indigenous cultures, as well as Islamic and Confucian values, progress toward SDG 5 is hindered by deeply rooted gender stereotypes. A prominent stereotype is that women are "too emotional to lead," which associates leadership with masculine traits such as rationality, assertiveness, and decisiveness, while emotionality—linked to femininity—is perceived as a leadership liability (Salo, 2024). This empirical study

investigates how this emotionality stereotype impacts women's advancement to leadership roles and Malaysia's alignment with SDG 5 objectives.

Malaysia has made strides in women's education and workforce participation, with women comprising 38.2% of the labor force in 2022 (Department of Statistics Malaysia, 2022). However, their representation in leadership remains low, with women holding only 24.7% of senior management positions and 17.9% of corporate board seats in 2021 (Securities Commission Malaysia, 2021). This gap reflects systemic barriers rooted in cultural norms that prioritize women's domestic roles over professional ambitions, reinforced by patriarchal traditions and collectivist values (Hecker, 2024). Women displaying emotions like passion or frustration are often judged as unprofessional, while men exhibiting similar behaviors are seen as authoritative, creating a gendered double standard (O'Connor, 2024).

This double standard undermines SDG 5's goals, particularly Target 5.1 (ending discrimination) and Target 5.5 (ensuring women's leadership participation). The Malaysian government's target of 30% women on corporate boards by 2020 was unmet, highlighting the persistence of structural and cultural obstacles. This study addresses the research question: How do gender-based emotionality stereotypes affect women's leadership advancement and Malaysia's progress toward SDG 5? Using a mixed-methods approach, it combines quantitative surveys of 300 Malaysian professionals with 20 semi-structured interviews to explore perceptions of emotionality and leadership. The research identifies cultural, organizational, and internalized barriers and proposes strategies to foster gender-equitable leadership, contributing to Malaysia's SDG 5 trajectory and the global discourse on gender equality in multicultural contexts.

The study's significance lies in its focus on Malaysia's unique cultural landscape, where Islamic, Confucian, and patriarchal norms intersect to shape gender roles. By examining how emotionality stereotypes operate within this context, the research offers insights into dismantling barriers to women's leadership. It also aligns with prior discussions on systemic barriers in professional settings, emphasizing the need for culturally sensitive interventions to promote equality (Tabassum & Nayak, 2021). The findings aim to inform policymakers, organizations, and advocates working toward inclusive leadership and sustainable development.

Literature Review

The literature studies aim at discussing the concepts and relationship between gendered stereotypes in leadership. This focuses on the stereotypes projected to females in organizations.

Gender Stereotypes and Leadership

Gender stereotypes categorize traits as masculine (e.g., assertiveness, independence, competitiveness) or feminine (e.g., empathy, nurturing, emotionality), with leadership roles historically aligned with masculine attributes (Zeala, 2024). The lack of fit model postulated by Robinson (2025) stipulates that women are not encapsulated as being fit to be leaders because of the mismatch between the stereotype of femininity and leadership stereotypes symbolizing decisiveness and control. The role congruity theory also suggests that Islamophobia toward the female leader exists when the gender role had to be communal and

nurturing is on conflict with norms of leadership which merge with agency and power (Xiu, 2025). This inconsistency results in prejudicial assessment in which women must work within a very thin scale of behavior that places them in competent judgments and in most cases becoming masculine in order to achieve the standards of the masculinity traits.

Such incongruity is enhanced in Malaysia by cultural factors. Collectivism values that are Malay, Chinese, and Indian oriented uphold group harmony and traditional gender roles where women are caregivers and breadwinners and men are breadwinners (Von Wong, 2023). Muslim culture, which influences a considerable part of the Malaysian social environment, tends to be viewed as favoring the privacy and the housewife role of women, which further restricts the ability to aspire to leadership positions (Irawan et al. 2024). Among the dominating lessons of Confucianism which the Chinese community embraced, one relegates hierarchical gender role with the emphasis on men as potential leaders by responsibilities. These cultural dynamics create societal expectations that women prioritize family over career, making leadership roles seem less attainable or socially acceptable.

Moreover, gender stereotypes are internalized, leading to self-limiting behaviors. Mohiuddin (2024) describes this as stereotype threat, where women internalize societal biases, reducing their confidence and willingness to pursue leadership. In Malaysia, this is evident in women's reluctance to negotiate promotions or assert authority, fearing backlash for defying feminine norms (Suleman et al. 2021). These internalized barriers, combined with external biases, create a glass ceiling that limits women's access to leadership, undermining SDG 5's goal of equal participation in decision-making (Target 5.5).

Emotionality and Leadership Perceptions

The stereotype that women are "too emotional" to lead is rooted in gendered emotional display rules, which expect women to express warmth and men to exhibit stoicism (Chalmers, 2021). Emotionality is often equated with irrationality or weakness in leadership contexts, particularly for women, who face harsher scrutiny for displaying emotions like anger, sadness, or even passion (Roy, 2022). Block et al. (2022) found that women leaders expressing anger are perceived as less competent than men, whose anger is interpreted as strength or authority. This double bind forces women to suppress emotions to appear professional, yet suppression may lead to perceptions of coldness, misaligning with feminine expectations of warmth and empathy.

Paradoxically, emotional intelligence—encompassing empathy, relationship-building, and self-awareness—is increasingly recognized as essential for effective leadership (Goleman, 1995). Transformational leadership based on the communication of inspiration, cooperation, and an emotional bond is more aligned with stereotypically feminine characteristics of community (Robinson, 2025). Meta-analysis demonstrates that women tend to exceed in transformational leadership since they can engage emotional intelligence, ensuring the cohesiveness of a group, innovativeness, and the welfare of employees (Vijai, 2025). Yet, these advantages are obscured by the stereotype of emotionality as a feminine weakness, thereby causing a gap between the excellence of women leaders and representation in current society.

Cultural preference of emotional reserve in professional environments of Malaysia intensifies prejudices against emotional expressions of women. Considering the example, when a woman

expresses passion in a boardroom she can be considered too emotional whereas the equivalent activity in a man is regarded as resolution as a leader (Sodhi, 2021). This discrimination is worsened by the fact that Malaysia is a collectivist society sanctioning peace and frowning upon actions seen as disruptive particularly as the emotion portrayed by a woman is again punished. The paradox is stark: while emotional intelligence is valued in modern leadership paradigms, its association with femininity undermines women's credibility, limiting their advancement.

In addition, study indicates that the expression of female emotions is more policed than men at all levels of leadership, including the middle management position and those in the executive positions (Tan & Rahim, 2023). Such divergent expectations may lead to self-monitoring mechanisms internalization, which lowers confidence, and supplies less true leadership expression. When women leaders are pressured to suppress or control their expressions to adhere to male ideals of leadership, they are deprived of the entire platform of expressions which builds connection and involvement with teams. Accordingly, breaking these stereotypes based on emotionality will not only be a fair estimate to reach but a condition of pre-qualification to reach the potential of leadership in Malaysia according to SDG 5.

SDG 5 and Malaysia's Context

SDG 5 calls for ending gender-based discrimination (Target 5.1), ensuring women's full participation in leadership and decision-making (Target 5.5), and adopting policies to promote gender equality (Target 5.c). Malaysia has made progress in women's workforce participation, with women constituting 38.2% of the labor force in 2022 (Department of Statistics Malaysia, 2022). However, leadership representation remains low, with women holding only 24.7% of senior management roles and 17.9% of corporate board seats in 2021 (Securities Commission Malaysia, 2021). The government's target of 30% women on corporate boards by 2020 was unmet, reflecting systemic barriers in implementation.

Cultural norms play a significant role in these disparities. Malaysia's collectivist culture, influenced by Islamic, Confucian, and patriarchal values, reinforces traditional gender roles, portraying women as nurturing and men as authoritative (Abdullah et al., 2016). These norms intersect with organizational practices, such as biased hiring and promotion criteria, which favor men perceived as "rational" or "decisive" (Tabassum & Nayak, 2021). As one example, there is the tendency to overlook the women in appointments applicative of strategic thinking or hardness (where evidence of their capability in such areas can be seen) (Davis, 2025). Women also do not find it easy to get access to leadership due to the absence of mentorship and the male-dominated networks (Thelma & Ngulube, 2024).

The situations are the same across the world where collectivist societies, such as those in South Asia do not promote women as leaders mainly due to cultural expectations of their roles at home (Saeed et al., 2022). Nevertheless, such organizations and industries as hospitality show that androgynous leadership, which consists of a combination of masculine and feminine qualities, improve the performance of the organizations, and this aspect can be emulated in the Malaysian environment (Xiong et al., 2022). It is essential to address emotionality stereotypes in order to meet SDG 5 because women tend to be true leaders of inclusive and sustainable developments (UNWTO, 2019). The situation in Malaysia is multicultural in nature and

necessitates specific interventions taking into consideration combination of cultures in the country and their compliance with the global agenda concerning gender equality goals.

Empirical Evidence and Methodology

The interactions of culture and stereotypes restricting women in their leadership have been identified by empirical studies in Malaysia. According to Sung (2022), cultural values, which put a premium on family function, form a glass ceiling, which does not allow women to reach senior jobs. The interpretation of Islamic norms has been observed to accord precedence to domestic roles of women giving such perceptions at the work place (Antasari, 2021). These barriers are facilitated by organizational biases, including male-dominated networks and the absence of mentorship (Thelma & Ngulube, 2024). Quantitative evidence proves that the process takes place too slowly because of the opposition to quotas and the presence of biases in the selection (Securities Commission Malaysia, 2021). According to the qualitative research, the women are asked to exist under scrutiny due to the actions that would be accepted by men, like the confident decision-making or response to their emotions (Tabassum & Nayak, 2021).

This study employed a mixed-methods approach to explore emotionality stereotypes. A purposive sample of 300 professionals (150 men, 150 women) aged 25–55 from Kuala Lumpur, Penang, and Johor Bahru was surveyed using adapted scales from Brescoll (2016) and Koenig et al. (2011) to measure perceptions of emotionality and leadership suitability. The survey included 30 Likert-scale items assessing beliefs about women's emotionality, leadership competence, and barriers to advancement. Twenty semi-structured interviews (10 men, 10 women) with managers explored lived experiences, focusing on gender stereotypes, emotionality perceptions, and SDG 5 barriers. Interviews were conducted in English and Malay, lasting 45–60 minutes.

Quantitative results showed that 71% of respondents viewed women as more emotional than men, with 57% believing this reduces leadership suitability ($\beta = -0.39$, $p < 0.01$ for women; $\beta = 0.06$, $p = 0.52$ for men). Women reported emotional displays harming career prospects (65% vs. 46% for men). Notably, 74% valued emotional intelligence in leadership, highlighting a paradox. Qualitative themes included cultural reinforcement of stereotypes, organizational biases favoring men, and women's internalized self-censorship, all impeding SDG 5 progress.

Strategies to Address Stereotypes

Overcoming gender-based stereotypes—particularly the perception that women are “too emotional” to lead—requires a multidimensional strategy that operates at cultural, institutional, and interpersonal levels. One of the most immediate interventions is the implementation of diversity, equity, and inclusion (DEI) training across public and private organizations. Such training should target unconscious biases and help reframe emotionality not as a weakness but as a leadership asset closely tied to emotional intelligence and transformational leadership styles (Tabassum & Nayak, 2021). Organizations need to learn how to embrace empathy, communicating with others, and cooperation as opposed to disregarding emotional expressiveness, which are features that are labeled as emotional but key to inclusive leadership.

Another key activity is mentorship and sponsorship programs. Through access to networks with more power and influence, mentors can do more than seek guidance on the career but also

advocate in courts of decision (Thelma & Ngulube, 2024). Through such programmes, women gain leadership identity and visibility which normalize female power. Notably, such initiatives do not have to disregard men; involving male allies in gender equity discussions through conversation encourages a spirit of shared responsibility and sweeps away established patriarchal ideologies (Guthridge et al., 2022).

Policy within the institution is very vital in materializing these changes in culture. The 30% voluntary limit in having females in business corporate boards set by Malaysia needs to be raised to mandatory quotas with open and visible appointment and the threat of sanctions of non-compliance (UNWTO, 2019). These structural changes, which have proven to not hurt performance, including the successful example of Norway quota system, show that gender-balanced leadership teams do not hurt performance (Seierstad et al., 2023).

There should also be the use of the public awareness campaigns to alter the image of female leaders. The stereotypes and the rest of the future leaders can be overcome by respectful media coverage, narration, and illustration of emotionally intelligent women leaders. The mention of the emotional intelligence as one of the assets of the leadership would make the binary thinking where the gender of the leaders would be considered the male gender and exclusively rational.

Malaysia has the option of using androgynous model of leadership model that is in use in its hospitality industry which encompasses agentic (assertive), and communal (nurturing) qualities to achieve successful leadership (Xiong et al., 2022). This paradigm questions the gender conventionalism and puts up a culturally-acceptable mode of restructuring leadership in the Malaysian landscape. Nevertheless, the measures should be culturally aware of the local traditions but comply with SDG 5 global vision to be equally sensitive to gender equality without forcing western-centered standards.

Conclusion

This study reveals that the stereotype of women as “too emotional to lead” significantly hinders their leadership advancement and Malaysia’s SDG 5 progress. Quantitative data confirmed a negative correlation between perceived emotionality and women’s leadership suitability, while qualitative insights highlighted cultural norms, organizational biases, and internalized stereotypes as key barriers. Despite emotional intelligence being valued, women face a double bind, penalized for emotional displays deemed acceptable in men. To align with SDG 5, Malaysia must implement diversity training, mentorship programs, and enforce policies like the 30% board quota. Reframing emotionality as a leadership asset, inspired by androgynous models, can shift perceptions. Future research should explore rural perspectives and longitudinal interventions, despite limitations like urban focus and potential self-report bias. Addressing these stereotypes is critical for gender equality and inclusive development.

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EXAMINING THE TEACHING COMPETENCIES OF ELEMENTARY TEACHERS AND THEIR RELATION TO THE MATHEMATICS PERFORMANCE OF ELEMENTARY STUDENTS

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Abstract: *The teachers' role is to influence, engage, commit, and support the students toward a positive outlook of Mathematics as a discipline. This suggests that students' understanding, acknowledgment, and achievement in the discipline primarily depend on the teachers. Considering teachers' roles and students' achievement, the study aimed to determine the teaching competencies affecting teachers' performances and their association with the students' mathematics performance. The study utilized a survey questionnaire, and the obtained data were analyzed using descriptive and inferential analysis. The respondents involved 51 elementary school teachers from Grades 4 – 6 in Tinoc District, Tinoc, Ifugao, Philippines. Results showed that the teachers always observed the teaching competencies in their Mathematics teaching. Conclusively, assessment of learning was the most observed competency, followed by personality traits, teaching pedagogy, and instructional material utilization. Results also showed no significant difference in the teaching competencies based on demographic factors. Moreover, results indicated a lower average Mathematics performance of the elementary students. Consequently, further analysis revealed a non-association between the teaching competencies and the students' mathematics performance. These results infer that the students' mathematical ability was at the beginning level, and mathematical concepts were not fully grasped. It also indicates that teachers were not able to affect the students' performances regardless of always observing the competencies. Nonetheless, a firm view of the teacher's ability to impact the students' understanding and achievement in mathematics is still sustained.*

Keywords: *Mathematics, Mathematics Performance, Mathematics Teaching, Elementary Students, Teaching Competency*

Introduction

Mathematics is regarded as the queen and servant of sciences. It is one of the serving foundations for science and technology and the progress of society (Li & Schoenfeld, 2019). Though Mathematics is abstract knowledge (Yeh et al., 2019), it stands alone among other disciplines (Diedrichs, 2019). It can be viewed as a universal language since its contexts are the same across nations, and no cultural boundaries and viewpoints can limit it (Parker Waller & Flood, 2016). In this 21st century, students are encouraged to be scientific, critical, and analytical (Abreh et al., 2018). This is where mathematics offers a groundwork for students' cognition, skills, and development, making it a compulsory part of the curriculum.

Despite the significance of mathematics, most students perceive it as a naturally challenging (Jameel & Ali, 2016; Michael, 2015). Indeed, the result of the Programme for International

Student Assessment (PISA) in 2015 disclosed that the United Kingdom (UK) performed at the lowest level of proficiency in Mathematics compared to some Asian countries (Blausten et al., 2020). The United States of America (USA) also reported that high-achieving Mathematics students were still below among the industrialized nations. This is despite the fact that USA is among the leading countries in its expenditures for the K to 12 Curricula (Hanushek et al., 2010). During the PISA 2012, Japan ranked second in Mathematics performance (Organization for Economic Cooperation and Development, 2012), emphasizing problem-solving and adopting constructive pedagogy (Gardner, 2016). In China, Mathematics was further reinforced at the early beginning of the 21st century when the country highlighted its practical applications by emphasizing the association between the subject and real-life (Tang et al., 2021). Singapore maintains high Mathematics performance on international tests because its initiatives and policies are guided by research evidence, educational systems of other countries, and supportive leaders (Kaur, 2014).

The focus of Mathematics in Philippine education includes facilitating contributions to productive life activities and providing a way of making sense of the world. However, it is alarming that most Filipino students' actual achievement in Mathematics does not correspond to their intellectual capabilities despite being average or above average (Suan, 2018). It implies that the students demonstrate exemplary performance in knowledge attainment but are significantly low in higher-order thinking skills. During the Trends in International Mathematics and Science Study (TIMSS) test in 2003, the Philippines ranked 67th in Mathematics and Science, while it ranked 79th in 2016-2017. These results indicate that the country had low performance in these areas over the years (Dela Cruz, 2017).

The latest survey of PISA 2018 showed that Filipino students ranked second to last in Mathematics. This highlights what many experts have long believed—the country's education system is in crisis. Correspondingly, it was revealed that the Mathematics performance of Filipinos is at the beginning level (Cordova & Tan, 2018), indicating that the country's K to 12 competencies is not fully grasped. Hence, the Philippine K to 12 Curriculum is seen as inefficient and needs to be reviewed (Torregoza, 2022). Similarly, the Philippine National Achievement Test (NAT) results from 2006-2013 exemplified a national average indicating low mastery. For instance, the result of NAT in the previous years showed low performance of Bicolano students in Mathematics (Estonato et al., 2017). The Department of Education (DepEd) supposed that the PISA results reflect the students' performance in NAT, accentuating the urgency to address issues and gaps to attain quality basic education. In the Cordillera Administrative Region (CAR), the proficiency level in Mathematical literacy of students is only 46.98% (DepEd, 2019).

The low Mathematics performance may be attributed to the non-exposure of students to the beauty and application of Mathematics in real life. This makes students perceive it as a dry subject, void of real-world applications (Noorani et al., 2010), and irrelevant outside school (Hunter, 2021). However, the students' perceptions may change depending on the teachers' role in delivering Mathematics instruction, manifested through teaching competencies. It is acknowledged that teaching competencies significantly impact students' academic performance (Waseka et al., 2016), and it has a powerful influence on the students' attitude toward a subject (Sinay & Nahornick, 2016). After all, individual teachers and their educational practices can enhance or negate Mathematics. It depends on the teacher's view of the subject and their capabilities, dramatically affecting the students.

Literature Review

Teaching competencies are the knowledge and skills that enable a teacher to be successful, including effectiveness, lesson preparedness, and classroom management. It may involve more knowledge than skill or attitude, whereas others may involve more skill or performance-based. Moreover, the teachers' competencies have been broadening concerning reform studies in education (Selvi, 2012). These competencies are observable and measurable, making it possible to assess a specific competency based on the teacher's performance (Nesipbayeva, 2012).

Personality traits are one of the teaching competencies. It describes a teacher's attitudes, behaviors, and social traits toward the students (Khan et al., 2016). Teachers with firmer self-efficacy beliefs showed a higher level of effort and persistence with students (Nurlu, 2015), which can create positive interactions and relationships in the classroom. Teachers who maintain positive mathematical attitudes can affect the students' perceptions (Sinay & Nahornick, 2016). Building effective relationships is an effective means to improve emotional and social engagements between teachers and students (Ibad, 2018).

Teaching pedagogy pertains to attributes and characteristics that aid a teacher in transferring knowledge among the students (Cankoy, 2010). For a Mathematics teacher to be effective, a complete comprehension of teaching pedagogy must be done (Morales et al., 2003). Being able to simplify mathematical concepts enabling the students to learn, manifests teacher with good teaching pedagogy. It can affect the students' understanding and avoid difficulties (Hill et al., 2005). Teachers may also allow collaboration among the students to promote active listening and sensemaking, including enhancing the students' study skills (Hunter, 2021).

The approach of instructional materials (IMs) utilization positively impacts the development of long-term mastery skills in Mathematics (Adipo, 2015). Students taught with proper IMs performed better (Akpan & Okoli, 2017). In the same way, there was a significant difference in the academic performance of students in Mathematics between those who experienced computer-aided instruction and those who were taught using the traditional method (Lashley, 2017). Additionally, the use of teaching aids such as educational games (Kebritchi, 2008) is instrumental in the development of mathematical skills and abilities and the learning habits of the students.

Assessment of learning describes the teacher's ability to utilize assessment methods to determine learning needs and may influence the students' grades (Buhagiar & Murphy, 2008; Pang, 2022). It can also be viewed as helping students in their quest for knowledge, monitoring progress, making teaching decisions, and enhancing the curriculum (Jimaa, 2011). However, it is noted that most teachers spend much time focusing on summative assessment when what matters is conducting diagnostic and formative assessments (Dabell, 2021). As such, teachers need to take an active role in making decisions about the purpose of the assessment and the content being assessed.

The relationship between teachers' competencies and students' academic performance is strongly associated with predicting mathematics achievement (Hill et al., 2005; Piopunik et al., 2014). Teachers of schools offering Mathematics curricula equipped with appropriate teaching strategies that promote critical thinking and problem-solving skills are perceived by students

as the most influential factor in satisfactory academic performance (Pascual, 2014). Studies revealed that gender does not affect the effectiveness of Mathematics teachers. Although, some studies found that male teachers were more effective in teaching, whereas females were average. In contrast, other studies revealed that females were more effective than males (Islahi & Nasreen, 2013).

Accordingly, studies indicated that the teachers' age influenced the students' achievement. However, teachers' age needs to account more for the variation in students' performance (Odiembo & Simatwa, 2014). This suggests that teachers' age does not significantly predict students' Mathematics performance (Waseka et al., 2016). Conversely, teachers above 30 tend to make decisions in teaching mathematical concepts (Chiang & Wang, 2014). A 2016 report from the National Assessment of Educational Progress (NAEP), the largest nationally recognized assessment of student performance, indicated that teachers who hold master's degrees produce students who consistently outperform students of teachers with only a bachelor's degree. It reflects that attaining a master's degree or higher will positively affect students' achievement in Mathematics (Horn & Jang, 2017). Moreover, having a master's or doctorate impacts the teachers' view of themselves as educators (Dial, 2008; Kowalczyk-Walędzia et al., 2017; Tucker & Fushell, 2013). In general, teachers with more than 20 years of experience were more effective but were less effective than those with five years of experience (Rice, 2010). It was found that students with teachers with more years of experience in any level of education showed higher post-test Mathematics scores (Clotfelter et al., 2007). Similarly, teachers' effectiveness increases with experience, especially in the early years of their profession under favorable circumstances, and continues to increase over their entire career (Avvisati, 2018). More experienced teachers support significant student learning, their colleagues, and the school.

Research Aim and Questions

With the seemingly continuous low performance of students in Mathematics and the capability of the teachers to influence the students, there is a further need to understand how the students' performances relate to the teachers' educational practices. This study is then developed to assess teaching competencies and their relation to students' academic performance. Specifically, the study aims to answer the following:

1. What are the teaching competencies employed by elementary school teachers in Mathematics teaching?
2. Are there significant differences in the teaching competencies according to demographic factors of the elementary school teachers?
3. What is the academic performance in Mathematics of the elementary school students?
4. Is there an association between the teaching competencies and the students' mathematics performance?

Methodology

Research Design

The study used quantitative approach in collecting and analyzing data. Descriptive-survey, inferential, and correlational designs were utilized to attain the research aim and answer the research questions. Descriptive-survey was used to explore the characteristics of the sample population (Anastas, 1999) in terms of teaching competencies and the elementary school

students' academic performance in Mathematics subject. The study used a modified questionnaire that was tested to be valid and reliable. Inferential analysis was used to examine the significant differences (Trochim, 2023) in the teaching competencies according to the teachers' gender, age, highest earned degree, and years in service. On the other hand, correlational analysis was used to study the association (Prematunga, 2012) between the teaching competencies and the students' mathematics performance. Further, total enumeration among the sample participants was used. The data collection process was conducted for four months, that is, from June to September 2020.

Participants

The participants involved 51 elementary school teachers in Tinoc District, Tinoc, Ifugao, Philippines. The study only considered the Grades 4 – 6 Mathematics teachers among the state-owned or public elementary schools in the district. This is in the interest of understanding how the students' performances relate to the teachers' educational practices in the district where one of the researchers is employed. Though the study involved total enumeration, the small number of involved teachers reflected the small populations of elementary school students which consisted of one or two class sections during the school year 2019 – 2020. The participants came from the 15 different elementary schools and one central school in Tinoc District. Table 1 shows the data on the distribution of the teacher-respondents according to their demographic factors. In terms of gender, there are more female teachers compared to the male group. Regarding age, the largest population is 20 – 30 years old, then 41 – 50 years old, 31 – 40 years old, and the minor population is 51 – 60 years old. As for the highest earned degree, there are more teachers with a bachelor's degree compared to a master's degree. Lastly, teachers with 1 – 10 years of service have the largest population, followed by 11 – 20 years, 21 – 30 years, and 31 – 40 years of service.

Table 1. Distribution of the participants according to demographic factors

Profiles		N	Percentage
1. Gender	a. Female	43	84%
	b. Male	8	16%
2. Age (in years old, y/o)	a. 20-30	17	33%
	b. 31-40	14	28%
	c. 41-50	16	31%
	d. 51-60	4	8%
3. Highest earned degree	a. Bachelor's	33	65%
	b. Master's	18	35%
4. Years in service (in years)	a. 1 to 10	30	59%
	b. 11 to 20	16	31%
	c. 21 to 30	4	8%
	d. 31 to 40	1	2%

Instrument and Procedures

A 15-item structured questionnaire designed explicitly for Mathematics subject by Balbalosa (2010) was adopted. It was modified to befit the conditions of the study and had an inter-rater reliability of 95%. The modified questionnaire was found reliable through pilot testing, with an overall Cronbach's Alpha of .819, signifying an excellent internal consistency among the

items. Moreover, the questionnaire was divided into two parts. The first part included demographic factors about gender, age, highest earned degree, and years in service. The second part consisted of the 15 items referring to teaching competencies that were classified into four categories: personality traits, teaching pedagogy, IMs utilization, and assessment of learning.

Before the commencement of data gathering, permissions were sought from the department officials, principals, and school heads of the Tinoc District. Likewise, permissions were also sought from the class advisers requesting to collect data of Grade 4-6 students' academic performance in Mathematics subjects. After all permissions were granted, consent forms were forwarded to the respondents, informing the purpose of the study and their voluntary participation. The researchers personally gathered the data to attain a higher percentage of the return of answered questionnaires. The results were then tabulated, analyzed, and interpreted, which served as the basis for coming up with the conclusions.

Data Analysis

The 4-point Likert scale denoted the level of teaching competencies that reflected the teachers' performance. The statistical limits shown in Table 2 serves as the equivalent range of scores describing the results of the computed weighted mean values. The weighted means were interpreted as Always (A), Sometimes (So), Seldom (Se), and Never (N) practiced.

Table 2. Distribution of Equivalent Range of Scores

Numerical Rating	Statistical Limits	Descriptive Equivalent
4	3.26 – 4.00	Always (A)
3	1.76 – 2.50	Sometimes (So)
2	1.76 – 2.50	Seldom (Se)
1	1.00 – 1.75	Never (N)

On the other hand, the students' Mathematics performances were determined through Mean Percentage Scores (MPS). The MPS indicates the ratio between the number of correctly answered items in a test and the total number of items. Table 3 shows the distribution of scores divided into four equal percentages: Superior, Upper Average, Lower Average, and Poor (DepEd, 2015).

Table 3. Range Distribution of Mean Percentage Scores

Quartile Distribution	Descriptive Equivalent
76 – 100%	Superior
51 – 75%	Upper Average
26 – 50%	Lower Average
0 – 25%	Poor

In analyzing the data, Analysis of Variance (ANOVA) was used to test if there was a significant difference in the level of teaching competencies that affected the teachers' performance when grouped according to their demographic profiles. Then, the Pearson-product-moment correlation (PPMC) was employed to test the association between the teachers' competencies and the students' MPS.

Results

Table 4 shows the assessment of learning ($M = 3.62$) as the most competency affecting the teaching performance in Mathematics. Personality traits ($M = 3.59$) ranked second, while teaching pedagogy ($M = 3.53$) and IMs utilization ($M = 3.28$) are ranked third and fourth, respectively. It is also identified that teachers' competencies are described as always observed, regardless of rank.

Table 4. Teaching Competencies Affecting Teaching Performance

Teaching Competencies	M	Descriptive Equivalent	Rank
1. Personality traits	3.59	Always (A)	2
2. Teaching pedagogy	3.53	Always (A)	3
3. IMs utilization	3.28	Always (A)	4
4. Assessment of learning	3.62	Always (A)	1

As gleaned in Table 5, the result shows that there is no significant difference at $p < .05$ level in the perceived effect of personality traits ($f = .31$, $p = .820$), teaching pedagogy ($f = .09$, $p = .772$), IMs utilization ($f = 2.78$, $p = .102$), and, assessment of learning ($f = .21$, $p = .646$) in the teachers' performance according to gender.

Table 5. Teaching Competencies Affecting Performance according to Gender

Teaching Competencies	Male		Female		f-value	p-value
	M	DE	M	DE		
1. Personality traits	3.67	A	3.57	A	.31 ^{ns}	.820
2. Teaching pedagogy	3.50	A	3.53	A	.09 ^{ns}	.772
3. IMs utilization	3.10	So	3.32	A	2.78 ^{ns}	.102
4. Assessment of learning	3.58	A	3.63	A	.21 ^{ns}	.646

Note: DE = Descriptive Equivalent; A = Always; So = Sometimes; Se = Seldom; N = Never;

* = significant ($p < .05$); ns = not significant ($p > .05$)

When it comes to the teachers' age, results in Table 6 shows no significant difference, also at $p < .05$ level, in the perceived effect of personality traits ($f = .22$, $p = .883$), teaching pedagogy ($f = 1.31$, $p = .282$), IMs utilization ($f = .25$, $p = .863$), and assessment of learning ($f = .77$, $p = .515$).

Table 6. Teaching Competencies Affecting Performance according to Age

Teaching Competencies	20-30 y/o		31-40 y/o		41-50 y/o		51-60 y/o		f-value	p-value
	M	DE	M	DE	M	DE	M	DE		
1. Personality traits	3.59	A	3.62	A	3.56	A	3.58	A	.22 ^{ns}	.883
2. Teaching pedagogy	3.42	A	3.60	A	3.57	A	3.54	A	1.31 ^{ns}	.282
3. IMs utilization	3.31	A	3.32	A	3.24	S	3.21	S	.25 ^{ns}	.863
4. Assessment of learning	3.61	A	3.71	A	3.58	A	3.54	A	.77 ^{ns}	.515

Note: DE = Descriptive Equivalent; A = Always; So = Sometimes; Se = Seldom; N = Never;

* = significant ($p < .05$); ns = not significant ($p > .05$)

Results in Table 7 reveals a significant difference at $p < .05$ level in the effect of teaching pedagogy ($f = 8.43$, $p = .005$) on teaching performance considering the highest earned degree of the teachers. On the other hand, there is no significant difference, also at $p < .05$ level, in personality traits ($f = 1.38$, $p = .246$), IMs utilization ($f = .82$, $p = .369$), and assessment of learning ($f = .01$, $p = .941$).

Table 7. Teaching Competencies Affecting Performance according to Highest Earned Degree

Teaching Competencies	Bachelor's Degree		Master's Degree		f-value	p-value
	M	DE	M	DE		
1. Personality traits	3.57	A	3.63	A	1.38 ^{ns}	.246
2. Teaching pedagogy	3.45	A	3.67	A	8.43*	.005
3. IMs utilization	3.25	So	3.34	A	.82 ^{ns}	.369
4. Assessment of learning	3.63	A	3.62	A	.01 ^{ns}	.941

Note: DE = Descriptive Equivalent; A = Always; So = Sometimes; Se = Seldom; N = Never; * = significant ($p < .05$); ns = not significant ($p > .05$)

As seen in Table 8, there is no significant difference at $p < .05$ level in the perceived effect of personality traits ($f = .18$, $p = .910$), teaching pedagogy ($f = 1.22$, $p = .312$), IMs utilization ($f = .01$, $p = .998$), and assessment of learning ($f = .05$, $p = .983$) in the performance of teachers when grouped according to years in service.

Table 8. Teaching Competencies Affecting Performance according to Years in Service

Teaching Competencies	1-10 yrs		11-20 yrs		21-30 yrs		31-40 yrs		f-value	p-value
	M	DE	M	DE	M	DE	M	DE		
1. Personality traits	3.58	A	3.60	A	3.54	A	3.67	A	0.18 ^{ns}	.910
2. Teaching pedagogy	3.47	A	3.61	A	3.63	A	3.50	A	1.22 ^{ns}	.312
3. IMs utilization	3.28	A	3.29	A	3.29	A	3.33	A	0.01 ^{ns}	.998
4. Assessment of learning	3.63	A	3.61	A	3.58	A	3.67	A	0.05 ^{ns}	.983

Note: DE = Descriptive Equivalent; A = Always; So = Sometimes; Se = Seldom; N = Never; * = significant ($p < .05$); ns = not significant ($p > .05$)

Table 9 summarizes the Mathematics MPS of 231 students from Grades 4, 5, and 6. The results show that all grade levels obtained a lower average MPS, thus, yielding an overall mean of 45.80%, indicating a lower average level of Mathematics performance.

Table 9. MPS in Mathematics of the Students

Grade Levels	N	MPS	Descriptive Equivalent
4	73	45.75%	Lower Average
5	79	41.96%	Lower Average
6	79	49.69%	Lower Average
Total/Mean	231	45.80%	Lower Average

Lastly, the result of the PPMC shown in Table 10 indicates no significant association at $p < .05$ level between the perceived level in all the teaching competencies, that is, personality traits ($r = -.2128$, $p = .1338$), teaching pedagogy ($r = -.2130$, $p = .1334$) IMs utilization ($r = -.2166$, $p = .1268$), and assessment of learning ($r = -.2415$, $p = .0878$) that affects the teachers' performance and the Mathematics performance of students. It can also be seen that correlational r -values are negative, indicating inverse relationship between the teaching competencies and the students' mathematics performance. However, further analysis of the p -values indicates shows non-association between the two variables.

Table 10. Association between the Teaching Competencies and Students' Mathematics Performance

Teaching Competencies	r-value	p-value
1. Personality traits	-.2128 ^{ns}	.1338
2. Teaching pedagogy	-.2130 ^{ns}	.1334
3. IMs utilization	-.2166 ^{ns}	.1268
4. Assessment of learning	-.2415 ^{ns}	.0878

Note: * = significant ($p < .05$); ns = not significant ($p > .05$)

Discussion

The identification of assessment of learning as the most competency that affected the teachers' performance in Mathematics (Table 4) recognizes the positive effect of assessment on the quality of learning (Buhagiar & Murphy, 2008; Jimaa, 2011). Through varied assessments, teachers could monitor students' progress (Buhagiar & Murphy, 2008), help the students to learn, and aids in decision-making to enhance instruction (Jimaa, 2011; Pang, 2022). It suggests that the teachers developed scoring guides/rubrics with the students allowing sufficient time for instruction. Feedback was used to communicate assessment results to the students, which helped to identify the students' strengths and weaknesses (Pang, 2022).

Results points-out that gender does not affect teaching competencies and effectiveness (Table 5). This is in contrast to studies identifying that male teachers were more effective in teaching, or that female teachers were more effective than males (Islahi & Nasreen, 2013). Though the results of this study indicate no relationship between teaching competencies and gender, there were still variances in the result. The result shows that female teachers scored higher in the assessment of learning while male teachers scored higher in personality traits. This exemplifies that female teachers prefer to communicate results to the students, while male teachers encourage them to participate in classes. Moreover, the groups of male and female teachers obtained similar results in teaching pedagogy and IMs utilization, indicating that both groups have mastery of the subject matter and provided practical and concrete mathematical examples.

It was indicated that age does not affect the teachers' perception of the competencies affecting their performance (Table 6). It confers that teachers' age does not significantly affect the students' academic performance (Waseka et al., 2016). However, it disagrees with results indicating that teachers' age influences students' achievement (Chiang & Wang, 2014; Odiembo & Simatwa, 2014). Additionally, assessment of learning was most observed by teachers aged 20-50 years old, while personality traits affected those 51-60 years old. This signifies that the teachers aged 20-50 years were better at providing feedback, returning results to the students, and using varied assessments. On the other hand, the teachers who were 51-60

years old preferred to impose proper discipline and needed to be more lenient in following the rules. The results also indicate that teachers seldom used IMs regardless of age. However, part of the result suggests a shift from traditional to technology-based IMs recognizing that it can positively affect students' Mathematics performance (Lashley, 2017).

Regardless of educational attainment, the teachers share the same perception among the teaching competencies (Table 7). This contrasts the positive correlation between the highest earned degree and students' Mathematics performance. It disagrees that the higher the teachers' educational attainment, the better the students' performance (Dial, 2008; Horn & Jang, 2017; Kowalczyk-Walędzia et al., 2017; Tucker & Fushell, 2013). This also does not reflect the NAEP 2016 report indicating that teachers with master's degrees produce better-performing students (Horn & Jang, 2017). Furthermore, results disclose the presence of a significant difference in teaching pedagogy among the teachers with master's degrees. This suggests that they were more organized in presenting subject matters, updated with the present trends relevant to the subject matter, able to use various strategies, IMs, and techniques, and related the lessons to students' lives and needs. Nevertheless, personality traits, IMs utilization, and learning assessment show no significant relationship with teachers' performance regardless of their highest earned degree.

Results reflect the non-significance among the teaching competencies according to years in service (Table 8). This contrasts with studies revealing the association between the teachers' years of service and the students' achievement. It does not agree with the results that long years of experience in teaching mean better students' performance (Avvisati, 2018; Clotfelter et al., 2007; Rice, 2010). Regardless of the years in service, the competencies in the performance of teachers are rated the same. It generally suggests that the teachers maintained a good relationship with the students, clearly explained the lesson's objectives, used practical and concrete examples, and developed scoring guides/rubrics with the students.

Based on the findings (Table 9), the mathematics performance of students is lower average. This result highly reflects the beginning-level performance of Filipino students in Mathematics (Cordova & Tan, 2018; Dela Cruz, 2017). The finding also parallels the results of national assessments (DepEd, 2019; Estonato et al., 2017) and international tests that were conducted. The result reflects the students' low proficiency level and low mastery of mathematical concepts among the Grade 4-6 students (DepEd, 2019). The results of related studies and the current undertaking justify the urgency to employ necessary measures to address the low performance of students and the need to help them improve their mathematical knowledge.

As determined, there is the absence of a significant relationship between the teachers' competencies and the mathematics performance of students (Table 10). Surprisingly, though the teachers always practiced the teaching competencies, these competencies did not affect the students' Mathematics performance. The result does not agree that teacher competencies are vital components (Hill et al., 2005; Piopunik et al., 2014) and can influence (Waseka et al., 2016) students' academic performance in the said subject. Furthermore, the lack of association signifies that teaching competencies did not affect and had no role in the students' academic performance. This result does not confer with the goals and objectives of content and performance standards of the learning competencies covered in the Philippine K-12 curriculum. Results suggest that teaching competencies do not affect the students' need to demonstrate understanding and appreciation of critical concepts and principles of Mathematics

as applied, using appropriate technology in problem-solving, critical thinking, communicating, reasoning, making connections, representations, and decisions in real life.

Conclusions

The teacher's role and capability are critical to motivating and honing the students' mathematical skills. This is why teaching competencies are essential and must reflect on what the teachers are expected to perform. The study unveiled that elementary school teachers always observed the teaching competencies during their Mathematics instruction, whereby the assessment of student learning was identified as most observed. Results also indicated no significant differences in the teachers' perceived effect of the teaching competencies according to demographic factors. Moreover, it was determined that elementary school students performed lower average in Mathematics. Further, the study disclosed that the teachers' competencies have no significant association with the students' Mathematics performance.

The low average performance of the students conforms with evaluations indicating that Filipino students perform at a beginning level. This may be an index of the observations that Mathematics lessons focus on broader breadth rather than depth. If this condition is not immediately addressed, students' pessimism towards the subject may linger and persist, affecting their analytical and critical development. We recommend that teachers go beyond their instructional practices and provide support through continuing professional development activities. Such activities will equip the teachers to enhance their students' mathematical knowledge and skills. Further, it is crucial for teachers to engage students to associate mathematical concepts with daily activities. Teachers must choose practical and real-life applications and tasks beyond what the students may already know and think they can do. The non-association of the teaching competencies and the students' academic performance in this study does not concur with the generally accepted principle that teachers can influence students. Nevertheless, the researchers still believe in a teacher's capability to impact the student's perspective and academic achievement in Mathematics. With varying results compared with earlier studies, the conduct of the study has limitations and does not represent the general academic population. A broader scope of the study should be undertaken.

Acknowledgment

The authors are grateful to the elementary school teachers of DepEd Tinoc District, Ifugao who participated in the conduct of the study.

Authors' contributions

All authors contributed equally to this manuscript.

Declaration of conflicting interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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PROJECT-BASED ROLE-PLAY AS A DRIVER FOR CHANGE: REDUCING ORAL COMMUNICATION ANXIETY IN ESL LEARNERS

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Abstract: *This paper examines the efficacy of a Project-Based Learning (PBL) model in mitigating oral communication anxiety among ESL learners. Traditional teaching methods often induce performance anxiety, hindering authentic language acquisition. This initiative introduces a low-stakes, technology-integrated PBL framework, where students engage in conversational and architectural tour-guide role-plays and publish their work on platforms like TikTok, fundamentally shifting the practice environment. The study utilised a mixed-methods approach to evaluate the project's impact on a student sample from the Oral Communication in English course. Data were collected via a single comprehensive post-project questionnaire. The instrument collected quantitative data on self-reported confidence and anxiety levels using a Likert scale and included qualitative open-ended questions to gather deep, experiential insights into the project's effectiveness. The findings demonstrate that the PBL framework, driven by authentic role-play activities, serves as a powerful mechanism for a transformative shift in student attitudes. Quantitative analysis showed a statistically significant increase in student confidence and a corresponding decrease in self-reported communication anxiety. Qualitative data reinforced these findings, with students specifically reporting that the activities helped them to "overcome fear and hesitation" and created a "safe space" for practice. The results indicate that this PBL model is a highly effective pedagogical tool for fostering genuine fluency and building self-esteem. By enabling the creation of new, authentic tasks, the project provides a replicable blueprint for educators seeking to address affective filters and promote a more confident, active generation of communicators.*

Keywords: *Project-Based Learning, Affective Filter, Oral Communication Anxiety, Role-Play, ESL*

Introduction

The ability to communicate in English is an essential skill for students to excel academically and professionally. In the teaching of the Oral Communication in English course, one of the primary learning objectives requires the students to speak reasonably fluently on a certain topic, which may be challenging for students with limited linguistic competence, coupled with speaking anxiety, to communicate spontaneously. Speaking anxiety is widely recognised as one of the most significant barriers to fluency among students learning English as a Second Language (ESL) or English as a Foreign Language (EFL). The fear of making mistakes while speaking the language, particularly in the classroom settings and in front of their peers, often heightens their anxiety and discourages active participation. For many students, this anxiety leads to their reluctance to engage in the speaking activities even though they genuinely want to improve their English proficiency. Horwitz et al. (1986) categorised this type of anxiety as a form of performance anxiety encompassing communication apprehension, test anxiety and fear of negative evaluation. Consequently, this anxiety not only hinders their fluency

development but also creates a mental block that prevents them from effectively applying what they have learned in communicative contexts.

Furthermore, the traditional teaching approaches often reinforce this anxiety cycle, as teachers tend to prioritise content delivery and assessing activities through high-stakes evaluation, such as oral tests or formal presentations. These practices frequently position students to assume the role of passive learners rather than active participants in the learning process. Thus, students are provided with limited opportunities for low-pressure, communicative practice that are necessary to help them overcome their fear and hesitation in speaking English.

Recognising the persistent anxiety among the students and the limitations of the traditional teaching approaches, this study explores an alternative, effective and learner-centred teaching approach to address and reduce the speaking anxiety among ESL learners. This study introduces a low-stakes, technology-integrated Project-Based Learning (PBL) framework, where students engage in role-play activities and publish their work on social media platforms like TikTok. This teaching approach aims to transform the traditional classroom from passive, teacher-centric instruction to active, student-centred and dismantle anxiety by creating a safe, low-stakes practice environment.

Literature Review

Speaking Anxiety in Second Language Learning

Speaking anxiety has long been recognised as one of the most prominent barriers to successful second language learning. Gardner and MacIntyre (1993), cited in Rafada and Madini (2017), defined language anxiety as “a feeling of apprehension that can arise from early language practice, leading to negative experiences that cause situation-specific anxiety” (p. 55). This anxiety can be attributed to several factors. Horwitz et al. (1986) identified three components of foreign language classroom anxiety, which are communication apprehension, test anxiety and fear of negative evaluation. Young (1991) expanded these sources to include personal and interpersonal anxieties, learner and teacher beliefs, teacher-learner interaction, classroom procedures, and language testing. Learners who experience high levels of anxiety often report psychological symptoms such as nervousness, self-consciousness and avoidance behaviours that eventually impede their oral performance (MacIntyre & Gardner, 1991b). Such anxiety is particularly evident in classroom situations where learners are required to speak spontaneously in front of their peers or instructors, leading to reduced participation and fewer opportunities for language practice (Young, 1991).

The Affective Filter Hypothesis

Krashen's (1982) Affective Filter Hypothesis suggests that emotional factors such as anxiety, motivation and self-confidence play a crucial role in determining the extent to which learners can acquire a second language. When anxiety levels are high, the affective filter rises, preventing input from being processed effectively. Consequently, students' linguistic competence may not translate into communicative performance, resulting in a persistent gap between knowledge and fluency. Therefore, a teaching approach that lowers the affective filter and promotes a psychologically safe learning environment is essential for addressing speaking anxiety.

Project-Based Learning

Project-Based Learning (PBL) has emerged as an innovative, learner-centred instructional model that promotes authentic learning through collaborative learning and real-world tasks. PBL is greatly influenced by the communication approach (Du & Han, 2016). Influenced by John Dewey's theory of learning by doing, PBL emphasises that learning should be more practical, encouraging students to experience the learning process through active classroom participation that simulates a real-life situation (Sapan et al., 2019). As Thomas (2000) stated that PBL emphasises active inquiry, problem-solving, creativity and allowing students to take ownership of their learning. Research has shown that PBL encourages meaningful communication, enhances learner motivation and self-confidence (Beckett & Slater, 2005; Stoller, 2006, cited in Du & Han, 2016; Putra & Prasetyo, 2025). This shows that PBL is a suitable framework for affective filter mitigation. The practicality and effectiveness of PBL have positively influenced language skills and motivation in which provide ample opportunities for students to use the target language in purposeful and contextually relevant ways, thereby bridging the gap between classroom learning and real-world communication.

Role-Play in English as a Second Language (ESL)

Role-play is a well-established pedagogical approach that aligns closely with the principles of PBL. According to Ladousse (1987), role-play allows learners to simulate real-life communicative scenarios and express themselves through assumed roles, which can mitigate the fear of personal judgment. By shifting focus from oneself to the roles, learners often experience decreased anxiety and increased spontaneity in communication. Budden (2004), cited in Moosa et al. (2025), affirmed that integrating role-play as part of the classroom activities provides experiences and opportunities for meaningful language production in a context where students can identify, respond and learn as they become more active users of the language.

Noting the usefulness of the role-play, many researchers are investigating its benefits and effectiveness in language development. A study by Nihazram and Masnan (2020) found that role-play in the early childhood ESL classroom improves the young learners' English proficiency, specifically in vocabulary, fluency and pronunciation. A similar result was also found in a study by Ahmada and Munawarah (2022), where role-play significantly improved students' fluency and willingness to speak. Moreover, incorporating role-play in the language classroom provides a stimulating and enjoyable classroom environment, which further improves the students' engagement in participating in the activity, thus helping them to build confidence in speaking the target language (Asrifan, 2022; Maldin & Sianipar, 2025; Shamsudin et al., 2023).

To sum up, the literature suggests that speaking anxiety remains a persistent obstacle in ESL learning contexts. However, Project-Based Learning, especially when combined with role-play, offers a promising solution for creating engaging and psychologically safe learning environments. By making language practice in authentic, collaborative and creative contexts, this project-based role play approach can help learners to overcome fear, increase participation and develop communication fluency and confidence.

Therefore, to evaluate the effectiveness of this low-stakes, technology-integrated project-based role-play approach in reducing students' oral communication anxiety, this study seeks to answer the following research questions:

- i) What are students' perceptions of the low-stakes activities, such as project-based role-play, in reducing their speaking anxiety in the Oral Communication in English classroom?
- ii) How do low-stakes activities, such as project-based role-play, reduce students' speaking anxiety in the context of Oral Communication in the English classroom?

Methodology

Setting and Participants

This study was conducted at Universiti Malaysia Sabah Labuan International Campus (UMSLIC), a branch campus of Universiti Malaysia Sabah (UMS). A total of 51 first-year undergraduate students (N = 51) from two faculties in UMSLIC enrolled in the Oral Communication in English class participated in this study. Their first languages were diverse, comprising Malay, Mandarin and Tamil, and they learned English as a Second Language (ESL).

Project-Based Role-Play Description

All participants in this study were enrolled in the Oral Communication in English class. This subject is one of the proficiency English subjects offered in Universiti Malaysia Sabah for students with the Malaysian University English Test (MUET) band result ranging from Band 2 to Band 3.5. MUET is an English test that is a requirement for undergraduate students before enrolling at Universiti Malaysia Sabah, as well as to determine the students' English proficiency level.

The researcher introduced a project-based learning (PBL) framework as an alternative approach aimed at transforming the students into active users of the target language and placed them at the centre of their learning. The critical element of this approach was the low-stakes rule, where the two PBL role-play activities were only supplementary and not assessed. This approach aimed to reduce students' anxiety and create a safe space for them to practice, experiment and build confidence without assessment pressure. The project was introduced to them as early as Week 3 of the semester. The final product of both role-plays was in the form of a video, utilising students' readily available devices to integrate technology.

Activity Implementation and Process

The instructional process of the project is structured to place students at the centre of their learning. In the first stage, preparation and guidance, the researcher, who was also the subject instructor, introduced the topics, focusing on the speaking skills such as asking questions, expressing opinions and active listening. Next, in the second stage, collaboration and scripting, students worked in groups of five or six to discuss, research and collaborate to prepare the script. This discussion was conducted in the classroom, allowing students to ask the instructor directly for clarification. In the third stage, the students were ready to record their role-play video on their own time outside of the formal class time. This stage facilitated self-correction during the recording and editing process, allowing them to improve their fluency and delivery. The final videos were then uploaded to TikTok to reach an authentic audience. Notably,

students still have the autonomy to re-edit and repost the video on TikTok even after the initial submission to encourage continuous self-improvement.

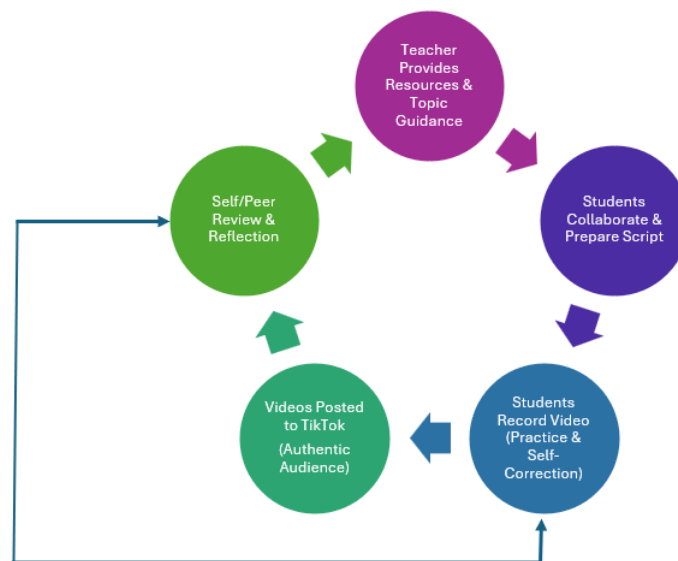


Figure 1: Implementation Process of the Low-Stakes, Technology-Integrated Project-Based Role-Play

Project-Based Role-Plays

To ensure manageability, two distinct role-play tasks were taken from the syllabus and administered to the students.

- i) Conversational Role-Play where students assumed the roles of friends, focusing on spontaneous, two-way dialogue
- ii) Architectural Tour-Guide Role-Play. The students researched a Malaysian historical landmark and assumed the roles of tour guides and tourists.

Data Collection and Instrument

Data were collected using a set of open-ended questionnaires administered to all participants after the completion of the project. Before administering the questionnaire, students were informed of the purpose of the study, and their responses were confidential, and their participation was strictly voluntary, thus obtaining informed consent. The questionnaire was designed using a mixed-method approach to get participants' perceptions of the teaching approach. The questionnaire consisted of three sections, starting with Section A, demographics data. Section B of the questionnaire consisted of 13 Likert scale items to measure the impact of project-based role play. The 13 items were adopted and modified from Shamsudin et al. (2023) to specifically suit the present study. A five-point Likert Scale was used for all items, with 1 representing 'Strongly Disagree' and 5 representing 'Strongly Agree'. Section C contained four open-ended questions aimed at gathering details and perceptions on the teaching approach.

Data Analysis

The quantitative data collected from the 13 items in Section B of the questionnaire, which employed a five-point Likert Scale, were analysed using descriptive statistics, specifically percentages. This analysis provided a clear overview of the participants' self-reported levels of confidence and anxiety related to oral communication. This analysis was crucial for answering the first research question, which addresses students' perceptions of the low-stakes activities. The responses obtained from the four open-ended questions in Section C were analysed using Thematic Analysis. Thematic analysis is defined as a systematic process of identifying, analysing, and reporting themes or patterns within the qualitative data (Maguire & Delahunt, 2017). Using thematic analysis allowed the researcher to identify relevant answers, recurring themes that provided answers to the second research question, 'How do low-stakes activities, such as project-based role-play, reduce students' speaking anxiety in the context of Oral Communication in English classroom? The analysis began with data familiarisation, during which the researcher repeatedly read the participants' responses to gain an understanding of their perspectives. The next stage involved generating initial codes, systematically identifying meaningful elements within the data. These codes were then grouped into potential themes based on their relevance to answer the research question. The qualitative findings used to substantiate the quantitative results provide a more comprehensive understanding of the project.

Results and Discussion

Research Question One: What are students' perceptions of the low-stakes activities, such as project-based role-play, in reducing their speaking anxiety in the Oral Communication in English classroom?

To answer Research Question One, quantitative data were collected via the Likert Scale section of the post-questionnaire project. The following items, as shown in Table 1, measured students' self-reported perceptions toward the use of Project-Based Role-Play (PBL) in the classroom. Based on the results, there were positive perceptions among the participants.

Table 1: Students' Perceptions Towards Role-Play

No	Item	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
1	I am interested in the role-play activities conducted in the class	0	0	7.8%	39.2%	52.9%
2	I can overcome public speaking anxiety thanks to role play.	0	2%	21.6%	39.2%	37.3%
3	I have a more relaxing atmosphere with role-play activities.	0	0	17.6%	39.2%	43.1%
4	Role play is fun and motivating.	0	0	3.9%	35.3%	60.8%
5	Role play allows students to speak more naturally.	0	0	2%	41.2%	56.9%

6	Through role-play activities, students can be more active and confident in speaking.	0	0	3.9%	37.3%	58.8%
7	I prefer role-play over traditional learning in the classroom.	0	0	13.7%	35.3%	51%

Table 1 showed that participants had highly positive perceptions towards the use of project-based role-play activities. This is evident in the finding of item 1, that 92.1% of students agreed that they were interested in the role-play activities conducted in the classroom. Furthermore, item 7 showed 86.3% of participants preferred role-play over traditional learning, which emphasises a desire for a more active pedagogical approach in the oral communication classroom. These findings indicated that employing role-play activities successfully heightens student interest and participation by simulating real-life situations. The role-play activities also provide an opportunity to apply language knowledge, which aligns with a previous study by Shamsudin et al. (2023) on the effectiveness of role-play in the ESL communication classes.

The quantitative data further validate that the low-stakes environment was the crucial mechanism in enabling successful practice and attitude change. The role-play activities provide a fun, relaxed atmosphere where the participants feel they can practice English without feeling pressure, which is often associated with formal assessments. Specifically, 82.3% of the participants agreed that role-play activities provided “a more relaxing atmosphere” (Item 3), and a highly significant 96.1% of the participants agreed that the activities were “fun and motivating” (Item 4). The attitude change was evidenced by the 98.1% agreement that engaging in the role-play activities allowed them to practice speaking English “more naturally” (Item 5). These findings echo previous studies supporting the affective benefits of role-play. A study by Liu and Ding (2009) affirms that role-play is an effective method to animate teaching and learning environments, which subsequently sparks students’ interest and contributes to impressive language acquisition. Additionally, the increase in motivation aligns with the findings of Lutfi et al. (2018), where role-play enhances students’ motivation to speak English, thus improving their speaking performance.

In addition, the quantitative results also revealed that role-play activities help reduce their anxiety with 76.5% agreement (Item 2), and the activities also improve their active participation and confidence in speaking with 96.1% agreement (Item 6). Previous studies like Silalahi and Naisa (2021) and Neupane (2019) found that role-play activities made the students feel more confident, and Lestari and Sridatun (2020) reported that students get more time through role play. Henisah et al. (2023) also found that engaging in the role-play activities enabled students to overcome students’ shyness in speaking as they were allowed to communicate and act like the other students. These quantitative results, with the support from previous studies, confirm that the low-stakes project-based role-play design successfully addressed the affective filter, which is anxiety, where it helps transform the classroom into a motivational and natural environment for oral communication practice.

Table 2: Students' Perceptions of Their Speaking Ability in Using Role-Play

No	Item	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
1	My speaking accuracy has improved through role play.	0	0	5.9%	45.1%	49.1%
2	I speak more fluently thanks to role play.	0	0	13.7%	47.1%	39.2%
3	I am able to express my ideas clearly through role play.	0	0	6%	44%	50%
4	I am able to understand and respond to other people appropriately through role play.	0	0	4%	50%	46%

The quantitative data further showed that through role-play activities, students were able to enhance their speaking ability in English. Engaging in these low-stakes activities, where they assume different characters and situations, helped students express themselves clearly while spontaneously learning new expressions. Even while performing in characters, participants could practice and apply the language skills and knowledge acquired in the classroom. Specifically, participants reported significant improvement in language mechanics and fluency. Item 1 showed that 94.1% of the participants agreed that role-play 'improved their speaking accuracy' and 86.1% of them believed that the activities helped them to 'speak more fluently' (Item 2). This improved fluency was likely supported by the opportunity students had to practice their dialogues several times before the recording session. Previous studies such as Andreas et al. (2023) and Shamsudin et al. (2023) support this finding, noting that through role-play activities, students were able to develop their speaking accuracy and fluency by providing opportunities to practice the language, thus improving their grammar, vocabulary and sentence structure.

Moreover, the quantitative data also found that high agreement regarding communicative competence, where 94% participants agreed that role-play activities made them 'able to express themselves clearly' (Item 3), and 96% agreed that they could 'understand and respond to the people appropriately through role-play' (Item 4). These findings are supported by Togimin and Jaafar (2020), who found that students participating in role-play activities were able to deliver clear content and present their ideas with less struggle, allowing them to respond to different topics appropriately. Similarly, a study conducted by Tandipayuk et al. (2023) also revealed that role-play-based speaking activities enhanced students' fluency, which allowed them to speak relatively easily and without hesitation.

Research Question Two: How do low-stakes activities, such as project-based role-play, reduce students' speaking anxiety in the context of Oral Communication in the English classroom?

Beyond the quantitative data, the greater impact of this alternative teaching approach is captured through participants' feedback, which reveals the method by which low-stakes project-based role-play activities reduced speaking anxiety.

Overcoming Fear and Anxiety: The Low-Stakes Mechanism

The primary explanation for the successful reduction of anxiety lies in the project's core intervention, which is to create a low-stakes environment to mitigate the Affective filter. Traditional teaching approaches often generate performance anxiety among students and position them as passive learners through formal evaluations. In contrast to the Project-Based Learning (PBL) framework, it successfully shifts the teaching and learning experience by establishing a critical element, which is that the project-based role-play activities were designed to be supplementary and not formally graded. This design choice was intended to dismantle the anxiety barrier.

The qualitative feedback confirms that this low-stakes environment successfully created a 'safe space' for students to practice English. The relaxed atmosphere while doing the role-play activities eliminated the fear of negative evaluation, which is one of the key reasons students are reluctant to speak, as they are afraid of being judged or evaluated when making mistakes. Participant P14 highlighted this mechanism, reporting that these activities allowed them to "feel comfortable in making mistakes in a safe space". This aligns with a study done by Tandipayuk et al. (2023), who found that by incorporating role-play activities as part of the teaching method in speaking class, and by taking roles, they created a safe and supportive environment which allowed them to practice without fearing making mistakes. Tompkins (1998), cited in Henisah et al. (2023), stated that role-play is a highly effective method for language acquisition, which allows students to practice the target language in a non-threatening environment.

"Role-playing activities help improve my english by building my vocabulary, making me more fluent, and boosting my confidence. I get to practice using new words in different situations, speak more naturally, and feel comfortable making mistakes in a safe space. It also helps with pronunciation and speaking clearly. Overall, it's a fun and effective way to improve my speaking skills." – P14

Furthermore, participants reported that the activities helped them to "overcome fear and hesitation", making them more comfortable and spontaneous in speaking English. This continuous, low-pressure practice led to a reduction in anxiety, consistent with the findings of Maldin and Sianipar (2025). Their finding reported that repeated exposure to role-play activities significantly reduced students' anxiety levels. This shows that project-based role-play directly addresses the source of language anxiety, which are the fear of negative evaluation, communication apprehension and test anxiety and through supportive and student-centred instruction (Han, 2022, as cited in Maldin & Sianipar, 2025). Consequently, applying project-based role-play activities successfully reduces speaking anxiety among students.

"Repeated speaking practice reduces my anxiety and boosts confidence when communicating in English. and regular speaking activities allowed me to think and express myself in English more quickly and naturally" – P7

"These activities provided a practical way to practice English in real-life scenarios, allowing me to gain confidence, improve my pronunciation, and enhance my ability to think and respond quickly in English." – P24

"I think it's good even though I bad in speak English. Everytime come the video assignment, im feeling afraid because need to show face and speak in English. Through those video assignments from Ms , it's really helped me in boosting my confidence so i won't worry about speaking task anymore in future." – P39

"It made me to feel more comfortable while speaking and my nervousness or anxiety was able to control as well as helped me to learn new vocabularies". – P41

"These speaking activities improved my english speaking skills in building confidence because speaking activities helps me to overcome fear and hesitation." – P44

Improve Confidence and Fluency

Students' reduced anxiety is also evident through an improvement in their confidence and fluency. Participants mentioned that their confidence level improved by having regular speaking activities, which made them comfortable in speaking English and expressing themselves spontaneously. This growth of confidence is directly linked to the activities simulating real-life situations, which provide them a platform to learn and practice new vocabulary. This practical application ultimately boosted their willingness to speak English in front of both teachers and peers. The findings resonate strongly with previous studies. Similar findings were found in studies by Moosa et al. (2025), where role-play activities not only motivated the students to learn but also significantly improved self-esteem. The continuous and low-pressure practice provided by the role-play activities stimulated this confidence growth, preparing them for the formal assessment usually conducted at the end of the semester.

"Speaking activities help me build confidence in speaking English" – P2

"Maybe confidence, I think I have become a little more confident now than before" - P3

"Increased Fluency and Confidence. This is because speaking activities get me talking in English more often. This regular practice helps me become more comfortable forming sentences and expressing yourself spontaneously. As I speak more fluently, my confidence in using English also grows" – P8

"My confidence and fluency when I speak in front of my coursemates" – P10

"Helping me practice and use new vocabulary in real-life situations. They also allowed me to become more confident when speaking" – P16

"These activities provided a practical way to practice English in real-life scenarios, allowing me to gain confidence, improve my pronunciation, and enhance my ability to think and respond quickly in English" – P24

"Through role-playing activities, I have boosted my confidence by talking in front of the teachers and other students" – P32

The qualitative data further demonstrate that the low-stakes practice environment was the direct incentive for developing confidence and fluency. Since the anxiety level was reduced, students could engage in the regular, repeated practice which are necessary for developing spontaneous speech. This practice led to immediate and perceived improvement in fluency. Participant P8 clearly mentioned this causal chain,

"Increased Fluency and Confidence. This is because speaking activities get me talking in English more often. This regular practice helps me become more comfortable forming sentences and expressing yourself spontaneously. As I speak more fluently, my confidence in using English also grows" – P8

Meanwhile, participants reported tangible improvements such as being able to “speak more fluently without any um or em” (P31) and improving their ability to “think and respond quickly in English” (P24). These qualitative responses reinforce the quantitative finding from Research Question 1, where participants significantly agreed that role-play activities helped them to speak more fluently. The positive impacts on improving students’ fluency in speaking English are also consistently reported across studies by Putri and Zaki (2025), Andre et al. (2023), Silalahi and Naisa (2021) and Togimin and Jaafar (2020). These studies found that role-play provides a structured, yet authentic platform for meaningful repetition and language acquisition, which is crucial for transferring language knowledge from passive comprehension to active and spontaneous production. Ultimately, the project-based role-play activities were critical in providing students with more opportunities to use the target language, thus effectively improving both their confidence and fluency.

Conclusion

This study successfully examined the effectiveness of using a low-stakes mechanism within the Project-Based Learning (PBL) framework, specifically through role-play activities in addressing oral communication anxiety among ESL learners. The findings of this study revealed that this approach to be a highly effective pedagogical tool for fostering genuine fluency, building confidence and creating an exciting and engaging learning environment. As quantitative data indicated, students held overwhelmingly positive perceptions towards the low-stakes role-play activities. The core intervention of this approach, which is the implementation of a non-graded, low-stakes practice environment, proved critical as it directly addresses the Affective Filter. The qualitative analysis also confirms that this approach successfully created a safe space for students to practice English. By eliminating the fear of negative evaluation, students were able to overcome fear and hesitation and feel comfortable making mistakes. Crucially, this approach achieves its primary goal, which is the reduction of anxiety and encouragement of more natural and regular speaking practice, resulting in perceived increased fluency and a boost in active participation and confidence. Thus, this approach supports Krashen's notion of lowering the affective filter by making language use more enjoyable, meaningful and less intimidating.

Limitations and Recommendations for Future Research

While the findings significantly demonstrate the effectiveness of the low-stakes Project-Based Learning (PBL) framework in reducing oral communication anxiety and boosting confidence, the study presents certain limitations that should be addressed in future research. First, the data collection was limited to the researcher’s sections, which constrains the generalisability of the findings. This restricted the sample size may not fully reflect the experiences of the entire student population taking the subject. To validate the findings, future research should implement an experimental study that includes a control group. Secondly, the present study was conducted within a short timeframe and utilised a cross-sectional design. This limits the ability to assess the long-term effect of this approach on students’ oral communication anxiety and skills development. Thirdly, the data collection heavily relied on a single, comprehensive post-project questionnaire. Future research should employ a mixed-method design to triangulate the data. This should include supplementing the questionnaire with objective

measures such as pre- and post-speaking tests to measure the improvement in fluency and accuracy.

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UNLOCKING DESTINATION APPEAL: A SCALE VALIDATION OF INNOVATION PRACTICES IN FOOD TOURISM CONTEXTS

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Abstract: *This paper aims to investigate the scale validation of innovation practices, focusing on the tourist destination image in the context of food tourism in Malaysia. By using a quantitative approach, data were collected through various methods, including online and self-administered at KLIA1 and KLIA2 or any other public hub station. A total of 650 responses were obtained from both domestic and international tourists. The data were then analysed by using SPSS to validate the Cronbach's Alpha for coefficient alpha analysis and exploratory factor analysis (EFA) to measure the validity of item used. To examine the scale validation of innovation practices, the study employs structural equation modelling (SEM). The analysis includes key procedures such as first-order confirmatory factor analysis (CFA) to validate the constructs and its respective items. For this particular procedure, the scale measurement focusing only on innovation practices. Based on the construct, innovation practices were measured by using five dimensions namely; product, service, process, organizational, and marketing innovation. The construct is a crucial part in measuring the relationship between tourist destination image and its influence on food tourism in Malaysia.*

Keywords: *Destination Image, Tourism Management, Innovation Practices, CB-SEM, Food Tourism*

Introduction

Innovation practices are recognized as a pivotal tool in shaping destination image and competitiveness in tourism industry. The rapid advancement of technology has significantly impacted the landscape of food tourism by enhancing the quality of visitor experiences. Business owners are increasingly leveraging digital tools to build customer trust, improve market visibility, and optimize profitability (Gheribi & Bonadonna, 2019). By referring to the Malaysia Budget 2025 that has been announced, RM550 million has been allocated by the government of Malaysia for improvement and development of the tourism destination and tourism image in accordance to the upcoming Visit Malaysia year 2026 (New Straits Times, 2024).

This funding is very important for the destination to be more equipped to remain competitive with the neighbouring countries such as Thailand, Indonesia, and Singapore. Previous scholars have analysed that the use of technology and innovation in the industry is crucial for sustainable development of the industry (Hassan, et al., 2019). Past studies elaborated more on innovation

where it influenced by various factors including technological advancement (Islam, et al., 2019).

In addition, before discussing innovation in the tourism industry, the focus can be turned to the tourist destination image (Tassiello & Tillotson, 2020). An evident from Indonesia indicated that creativity and innovative factors supporting tourism activities in Indonesia have attracted tourist to come to Indonesia (Lita, et al., 2020). Their policy to develop a creative and innovative approach in the industry has become highly influential. In relation with theory of innovation by Schumpeter (1952), it is understandable that innovation is an integral part to the food tourism industry (Bee, et al., 2019). It is derived from innovation studies, which identify the integral elements of innovation practices as product, process, service, organizational, and marketing were explored (Lee, et al. 2016).

Relatively, the introduction of innovation practices has benefited tourism industry. The subsequent from the implementation, the creation of new motivation and experience could create new market segments in Malaysian food tourism (Abdullah, et al., 2023). Recent study shows that there is uncertainty from the business owner in applying innovation, however, the empirical evidence demonstrated that innovation has a major influence for the adaptability and competitive advantage (Hjalager, 2022).

However, the issue regarding innovation practices has been relatively impacting tourist destination image and food tourism industry in Malaysia negatively. This is due to the business organization in food tourism would not take a risky approach to apply such a costly figure due to the limited knowledge on the innovation application (Nor, et al., 2020). Moreover, the rapidly changing knowledge era driven by technology and innovation has become central to innovation strategies in tourism development especially in food tourism (Yilmaz & Comez, 2020). Nevertheless, there have been a limited studies on the innovation practices relation with tourist destination image in the context of food tourism in Malaysia.

Past studies have shown that various innovation practices constructs have been discussed in the context of food tourism, however, it lacks of evidence whether innovation practices could possibly bring a success towards destination image in the context of food tourism in Malaysia (Mohd Alias, et al., 2024; Alias, et al., 2021; Mohammad, et al., 2019; Tan, et al., 2019). The discussion on the subject had not been discussed widely as well as published and unpublished studies from the related subject. Hence, this paper is aiming to validate the innovation practices construct and its predictors with the validation will have a better interpretation on the food tourism context in Malaysia.

Literature Review

Innovation Practices and Destination Appeal

The tourism industry has a unique characteristic in terms of development. Innovative idea has shaped tourism industry's consistency in building ideas, seeking complex problem solving, and competencies (Marasco et al., 2018). The industry fluidity has been recognized which it applies to the changes in recent trends. Although there is lack of evidence to refer innovation in the tourism industry (Elzek et al., 2020), However, the concept can be traced to Schumpeter, the father of innovation theory, which can be significantly benefited the tourism industry. Islam et al. (2019) disclosed that competitiveness in the tourism industry should be widely discussed to

deploy new strategies in the competitive market. Hence, innovation was mentioned to be adopted that could trigger technology advancement in different tourism services. Based on the previous study, the technology adoption is derived from the innovation availability that leads to the business efficiency, effectiveness of the business operation, and investment towards information, computer systems, and technology (Ahmad & Scott, 2019).

Destination appeal should be equipped by these technologies from the business perspective as Lee et al. (2016) suggested that innovation practices including product innovation, service innovation, process innovation, marketing innovation, and organizational innovation could be the factor of cost effectiveness, increase quality and reputation, and increase the destination's ability to attract repeat visitors. As highlighted by the previous researchers, destination appeal brings numerous impacts in terms of creation that could improve the quality of the destination (Phang et al., 2019; Chowdhury et al., 2020). In the context of this current study underlined the impact to the destination image in the context of food tourism in Malaysia. Researchers mentioned that the quality of food, the way it is served, and the quality measurement of the menu could be an important element in preserving the destination attraction. This has been highlighted as the capabilities of the businesses in applying different sets of innovation could be the major turnover of the adaptability and competitive advantage (Abdullah et al., 2023). Recent studies deduced the proportion of the food tourism development comes from the value creation that suggested new technologies and the creation of experience-based tourist motivation should be considered (Abdullah et al., 2023; Hjalager, 2022). Thus, it is important to underscore the element of development to attract visitors from the study of innovation and destination appeal, in the context of food tourism in Malaysia involving; product innovation, service innovation, process innovation, marketing innovation, and organizational innovation.

Dimension of Innovation Practices

One of the important aspects of restaurant sustainability is product innovation that can be measured by using radical way, which referring to the changes to follow the competitor's capability in transforming their similar changes (Hussain et al., 2020). Product innovation has been identified as a strategic tool that helps small and medium-sized restaurants (Najib et al., 2020). In a study of the influence of product innovation, it can be emphasized on the findings focusing on physical evidence towards purchasing decisions in the food and beverage industry (Wahyuni, 2019). The result indicated that the product innovation could be an integral solution for the product placement and branding.

In a different study, investment has been demonstrated as an important part of applying process innovation in a business organization (Awan et al., 2020). The essence of the process innovation comes from knowledge and resources that have been mentioned as vital components for the factor. In a similar study of innovation application, Process innovation was measured by examining its significant relationship with innovative ideas in organisational process (Madrid-Guijarro et al., 2020). However, some studies have mentioned that process innovation is a main concern for significant improvement with the aim of creating better productivity and efficiency (Elmo et al., 2020; Hoang et al., 2020). The implementation of process innovation in the tourism industry has already shown positive effects, whereby it creates an opportunity for tourism players to foresee the impact of constant innovative application.

The concept of service innovation has a broad meaning and hard to distinguish (Witell et al., 2016). However, in a similar study, they categorized service innovation derived from technological advancement to be applied in the business organisations. While the integration process of service innovation would create a comprehensive chance in competitive advantage, hence, it can be defined as an integral solution for the growth and profitability of the business (Salunke et al., 2018). In the context of food tourism, service innovation must be the main image to be portrayed at the particular destination. This has been ruled as the integration should indicated a significant impact on the behavioural intention and customer experience (Ogunmokun et al., 2020). Empirical evidence shows a direct relationship between the innovative component namely service innovation and business performance (Su, 2011). Therefore, service innovation is one of the main parts in developing a unique environment in giving positive experience to the destination.

Moreover, in terms of strategic organisation, marketing innovation is shown as a useful step for business in promotional, pricing, and creating new relationship with customers (Lee et al., 2019). The study reported that, technological applications and tools such as internet and modern gadget as a trendsetter to reach their unique target market. In the restaurant industry, marketing innovation is important in terms of menu items and systems (Cho et al., 2019). This is following the study on market preferences which indicated that customer needs and wants can be differ over time. Thus, value perspective in terms of marketable solution should emphasised on the menu, quality, service, and overall performance of the restaurant (Yrjola et al., 2019).

Previous studies mentioned in relation to these elements that the performance of the business organisation could be depending on organisational innovation (Birkinshaw et al., 2008; Volberda et al., 2013). The stimulation of management in handling the prospect of improvement in the business structure, especially in the restaurant industry, will help the business to gain recognition by the customers and provide an acceptable strength for business performance. In the restaurant industry, the key performance is including management innovation which comes from the manager's perspectives, ideas, and traditional contribution (Najib et al., 2020). Researchers have explained that attention needs to be measured for the tourist and customer to revisit the restaurant, and quality measurement with innovation has to be included (Phang et al., 2019; Chowdhury et al., 2020). Thus, it is important for innovation practices being deployed in restaurant performance sustainability that refer to the particular innovation factors.

Innovation Practices and Tourist Destination Image

In this study, the theory of innovation was referred as a set of new ideas and perspectives in the concept of expansion (Schumpeter, 1952). The theory then expanded and widened to be used in the current business perspectives (Hjalager, 2010). In addition, the expansion began to point out components of innovation practices, namely product, service, process, marketing, and organisational (Hall, 2009; Hjalager, 2010; Varis & Littunen, 2010). The study marks the importance of innovation practices in the business performance. The diversity in business organisations allows profitable indication to be utilized by implementing new strategies and technologies (Douglas & Prentice, 2019). This has made a significant change in the concept of modern business organisation strategy.

Tourism industry has a relativity with the innovation process. Visitors commonly come to the destination to seek for leisure, knowledge, experience, and satisfaction (Cheng et al., 2020). They added that, industry itself needs to apply sufficient ideas as well as innovative information. Furthermore, innovation has been studied as a tool to improve destination image as well as to provide particular experience and satisfaction to the visitors. A study on revisit intention has concluded that a destination will be occupied by the visitors depending on the destination image (Setiawan & Shiratina, 2023). The indication shows that innovation application in the tourism destination has brought in more tourists who revisit, and the indirect effect of innovation has arguably a positive effect on the sustainability of destination image. The relation with the destination image is seen as one of the fundamental attractiveness for bigger opportunities in attracting visitors and a profitable outcome. While destination image was argued to be a major influence for revisit intention, the impact of innovation, specifically in service, needs to be maintained (Boon et al., 2021). Thus, it can be concluded that the construct between innovation practices and tourist destination image can be seen as the essential factors in terms of development in tourism destinations in the context of food tourism.

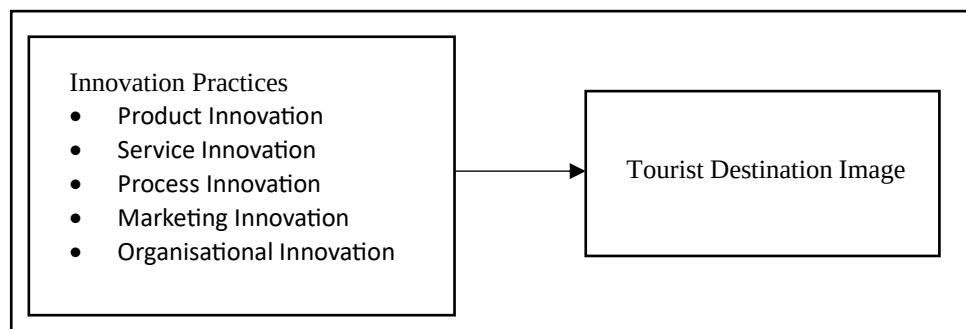


Figure 1: Conceptual Framework

Objectives

In connection of this background, the objective of this paper is as follows:

1. To identify the dimensions of innovation practices in the context of Malaysian food tourism industry.
2. To validate the dimensions of innovation practices in the context of Malaysian food tourism industry.

Hypotheses

In this paper, innovation practices are discussed to analyze whether the dimension used can be confirmed through the analysis tools namely SPSS and SEM. By focusing on SEM, first-order confirmatory factor analysis (CFA) shows the exact value from the measurement. The hypotheses are as follows:

H1: Confirming the innovation practices dimensions:

- H1(a): Product is confirmed as innovation practices dimension.
- H1(b): Service is confirmed as innovation practices dimension.
- H1(c): Process is confirmed as innovation practices dimension.
- H1(d): Organizational is confirmed as innovation practices dimension.
- H1(e): Marketing is confirmed as innovation practices dimension.

These dimensions are organized to validate innovation practices construct for this particular study with its dimensions; product innovation, service innovation, process innovation, organizational innovation, and marketing innovation.

Research Methodology

Populations and Sample

This paper aims to include a large population, focusing on domestic tourists and international arrivals who travel to Malaysia and have tried Malaysian food. Based on the statistical data from Tourism Malaysia, the significant number of tourists is employed. Recent studies elaborated on this topic, where measuring significant changes in tourism activities from the mobility of tourist is crucial to gain their perspective on the development. The use of these particular populations is considered reliable in accordance to study perspectives and characteristics that related to the purpose of the study (Fitrizal, et al., 2021).

Other than that, other scholar mentioned about the difficulty in drawing the actual population of tourist (Bayih & Singh, 2020). This kind of method is useful to get the population needed for the purpose. Statista has reported that in 2023, 213.74 million domestic tourists recorded have travelled around Malaysia (Siddharta, 2024). On the other hand, Tourism Malaysia reported that in 2023, there were approximately 20.1 million international arrivals from all over the world. From the number, 11.8 million were from Southeast Asia. These numbers indicated that domestic and international tourist have significant motive to travel to Malaysia whether it is because of education, business, visit friends and relatives, or even for food tourism. Thus, the sample in this study are coming from domestic and international tourists.

Furthermore, the criteria for respondents to participate legally are that they must be in the age of 18 years old and above (Halpern, et al., 2021). Furthermore, the method uses in this quantitative study is convenience sampling. In non-probability sampling, convenience sampling is the data collection process from a research population that is reachable (Golzar & Tajik, 2022; Rahi, 2017). Previous scholar defined convenience sampling as a technique which allow researcher to go to the public location and ask the passer-by to participate as respondent (MacNealy, 1999). In this study, convenience sampling is considered applicable as it has several benefits; (1) the researcher can minimize effort in selecting respondents, (2) the sampling process is cost-effective and requires minimal financial resources, (3) less time is needed to manage and administer the sample, and (4) the researcher is required to prepare a comprehensive list on the entire population.

Research Tools

This paper monopolizing survey conducts by referring to the quantitative research approach. This study uses questionnaire for data collection as it suggested as one of the strategies to gather the data. Sekaran and Bougie (2020) asserted that questionnaire distribution is the most practical way to gain the data from the convenience respondent.

Data Collection

There are various ways to administer the survey including personal administration, email, and any technological dissemination. The settings of the questionnaire to be administered was at

Kuala Lumpur International Airport 1 and 2 or any public transportation hubs as it is reliable for the researcher to gather the data (Phoon, 2021). In accordance to the sampling method, questionnaires were distributed to 650 respondents to measure the data. In selecting data analysis for pilot study, as this study purposely using CB-SEM to validate the first-order of CFA scale of innovation practices, large dataset over 500 samples is required (Hair, et al., 2019; Memon, et al., 2020). Thus, for the data from pilot study to be effective, the suggested number of samples is taken as consideration. It is reliable for the data to be measured and analysed by using the appropriate methodology. For research instrument, innovation practices construct consists of five dimensions and 25 items in total measured using 10-Likert scale. As mentioned by previous scholar, 10-point Likert scale is efficient in operating measurement model and more reliable to the metrics analysis (Awang, et al., 2016). Based on the statement by the justification mentioned, a scale without label is suggested in the current study ranges from 1 (Strongly Disagree) and 10 (Strongly Agree).

Data Analysis

In this particular study, the analysis of research data is focusing on CB-SEM to validate the first-order of CFA. This procedure is mentioned by scholars as the main structure to analyze convergent and discriminant validity (Watkins, 2018). Furthermore, CFA is used to evaluate reliability and variance after a new scale was developed. Hair, Black, Babin, and Anderson (2017) supported with the elaboration of CFA that uses fit indices to measure the satisfactory fit. This study is focusing on the chi-square statistics that is the traditional analysis to measure overall model fit. Meanwhile, from past studies indicated that, a good model fit would be stated as $p > 0.05$ (Byrne, 2010; Pallant, 2010).

For convergent validity, the data must undergo further testing. To determine the goodness of fit, the measurement can be classified into two different breakdowns; (1) small χ^2 - values represent the bad fit and large χ^2 - values represents a good fit. The common practice to assess the goodness of fit is previewed as CMIN/df, GFI, P, and RMSEA. Table 1 below shows the assessment of the above statement:

Table 1: Assessment of Goodness-of-Fit

Indices	Abbreviation	Acceptable Level
Chi-Square	(χ^2) (df/p)	$p > 0.05$ at $\alpha = 0.05$
Goodness of Fit	GFI	GFI > 0.90
Probability	P	> 0.05
Root Mean Squared of Approximation	RMSEA	RMSEA < 0.80

Source: Kline (1996); Hair et al. (2017); Byrne (2010); Ernest (2008)

The procedure to measure the goodness of fit is one of the procedures that is needed for the analysis. Campbell and Fiske (1959) explained about convergent validity are related to the latent variable that measures a several components namely values between variables and indicators. The process is done to observe whether the indicator used is suitable for the construct or otherwise, need to be removed. As stated by Gaskin (2016), an appropriate result should be prioritized in convergent validity and if there is no converge in the item, removal of the item is needed. On the other hand, discriminant validity is the requirement for the system to be processed. It looked upon coefficient and correlation among the components used

(Gaskin, 2016). The scale validation for innovation practices construct is shown in Table 2 below:

Table 2: Results of First Order CFA of Innovation Practices Dimensions

Variables	Chi-Square (χ^2)	(df)	GFI	RMSEA	P-Value
Product	14.582	6	0.972	0.064	***
Service	4.380	2	0.989	0.068	***
Process	11.726	7	0.978	0.031	***
Organizational	4.000	3	0.990	0.059	***
Marketing	7.561	4	0.982	0.040	***

After analysis by using CFA, the results were clearly shown in the Table 2. There were a few items that need to be removed to get a fit model. For product innovation and process innovation dimensions, all items are considered fit within the first order of CFA. However, for service innovation, SRV5 was dropped to get a good fit for the model. For organizational innovation and marketing innovation, one item ORG5 and MKT1 were dropped to get the model validated. As mentioned by Nijssen and Douglas (2004), the item dropped is not necessarily unfit, but it is through a sensible validation to get a good model fit. It is one of the procedures in CFA that can be taken into consideration. Table 3 below shows the result from the estimated parameters between latent variables and indicators:

Table 3: Estimated Parameters Between Latent Variables and Indicators

Latent	Indicator	Standardized Reg. Weight	S. E.	C. R.	P
Product	PRD1	0.919	0.052	8.977	***
	PRD2	0.973	0.027	6.762	***
	PRD3	0.963	0.033	7.634	***
	PRD4	0.961	0.034	7.805	***
	PRD5	0.946	0.052	8.401	***
Service	SRV1	0.899	0.084	8.818	***
	SRV2	0.611	0.071	5.809	***
	SRV3	0.729	0.209	10.911	***
	SRV4	0.832	0.144	9.646	***
Process	PRS1	0.919	0.052	9.721	***
	PRS2	0.973	0.027	8.977	***
	PRS3	0.963	0.033	7.634	***
	PRS4	0.961	0.034	7.805	***
	PRS5	0.946	0.052	8.401	***
Organizational	ORG1	0.939	0.057	7.489	***
	ORG2	0.950	0.067	7.900	***
	ORG3	0.969	0.033	6.245	***
	ORG4	0.936	0.059	7.591	***
Marketing	MKT2	0.891	0.103	9.046	***
	MKT3	0.922	0.064	8.558	***
	MKT4	0.975	0.036	5.125	***
	MKT5	0.966	0.041	6.300	***

Based on the Table 3 above, referred to standardized regression weight in SEM AMOS, the magnitude of all indicators must be 0.40 and above (Hatcher, 1994). Meanwhile, the standard

error (S.E.) recorded for all items were balance which the value is not too large and not too small (Byrne, 2013). The critical ratio (C.R.) values that have been listed show the significance parameters which exceeded the benchmark of ± 1.96 . Therefore, for these particular dimensions, the values have achieved the minimum acceptable values as mentioned by Fornell and Larcker (1981).

Discussion and Conclusion

Discussion

The study aimed to identify the dimensions of innovation practices and validate the scale of the dimension of innovation practices in the context of food tourism in Malaysia. After the analysis, the first-order of CFA confirmed the construct validity, convergent validity, and discriminant validity of the innovation practices dimensions. Based on the results, all factor loadings exceeded the threshold and AVE and CR have been recorded above acceptable levels. The value is crucial to support reliability and internal consistency of the study. Based on the Schumpeterian innovation theory and its expansion, these results indicated that the theory used posits that perceived innovativeness in the tourism industry, particularly in the food tourism sector, enhances adoption likelihood.

In food tourism in Malaysia, product offerings, service quality, culinary style, and food tasting experience are more captivate tourist loyalty and their intangible experience. Thus, from other theoretical perspectives and implications, the validated scale will have an impact to tourism innovation literature by providing a reliable measurement for measuring innovation practices focusing on food tourism in Malaysia. It will also contribute to enhance destination image that related to the upcoming Visit Malaysia Year 2026. On the other hand, this study will be reliable to enhance the innovation efforts from practical perspectives. The effort should align with tourists' evolving expectations in seeking novelty, authenticity, quality, and creative.

Conclusion

This study required the researchers to confirm the scale of innovation practices dimensions to be part in the construct. Eventually, all scales discussed have been validated and accepted for the study progression. It indicates that innovation practice dimensions play a pivotal role in terms of destination image development in the context of food tourism in Malaysia.

Research Recommendations

Tourist destination image in Malaysia should be improved in order to get recognition by the tourist as the Visit Malaysia Year 2026 (VMY2026) is an important aspect to be focused on. As innovation practices become a vital point for the improvement, there are several recommendations for the future research that can be clarified based on the findings of scale validation of innovation practices dimensions:

1. Future research should investigate how tourists' perceptions of innovativeness of food tourism experiences in Malaysia that eventually influences destination loyalty, satisfaction, and revisit the destination for the common purpose.

2. Future studies should explore how food tourism businesses such as SMEs, hawkers, and small-scale restaurants perceive the application of innovation practices and benefit its initiatives. Mixed method approach should be appropriate to distinguish the findings.
3. Cross cultural studies Cross-cultural studies could be one approach to validate innovation practices scale in different regions and origins. It would boost its robustness and generalization as well as insight to customize the expectations of international tourists towards food tourism quality.

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DETERMINANTS OF DESTINATION LOYALTY IN STUDENT TOURISTS

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Abstract: *The informal links between destination loyalty, co-creation practices, emotional solidarity, and self-consistency have not received much empirical attention. In addition, the impact of co-creation practices and certain aspects of emotional solidarity from a customer-dominant perspective on student visitor destination loyalty is rarely given much thought. Thus, the aim of this study is to determine whether these values have a real impact on student tourist destination loyalty, and how it affects tourist destinations in Guilin, China. This study is significant because it examines the loyalty of college students to destinations and how they contribute to them, which is increasingly important in China. To find out how these factors affect destination loyalty, relevant hypotheses have been established, tested, and further investigated. In this study, 400 college students from Guilin, China, were involved in completing of the questionnaire. The results showed that co-creation practices, emotional solidarity, and self-consistency significantly affect destination loyalty among college student tourists. These findings were validated by Pearson's correlation analysis.*

Keywords: (TNR, 12, *Italic, Justify, Single Spacing, Capitalize Each Word*) - Min 3 Keywords and Max 5 Keywords

Introduction

Although there has been a great deal of research on visitor destination loyalty in the tourism context, there have been few reports on the links between student visitors' co-creation practices, emotional solidarity, self-consistency, and destination loyalty, especially from the perspective of sojourning college students. According to Abror Abror et al. (2023), destination loyalty arises from people's subjective intentions and is related to the environment. It is essential to develop students' destination loyalty to their study location, as their word-of-mouth recommendations and re-purchases are more likely to convince their relatives and friends and attract other tourists (Beerli et al., 2007).

According to Deci and Ryan (2000), an individual's internal motivation to engage in a particular activity depends on how well they internalize and integrate the rules and values in the activity. Student visitors create value with others in the local recreation process, bringing them closer to their contacts and building consistency with the place. Destination loyalty is generated during the time it is served, and it can occur before and after the service. Previous studies on co-creation practices, emotional solidarity, and self-consistency have shown a positive impact on tourist destination loyalty (Beerli et al., 2007; Tiwari et al., 2023; Šegota et al., 2021). However, there is a lack of research on the impact of co-creation practices and certain aspects

of emotional solidarity from a customer-dominant perspective on the loyalty of student tourists to their destinations, especially among Chinese college students.

The study was conducted to determine whether co-creation practices, emotional solidarity, and self-consistency affect destination loyalty among Chinese college student tourists. More specifically, the researchers collected data at a college in Guilin, China in December 2024. Convenience sampling ensured that data from specific population samples were collected more accurately. The results of this study are expected to enrich our understanding of Chinese college students' loyalty to their learning destinations. It is essential for tourism managers and policymakers who aim to create a supportive and productive tourism environment. By creating a value co-creation environment, cultivating students' emotional solidarity with tourists, and helping them build self-alignment with the place where they are studying, it effectively motivates Chinese college students to be loyal to their destinations.

Literature Review

Co-creation Practices

The concept of co-creation of customer value continues to evolve with the development of society. The co-creation practice of customer-dominant (C-D) logic emphasizes that the customer allows the business to participate in daily life to co-create value with the goal that the customer can make itself better (Heinonen & Strandvik, 2015). Mitchell & Reid (2001) argued that co-creation practices: Tourists' co-creation practices are "dynamic and positive", not only bringing about friendship and intimacy between individuals, but also potentially invisibly dictating people's behavioral intentions. Xiao et al. (2020) argue that customer engagement is a positive driver of loyalty, and highly engaged consumers generate significant travel brand loyalty. Xu et al. (2021) discussed the influencing mechanisms of tourist engagement behavior and citizen behavior on destination loyalty through each sub-dimension of perceived value. The results show that destination loyalty is driven not only by tourism behavior (in-person) but also by citizen behavior (out-of-person). For ease of understanding, we simplify the co-creation practice as TVC. Therefore, this study proposes the following hypothesis:

H1: Co-creation practice has a significant positive impact on student tourists' destination loyalty.

Emotional Solidarity

Affective solidarity is an emotional bond that arises from interactions with others and the sharing of beliefs and behaviors in interactions (Wallace & Wolf, 2006). Emotional solidarity is an important factor influencing tourism activities, both for residents and tourists (Woosnam, Aleshinloye, & Maruyama, 2016). Especially in a tourism environment, people from different backgrounds come into contact with each other. Group contact and interaction help people build a sense of mutual identity (Bastida, Wallace, & Wolf, 1987). Levang (2023) pointed out that festivals create an environment for people to be relaxed and contacted, and that openness, tolerance, and the "festive atmosphere" that can talk to anyone deepen the understanding of identity among people. Those like-minded people form intimate connections through festivals, and this connection may be maintained for a long time and continue to influence future behavioral intentions (Sun, Wu, Li, & Dai, 2019). Joo et al., (2019) pointed out that the perception and establishment of tourists' affective solidarity has a profound impact on

subsequent behavior. For ease of understanding, we will simplify emotional solidarity as EMS. Therefore, this study proposes the following hypothesis:

H2: Emotional solidarity has a significant positive impact on students' destination loyalty.

Self-consistency

Self-consistency refers to the degree to which a customer's self-concept matches the product/brand image (Sirgy, 2000). In the context of tourism, tourists' self-consistency is understood as the tourists' perception of the degree to which they match the image of the tourist destination (Chon, 1992). The more similar the two, the higher the perceived self-consistency, and vice versa. Beerli et al. (2007) demonstrated the role of self-congruence in destination preference. His research showed that a customer's visit to a destination or a high level of engagement with the trip increases the impact on self-consistency. The findings of Tran et al. (2021) showed a link from self-consistency to perceived destination quality, then visitor satisfaction, and finally destination brand loyalty. The findings highlight that the frequency of visits and the degree of participation play an important role in self-consistency. Joo et al. (2020) confirmed the positive correlation between travelers' self-consistency and emotional solidarity, and how this affects travel satisfaction and destination loyalty. For ease of understanding, we simplify self-consistency as SCG. Therefore, this study proposes the following hypothesis:

H3: self-consistency has a significant positive impact on student tourists' destination loyalty.

Conceptual Framework and Hypotheses

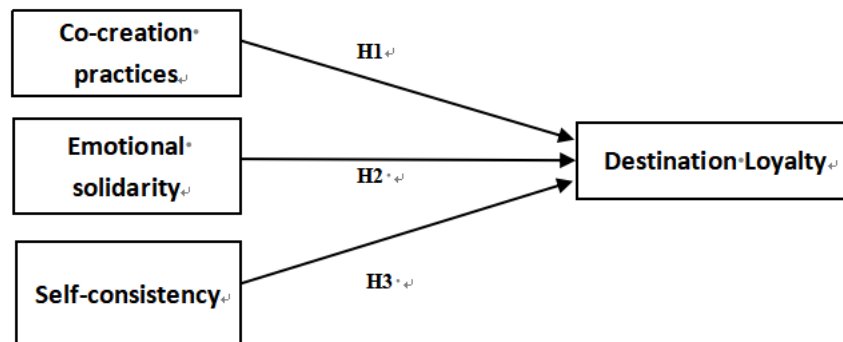


Fig. 1. Conceptual Framework And Hypotheses

Review Research Methodology

Sample Size

The target population of this study was college students with sojourn status, and the face-to-face survey technique was used for data collection. Convenience sampling was used as it proved impossible to implement random sampling in a large outdoor space and the college students interviewed had to come from households outside the place of study. Data will be

collected in December 2024 at 1 college in Guilin, China. A total of 400 questionnaires were completed and 367 valid questionnaires were used in the data analysis.

Measuring Instruments

The tools used in this study were taken from the questionnaires of the original study. As for demographic data, self-created surveys were used. There are a total of 21 questions in these two sections: the demographic component and the items related to the independent and dependent variables. Four questions covered the demographic component, while the remaining questions covered variables. The demographic section contains the respondents' gender, age, marital status, household income.

For variables, these variables are independent variables (about co-creation practices, self-consistency, and emotional solidarity) and dependent variables (word-of-mouth intention). The title of Co-creation Practice is adapted from Rather et al. (2021) and uses customer-dominant logic and is measured as a one-dimensional structure. Affective solidarity was measured using six items from the three-dimensional affective solidarity scale of Woosnam and Aleshinloye (2013). The self-congruence items were derived from the four items in the two-dimensional scale of Šegota et al. (2021). The title of destination loyalty comes from Chen and Rahman (2018).

All scale items are presented in a five-point Likert scale format, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The items are arranged in two languages according to variables: Chinese and English. The use of bilingualism enables respondents to understand directions and inquiries more clearly.

Statistical Analysis

The purpose of data analysis is to characterize and synthesize the data, evaluate the reliability of the variables, determine any positive or negative correlations between the variables, and finally identify any differences between the variables. The types of statistical techniques used in this study are descriptive, frequency, mean, maximum, minimum, standard deviation, cross-tabulation, and correlation. SPSS 29.0 is used as a data analysis tool to test the reliability, regression, and correlation of the questionnaire item score data and to determine whether the assumptions were acceptable.

Results

Demographic Profile of Respondents

367 Chinese college students participated in the study. The ratio of male and female respondents was almost equal, with slightly more females. Of these, 48.50% were male and 51.50% were female. Since the target population of this study was college students who only lived in China, all respondents were from Guilin, China. Most respondents were between 19 and 21 years old (38.69%), followed by 22 to 24 years old (34.33%), under 19 years old (21.25%), and over 24 years old (5.72%). In terms of education level, the vast majority of respondents were studying for a bachelor's degree (36.51), followed by a college degree (29.70%), a master's degree (26.43%), and a doctorate (7.36%).

Respondents were also asked about their length of stay in the place of study and their participation in local tourism. 33.51% of the people travel for 3 to 4 years, 28.88% travel for 1 to 2 years, and fewer people travel for less than 1 year (18.53%) or more than 4 years (19.07%). In terms of the number of trips, most people travel 3 to 4 times (41.96%), followed by 1-2 times (29.43%), and more than 5 times (28.61%). 48.23% of the people travel 3 to 4 times a year, followed by 28.34% who travel 1 to 2 times a year, and 23.43% who travel more than 5 times a year. Since the target of the respondents in this study is people with local travel experience, these data support the respondents' choices.

Normality Analysis

Hair et al. (2010) believed that if the skewness and kurtosis are both between -2 and +2, the data is considered normal. As can be seen from Table 1, all the values of skewness and kurtosis in this study meet the threshold of the indicator, which means that all variables are considered to be normally distributed. Therefore, regression analysis can be continued.

Table 1 shows the results of the mean, standard deviation, skewness and kurtosis of this study. The average score shows that the mean value ranges from 3.512 to 3.732, indicating that most respondents' answers are at 3-4 levels, that is, "average" to "agree". The highest standard deviation is 1.014 for TVC and the lowest standard deviation is 0.926 for TDL.

Table 1. Summary for Mean, SD, Skewness and Kurtosis scores

Construct	Mean	SD	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TVC	3.547	1.014	-0.590	0.127	-0.307	0.254
EMS	3.732	0.967	-1.080	0.127	0.383	0.254
SCG	3.512	0.944	-0.562	0.127	-0.346	0.254
TDL	3.558	0.926	-0.573	0.127	-0.075	0.254

Reliability Analysis

In order to evaluate the reliability of the internal consistency of the scale and whether the items that make up the scale measure the same basic concept, the Cronbach's alpha value was calculated. Nunally (1978) pointed out that a Cronbach's alpha value above 0.7 indicates acceptable reliability, while a value below 0.5 indicates low reliability and the factor should be rejected. In addition, according to Sekaran (2003), a Cronbach's alpha value must be greater than 0.5 to be considered reliable. Table 2 lists some of the items in the questionnaire and the Cronbach's alpha coefficients of each part.

As shown in Table 2, the Cronbach's alpha of destination loyalty for the dependent variable is 0.895, indicating good reliability. Since the alpha is greater than 0.7, the variable can be classified as a good level, which indicates that it can be measured. All independent variables, i.e., co-creation practice (0.914), emotional solidarity (0.876) and self-consistency (0.817), both indicating that the study was excellent. At the same time, the dependent variable destination loyalty is Cronbach's alpha of 0.895, indicating good reliability. Finally, the Cronbach's alpha reliability coefficient of destination loyalty was well and positively correlated with variables such as co-creation practice, emotional solidarity, and self-consistency.

Table 2. Sample of questionnaire items with Cronbach's alpha for each section

Construct	No. of Item	Sample Item	Cronbach's alpha
TVC	5	I asked for advice from others to arrange this tour	0.914
EMS	6	I am proud to visit this place	0.876
SCG	4	The typical visitor of this place agrees with my opinion of myself	0.817
TDL	6	I will recommend this place to my friends	0.895

Pearson's Correlation Analysis

According to Pallant (2020), if the factors are correlated, then regression analysis can be performed. The value of R ranges from -1 to +1. -1 indicates a strong negative correlation, +1 indicates a strong positive correlation, and 0 indicates no correlation. Pallant (2010) believes that when $r = 0.1 - 0.3$, the correlation is weak; when $r = 0.3 - 0.5$, the correlation is moderate; when $r = 0.5 - 1.0$, the correlation is strong. In addition, when the Pearson correlation coefficient between two variables is greater than 0.8, it indicates the possibility of multicollinearity (Shrestha, 2020).

Table 3 shows the results of the Pearson's correlation analysis of this study. The correlation values between all variables are less than 0.8, so there is no multicollinearity. All correlation coefficients are marked with ** (** indicates $P < 0.01$), which means that there is a significant positive correlation between the co-creation practice, emotional solidarity, and self-consistency variables. The correlation values range from 0.343 to 0.537, indicating that there is a moderate to strong correlation between the items. The strongest correlation is between TVC and SCG, which is 0.537, that is, if TVC and SCG change in the same direction, TVC increases and SCG also increases. The results of the correlation analysis provide preliminary support for the research hypothesis.

Table 3. Pearson's correlation analysis Result

Variables	TVC	EMS	SCG	TDL
TVC	1.000			
EMS	.343**	1.000		
SCG	.537**	.456**	1.000	
TDL	.437**	.364**	.438**	1.000

Regression Analysis

This study used regression analysis to test the proposed hypotheses. Regression analysis shows the relationship and degree of correlation between the dependent variable and the independent variables. The degree of correlation is expressed by the R value, which ranges from 0 to 1. Values close to 1 indicate a strong correlation, and values close to 0 indicate a weak correlation. The goodness of fit of the regression model is determined by R^2 and adjusted R^2 . According to Montgomery et al. (2015), if the regression model contains multiple variables, the adjusted R^2 is more explanatory because it takes into account the impact of the number of independent variables in the model. $F > 4$ usually means that the model may be significant.

The results of the study show that (as shown in Table 4), the correlation between the three independent variables is $R=0.522$, which is a strong correlation. The influence of the three independent variables in the model on the dependent variable can be captured by the linear regression equation we established, which accounts for 26.70% of the information. This means that the results of this operation can truly reflect the influence of co-creation practice, emotional solidarity, and self-consistency on the destination loyalty of student tourists. $F = 45.382$, exceeding the minimum threshold for the model to be significant.

Table 4. Summary of Regression Model Coefficients

Model	R	R Square	Adjusted R Square	F
1	.522	0.273	0.267	45.380

a Predictors: (Constant), SCG, EMS, TVC
b Dependent Variable: TDL

Multiple Regression Analysis

This study also used multiple regression analysis to test the proposed research hypotheses. According to Kutner (2005), a variance inflation factor (VIF) > 5 is considered to be severely collinear, and the value affecting the significance of the model is unreliable. $P < 0.05$ means that at least one independent variable significantly affects the dependent variable, and the significance is strong. The linear equation regression coefficient β is used to quantify the direction and degree of the influence of the independent variable on the dependent variable.

Table 5 shows the results of the hypotheses in the multiple regression of this study. The VIF of the three independent variables is all less than 5, which means that there is no multicollinearity between the independent variables. $P < .001$ for the three independent variables indicates that the three independent variables, co-creation practice, emotional solidarity, and self-consistency, all have a significant impact on the dependent variable destination loyalty. In addition, three independent variables were positively and significantly correlated with student tourists' destination loyalty: co-creation practices ($\beta = 0.237$, $p < 0.001$), emotional solidarity ($\beta = 0.168$, $p < 0.001$), and self-congruence ($\beta = 0.214$, $p < 0.001$).

Table 5. Multiple Regression Results

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Beta			Tolerance	VIF
TVC→TD						
L	0.237	0.259	4.848	<.001	0.7	1.429
EMS→T						
DL	0.168	0.175	3.457	<.001	0.779	1.284
SCG→TD						
L	0.214	0.219	3.869	<.001	0.628	1.592

a Dependent Variable: TDL

Hypothesis Test Results

As shown in Table 6, all three hypotheses were accepted: co-creation practices, emotional solidarity, and self-consistency. In terms of hypothesis testing, Hypothesis 1 indicates that the results of the study are acceptable. The study found that the co-creation practice of student tourists had a significant impact on destination loyalty. Second, hypothesis 2 suggests that the outcome has a significant effect on the dependent variable. This could mean that emotional solidarity is an important provider of dependent variables. A p-value of less than 0.05 indicates a significant relationship. Therefore, there is a significant correlation between the emotional solidarity of student tourists and destination loyalty. Therefore, hypothesis 2 is accepted. Hypothesis 3 indicates significant self-consistency and destination loyalty of student tourists. At the same time, Hypothesis 3 suggests that self-consistency is a strong predictor of student visitor destination loyalty.

Table 6. Hypothesis Results

	Hypothesis	Result	Remarks
H1	Co-creation practices → Destination loyalty	Accepted	Supported
H2	Emotional solidarity → Destination loyalty	Accepted	Supported
H3	Self-consistency → Destination loyalty	Accepted	Supported

Discussion and Conclusions

Discussions

As Xu et al. (2021) said, creating value with others is the beginning of a person's identification with the local. The practice of value co-creation effectively enhances students' sense of responsibility and makes them willing to be loyal to the place. The learning place can encourage college students to participate in rich interactions to enhance multi-dimensional value. For example, the Internet can be used to create online communities for tourism topics, online tourism Q&A, and special lines for college student tourism to promote information exchange and experience sharing between student tourists and other tourists. Offline, the efforts to organize participatory activities, such as cultural performances and festivals, can be expanded to encourage college students to collaborate and share with their families, friends, and even other unfamiliar tourists, thereby enhancing college students' sense of identity and belonging as locals. In addition, considering the characteristics of the student group, exhibitions and theme activities with local cultural and educational significance can also be designed in a targeted manner to truly achieve entertainment and physical and mental integration. At the same time, modern information technology can be adopted to provide customized and traceable services. Large-scale group participation such as schools and clubs will also enhance the possibility of college students' destination loyalty, because team spirit helps to enhance individual sense of belonging.

College students have the dual identities of tourists and residents (Zhang et al., 2019). Making them feel welcome is the basis for college students to establish friendships with local residents. As tourists, feeling welcome makes college students keep revisiting and promotes word-of-mouth recommendation intentions. Therefore, tourism management departments and

governments should try their best to create a social atmosphere where tourists and residents respect and tolerate each other. In addition, intimacy is an important part of emotional solidarity, and people are always willing to give more positive evaluations to people or places with whom they feel close. Destination management departments should provide more opportunities for college students to have the opportunity to directly contact residents and integrate into local life, thereby enhancing their intimacy with places and residents. Identifying and understanding the lifestyle of residents is also a major way to enhance destination loyalty, which may be similar to self-consistency. Management departments can increase online and promotional and offline experience activities to create a platform for identification and understanding for student tourists. Providing positive feedback and using information technology to promote emotional connection can promote their emotional perception experience and destination loyalty.

The higher the degree of consistency between self-cognition and destination, the easier it is to have a positive destination experience and form good destination loyalty (Chon, 1992). Previous studies rarely used college students as independent marketing, but it is very important to accurately position the student group, and their destination loyalty will create more opportunities for the tourism industry. Encouraging a clearer cognitive self is a good way to enhance the self-consistency of the student group. Destination managers can create a sharing platform for college students' evaluations through self-media, providing college students with a channel to express their self-worth and show their self-image, thereby arousing other tourists' emotional resonance and value recognition of the tourist destination. In addition, the civic awareness of the student group should be enhanced so that they think they are part of the destination. The destination can establish and improve the complaint feedback mechanism, improve the destination management model through complaints and suggestions, deeply grasp the psychological needs of college students, strive to establish and maintain a stable emotional connection with college students, and obtain college students' preference for learning destinations.

Conclusion

This study enriches our understanding of Chinese college students' study destination loyalty behaviors, which has not been fully demonstrated in previous studies. The results of data analysis show that college students' co-creative practices in local tourism, emotional solidarity with the study place, and self-consistency have a significant impact on their destination loyalty behaviors. Therefore, for Chinese college students, co-creative practices, emotional solidarity, and self-consistency are important factors in destination loyalty.

The findings from this study have important implications for theory and future research. College students differ from tourists in that they are more knowledgeable about the destination than tourists who travel for a short period of time, but insufficient attention has been paid to this group, especially in the context of mainland China. In fact, the word-of-mouth and repurchase behaviors generated by college students who live in the study location are more likely to persuade their friends and relatives and recruit other tourists than other tourists and local residents.

Based on previous research, the three independent variables were determined to have an impact on student tourist destination loyalty. Understanding these relationships inspires future

research and is essential for tourism managers and policymakers who aim to create a supportive and productive tourism environment. Destination loyalty of Chinese college students can be effectively motivated by creating a value co-creation environment, cultivating emotional solidarity among student tourists, and helping them establish self-congruence with the study location.

Limitations and Future Research

Due to several limitations, this study has implications for future research. This study continues and broadens this line of inquiry in schools, as most studies on destination loyalty are limited to the perspective of tourists. However, the results of this university sample cannot be generalized to all schools (elementary, secondary). Researchers can learn more about the generalizability of this study's final model by testing it in a variety of educational settings.

This study examines the direct effects of co-creation practices, affective solidarity, and self-congruence on destination loyalty. The findings of this study can be extended to the interrelationships between the variables, such as mediation or moderation. It is also suggested that, in order to adequately represent China, future studies should expand the sample to include college students from across northern and southern China. This greater focus would increase the generalizability of the findings and provide a more thorough grasp of the variables that influence college students' destination loyalty.

Acknowledgements/Funding

The authors would like to thank the Faculty of hotel and tourism management, Universiti Teknologi MARA (UiTM), for providing the facilities for this research, as well as the respondents in this study.

Conflict of Interest Statement

The authors agree that this research was carried out without any self-benefit, commercial, or financial conflicts, and they state that they have no conflicting interests with any other party, and that no financial support was obtained for this study.

Authors' Contributions

Liu Mengyuan developed the research concept, wrote, and revised the article. PROF. DR. HASHIM FADZIL ARIFFIN and DR. ANDERSON NGELAMBONG contributed to providing insightful guidance and critical feedback.

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FACTORS INFLUENCING HUMAN CAPITAL DEVELOPMENT: EXPLORING THE ROLES OF BUSINESS PARTNERSHIP WITH THE NGOs AND PRIVATE SECTORS

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Abstract: Human capital development (HCD) is important for socio-economic development, providing individuals with skills and knowledge that are mandatory for labor market success. In the Philippines, a persistent mismatch between job requirements and available talents, resulting in unemployment and underemployment. Partnerships between non-governmental organizations (NGOs) and the private sector emerged as essential mechanisms to fill these gaps. This study explores the factors influencing the effectiveness of such partnerships in promoting HCD within the Philippine context. The study combines quantitative data from semi structured surveys conducted with 77 organizations comprising NGOs and private sector entities with qualitative data from key informant interviews, employing a mixed-methods approach using Exploratory Sequential Design. Statistical analyses, such as regression models and moderation analyses, shows that partnership levels are positively influenced by long-term sustainability and social impact. However, talent acquisition and CSR shows complex dynamics, which may indicate resource competition or misaligned priorities. Although diminishing returns were observed at higher engagement levels, the maturation of partnerships proved to be a strong predictor of successful HCD activities. The results of these partnerships highlight the substantial advantages they provide, such as geographic expansion, financial resource diversification, and capacity-building. Businesses act as financial supporters, technical experts, and policy influencers, while NGOs leverage on grassroots networks to facilitate community engagement. Nonetheless, challenges continue to exist, including communication gaps, misaligned objectives, short-term corporate obligations, and logistical obstacles in remote areas. The significance of aligning initiatives with community needs, fostering clear communication, and institutionalizing partnerships is emphasized in the study. Policy considerations include incentives for ongoing private sector engagement and the improvement of capacity-building efforts. The results highlight the potential of strategic, well-aligned partnerships to improve employment and socio-economic conditions, therefore aiding the sustained development of marginalized communities in the Philippines.

Keywords: Human Capital Development, Ngos, Partnership, Private Sector

Introduction

Human Capital Development (HCD) is the process of enhancing individuals' skills, education, and productivity to drive economic growth, reduce poverty, and foster sustainable development by increasing labor efficiency, innovation, and income generation (Li & Qamruzzaman, 2022). It encompasses skilling, upskilling, reskilling, and lifelong learning, with core components including education, health and well-being, work experience, and access to opportunities. Recent shifts highlight the growing emphasis on skills-based hiring, where practical

competencies in fields like AI, sustainability, and digital technology increasingly outweigh formal credentials (SHRM, 2025). At the same time, the integration of artificial intelligence into workforce management and the rising importance of employee well-being and human sustainability emphasize the need for continuous upskilling and a more inclusive, people-centered approach to workforce development.

In the Philippines, the evolving work landscape reflects these global transformations. Hybrid work models are now common, with flexibility highly valued yet engagement challenges persisting. High turnover rates in sectors such as BPO underscore the urgency of stronger retention strategies, while rapid digitalization means that nearly 68% of Filipino workers will require further training by 2025 (Peoplehum, 2025). Organizations are responding by embedding inclusive leadership, prioritizing innovation and belonging, and leveraging people analytics to guide workforce planning (PHRI, 2025). Labor market data further reveal progress: in January 2025, unemployment declined to 4.3%, labor force participation rose to 63.9%, and youth employment improved significantly as the NEET rate dropped to 11.7% (PSA, 2025). These gains signal momentum in addressing job mismatch, a long-standing challenge that limits the full potential of young Filipino human capital (Raagas, 2023).

Within this context, multi-sectoral partnerships—particularly between NGOs and the private sector (PS)—play a crucial role in bridging education, training, and employment gaps. NGOs bring grassroots connections and community trust (Habtom, 2019), while the private sector contributes resources, technical expertise, and opportunities. However, these collaborations face persistent challenges: NGOs grapple with restrictive funding and complex reporting requirements (GEO, 2015), while PS entities operate under compliance demands and profitability pressures. Disparities in organizational culture, resource distribution, and performance expectations often complicate collaboration (Abiddin et al., 2022). Sustaining partnerships requires building mutual trust, shared values, and adaptive communication (Kulykovets, 2024), alongside inclusive frameworks that address gender disparities and cultural sensitivities (Gupta, 2021). Moreover, restrictive legal frameworks further constrain NGO capacity to mobilize funding and advocate effectively (Hayman, et al, 2019).

A further challenge lies in measuring impact: NGOs typically prioritize qualitative indicators of social change (Goncharenko, 2019), while businesses emphasize quantitative metrics such as return on investment (Salifu, 2023). Reconciling these differences through shared impact metrics and accountability mechanisms is essential to ensure that partnerships remain effective, sustainable, and responsive to community needs (Russell et al., 2021). In sum, strengthening NGO–private sector collaboration in HCD is vital to maximizing human capital potential in the Philippines and achieving long-term socio-economic progress.

Methodology

This study employed a comparative quantitative design, complemented by a mixed-methods Exploratory Sequential approach, to examine NGO–private sector partnerships in HCD. Guided by Bloomfield and Fisher (2019), the quantitative phase measured variables systematically through structured surveys, while the qualitative phase provided depth via key informant interviews (KIIs). Insights from the qualitative strand informed survey development, ensuring contextual relevance. To strengthen rigor, advanced statistical tools were used, including Bootstrap-Corrected and Accelerated (BCa) Regression to address small samples

and non-normality, quadratic regression to capture nonlinear trends, moderation analysis to test how NGO-provided benefits influenced partnerships, and Bootstrap Independent Samples Tests for group comparisons. This design allowed integration of social and economic vulnerabilities such as financial instability, workforce challenges, and social inequities into the analysis, producing evidence-based interventions.

The study engaged two main participant groups: private sector executives and CSR practitioners across all industries; and NGO leaders engaged in HCD initiatives such as education, skills training, workforce readiness, and job placement. NGOs focused on non-HCD advocacies were excluded. Coverage spanned nine Philippine regions (CAR, Regions I, III, IV-A, VII, IX, X, XII, and NCR) to capture both rural and urban contexts. Purposive sampling was employed, with seven NGO leaders and seven private sector partners interviewed, while 84 individuals participated in the survey (14 NGO personnel and 70 private sector representatives from 77 organizations). Sample size adequacy was justified through saturation theory for qualitative data (Saunders et al., 2018) and a 10:1 sample-to-variable ratio for regression analysis (Memon et al., 2020).

Two instruments were utilized: a structured survey questionnaire and a semi-structured interview guide. Separate versions of the survey for NGOs and private sector respondents included four sections: respondent information, factors enhancing private sector engagement, NGO-private sector partnerships, and HCD outcomes. Responses were measured on a four-point Likert scale. The interview guide contained three sections—challenges and resolutions, community and HCD impact, and partnership insights—allowing exploration of emerging themes. This combination enabled both statistical comparison and contextual depth.

Data collection began with approval from the UST Graduate School Ethical Review Committee (USTGS-ERC) and consent from the research advisor. Participants provided informed consent after being briefed on the study's purpose, risks, and rights, including the freedom to withdraw anytime. Recruitment was conducted via email invitations with study details. NGO leaders with at least three years of HCD experience were included, while non-HCD NGOs were excluded. For the private sector, only companies partnered with the selected NGOs were invited. Surveys were distributed through Google Forms for consistency and ease, while KIIs were conducted either in person or online depending on logistics.

Ethical safeguards were strictly observed. Confidentiality was maintained by assigning codes, anonymizing data, and securing files. Participation was voluntary, with clear communication of rights and avoidance of coercion. Risks such as discomfort were mitigated through supportive interviewing practices, flexible scheduling, and provision of referral information if needed. The researcher also ensured objectivity and integrity by avoiding bias and faithfully representing participant views.

Data analysis followed the exploratory sequential process. Qualitative data from KIIs underwent thematic analysis, with transcripts coded and grouped into themes that highlighted recurring challenges, strategies, and perspectives. These themes informed survey design and later contextualized quantitative findings. Quantitative analysis then employed BCa regression, quadratic regression, moderation analysis, and bootstrap independent samples testing to validate relationships and test hypotheses. The integration of both strands yielded a

comprehensive understanding of partnership dynamics, challenges, and impacts, producing findings that combined statistical reliability with contextual depth.

Results and Discussion

The Factors Enhancing HCD Positively Influence the Level of Partnership

The data were analyzed using bootstrap bias-corrected and accelerated (BCa) quadratic regression to examine how five predictors—Talent Acquisition and HCD, Corporate Social Responsibility (CSR), Long-Term Sustainability, Social and Community Impact, and PSNGO² (Private Sector and NGO Partnership, squared)—influence partnership levels.

BCa regression was chosen for its robustness in small sample sizes, adjusting for bias and skewness and improving confidence intervals without assuming normality (Iba et al., 2021; Pan & Zhou, 2021; Heng & Lange, 2024). Prior research (Rha, Kao, & Pan, 2021; Jenkins & Quintana-Ascencio, 2020; Li & Xiao, 2022) supports its use in quadratic regression, especially to capture curvilinear relationships and turning points in partnership dynamics.

Table 1. Regression Coefficients of Factors Impact Positively the Level of Partnership

Predictor	B	Std. Error	Beta	t	p
(Constant)	2.165	0.001	-	2257.97	<.001
Talent Acquisition and Human Capital Development	-0.054	0	-0.156	-194.6	<.001
Corporate Social Responsibility	-0.028	0	-0.092	-114.32	<.001
Long-Term Sustainability	0.067	0	0.172	265.31	<.001
Social and Community Impact	0.004	0	0.011	15.32	<.001
PSNGO ²	0.092	0	0.742	1066.4	<.001

All predictors were significant ($p < .001$). Long-Term Sustainability and Social and Community Impact had positive effects, while PSNGO² was the strongest positive predictor, confirming non-linear benefits of partnership maturity. Conversely, Talent Acquisition and CSR showed negative associations, suggesting potential misalignments or reputational risks. This aligns with Nijhof, de Bruijn, and Honders (2008), who note that NGOs face legitimacy risks when partnering with corporations perceived as controversial, sometimes resulting in “greenwashing” or “blue-washing.”

Partnership Enhances the Benefits to NGOs

Across four benefit domains—(1) financial resources and funding diversification, (2) capacity-building and technical expertise, (3) infrastructure and geographic expansion, and (4) program development and industry knowledge—bootstrap independent-samples tests (Groups: 3 = Moderate evidence, 4 = Strong evidence) consistently show significant mean differences favoring the “Strong” group. Negative mean differences therefore indicate higher perceived benefits when partnership intensity/quality is stronger. Levene’s tests are reported to guide variance assumptions.

a. Financial Resources and Funding Diversification

Partnerships are associated with stronger perceived benefits in all six factors, with the largest gap in Innovation & Best Practices ($MD = -0.750$, $p < .001$). Results underscore that deeper private–NGO collaboration improves strategic alignment, financial/ROI outcomes, community impact, operational effectiveness, innovation, and sustainability—albeit with some variance heterogeneity (e.g., Strategic Alignment; Sustainability). Qualitative accounts explain frictions around ROI expectations, short-term funding cycles, and misaligned metrics, but also describe budget-reallocation tactics, allowances/stipends, and embedded budgeting that stabilize funding. Findings align with Indangasi (2023) on revenue diversification driving NGO sustainability.

Table 2. Bootstrap Independent Samples Test—Financial Resources & Funding Diversification

Factor	Mean Difference	Sig. (2-tailed)	Levene's Test for Equality of Variances
Strategic Alignment and Objectives	-0.571	<.001	F = 157.091, Sig. = 0.001
Financial and Return on Investment (ROI)	-0.5	<.001	F = 0.736, Sig. = 0.413
Impact Social and Community Impact	-0.071	<.001	F = 0.068, Sig. = 0.800
Resource Allocation and Operational Effectiveness	-0.357	<.001	F = 3.409, Sig. = 0.098
Innovation and Best Practices	-0.75	<.001	F = 0.113, Sig. = 0.744
Sustainability and Scalability	-0.107	<.001	F = 6.236, Sig. = 0.034

It was supported that Partnership level significantly enhances funding diversification and financial resilience, especially when innovation and institutionalization (e.g., annual budget lines, LGU ordinances) are present.

b. Capacity-Building and Technical Expertise

All six factors show significant advantages for the “Strong” group. The largest differences appear in Financial & ROI Impact ($MD = -0.767$, $p < .001$) and Strategic Alignment ($MD = -0.667$, $p < .001$), indicating that clear, business-aligned goals and credible value cases are pivotal for capability gains. Interviews reveal tension where long-term returns are hard to quantify, yet partnerships still deliver skills alignment, targeted training, mentoring, and OJT models.

Table 3. Bootstrap Independent Samples Test—Capacity-Building & Technical Expertise

Factor	Mean Difference	Sig. (2-tailed)	Levene's Test for Equality of Variances
Strategic Alignment and Objectives	-0.667	<.001	F = 33.727, Sig. = <.001
Financial and Return on Investment (ROI)	-0.767	<.001	F = 2.399, Sig. = 0.156
Impact Social and Community Impact	-0.633	<.001	F = 0.066, Sig. = 0.802
Resource Allocation and Operational Effectiveness	-0.6	<.001	F = 117.818, Sig. = <.001
Innovation and Best Practices	-0.233	<.001	F = 4.906, Sig. = 0.054
Sustainability and Scalability	-0.033	<.001	F = 2.869, Sig. = 0.125

It was supported that higher-quality partnerships strengthen skills, technical depth, and delivery capacity, especially when strategic alignment and credible ROI narratives are in place.

c. Infrastructure and Geographic Expansion

Perceived benefits are significantly higher for the “Strong” group across all factors, with Financial & ROI Impact again most pronounced ($MD = -0.833$, $p < .001$). Evidence highlights institutionalization (e.g., ordinances, policy integration), pooled resources, and best-practice process discipline as engines for regional scaling (training centers, digital platforms, supply-chain facilities). Unequal variances in some factors (e.g., Social Impact; Resource Allocation; Innovation) suggest heterogeneity in implementation contexts. Results align with Dahan, Doh, Oetzel, & Yaziji (2010) on overcoming geographic/institutional barriers via trust, transparency, goal alignment, and local context understanding.

Table 4. Bootstrap Independent Samples Test—Infrastructure & Geographic Expansion

Factor	Mean Difference	Sig. (2-tailed)	Levene's Test for Equality of Variances	F	Sig.
Strategic Alignment and Objectives	-0.167	<.001	Equal variances assumed	0.205	0.662
Financial and Return on Investment Impact	-0.833	<.001	Equal variances assumed	0.205	0.662

Social and Community Impact Resource Allocation and Operational Effectiveness	-0.556	<.001	Equal variances not assumed	130.909	<.001
Innovation and Best Practices	-0.333	<.001	Equal variances not assumed	6.16	0.035
Sustainability and Scalability	-0.222	<.001	Equal variances assumed	3.486	0.095

The Stronger partnerships expand infrastructure and footprint, enabled by financial viability, local skills pipelines, and governance mechanisms that persist across leadership.

d. Program Development and Industry Knowledge

All factors are significantly better for the “Strong” group. The largest gap appears in Financial & ROI Impact (MD = −0.708, $p < .001$), followed by Strategic Alignment (MD = −0.417, $p < .001$). Partnerships co-produce market-aligned curricula, mentorship, and TOR-driven accountability, improving industry relevance, reducing recruitment/training costs, and boosting retention. Variation in variances (e.g., Resource Allocation; Innovation; Sustainability) indicates diverse operating models. Consistent with Warner & Sullivan (2017), trust, governance, and appropriate depth of engagement are critical preconditions to translate partnership into repeatable program know-how.

Table 5. Bootstrap Independent Samples Test—Program Development & Industry Knowledge

Factor	Mean Difference	Sig. (2-tailed)	Levene's Test for Equality of Variances	F	Sig.
Strategic Alignment and Objectives	-0.417	<.001	Equal variances assumed	0.211	0.657
Financial and Return on Investment Impact	-0.708	<.001	Equal variances assumed	0.061	0.811
Social and Community Impact Resource Allocation and Operational Effectiveness	-0.167	<.001	Equal variances assumed	0.818	0.389
	-0.375	<.001	Equal variances not assumed	36.818	<.001

Innovation and Best Practices	-0.375	<.001	Equal variances not assumed	10.227	0.011
Sustainability and Scalability	-0.250	<.001	Equal variances not assumed	6.413	0.032

Strong partnerships upgrade program design and sector knowledge, marrying private-sector innovation/finance with NGO grassroots expertise to yield scalable, market-relevant solutions.

Factors of NGO-Private Partnership that Influence HCD Initiatives

NGO–private sector partnerships are increasingly recognized as vital to advancing HCD by combining resources, expertise, and networks. This study used a BCa regression analysis to examine which factors most strongly influence partnership effectiveness.

Table 6. Bca Analysis for The Factors Influencing NGO-Private Partnerships in Human Capital Development Initiatives

Variable	B	Bias	Std. Error	Sig. (2-tailed)
(Constant)	0.006	-0.007	0.085	0.858
Strategic Alignment and Objectives	0.222	-0.001	0.005	< .001
Financial and Return on Investment (ROI) Impact	0.114	0.016	0.044	< .001
Social and Community Impact	0.028	-0.003	0.01	0.032
Resource Allocation and Operational Effectiveness	0.505	-0.001	0.006	< .001
Innovation and Best Practices	0.335	-0.009	0.029	< .001
Sustainability and Scalability	-0.205	0.001	0.005	< .001

The strongest predictor of HCD outcomes is Resource Allocation and Operational Effectiveness ($B = 0.505$, $p < .001$), showing that clear frameworks, transparent agreements, and efficient deployment of financial, human, and technical resources are essential to workforce development. Interviews confirmed that structured processes, frequent stakeholder dialogues, and institutionalization through policies or ordinances ensure continuity and effectiveness.

Innovation and Best Practices ($B = 0.335$, $p < .001$) also had a major positive effect. Partnerships that shifted from transactional arrangements to collaborative models, introduced mentoring programs, aligned training to industry needs, and targeted vulnerable groups (youth, women, PWDs) were perceived as especially impactful.

Strategic Alignment & Objectives ($B = 0.222$, $p < .001$) and Financial & ROI Impact ($B = 0.114$, $p < .001$) further highlight the importance of aligning corporate CSR goals with NGO missions while ensuring measurable returns. These factors strengthen trust, increase program relevance, and enhance funding sustainability. Social and Community Impact was significant but modest ($B = 0.028$, $p = 0.032$), indicating that inclusion and equitable access remain important complementary outcomes.

Interestingly, Sustainability and Scalability showed a negative coefficient ($B = -0.205$, $p < .001$), reflecting persistent challenges. Participants cited reliance on short-term funding, inconsistent stakeholder commitment, and the absence of standardized replication frameworks. Without long-term investment strategies, institutionalized mentorship, or policy backing, many partnerships risk remaining one-off projects rather than scalable solutions.

Model diagnostics show an $R = 0.733$, indicating a strong correlation, with $R^2 = 0.537$ suggesting that 53.7% of variance in HCD outcomes is explained by the predictors. The Adjusted $R^2 = 0.460$ refines this to account for predictor count. The F-statistic = 6.966, $p = 0.001$ confirms overall model significance.

Overall, HCD success requires a holistic approach that integrates strategic alignment, financial investment, operational efficiency, social inclusion, and innovation, while systematically addressing sustainability gaps.

The Relationship Between Private–NGO Partnerships and HCD Depends on the Benefits Received by NGOs

Human Capital Development (HCD) is central to socio-economic progress, particularly in developing contexts where partnerships between NGOs and the private sector can mobilize complementary resources and expertise. This study tested whether the benefits provided by NGOs moderate the impact of private–NGO partnerships on HCD.

The regression analysis shows that both Private–NGO Partnerships ($B = 0.026$, $p < .001$) and Benefits received by NGOs ($B = 0.133$, $p < .001$) are positive, significant predictors of HCD. Importantly, the interaction term (PSNGO*BENEFIT) is also positive and highly significant ($B = 0.184$, $p < .001$), indicating that the effect of partnerships on HCD is amplified when NGOs provide substantial benefits such as education, vocational training, or health services.

Findings confirm that NGO-provided benefits significantly strengthen the positive relationship between partnerships and HCD. As benefits increase, the partnership's impact grows stronger, suggesting that benefits act as a moderating factor.

The positive interaction between private–NGO partnerships and HCD can be explained by several reinforcing dynamics. Resource synergy allows private firms to contribute funding and technical expertise, while NGOs provide local trust and networks. Their complementary skills

combine corporate efficiency with NGOs' social knowledge, creating more holistic interventions. Partnerships also achieve enhanced reach, as NGOs extend initiatives into underserved areas that private firms may otherwise overlook. Sustainability is strengthened when private funding is paired with NGO community engagement, ensuring long-term program viability. Furthermore, innovation and adaptability are enhanced as corporations introduce new methods and technologies that NGOs can tailor to local contexts. Partnerships also gain trust and legitimacy through NGO endorsement, which increases community acceptance of private sector initiatives. Finally, monitoring and evaluation systems within NGOs strengthen accountability and provide continuous learning for improvement. Taken together, these factors show that partnerships thrive when NGOs deliver tangible, high-quality benefits that effectively complement private sector resources.

Roles That Businesses Can Adopt in Supporting HCD Initiatives in Partnership with NGOs

a. Challenges Faced by NGOs

From the NGO perspective, businesses play a multifaceted role in ensuring the success and sustainability of HCD initiatives. They act primarily as financial enablers, providing critical funding that allows programs to operate and reach underserved communities. This financial support covers training materials, venues, stipends, and trainers, ensuring that vulnerable groups receive access to education, health, and livelihood opportunities. Without this assistance, many NGOs would not have the capacity to deliver wide-reaching and comprehensive programs. Beyond financial support, businesses also provide technical expertise and mentorship by giving access to advanced facilities, industry-standard equipment, and skilled professionals who guide trainees through hands-on learning. Such contributions bridge the gap between academic theory and workplace practice, aligning training with industry needs and emerging labor market trends. Businesses also participate in curriculum development, helping NGOs design programs that respond to skills mismatches, for example by integrating digital literacy or data analysis based on employer feedback. This direct involvement improves the employability of graduates and ensures training programs remain relevant. Moreover, companies facilitate the transition from training to employment by offering internships, apprenticeships, and job placements, which not only benefit the participants but also supply businesses with a pool of job-ready talent. These partnerships extend to strengthening NGO staff capacity, where corporate partners deliver leadership training and operational support that enhance project management and improve community outcomes. At the systemic level, businesses contribute to policy development, working with NGOs and governments to institutionalize training programs through ordinances and regulatory frameworks. By embedding initiatives within community structures, sustainability councils, or local policy, they ensure that programs continue beyond initial funding cycles. Innovation is another area where business involvement is critical, as companies help design hybrid training systems or adaptive models that respond to local challenges such as limited internet access. They also support broader community well-being by investing in youth leadership, mental health awareness, and peer mentoring programs. From the NGO perspective, businesses are therefore seen not just as funders but as technical experts, employment facilitators, policy influencers, sustainability champions, and innovators who provide comprehensive support that extends far beyond financing alone.

From the private sector perspective, partnerships with NGOs are equally valuable, as they simultaneously fulfill corporate labor needs, strengthen community ties, and enhance business reputation. Businesses often see themselves as workforce developers and talent enablers, collaborating with NGOs to close skills gaps through technical training, mentorship, and structured immersion programs. These arrangements provide companies with a steady pipeline of qualified workers, particularly in industries like hospitality and manufacturing, while also improving employability for marginalized groups such as out-of-school youth. Firms also view themselves as employment facilitators by providing trainees with work placements and immersion opportunities that allow them to gain real-world experience and immediately contribute to organizational efficiency. This collaboration reduces recruitment costs, shortens hiring processes, and alleviates labor shortages during peak seasons. Beyond workforce benefits, businesses emphasize their role as community builders and CSR advocates by sponsoring feeding programs, health initiatives, and infrastructure projects that enhance both local livelihoods and corporate credibility. They also see themselves as innovators, applying frameworks such as 21st Century Skills to refine training approaches, incorporating new recruitment methods to improve retention, and redirecting internal budgets during crises to sustain human capital initiatives. Communication and monitoring are also considered critical, as companies often establish regular meetings, feedback loops, and data systems that track trainee progress and employment outcomes, ensuring that programs remain efficient and results-driven. Many firms also act as policy catalysts, advocating for ordinances or tax incentives that institutionalize HCD initiatives and encourage wider private sector involvement. In times of uncertainty, businesses adapt as risk mitigators, reallocating resources to maintain program continuity and partnering with NGOs to sustain operations. They also strengthen institutions by promoting inclusivity, making facilities more accessible, and embedding lifelong learning practices into organizational cultures. From their perspective, providing mentorship, allowances, and direct participant support not only smooths transitions into employment but also fosters loyalty and morale within the workforce.

Taken together, these perspectives converge on the view that businesses in NGO partnerships assume roles that extend far beyond financial sponsorship. NGOs recognize them as providers of funding, expertise, employment pathways, and policy support, while the private sector views itself as a strategic partner that gains skilled labor, operational efficiencies, and reputational benefits. Both sides agree that the most effective partnerships are built on transparency, adaptability, and mutual recognition of strengths. Businesses act simultaneously as enablers, mentors, innovators, and advocates, creating partnerships that advance community development, strengthen organizations, and meet business objectives. By balancing short-term program needs with long-term sustainability strategies, these partnerships elevate human capital, build resilient communities, and contribute to inclusive economic growth.

b. Challenges and Solutions in NGO–Private Sector Partnerships for HCD

Although NGO–private sector partnerships are crucial for advancing HCD, NGOs face significant challenges that affect effectiveness and sustainability. A primary difficulty lies in the misalignment of priorities. While businesses focus on immediate returns such as skilled labor pipelines and enhanced reputation, NGOs often emphasize long-term social change. This tension can stall program design, especially when corporations push for quick results while NGOs advocate for advocacy or systemic approaches.

Sustainability and funding constraints pose another challenge, as most partnerships are tied to short-term corporate budget cycles or project grants. When funding ends, many programs lose momentum, with limited resources to track long-term outcomes such as career progression or income growth. For example, one workforce training initiative placed participants in jobs but lacked mechanisms to monitor advancement beyond the first six months.

NGOs also grapple with logistical and operational barriers, particularly in remote areas where poor internet access undermines online training delivery. Political transitions further complicate implementation, as newly elected officials may deprioritize or delay existing programs, such as stipend distribution during a municipal leadership change. Communication gaps between partners can create additional problems, as unclear expectations often lead to missed deadlines and misunderstandings. Cultural differences exacerbate these issues: NGOs typically prioritize participatory, community-based approaches, while corporations focus on scalability and profitability.

Another persistent difficulty is impact measurement. While most programs can track immediate outputs such as the number of participants trained, few have the capacity to conduct tracer studies on sustained mobility or job retention. Moreover, resistance to innovation slows progress. Despite Industry 4.0 opportunities, some employers hesitate to adopt new technologies due to costs or fear of disruption. Finally, economic instability forces companies to scale back social commitments to protect their core business, directly shrinking program scope and reach.

To address these barriers, NGOs highlight the importance of early sustainability planning, embedding initiatives into local government ordinances or industry councils to ensure continuity beyond donor cycles. Transparency, regular communication, and trust-building are also essential to align divergent priorities and foster win-win solutions. By institutionalizing programs and nurturing mutual respect, NGOs can better balance business objectives with community needs and secure lasting impact.

Challenges Faced by the Private Sector

The private sector also encounters challenges in HCD partnerships. A frequent concern involves participant behavior and discipline, particularly when trainees struggle to adapt to structured workplace environments. NGOs often intervene quickly to address such issues, but behavioral concerns can still disrupt training. Skills mismatches and weak participant commitment also hinder program outcomes, as endorsed trainees may lack the competencies businesses need. To resolve this, firms collaborate with NGOs on pre-screening processes, capacity-building programs, and clear terms of reference to ensure only motivated and qualified candidates participate.

Private firms additionally face structural and financial barriers. Some NGOs assume that business involvement equates to direct financial contributions, overlooking the need for reciprocity. Misaligned expectations can be mitigated through transparent dialogue and clarified responsibilities. Resource limitations also restrict the ability to meet long-term workforce demands. For instance, short-term initiatives may not produce enough trained workers to address chronic labor shortages. Companies have therefore adapted by reallocating

internal training budgets to sustain programs during funding gaps, ensuring continuity despite constraints.

Communication challenges further complicate partnerships. Inconsistent feedback or delays in coordination can derail shared objectives. To improve alignment, companies and NGOs increasingly rely on structured monitoring, email updates, focus group discussions, and regular meetings to address problems proactively. At the policy level, weak incentives discourage sustained private sector participation. Without adequate tax breaks or recognition programs, many firms struggle to justify long-term investments. Some businesses have responded by embedding HCD programs into annual budget plans, ensuring their institutionalization beyond the pilot stage.

Despite these hurdles, several solutions have proven effective. Companies that exceed baseline program requirements, such as providing meals, transport allowances, or stipends, report higher participant motivation, improved retention, and stronger workplace morale. Firms that maintain transparency and open communication also report smoother implementation and better alignment with NGO objectives. Embedding partnerships into government ordinances and organizational policies further strengthens sustainability, while employers increasingly extend internship periods—especially for senior high school students—to maximize developmental impact.

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6th Penang International Multidisciplinary Conference 2025

eISSN 3036-0331

8th - 9th November 2025

Shang-Ri La Hotel, Penang, Malaysia

Warner, M., & Sullivan, R. (Eds.). (2017). *Putting partnerships to work: Strategic alliances for development between government, the private sector and civil society*. Routledge.

A STUDY ON THE SYMBOLIC MEANINGS AND CULTURAL CHARACTERISTICS OF TRADITIONAL MIAO BATIK PATTERNS

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Abstract: *As one of China's first batch of national intangible cultural heritage listings, Miao batik patterns embody rich historical and cultural value, holding significant research value and importance. However, research on traditional Miao batik patterns generally shows that Chinese regional academic community resources are relatively abundant, while international academic literature remains relatively limited. Due to language barriers and regional restrictions on publishing platforms, these two sources cannot effectively exchange data. This situation has prevented Miao batik from achieving a breakthrough in its international influence. This paper aims to summarize and organize the symbolic meanings and cultural characteristics of nine primary patterns in Miao batik through document analysis of existing literature (primarily in Chinese), compiling the findings into a summary table. This study contributes by providing reference materials for related research in the English language world, promoting international cultural exchange, and enhancing the dissemination of Miao batik culture.*

Keywords: *Patterns, Symbolic Meaning, Cultural Characteristics, Miao Batik*

Introduction

Research Background

Lu Pu (1984) noted that “batik has a history of over two thousand years in China, historically known as ‘wax printing,’ and is one of the three renowned dyeing techniques in Chinese history (wax printing, twisted dyeing, and clamp dyeing).” It is a cultural code, a conduit for information and an expression of ideas, long celebrated as the foremost dyeing art of the East. Renowned for its long history and exquisite craftsmanship, it was included in China's first batch of intangible cultural heritage listings in 2006. The patterns embody the cultural history and ethnic characteristics of the Miao people, recording their totem worship, myths and legends, religious culture, and social history, reflecting the Miao people's aesthetic sensibilities and ethnic beliefs. However, research on Miao batik has primarily been presented through Chinese academic databases, with relatively limited international scholarly literature on the subject. Language barriers and database limitations have resulted in insufficient international research in this field.

Problem Statement

Regarding the symbolic meanings of Miao batik patterns, a number of Chinese scholars have accumulated substantial research findings, but there is a lack of English-language compilation and comprehensive synthesis. CNKI has indexed numerous academic resources related to the symbolic meanings of Miao batik patterns, but most of which were published in Chinese. Relevant English-language research findings are limited in international databases such as Google Scholar and SCOPUS. If this issue persists, the international dissemination of the

symbolic meanings behind Miao batik patterns will be constrained, and cross-cultural exchange among scholars will be hindered. This will not be conducive to the internationalization of Miao batik culture research, its cultural dissemination, and its inheritance and innovative development.

Research Questions

Q1. What are the symbolic meanings of the primary common patterns in Miao batik craftsmanship?

Q2. How do these meanings reflect characteristics of Miao culture?

Research Objectives

To organize and present the symbolic meanings of the primary common patterns in Miao batik craftsmanship, and to explain what characteristics of Miao culture they embody.

Research Significance

1. Promote the long-term development of Miao batik craftsmanship through innovation, engagement with the international academic community, and expansion of its application domains.
2. Disseminate outstanding Miao cultural heritage, foster academic exchange, advance mutual recognition among international scholarly literature, and strengthen cultural identity.
3. Contribute to international scholars' understanding of Miao culture through cultural dissemination, thereby attracting more qualified practitioners to preserve this heritage.

Literature Review

Relevant Research in Chinese Academic Community

Research on Miao batik is relatively rich, primarily divided into three categories: applied research on Miao batik, pattern studies of Miao batik, and research on the inheritance and innovative development of Miao batik.

Introduction to the application research of Miao batik

This section explores the influence of Miao batik in contemporary design, integrating traditional craftsmanship with modern aesthetics. Xu Xin et al. (2024) note that “designers are beginning to incorporate ethnic cultural elements such as batik into functional designs to enrich the cultural connotations of spaces.” In the contemporary context, interior soft furnishings design primarily emphasizes technical innovation while lacking cultural depth in its expressions. Miao batik, with its profound cultural heritage, can fulfill people's spiritual aspirations for a better life as well as enhance its cultural influence. Wu Qian (2025) noted that “recreating intangible cultural heritage elements through artistic means—such as applying Miao batik patterns to landscape walls, sculptures, or public facilities—not only beautifies the community environment but also allows residents to experience profound historical and cultural resonance in their daily lives.” Miao batik has emerged in new forms within the public, not only beautifying community environments but also bridging the gap between residents and Miao batik culture, promoting the industrialization and marketization of Miao batik.

Introduction to the Study of Miao Batik Patterns

This category of research focuses on the rich and diverse patterns of Miao batik and their symbolic meanings. Chen Yijun (2013) noted that “Miao batik patterns in Guizhou primarily include two categories: natural motifs and geometric designs. Natural motifs are further subdivided into plant and animal patterns.” Miao batik patterns exhibit remarkable diversity and rich composition, with research indicating regional variations in their designs. Hu Wenjuan & Wang Yixin (2025) note that “these patterns are artistic symbols formed by the Miao people through the abstraction and refinement of natural and everyday elements throughout history, effectively conveying emotions and culture.” They serve not only as artistic expressions but also as cultural carriers, documenting and transmitting the transformations of historical development, migratory memories, and the cultural values of their people.

Introduction to Research on the Inheritance and Innovative Development of Miao Batik

This category of research argues that the development of Miao batik must balance both preservation and innovation. Du Yingbei (2025) notes: “This ancient craft of Miao batik in Guangxi, though bright in history, cannot withstand the impact of modern industrial civilization. Issues such as the discontinuity of skill transmission, shifting market demands, and fading cultural identity are increasingly prominent, compelling us to deeply contemplate pathways for its inheritance and innovative development.” Traditional methods of cultural transmission suffer from insufficient dissemination, leading to a lack of young participants and elderly practitioners. If Miao batik products fail to innovate and overcome the challenge of large-scale production, market demand will inevitably decline. Zhang Yetong (2024) noted that “by integrating traditional batik techniques with innovative practices, Miao batik can be connected to modern culture. This approach allows more people to understand and embrace Miao culture, thus promoting the inheritance of the traditional craft—Miao batik.” The inheritance and innovative development of Miao batik not only offers a solution to current challenges but also represents an inevitable trend for future growth.

Relevant Research in the International Academic Field

Research in this field within the international academic community began relatively late, resulting in a limited body of findings. These studies primarily include research on cultural heritage, investigations into educational transmission, and case studies of handicrafts.

Introduction to Cultural Heritage Studies

For example, Zhennan (2023) points out “Batik not only reflects the life interest and aesthetic ideal of Miao people, but it also becomes the carrier of Miao nationality culture and historical development.” “With the development of globalization, the traditional batik is dying in a fast rate, and the present situation of its inheritance is worrying.” This perspective argues that contemporary Miao batik is no longer merely a traditional craft, but rather a vehicle for ethnic culture, religious beliefs, and aesthetic concepts.

Research on Educational Inheritance

For example, Liu & Ko (2021) mentioned “Therefore, we should pay attention to the inheritance and development of Miao batik culture in Western Hunan, and combine the educational psychology of teachers and students, make full use of educational methods, deeply study the artistic value and cultural connotation of Miao batik patterns in Xiangxi, draw up an effective inheritance scheme of Miao batik culture in Xiangxi, and enter the school gate and put it into the classroom Education.” This perspective argues that education should be leveraged to infuse cultural vitality into the preservation, transmission, and innovation of Miao batik, thereby revitalizing intangible cultural heritage and ensuring its sustainable development.

Case Studies of Handicrafts

For example, Jian & Ramli (2024) mentioned “This batik pillow mat with a pomegranate pattern, collected in the State Administration of Cultural Heritage, is full of patterns, ... It reflects the ancient people's desire for reproduction.” “This pleated skirt with egret patterns, collected in the National Museum, ... expressing the Miao people's pursuit of equality and freedom in the face of oppression.” Through case studies, the authors reveals the broader cultural significance of Miao batik patterns, each of which has its own deep-rooted origins and carries specific meanings.

Review of Related Research

During the literature review process, it was found that studies examining the symbolic meanings and cultural characteristics of Miao batik patterns based on their positioning yielded 542 relevant articles in CNKI. In contrast, Google Scholar and SCOPUS (OA) contained fewer than 50 articles on Miao batik. There exists a wealth of relevant Chinese literature with substantial content. However, due to language barriers and limitations of archival platforms, coupled with limited opportunities for showcasing and discussing Miao batik in international collaborative projects and academic conferences, it has failed to achieve global influence. This makes it difficult for international scholars to build upon existing research and conduct further studies. As a result, there is a lack of relevant research findings from international literature to serve as reference and support in this area. More concrete measures should be implemented to address this issue.

Methodology

Research Methods

This study comprehensively reviews and analyzes the existing theoretical foundations, research findings, and developmental history of the symbolic meanings and cultural characteristics of Miao batik patterns through extensive consultation of relevant domestic and international literature, including books, academic journal articles, dissertations, monographs, and other sources. Thus, this study clarifies its position within the field, providing a solid theoretical foundation and research insights for subsequent investigations.

Data Sources

The literature data for this study was sourced from the China National Knowledge Index

(CNKI), a platform for Chinese academic papers. Image data related to previous research on Miao batik was derived from illustrations in He Chen's 2006 monograph "Miao Batik", as well as publicly available data from the Guizhou Provincial Museum's official website and the internet. The above choices were made because CKNI has a high usage rate within China's academic community and offers abundant scholarly resources; monographs provide more comprehensive and detailed documentation on Miao batik research; and Miao batik has a long history of development in Guizhou Province, making the resources on the Guizhou Provincial Museum's official website more reliable.

Data Analysis Methods

This paper analyzes nine conventional patterns in Miao batik, including swirls, butterflies, fish, birds, dragons, pomegranates, geometric designs, "卍", and bronze drum motifs. It employs visual analysis to describe the formal elements of these patterns and uses document analysis to summarize their symbolic meanings.

Ethical Considerations

This study does not involve any experiments with human subjects, animals, or microorganisms and therefore does not require research ethics review. All data are sourced from publicly available, legitimate, and valid sources and constitute proper and reasonable academic citations.

Research Findings

Whirl Patterns

Figure 1 depicts eight circular patterns extending from the center to the outer edge along a single curve, rendered in white on a blue background and arranged in pairs of symmetrical counterparts. However, this is merely one manifestation of swirl patterns; visually, it represents one of the most striking geometric motifs in batik. Yang Shanshan (2021) proposed three possible interpretations of the artistic significance of the whirlpool pattern: The first possibility is that the "whirl pattern originated from the ancient migration of the Miao people. At that time, the ancestors of the Miao lived in the middle and lower reaches of the Yellow River, and the whirlpool pattern imitated the whirlpools in the Yellow River". The second possibility suggests an origin in Miao sacrificial rituals. "Water buffalo were indispensable sacrificial offerings in Miao ceremonies, requiring animals with beautifully shaped horns and well-formed spiral patterns. Only buffalo of the highest quality were presented to ancestors as a sign of reverence." The third possibility is that the whirl pattern "evolved from the totems or tribal emblems of early bird-clan tribes, serving as a symbolic emblem of the tribe." These symbols represent the perpetual cycle of life and the arduous migratory journey of the Miao people.



Figure 1: Whirl Pattern

Image Source:

<https://news.cctv.com/2019/08/19/ARTIMA6F7Ho9JHK3jSkBzRtX190819.shtml>

Butterfly Pattern

Figure 2 depicts a butterfly pattern rendered in white markings against a blue background. The butterfly's form is full-bodied, with both wings spread. The wings, antennae, and eyes are perfectly symmetrical on both sides. Composed of a simple outer contour and intricate internal lines. Yu Jiping and Tian Jun (2011) note: "The Miao people's worship of butterflies is depicted in the ancient Miao song "Song of the Maple Tree", which tells how the maple tree nurtured a butterfly. The butterfly laid twelve eggs, from which hatched the human ancestor Jiang Yang, thus establishing a blood kinship between butterflies and humans. Consequently, the butterfly totem frequently appears in numerous patterns of Miao traditional handicrafts, reflecting the Miao people's affection and reverence for butterflies, and embodying their simple, primitive religious beliefs." It can be seen that this motif represents one of the totemic beliefs within Miao totem worship, serving as an artistic expression of the Miao people's primitive religious faith. This symbolism embodies the ancestral reverence inherent in their original consciousness, as well as their profound respect and love for life.



Figure 2: Butterfly pattern

Image source: <https://www.yuncunzhai.com/article/285684.html>

Fish Pattern

Figure 3 depicts two white fish patterns rendered upon blue fabric. The fish possess rounded, full bodies with large heads, their forms curved as if swimming. The pair is arranged in a configuration similar to the Tai Chi symbol, with dorsal fins extending outward as flowing lines. The abdominal lines represent an abstract interpretation of fish eggs and scales. Han Shanshan (2025) noted that "fish motifs feature extensively in Rongjiang batik. Master Yang,

a traditional artisan, explained that locally, three fish are used to worship ancestors during a child's birth, marriage, and house-building ceremonies—a time-honoured custom. Given their prolific breeding, fish also symbolise good harvests and prosperity.” The symbolic significance of its motifs reflects humanity's worship of fish for their prolific reproductive capacity. Over time, these evolved to embody other auspicious meanings, such as the Han Chinese motif of the “carp leaping through the dragon gate”, symbolising advancement and success. These symbolic meanings continue to develop with the times, taking on new connotations in response to humanity's evolving aspirations.



Figure 3: Fish pattern

Image source: He Chen. (2006). Miao Batik. Yunnan University Press.

Bird Pattern

Figure 4 depicts a white bird rendered in profile upon a blue cloth. The bird's head is tilted slightly forward, its eyes round and expressive. Both head and body exhibit rounded contours, while wings are spread wide in a soaring posture. Wang Xiaoxue (2020) notes that "the mythological epic ‘Ancient Songs of the Miao’ recounts how the giant bird Ji Yu replaced the butterfly in conceiving the first human being. This giant bird is revered as a divine bird possessing extraordinary powers. The Miao people of Zhijin regard this divine bird as the phoenix, the king of all birds, heralding auspicious omens. Thus, the bird motifs in their batik symbolise good fortune and prosperity." Not only that, the Miao people revere birds as divine beings, viewing them as symbols of masculinity and positivity, imbued with significance in fertility worship. This symbolic meaning embodies the Miao people's desire and pursuit of a better life and the joy of having many children and grandchildren.



Figure 4: Bird Pattern

Image source: He Chen. (2006). Miao Batik. Yunnan University Press.

Dragon Pattern

Figure 5 depicts a dragon motif rendered in white against a blue background. The dragon's body coils upwards inwards, primarily formed by curved lines. Its eyes are wide and round, gleaming with intensity, conveying the dragon's majestic authority. Gu Shixue (2024) notes that "among the Miao people of the Xijiang River, the dragon motif appears with particular frequency. The Qingshui and Duliu rivers feed the Miao people and nurture their embroidery culture. As the divine guardian of the waters, the dragon holds profound significance for the Miao, whose livelihoods depend on fishing. Thus venerated as a deity, it reflects the Miao people's earnest wish for the dragon god's blessing upon bountiful harvests and favourable weather year after year." It is the guardian deity of the people, safeguarding the peace of villages and hamlets, bestowing prosperity upon descendants, and granting blessings to all. In the egalitarian society of the Miao people, the dragon embodies the consciousness of the common folk. It is not beholden to any authority nor owned by any individual. Thus, the Miao dragon consistently manifests characteristics of friendship, equality, and harmonious coexistence with humans and all living beings, appearing warm and endearing.



Figure 5: Dragon Design

Image Source: <https://www.yuncunzhai.com/article/285684.html>

Pomegranate Pattern

The pomegranate motif in Figure 6 features four pomegranates rendered in white against a blue fabric background, surrounding a pomegranate blossom. This cross-sectioned pomegranate depicts its seeds as dots connected along the outer edge, symbolizing the auspicious meaning of "a hundred seeds unfolding from the pomegranate." Wang Xiaoxue (2020) notes that "the pomegranate symbolizes fertility and new beginnings. Its seeds and fruit represent the continuation of life. For the Miao people of Zhijin, the pomegranate flower not only shares the same meaning of numerous children and blessings as fish motifs, but also embodies the wish for family harmony, unity, and happiness." The pattern belongs to the floral and botanical motif category, which typically appears in public view as an auxiliary design. The symbolic meaning of this motif reflects the Miao people's fertility worship, reflecting the status and importance of reproductive capacity in the minds of the people at that time.



Figure 6: Pomegranate Design

Image Source: Guizhou Provincial Museum Official Website: <https://www.gzmuseum.com>

Geometric Patterns

As shown in Figure 7, white geometric patterns are drawn on deep blue fabric, featuring dense short lines radiating toward a central point. These lines form layered, non-closed circular patterns running from the innermost to the outermost layers. Li Shan (2019) noted that “the geometric patterns in Dan Zhai Miao batik are highly abstract yet intimately connected to objects in real life. This high degree of abstraction possesses an orderly aesthetic. The use of geometric patterns to abstractly summarize objects in Dan Zhai Miao batik thus takes on an air of mystery.” The patterns, rendered in abstract imagery and color, embody reverence for ancestors and document migration routes and arduous journeys. They showcase the multifaceted nature of batik art, representing abstract aesthetics and cultural heritage. These designs carry the Miao people's aspirations for blessings and protection from calamity, as well as their deep affection for life.



Figure 7: Geometric Patterns

Image Source: He Chen. (2006). Miao Batik. Yunnan University Press.

“卍” Pattern

Figure 8 depicts a “卍” pattern rendered in white on blue fabric. The design features a rectangular outline formed by straight lines, with a swastika at its center, creating a simple yet bold aesthetic. Featuring a sense of rotation, its patterns typically appear in block or linear forms, with stylistic variations depending on their location. Dong Yufei (2022) notes that “elders from the Huawu branch in Qianxi recount that among ethnic minorities, the swastika

motif symbolizes family members dancing hand-in-hand, representing fertility and procreation. The '卍' pattern holds significant importance in ethnic minority worship. Totem worship originates from the Miao belief in animism—the idea that all things possess spirits. The connotation of fertility and procreation stems from the swastika pattern's derived meaning of 'the union of yin and yang, the joy of fish and water.'" This symbolism reflects humanity's reverence for procreation and its deep respect for all things in nature.



Figure 8: "卍" Pattern

Image Source: <https://www.yuncunzhai.com/article/285684.html>

Bronze Drum Patterns

Figure 9 features a white design on blue fabric, centered around a concentric circle. Within the circle are two symmetrical floral designs, surrounded by floral patterns and fern motifs arranged in a regular composition, creating a dignified and elegant effect. Li Shan (2019) noted that "in ancient times when the Miao people waged war, bronze drums served as instruments for command. In the modern era of peace, the Miao people primarily use bronze drums in sacrificial rituals. Bronze drum patterns frequently appear in batik designs as diverse combinations of motifs. The Miao people of Danzhai paint bronze drums onto batik textiles as a form of remembrance and reverence for their ancestors." Among many ethnic groups, bronze drums symbolize wealth and authority. Their symbolic significance reflects the Miao people's aspirations for peace and prosperity, as well as their identification with their historical and cultural heritage.



Figure 9: Copper Drum Patterns

Image Source: He Chen. (2006). Miao Batik. Yunnan University Press.

Summary

Miao batik patterns primarily feature white designs on a blue background. As shown in Table 1, the symbolic meanings of multiple patterns reveal that reproduction and procreation held significant importance in ancient Miao culture. These symbolic interpretations were shaped by social, cultural, natural, daily life, and life-related influences.

Table 1: Typical Miao Batik Patterns and Their Symbolic Meanings

Pattern	Symbolic meaning
Swirl Pattern	Depicting the ceaseless cycle of life and the arduous migratory journey of the Miao people
Butterfly pattern	Symbolizing ancestor worship and reverence and love for life
Fish pattern	A symbol of womanhood, representing fertility and abundance, embodying the continuity of life and the cycle of generations.
Bird pattern	Symbolizing good fortune and prosperity, it represents the origin of all things and the perpetuation of life.
Dragon Pattern	Symbolizing the welcoming of blessings and auspiciousness, and the warding off of misfortune and calamity.
Pomegranate pattern	Symbolizing fertility, unity, and harmony
Geometric patterns	Awe and praise for nature, reverence and veneration for ancestors
“卍” pattern	symbolizing fertility and the continuation of the family line.
Bronze Drum Patterns	Among many ethnic groups, bronze drums symbolize wealth and authority, as well as reverence and veneration for ancestors.

Source: (Author's Production Summary)

Conclusion

This study examines nine Miao batik patterns: swirls, butterflies, fish, birds, dragons, pomegranates, geometric designs, “卍”, and bronze drum patterns. In general, these patterns reflect the Miao people's reverence for ancestors, their worship of fertility and prosperity, their veneration and love for deities and nature, as well as their pursuit of a better life and aesthetic beauty.

This study contributes by providing a rich resource for contemporary art and design creation worldwide, offering reference materials for related research in the English-speaking world. It helps the international community gain a deeper understanding of Miao batik, reduces cultural barriers, and promotes mutual understanding and communication between different cultures.

The limitations of this study lie in its reliance solely on literature review, lacking field investigations. Consequently, future research will advance toward integrating fieldwork with digital preservation studies. Enhancing the authenticity and credibility of data related to Miao batik will further promote its preservation and research development.

Data Availability Statement

All data pertaining to the results are provided within the main text of the paper and do not require additional data sources. All visual data cited in the text are sourced from publicly available materials.

Funding Source

This study received no funding from any organization.

Other Matters

The Chinese literature cited in this paper originates from the CNKI database platform. The DOIs of Chinese data platforms are not universally recognized internationally. The citations of Chinese literature in this paper are the author's own translations.

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UNDERSTANDING SMES' DIFFICULTIES IN COMPLYING WITH SALES AND SERVICE TAX 2.0

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Abstract: *The reintroduction of Malaysia's Sales and Service Tax 2.0 (SST 2.0) has created notable compliance challenges for Small and Medium Enterprises (SMEs), particularly in adapting to new procedural and technological requirements. This study investigates the core areas in which SMEs experience difficulties in complying with SST 2.0 obligations. The research sample comprises 127 SMEs across Malaysia, surveyed through a structured questionnaire. Descriptive statistical analysis was employed to identify and rank the major compliance obstacles. Findings reveal that the most prominent challenge involves the necessity to upgrade digital and computerization systems (mean = 3.94, SD = 0.784), underscoring technological inadequacies that constrain compliance efficiency. Similar issues emerge in relation to accounting system enhancement (mean = 3.91) and heavy documentation demands for record-keeping (mean = 3.78), both of which highlight administrative and operational limitations. Knowledge-based weaknesses, including insufficient understanding of SST concepts (mean = 3.83) and low familiarity with tax legislation (mean = 3.56), further compound these difficulties. SMEs also face uncertainties concerning HS Code classification for taxable goods and services, alongside risks of double taxation within supply chains. The findings suggest an urgent need for targeted interventions by policymakers and tax authorities. Proposed initiatives include clearer procedural guidelines, simplified reporting systems, enhanced training and outreach efforts, and financial or technical incentives to support SMEs in modernizing their accounting and IT infrastructure. These measures are essential to strengthen SST 2.0 compliance, reduce administrative burden, and promote a more effective and sustainable tax environment in Malaysia.*

Keywords: *SMEs, Sales and Service Tax 2.0, Compliance Barriers, Administrative Burden, Tax Policy*

Background of the Study

Small and Medium Enterprises (SMEs) form the cornerstone of Malaysia's economic structure, serving as a key driver of employment creation, technological innovation, and national productivity growth. Their extensive presence across diverse industries not only strengthens domestic economic performance but also contributes to regional development and enhances Malaysia's overall competitiveness in the global market (World Bank Group, 2020). Despite their strategic importance, SMEs frequently operate under resource constraints, including

limited capital, expertise, and institutional capacity, rendering them highly sensitive to shifts in policy and regulatory frameworks.

A major policy shift occurred when the Malaysian government decided to replace the Goods and Services Tax (GST) with the Sales and Service Tax 2.0 (SST 2.0) in September 2018. Although the SST was designed to be less complex than GST, the reimplementation required businesses especially SMEs to readjust their administrative systems, documentation procedures, and tax submission processes. For many smaller enterprises, this transformation proved challenging due to inadequate financial resources, limited technical skills, and insufficient access to professional guidance. These constraints highlighted a significant mismatch between governmental policy intentions and the actual capacity of SMEs to comply effectively with the revised tax system.

Unlike large corporations equipped with structured compliance systems and professional tax support, SMEs typically operate with minimal staff, basic technological infrastructure, and limited access to expert consultation (Kgakatsi et al., 2024; Bello et al., 2024). Such structural limitations make SMEs more prone to errors, delayed reporting, and confusion regarding tax obligations. Although SST 2.0 introduced measures such as threshold-based registration and selected exemptions to ease compliance burdens, many operational difficulties persist. Complex procedures, inadequate guidance, and inefficiencies in the system continue to hinder compliance, often leading to unintentional errors and disruptions in day-to-day business operations.

This study seeks to explore the major areas of difficulty encountered by SMEs in meeting the compliance requirements of the SST 2.0 framework. Specifically, it aims to identify administrative, technical, and knowledge-based challenges that impede effective compliance and to propose practical measures to enhance SMEs' readiness and efficiency. By addressing these aspects, the research intends to bridge the gap between policy objectives and actual business practices. The findings are expected to inform the formulation of a more targeted SST facilitation program designed to assist SMEs in managing their compliance responsibilities and improving their integration into Malaysia's indirect tax ecosystem.

Literature Review

Definition and Role of SMEs in Malaysia

Small and Medium-sized Enterprises (SMEs) constitute an essential pillar of both national and global economies, serving as engines of growth, innovation, and employment creation. In Malaysia, the definition of SMEs, as outlined by SME Corp. Malaysia (n.d.), varies according to sectoral characteristics. For the manufacturing sector, SMEs are identified as firms with annual sales turnover not exceeding RM50 million or employing no more than 200 full-time workers. In contrast, for the services and other related sectors, the threshold is set at an annual sales turnover not exceeding RM20 million or employment of fewer than 75 full-time workers.

As of 2023, Micro, Small, and Medium-sized Enterprises (MSMEs) accounted for 96.9% (1,101,725 firms) of Malaysia's total business establishments. Within this segment, microenterprises represented the majority, contributing 69.7% (767,421 firms), followed by small enterprises at 28.5% (314,465 firms), and medium-sized enterprises forming the remaining 1.8% (19,839 firms) (SME Corp. Malaysia, 2024). This distribution demonstrates

the dominant role of microenterprises in the Malaysian business ecosystem and reflects the evolving structure of the MSME sector.

SMEs have long been recognized as key agents of Malaysia's socioeconomic transformation. Since the 1990s, they have significantly contributed to job creation, income generation, and national industrial diversification (Chin & Lim, 2018). In addition, SMEs act as a foundation for promoting entrepreneurship among youth, women, and underrepresented communities. Despite these contributions, SMEs often face limitations in scale and resources, particularly in areas such as digital adoption, access to finance, regulatory compliance, and strategic management. According to SME Corp. Malaysia (2025), MSMEs contributed 39.1% to Malaysia's Gross Domestic Product (GDP) in 2023, 48.5% of total employment, and 12.2% of total exports. Given these significant contributions, continuous institutional support, tailored policy interventions, and capacity-building initiatives are crucial to ensure that MSMEs can sustain their growth and strengthen their competitiveness in a rapidly changing economic landscape.

Overview of Tax Compliance in SMEs: Global Perspectives

Tax compliance, as defined by Inasius (2018), refers to a taxpayer's capacity and willingness to follow tax regulations, including the accurate declaration of income and timely payment of due taxes. Similarly, Alshira'h and Abdul-Jabbar (2020) describe tax compliance as the process of filing annual tax returns accurately, applying eligible deductions, reliefs, and exemptions in accordance with relevant laws and judicial decisions. Mohd Ali et al. (2020) emphasize that tax compliance remains a critical aspect of fiscal policy in both developing and developed economies, underscoring the responsibility of all taxpayers regardless of business form or size to fulfil their obligations transparently and efficiently. Nonetheless, compliance behaviours differ significantly among countries due to variations in regulatory systems, economic structures, and cultural norms. Therefore, assessing SME tax compliance from both global and regional viewpoints provides a more comprehensive understanding of the issue.

Within the European Union (EU-28), SMEs represent nearly the entire non-financial business sector, accounting for 99.8% of all enterprises. They contribute approximately 66.6% of employment and 56.8% of value added in the non-financial sector. Given their substantial role, even marginal improvements in regulatory and tax compliance frameworks can generate significant economic benefits across the region. Despite their importance, SMEs continue to face disproportionate compliance costs compared to large-scale enterprises (LSEs). Although LSEs incur higher absolute tax costs, the relative financial burden on SMEs is considerably heavier, partly because compliance costs tend to be fixed, allowing larger firms to enjoy economies of scale in tax administration. Among the most challenging taxes for SMEs are income related taxes, social security contributions, property and real estate levies, and local taxes. To address these issues, several EU member states have adopted simplified tax schemes aimed at reducing compliance costs, although implementation varies across countries. These simplification efforts endorsed under the European Investment Plan seek to streamline procedures, enhance clarity, and foster a more SME friendly regulatory environment, including within tax administration (European Commission et al., 2022).

In developing economies such as Ghana, SMEs similarly play a pivotal role in employment generation, income distribution, and inclusive growth. According to Ernest et al. (2022), SMEs

contribute roughly 70% to Ghana's GDP and account for 99.6% of registered enterprises, underscoring their importance in poverty reduction and national development. However, SMEs in Ghana and by extension, in many developing economies face substantial challenges in meeting tax obligations. Compliance tasks such as maintaining accurate records, preparing returns, and understanding complex tax legislation impose heavy administrative and financial burdens. Engaging tax professionals, adopting record-keeping systems, and keeping pace with regulatory updates often increase operational costs and reduce profit margins.

Excessive compliance costs can discourage formalization, limit business expansion, or even push firms toward informality. In addition, such inefficiencies can reduce tax revenues while placing additional strain on smaller businesses. Conversely, simplifying tax procedures and lowering compliance-related expenses can enhance SME competitiveness, allowing firms to redirect resources toward innovation, productivity improvements, and job creation. Hence, creating an enabling tax environment that balances government revenue needs with SME sustainability remains a critical priority for policymakers in both developed and developing economies.

Direct vs Indirect Taxation in Malaysia

Taxation forms one of the key pillars underpinning a nation's economic development and fiscal stability. In Malaysia, the tax framework is composed of both direct and indirect tax systems, each serving distinct yet complementary functions in public revenue generation. The Inland Revenue Board of Malaysia (IRBM) is the principal authority responsible for the assessment and collection of direct taxes, which include individual and corporate income tax, petroleum income tax, real property gains tax, and stamp duty. Conversely, the Royal Malaysian Customs Department (RMCD) oversees the administration and enforcement of indirect taxes, encompassing customs duties, excise duties, the Sales and Service Tax (SST), and the now-abolished Goods and Services Tax (GST) (Mohd Jamel et al., 2021).

In many developing nations, including Malaysia, tax revenue represents a fundamental instrument for financing national development. It supports essential public services such as healthcare, education, and infrastructure while also encouraging industrial expansion and export performance (Lee & Nair, 2024). According to Teh et al. (2024), Malaysia's tax income largely comprises taxes on income, profits, and capital gains. The stable flow of tax revenue not only provides the government with a reliable source of income but also reduces dependence on foreign borrowing and enhances fiscal autonomy. Furthermore, taxation contributes to strengthening governance through improved accountability and transparency while enabling the government to provide targeted assistance to vulnerable populations. Collectively, these outcomes foster sustainable economic growth and reinforce the formal structure of the national economy.

Over the years, Malaysia's indirect taxation system has undergone major transformation, most notably with the introduction of the Goods and Services Tax (GST). However, in 2018, the GST was repealed and replaced by the reimplementations of the Sales and Service Tax (SST), marking a significant shift in Malaysia's approach to indirect taxation. This transition was viewed by some as less successful due to limited public acceptance and resistance from certain business sectors. Although the reintroduction of SST was intended to address dissatisfaction surrounding GST, its rollout was not without criticism. Several scholars have argued that SST

continues to exert a financial strain on consumers (Mohd Jamil et al., 2021). Public discourse has also centred on the perceived inequity of the SST framework, particularly its disproportionate impact on lower-income groups. As noted by Mohd Jamil and Popoola (2020), households within the low- and middle-income brackets tend to bear a heavier financial burden under the SST regime compared to higher-income earners, thereby raising concerns regarding tax fairness and economic inclusivity.

Evolution of the Sales and Service Tax (SST 2.0) in Malaysia

In 2018, following a significant change in Malaysia's political leadership, then Prime Minister Tun Dr. Mahathir Mohamad announced the abolition of the Goods and Services Tax (GST). The decision led to the reimplementation of the Sales and Service Tax (SST), which was relaunched in a revised form known as SST 2.0. This updated system officially came into effect on June 1, 2018, and continues to operate to the present day. Malaysia had previously introduced the original version, SST 1.0, in 1972. However, due to various operational and structural shortcomings, it was replaced in 2015 by the GST, which aimed to broaden the tax base, improve revenue collection, and reduce the country's fiscal deficit. Despite these objectives, the GST was repealed only three years later, and SST 2.0 was reinstated as a more streamlined and simplified system. The reintroduced framework features revised tax rates, a narrower scope of taxable goods and services, and enhancements in administrative and collection mechanisms (Kothandan & Palil, 2022).

According to the Royal Malaysian Customs Department, the current SST framework comprises two distinct components: the Sales Tax and the Service Tax. The Service Tax applies to taxable services provided by registered businesses during their commercial operations within Malaysia. Conversely, the Sales Tax functions as a single stage levy imposed on both domestically manufactured and imported goods, charged either upon importation or at the point of sale or disposal by the manufacturer. Sales tax rates are generally set at 5%, 10%, or a specific rate, depending on the category of goods involved. Effective March 1, 2024, the Service Tax rate was revised upward from 6% to 8% for most taxable services. Nevertheless, certain sectors such as food and beverage (F&B), logistics, telecommunications, and parking services continue to be taxed at the previous rate of 6%.

Under the Sales Tax Act, a taxable person is defined as an individual or entity engaged in the manufacture of taxable goods and who meets specific conditions namely, being liable for registration, reaching an annual sales threshold of RM500,000 (as a manufacturer or subcontractor), and being either mandatorily or voluntarily registered under the Act. Similarly, for the Service Tax, any business entity providing taxable services is required to register if the total value of those services exceeds the prescribed annual threshold, typically RM500,000 within a 12-month period.

Difficulties Faced by SMEs in Complying with SST Requirement

Malaysia continues to experience persistent challenges in promoting tax compliance among Small and Medium Enterprises (SMEs). One of the most significant obstacles undermining the effectiveness of the national tax collection system is the prevalence of non-compliance. Several contributing factors have been identified, including taxpayer morale, the frequency and quality of tax audits, and perceptions of fairness within the taxation system particularly in terms of

how tax burdens and benefits are distributed between individuals and corporate entities. These issues may point to structural inefficiencies embedded within the country's existing tax framework (Lee & Nair, 2024).

According to Aziz et al. (2022), early awareness and understanding of tax obligations are crucial for SMEs, given that they constitute the largest share of Malaysia's business landscape. SMEs significantly contribute to national economic growth through employment generation, innovation, and increased tax revenue. However, many SMEs operate informally, without proper registration with the tax authorities, which poses serious challenges for accurate tax assessment and collection. Such circumstances often give rise to tax evasion and tax avoidance. The former refers to exploiting legal provisions in unintended ways, whereas Gjoni et al. (2024) define tax avoidance as the unlawful act of evading tax liabilities through means such as underreporting income, overstating deductions, concealing transactions, or manipulating financial records.

The reintroduction of the Sales and Service Tax (SST) has also generated mixed reactions from the public and the business community. From a business standpoint, a range of operational and strategic challenges have emerged during the transition to SST 2.0. As highlighted by Kothandan and Palil (2022), many businesses remain inadequately prepared to comply with the revised system. Key difficulties include internal communication gaps, particularly in the dissemination of critical SST-related knowledge and technical expertise from senior management to staff across all departments.

The transition from the previous system further compounds the problem, as firms are required to modify established workflows and align with updated administrative requirements. Additionally, operational disruptions may arise due to growing concerns over potential price increases, which can negatively impact both producers and consumers. The intricate procedures associated with SST 2.0 implementation also add to the administrative burden faced by firms.

Another major challenge pertains to the financial impact of the SST reinstatement. Businesses face rising uncertainty in market prices, largely influenced by supplier and vendor pricing structures, which in turn complicate cost management and profitability. Moreover, the scope of tax exemptions under SST is relatively narrow; many sectors do not qualify for relief, meaning that businesses within non-exempt industries are unable to reclaim input tax. This limitation places additional financial strain on these enterprises.

Furthermore, most companies lack effective internal mechanisms to resolve SST-related implementation issues. Although various corrective strategies are being attempted, many have shown limited success due to insufficient expertise and weak adaptation frameworks. Lastly, the overall perception among business owners toward SST 2.0 remains largely negative. This sentiment is often influenced by speculative discussions in social and professional circles, which frequently compare SST to the previously implemented GST even though the two systems differ substantially in design, tax scope, and operational impact.

Probable Area of Difficulties in SST 2.0

According to Collins Dictionary (n.d.), an area of difficulty refers to a subject or task that presents challenges. In the context of policy reform, this concept may be extended to the

obstacles that arise during the introduction and implementation of new measures within a country or organization. As attention shifts to the implementation of SST 2.0, insights from the experience of GST are deemed crucial. The similarities in structure and operation between the two tax regimes indicate that the compliance issues experienced under GST may provide a useful reference point for anticipating potential challenges in implementing SST 2.0. These difficulties are likely to emerge in areas related to administrative procedures, business readiness, and taxpayer compliance, all of which require closer examination in the context of the new system.

Based on the study conducted by Marimuthu and Bidin (2016), it was found that the probable area of difficulties in implementing GST include limited knowledge of GST, excessive documentation requirements, the need to upgrade computerized systems, issues related to refunds, improvements in accounting systems, ambiguity regarding taxability, inadequate understanding of GST legislation, interactions with tax authorities, lack of cooperation, challenges in claiming input tax credits, treatment of exempted goods and services, deadlines for filing tax returns, the management of zero-rated goods and services, and others.

Another study by Loo and Bin Md Taib (2017) stated that most business operators identified challenges including maintaining appropriate business records, document storage, recruitment of new staff, and training of existing personnel in relation to GST management were perceived as factors contributing to increased compliance costs. Respondents further acknowledged potential difficulties in areas including the adjustment of prices for goods and services, the submission of GST returns, the remittance of tax liabilities, and the process of claiming input tax refunds.

A high level of tax knowledge would help increase the level of tax compliance (Marimuthu & Bidin, 2016). Findings from factor analysis further revealed that the probable areas of difficulty associated with GST among managers of manufacturing companies in Malaysia are multidimensional. This suggests that tax knowledge plays an important role not only in shaping compliance behaviour but also in supporting the effective implementation of subsequent tax regimes such as SST. Nevertheless, the introduction of a new tax system is likely to generate its own set of challenges, which must be addressed proactively to ensure smoother compliance. Strengthening education and awareness initiatives may therefore be a critical strategy in mitigating these difficulties.

Method

This study adopts a cross-sectional research design, which allows data collection at a single point in time to reflect the prevailing conditions and perceptions of respondents. The unit of analysis comprises owners or managers of Small and Medium Enterprises (SMEs) located in the Northern Region of Malaysia, encompassing the states of Perlis, Kedah, Penang, and Perak. Given that approximately 97% of all business entities in Malaysia are classified as SMEs, this group serves as a strong representative of the broader Malaysian business landscape. The list of registered SMEs in the four northern state capitals was obtained from SME Corporation Malaysia (2024). According to the database, there are 7,884 SMEs in Perlis, 52,531 in Kedah, 78,673 in Perak, and 82,676 in Penang. From this population, a final sample of 300 SMEs was randomly selected from the lists of enterprises operating in the respective state capitals. The research instrument was adapted from that developed by SME Corporation Malaysia (SME

Corp, 2024). Minor modifications were made to ensure relevance to the present study's objectives specifically, to examine the key areas of difficulty encountered by SMEs in complying with the SST 2.0 framework following its implementation in Malaysia.

Results

A total of 500 questionnaires were distributed, of which only 127 were deemed usable after excluding non-responses and outliers. The response rate is considered acceptable, as Roscoe (1975, as cited in Sekaran & Bougie, 2016) suggested that sample sizes ranging between 30 and 500 are appropriate to perform an analysis.

Descriptive Analysis

Referring to Table 1.1, the distribution of respondents by business location is presented. Out of a total of 127 respondents, 12.6% were from Perlis, 36.2% from Kedah, 22.0% from Penang, and 29.1% from Perak. The analysis indicates that Kedah recorded the highest number of respondents (46), followed by Perak (37) and Penang (28). Perlis contributed the smallest proportion, with only 16 respondents, representing 12.6% of the total sample.

Table 1.1: Location of Business / Company (n=127)

Location of Business/Company	Frequency	Percent
Perlis	16	12.6
Kedah	46	36.2
Penang	28	22.0
Perak	37	29.1
Total	127	100.0

Table 1.2 presents the distribution of respondents by position within their respective businesses. Out of 127 respondents (n=127), 59 individuals (46.5%) fell into the "others" category, which consists of those who did not disclose their actual positions. Meanwhile, 32 respondents (25.2%) were accountants, 13 (10.2%) served as general managers, and 9 (7.1%) were finance managers. The results suggest that most respondents came from positions outside finance-related roles, with accountants forming the second largest group. This indicates that perspectives on the implementation of the Sales and Service Tax (SST) were not limited to finance or accounting departments but also included input from other business functions. Such diversity of respondents provides broader insights, enhancing organizational awareness and understanding of the SST mechanism and its implementation.

Table 1.2: Position in the Business / Company (n=127)

Position	Frequency	Percent
Director	14	11.0
General Manager	13	10.2
Finance Manager	9	7.1
Accountant	32	25.2
Others	59	46.5
Total	127	100.0

Table 1.3 depicts the respondents' years of experience in their current business or company. Out of the total 127 respondents, 72 individuals (56.7%) reported having less than five years of experience, while 44 respondents (34.6%) had between six and ten years of experience. Furthermore, 8 respondents (6.3%) had between eleven and fifteen years of experience, while the remaining 3 respondents (2.4%) reported having more than fifteen years of tenure. The findings indicate that most employees in SMEs have less than ten years of experience in their present organizations. In contrast, a minority number of employees which work from 11 to more than 15 years are those who most likely switch organization for better exposure and career development.

Table 1.3: Year of experience in the present designation (n=127)

Years of experience	Frequency	Percent
Less than 5 years	72	56.7
6 to 10 years	44	34.6
11 to 15 years	8	6.3
More than 15 years	3	2.4
Total	127	100.0

Table 1.4 illustrates the frequency of the respondents' qualifications in their current business or company roles. Most respondents, comprising 99 employees (78.0%), hold a bachelor's degree, followed by 8 respondents (6.3%) with other types of qualifications. In addition, 7 respondents (5.5%) reported holding a diploma, while the same number of respondents possessed a master's degree. The remaining 6 respondents (4.7%) reported holding professional qualifications. Overall, the findings indicate that most respondents are degree holders, reflecting the current trend in which a bachelor's degree has become the minimum requirement for employment opportunities. In contrast, professional qualifications were the least represented, likely due to the higher costs and additional commitments associated with obtaining such credentials.

Table 1.4: Qualification (n=127)

Qualification	Frequency	Percent
Diploma	7	5.5
Degree	99	78.0
Master	7	5.5
Professional	6	4.7
Others	8	6.3
Total	127	100.0

Table 1.5 outlines the frequency of business types among the respondents. Out of the total sample (n = 127), a total of 38 respondents (29.9%) reported operating as sole proprietorships. The majority, which are 79 respondents (62.2%) were from private limited companies, while partnerships accounted for the smallest group with only 10 respondents (7.9%).

Table 1.5: Type of Business (n=127)

Type of Business	Frequency	Percent
Sole Proprietorship	38	29.9
Private Limited Company	79	62.2
Partnership	10	7.9
Total	127	100.0

Reliability Test

A reliability analysis was conducted to examine the internal consistency of the items. Cronbach's alpha is one of the most widely used statistics for assessing the reliability of research instruments, as it indicates how well a set of items collectively measures the intended construct (Cronbach, 1951). According to Nunnally (1978, as cited in Ahmad et al., 2024), a Cronbach's alpha coefficient of 0.70 or higher is generally acceptable for basic research, while more advanced studies or those requiring high precision may demand values of 0.80 or above to ensure stronger reliability. As shown in Table 1.6, the Cronbach's alpha for the 11 items measuring areas of difficulty is 0.902, suggesting excellent internal consistency. Overall, the results confirm that the measurement elements used in this study can be considered both reliable and acceptable.

Table 1.6: Reliability Analysis of Variable (n= 127)

Variable	No. of items	Cronbach's Alpha
Probable area of difficulty	11	0.902

Area of Difficulties

The mean scores and standard deviations of the eleven items in this study were analyzed to identify the areas of difficulty faced by SMEs in implementing SST 2.0. The results revealed an overall mean score of 3.74, suggesting that SMEs in the Northern Region of Malaysia experience a moderate level of challenge in complying with the tax system. According to the conventional interpretation of the Likert scale, mean values ranging from 3.00 to 3.99 are generally considered moderate, indicating that respondents perceive the implementation issues as not overly severe yet not insignificant, but rather at a level that warrants further attention and improvement.

All the eleven statements' mean score is more than 3.00 which are "need to upgrade the computerization system" (mean = 3.94); "enhance the accounting system to accommodate for SST" (mean = 3.91); "increase documentation burden for record keeping" (mean = 3.78); "keeping records and documentation" (mean = 3.85); "clarity of goods in terms of HS Code and services taxable" (mean = 3.80); "lack of SST knowledge" (mean = 3.83); "understanding of SST legislation" (mean = 3.56); "calculation of sales and service tax" (mean = 3.65); "shorter period time to lodge document to tax authority" (mean = 3.48); "list of exempted goods and services" (mean = 3.69); and "possibilities of double taxation in the supply chain for good and services" (mean = 3.62). This shows the highest mean score is 3.94 for Item 1 with the lowest standard deviation (SD = 0.784) and the lowest mean score is 3.48 for Item 9 with the normal standard deviation of 0.907. The findings further reveal that the most challenging area

identified was the need to upgrade computerisation systems, whereas the least challenging area was the shorter timeframe for submitting documents to the tax authority. Taken together, the results demonstrate that all items recorded mean scores above 3.0, suggesting that SMEs encounter considerable challenges in SST 2.0 implementation from multiple perspectives.

Table 1.7: Result for Area of Difficulties

	Statistics											Mean Area Diff.
	Prob. Area 1	Prob. Area 2	Prob. Area 3	Prob. Area 4	Prob. Area 5	Prob. Area 6	Prob. Area 7	Prob. Area 8	Prob. Area 9	Prob. Area 10	Prob. Area 11	
Mean	3.94	3.91	3.78	3.85	3.80	3.83	3.56	3.65	3.48	3.69	3.62	3.7373
Median	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.8182
Mode	4	4	4	4	4	4	4	4	4	4	4	3.00
Std. Deviation	.784	.836	.934	.788	.876	.889	1.036	.894	.907	.923	.917	.63463
Skewness	-.290	-.332	-.555	-.025	-.450	-.632	-.682	-.541	-.329	-.682	-.807	-.169
Std. Error of Skewness	.215	.215	.215	.215	.215	.215	.215	.215	.215	.215	.215	.215
Kurtosis	-.437	-.129	.064	-.790	.303	.478	.214	.508	.089	.719	1.009	-.173
Std. Error of Kurtosis	.427	.427	.427	.427	.427	.427	.427	.427	.427	.427	.427	.427

Discussion

The objective of this study is to identify the probable area of difficulties among faced by Small and Medium Enterprises (SMEs) in Malaysia in complying with the requirements of the Sales and Service Tax 2.0 (SST 2.0). Findings from the Northern Region indicate several critical challenges that hinder effective implementation. The overall mean score across the eleven items assessed was 3.74 (SD = 0.635), suggesting that SMEs generally perceive the implementation of the SST 2.0 framework as moderately challenging, possibly due to their prior exposure and experience with the earlier SST 1.0 regime. Among the issues identified, the highest mean score was recorded for the need to upgrade computerization systems (mean = 3.94, SD = 0.784). This underscores the limited technological infrastructure that persists within many SMEs, constraining their ability to manage SST processes effectively. This observation is consistent with prior studies that have highlighted digital readiness as a persistent weakness among smaller firms. For instance, Abdul Halim et al. (2018) emphasized that the lack of focus on innovation has hindered technology adoption among Malaysian SMEs. More recent work by Loo et al. (2023) further supports this view, observing that gaps in digital capability continue to restrict SMEs from competing effectively in an increasingly technology-driven market. Closely related to the previous point is the need to improve accounting systems to align with SST requirements (mean = 3.91), alongside the increased administrative burden associated with record-keeping (mean = 3.78). Collectively, these findings suggest that system-related and administrative limitations remain as major obstacles to compliance.

In addition to technological and administrative barriers, knowledge-related deficiencies further complicate the compliance efforts. The relatively high mean scores for inadequate SST knowledge (mean = 3.83) and limited understanding of SST legislation (mean = 3.56) reveal persistent gaps in awareness and technical interpretation among SME owners and staff. Moreover, challenges linked to the classification of goods and services such as the clarity of

HS Codes and taxable service categories (mean = 3.80) as well as concerns over potential double taxation within supply chains (mean = 3.62), further highlight the complexity faced by SMEs in ensuring compliance.

While the lowest mean score associated with the requirement to submit documents within shorter timelines (mean = 3.48, SD = 0.907), the result reflects a practical constraint that may compromise both accuracy and punctuality of reporting. The consistently high mean values across all eleven dimensions examined reaffirm that SMEs require comprehensive and sustained support in order to navigate the operational, administrative, and knowledge-based difficulties associated with SST 2.0 compliance.

Given the significant role of SMEs in Malaysia's economic ecosystem, it is imperative that the tax authority takes these findings seriously. Proactive measures such as clearer guidelines, user-friendly filing procedures, continuous training, and accessible advisory services are essential to reduce misunderstandings and errors. This statement aligns with a recent study on tax compliance among SMEs in Selangor, which reported that enhanced tax education significantly contributes to improved compliance rates (Lee & Nair, 2024). Additionally, a KPMG survey on e-invoicing implementation highlighted the need for more transparent guidelines, upskilling, and system usability enhancements, underscoring the importance of user-focused support (KPMG, 2024).

Furthermore, incentives for digitalization and system upgrades would directly address one of the most pressing barriers which is the lack of adequate computerization and accounting systems. Government initiatives such as funding schemes, training programs, and infrastructural support, play a crucial role in this process, as they help SMEs integrate digital tools and strengthen consumer engagement. By leveraging such support, Malaysian SMEs can build stronger competitiveness and ensure long-term resilience in a digital economy (Tajudeen et al., 2025).

By prioritizing these areas for improvement, the tax authority can help streamline SST 2.0 implementation and strengthen voluntary compliance among SMEs. Higher compliance rates will, in turn, secure a more stable revenue base and contribute to a more efficient and transparent tax administration system. Future research may explore these challenges across different regions, sectors, or firm sizes, to design even more tailored strategies that effectively support SMEs in fulfilling their SST obligations. Future research would benefit from expanding the scope of the study to include all states in Malaysia to enhance the generalisability of the findings. Strengthening the SST 2.0 system through such targeted interventions will not only benefit SMEs but also reinforce Malaysia's fiscal sustainability and economic resilience.

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6th Penang International Multidisciplinary Conference 2025

eISSN 3036-0331

8th - 9th November 2025

Shang-Ri La Hotel, Penang, Malaysia

A METHODOLOGICAL FRAMEWORK FOR OPTIMIZING VOCAL RESONANCE: INTEGRATING PHARYNGEAL VOICE TRAINING AND MODERN ACOUSTICS

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Abstract: *Vocal resonance is a key factor in the singing's quality, projection, and expressive richness, but the existing approaches to its training are disjointed. The old pedagogical techniques, like the eight steps of pharyngeal voice training as employed by Lin Junqing, offer a solid understanding upon which they tend to be not systematically academically framed. On the other hand, contemporary studies of acoustics provide extensive accounts of the phenomenon of resonance, such as that of formant tuning, the formant of the singer, and that of resonance tube phonation, but do not generally connect to the applied pedagogy. This research fills the gap as it suggests a methodological framework of maximal vocal resonance enhancement that involves the combination of the conventional pharyngeal voice training with the current theory of acoustics. Based on the literature synthesis and practice-based analysis, the framework extends the eight-step model proposed by Lin into a ten-step protocol, with each step characterised by its pedagogical goal, physiological process, anticipated outcome and scholarly support. Results indicate that this ten-step model does not only render resonance pedagogy more refined but is also relevant to the research of performing arts, since it indicates how methods of practice can be designed in an academic context. The article finds the possibility that these integrative frameworks can enhance vocal pedagogy, interdisciplinary voice research, and the discussion of methodology in the performing arts.*

Keywords: *Vocal resonance, Pharyngeal voice, Vocal acoustics*

Introduction

It has been believed long enough that vocal resonance is one of the most defining elements of the quality, projection and the expressive nature of the singing voice. Resonance is also an essential element of vocal technique along with breathing, phonation, and articulation. As breathing supplies the source of energy and phonation supplies the main tone, the resonance plays the role of how this tone is increased, coloured and heard by the listener. Even technically correct phonation cannot be brilliant, projected, and communicative without good resonance adjustment. It is due to this that resonance has become a key subject of vocal pedagogy as well as voice science.

Traditional vocal schools have, in the past, made a great contribution to the teaching of resonance. The bel canto style in the Western classical tradition focused on the positioning of the voice to create a balance between brightness and warmth, with the help of intuitive images and drills. Lin Junqing (1982, 2019), in his book in China, suggested a systematic system in the modification of resonance, especially the importance of the pharyngeal cavity in

strengthening the overtones. The similarity between these pedagogical methods is that they are all aimed at the task of converting the uncultured sound at the vocal folds into a vibrant, musical quality of singing. However, those traditional approaches frequently stay in the domain of the experiential pedagogy, which has no systematic scholastic context and empirical incorporation into the field of modern voice science.

Contemporary voice science could further evolve alongside the educational traditions where much progress has been made in the understanding of the acoustics and physiology of resonance. Singers are selectively tuning the formants in their larynx to correspond better with the harmonic frequencies: formant tuning has been found to be one of the reasons why singers can project better (Sundberg et al., 2013). The phenomenon of the singer's formant, which is an accumulation in the spectrum at 2.5-3 kHz, has been shown to play a role in the transmission power of operatic voices (Titze 2022). In addition, some techniques (e.g., resonance tube phonation) have been researched for their pedagogic and therapeutic value, with measurable improvements in efficiency and timbre as a result (Enflo et al., 2013). These findings have contributed to a scientific understanding of resonance, but it is generally detached from the learning process.

The boundary between traditional pedagogical methods and modern acoustic practices introduces complexities for both theoretical interests and methodologies. On the one hand, traditional approaches provide an enormous wealth of practical knowledge accumulated over the centuries in which the teaching and performing have been practised. On the other, the acoustic research provides exact physiological and spectral answers to the phenomena of resonance. Yet few studies attempt to combine these two perspectives into a comprehensive methodological framework that will be useful for both performers and scholars. Therefore, the field will still be at risk of getting caught in a dilemma of choosing between experiential pedagogy and scientific enquiry, which will hinder the opportunities of interdisciplinary development.

This gap is the reason why the present research aims to fill it with a methodological approach to vocal resonance optimization that merges pharyngeal voice training and current acoustic knowledge. It modifies the ten-step model of the pharyngeal voice training by Lin Junqing into a broader eight-step approach but places all ten steps in the framework of current acoustical studies. It is the integration that offers a systematic way of teaching and situates the methodology within a wider scholarly framework of the study of vocal science and performing arts.

The objectives of this research are threefold. First, the manuscript attempts to clarify the physiological and acoustical processes that make up traditional resonance exercises to redefine them as empirically based strategies and not purely experiential instructions. It follows this with a systematically ordered ten-step schema that can be subjected to a pedagogical application as well as academic analysis of resonance. It eventually highlights the scholarly and interdisciplinary relevance of resonance training through the examples of its applicability to other fields like music performance science, psychoacoustics, and speech therapy.

The benefit of the study is its methodological orientation. Offering a well-developed structure that will allow the collision of traditional pedagogy and contemporary acoustics, it not only enhances the sphere of vocal pedagogy but will help to promote the academic knowledge of

resonance as a multidimensional phenomenon. In the case of the performing arts discipline, this research paper has shown that practice-based research could produce high quality frameworks which have pedagogical applications as well as academic importance.

Literature Review

Traditional Vocal Pedagogy

The development of training in vocal resonance has been influenced, in large part, by vocal pedagogy traditions in Western and Chinese contexts. Within Western classical singing, the resonance traditions of the bel canto school viewed vocal resonance as the primary means to attain the desirable combination of brilliance and warmth. “Placing the voice” was a common technique, where the instructor and the singer would converse in a manner where the singer was expected to place and project the voice so the sound was rich. While effective, a large part of the instructions and observations of the method skipped the scientific explanation and focused on metaphor. Sundberg (1987) acknowledges this “power” in pedagogy but explains the lack of adjustment description in the vocal tract. Miller (2008) points out further that the science of resonance in singing was, and still is, partly a neglected art, leaving systematic explanation wanting. Most recently, Sadolin (2021) attempts to provide comprehensive codification of disparate techniques. However, the primary material remains practice-orientated.

In China, the works of Lin Junqing (1982, 2019) significantly integrated pharyngeal voice training (*yàn yīn*) into the development of resonance. In particular, Lin’s Eight Steps of Pharyngeal Voice Training outlined a set of exercises intended to unlock the throat, increase the pharyngeal cavity, and fine-tune the resonance of the voice. There are attempts to codify pre-existing traditional pedagogy into systemised stages. But while Lin’s influence permeated the teaching of voice in China, it remained within the boundaries of pedagogy and did not engage contemporary acoustics.

Traditionally, the pedagogy of voice teaching and learning has posed rich experiential material for resonance. But the absence of scholarly treatment has come from the predominance of imagery and abstract instructional methods. Therefore, we must frame traditional exercises within a robust scientific and cross-disciplinary paradigm.

Modern Vocal Acoustics

As pedagogy continues to evolve, contemporary voice science has provided detailed understanding of the intricacies of vocal resonance. Studies on formant tuning have shown how singers shaped the vocal tract to bring the formants into alignment with harmonic frequencies, thus increasing the singer’s voice. Sundberg et al., (2013) showed that professional singers shift vowel formants, and thus the singer’s voice, to maximise resonance, while Titze (2022) explained the acoustic principles underlying the tuning. The works cited above demonstrate that resonance and the resonance pedagogy explained can be understood as an acoustic phenomenon that can be measured.

Another major contribution modern voice science has made is the work done on the singer’s formant. It’s defined as the clustering of frequencies between 2.5 and 3 kHz, which helps the voice to carry during performances. Ambros and Andrada e Silva (2025) examined this

phenomenon in professional tenors and emphasised the projection-sustaining resonance strategies employed during performances. Likewise, Lee et al., (2008) investigated the acoustic and perceptual dimensions of operatic “ring” and underscored the importance of professional singing formant clustering in operatic singing.

Resonance tube phonation has had a profound impact on the understanding of resonance training. Enflo, Sundberg, and McAllister (2013) examined semi-occluded vocal tract exercises and the impact on phonation threshold pressure and vocal fold collision during the time of study. Somanath and Ma (2016) supported this work in voice rehabilitation and voice training and pointed out the value of resonance tube exercises in therapy. The impact of their work supports the concept of resonance tube phonation in the enhancement of efficiency and timbre, along with a clinical and pedagogical approach.

Modern acoustic research brings forth the primary use of empirical research in resonance and the use of spectrographic and physiological models. Though this is the case, this research is mainly disconnected from the practical use of vocal pedagogy, and for this reason, the impact of this work on training singers is minimal.

Interdisciplinary Perspectives

The exploration of resonance goes far beyond pedagogy and acoustics. It can also take on perspectives from psychology, the performing arts, and speech therapy. The psychology of music provides some understanding of how singers experience resonance and tone colour. Raveendran and Krishna (2025) state that for instance, studied the auditory-perceptual assessments of resonance with professional singers, demonstrating the impact of perception on performance decisions. Ternström (2023) studied the acoustic measures of voice quality and emphasised the perceptual correlates of resonance in the assessment of vocal timbre within the context of older literature and research.

Within resonance studies from the performing arts perspective, the most common understanding of resonance focuses on the concept of embodied performance practice. Welch (2016) state that singing teaching should combine pedagogy with the art of embodiment, thus aligning scientific integration with artistic performance. In the same way, Callaghan (2014) focuses on the connection between the body, brain, and voice, the phenomenon of resonance as both physiological and performative.

The literature has covered resonance training in the context of speech therapy and voice care. Rosenberg and LeBorgne (2019) discuss the role resonance strategies can play in safeguarding the vocal health of professional “vocal athletes”. Davids and LaTour (2021) discuss the formation of healthy vocal habits, stressing that resonance exercises are key to avoiding vocal strain and fatigue. These descriptions show that the role of resonance is not limited to the performance context and also serves voice rehabilitation and voice maintenance.

From different fields, the role of resonance in perception, performance, and vocal health attests to its cross-disciplinary nature. These disparate insights, while important, do not cohere to form a unified pedagogical or methodological approach, indicating the need for synthesis.

Synthesis and Research Gap

The reviewed literature highlights three fundamental gaps. First, traditional pedagogy is lacking a systematic academic framing, and although practice pedagogy contains plenty of good insights, it is still a classic case of ‘contextualising the science after the practice’. Exercises such as Lin’s Eight Steps remain pedagogically effective but scientifically contextualised. Second, modern acoustics certainly offers precise empirical explanations but almost never offers insights as to how these could be converted into pedagogically framed training for singers. Third, interdisciplinary research, while certainly valuable for the most part regarding perception, performance, and health, tends to avoid dealing with pedagogy.

This study aims to address these gaps by developing a ten-step methodological framework for vocal resonance training. The framework integrates classical pedagogy with contemporary acoustics by broadening Lin Junqing’s Eight Steps into a ten-step model and contextualising each stage within contemporary voice science. Additionally, by focusing on its relevance to cross-disciplinary scholarship, the study serves vocal pedagogy and the scholarship on the performing arts more generally.

Methodology

Nature of the Study

This research comprises both methodological and practice-based components. Rather than conducting experimental studies utilising spectrographic analysis or perceptual testing, this research integrates and organises a framework of traditional pedagogical practices with contemporary studies of acoustics. In performing arts research, practice-based research has also been recognised as a legitimate form of scholarship, where practice is both the subject and the source of knowledge (Welch, 2016). For this reason, the current study considers vocal training methods as more than just techniques for instruction. It sees them as methodological components that can contribute to pedagogy and scholarship.

Data Sources

Three classes of such data sources were used to construct the framework:

Classical Pedagogical Literature

The Eight Steps of Pharyngeal Voice Training (2019) by Lin Junqing are the foundation for this book. These works contain a system of exercises for the opening of the throat, expansion of the pharynx, and resonance regulation. These works are some of the most systematic attempts to describe Chinese vocal pedagogy in a formal way, and are thus important for formulating an organized approach.

Modern Acoustic Research

A second source of information was empirical research in the area of vocal acoustics. These include studies of formant tuning (Sundberg et al., 2013), the singer's formant (Ambros & Andrada e Silva, 2025), and resonance tube phonation (Somanath & Ma, 2016). Scientific basis

is given by a range of sources so that each exercise can be put into context in voice science today.

Interdisciplinary Perspectives

Finally, transdisciplinary scholarship was included for the purpose of enhancing the applicability of the framework. Resonance training and its perceptual, physiological and aesthetic dimensions are interrelated, and their connection is clearly illustrated in music psychology (Raveendran & Krishna, 2025), voice health and therapy, and performing arts studies. By this means, the sources provide a further, non-pedagogical application for the framework, placing it in the wider corpus of performance studies scholarship.

Together, these sources became the pedagogical framework, provided empirical support, and highlighted the interdisciplinary relevance that was necessary to develop the ten-step methodological framework.

Research Procedure

The methodological process was carried out in four steps:

1. Literature Collection: A collection of literature was made, including Chinese pedagogy manuals, Western voice pedagogy literature, modern acoustic research, and interdisciplinary research.
2. Extraction of Pedagogical Principles – Lin's Eight Steps were dissected, and the key principles of throat opening, resonance tube formation, and vowel calibration were highlighted.
3. A comparative study was made based on the modern acoustic theory and compared systematically with Titze's models of the vocal tract acoustics and Sundberg's work on formant tuning.
4. Framework Development - The original eight-step model was developed into a ten-step framework. Each step was defined with regard to (a) target or aim, (b) physiological mechanism, (c) expected outcome, and (d) supporting scholarly references.

During this development process, the framework was not a reorganisation of pedagogical exercise but a scientific model based on tradition and current scientific research.

Limitations

A number of limitations need to be mentioned. First, the study is not directly empirically validated, for example, using spectrographic measurements or perceptual evaluations. Although the framework is conceptually sound, further research is necessary to validate its acoustic results using systematic experimental means. Second, the framework has been developed mostly in the classical and pedagogical settings. Its usefulness for other genres—such as popular music and musical theater—remains untested empirically. Finally, despite the integration of interdisciplinary literature, the framework has not been tested in clinical or therapeutic settings, where resonance training might offer added value.

Summary

The methodology used in this study is a combination of tradition and science. By referencing pedagogical, acoustic, and interdisciplinary sources as well as converting existing training practices into a ten-step framework, the research serves resonance training as a practicable tool as well as an academic model. While not ideal, the methodological approach highlights the role of practice-based research in contributing to the development of knowledge in the performing arts field.

Findings: A Ten-Step Framework for Optimizing Vocal Resonance

This paper presents a ten-step method, which structures a systematic approach that combines traditional laryngeal voice training methods with modern acoustic theory. Table 1 describes the framework, and the subsequent sections explain the components in detail.

Table 1: Ten-Step Framework for Optimizing Vocal Resonance

Step	Target / Aim	Vocal Mechanism	Expected Outcome
1. Correct Throat and Mouth Openings	Establish relaxed pharyngeal cavity and jaw	Jaw relaxation, pharyngeal expansion, laryngeal positioning	Reduced jaw tension improves overtone resonance
2. Diaphragmatic Breath Control	Strengthen breath support and diaphragm control	Diaphragm–abdominal antagonism, costal breathing	Stable airflow, endurance for singing
3. Jaw Relaxation	Prevent constriction during phonation	Suprahyoid muscle release, chin relaxation	Freer phonation reduces tension
4. Tongue Groove Formation	Optimize airflow direction and resonance	Longitudinal tongue groove, hyoid bone elevation	Clearer resonance, stable vowel shaping
5. Wide-Mouth Phonation	Amplify overtone series	Pharyngeal tube formation, triangular mouth shape	Stronger, high-frequency resonance, projection
6. Humming Resonance Exercise	Encourage forward placement and nasal resonance	Soft palate elevation, nasal airflow management	Bright, focused tone, efficient projection
7. Small-Mouth Resonance Transition	Transition from nasal to oral resonance	Zygomatic muscle lift, laryngeal lowering	Balanced timbre, smoother vowel transitions
8. Pitch and Vowel Calibration	Maintain resonance alignment across pitch	Formant tuning, vowel modifications	Balanced timbre across vowels and registers
9. Pharyngeal “U” Exercise	Strengthen resonance tube function	Fundamental tone tube + overtone tube	Fuller, brighter, penetrating sound
10. Open-Throat Resonance Integration	Integration of resonance cavities: control of timbre	Laryngeal lowering, pharyngeal expansion	Darker, rounder timbre; expressive flexibility

Step 1. Correct Throat and Mouth Opening

Basically, the first step of the framework is to relax as much as possible the pharyngeal cavity and the jaw. This allows for the expansion of the vocal tract and allows it to act as a resonating chamber of elevated acoustic quality. The key anatomical materials are jaw relaxation, pharyngeal space expansion, and laryngeal stabilisation. These actions are used to reduce unnecessary muscle tension from the jaw and pharynx that would otherwise interfere with the process of phonating.

In proper vocal technique, the proper opening up of the pharyngeal region results in the enhancement of the higher harmonic partials, and the timbre of the voice becomes brighter and richer. Lin (2019) notes that throat opening is one of the most important embodiments in pharyngeal training, a door to the control of resonance. Likewise, Dimon (2018) says that from the anatomical side, the pharyngeal cavity is a resonant booster, and its stretching directly increases the vocal clarity.

Step 2. Diaphragmatic Breath Control ("Puppy Panting")

The second step increases breath support through engaging the diaphragmatic control. The method, which is sometimes called "puppy panting," teaches the singers how to coordinate their diaphragm and abdominal muscles during bursts of inhalation and exhalation. This practice is focused on the antagonistic relationship between the diaphragm and abdominal wall while keeping the costal part expanded.

This is useful in making the airflow become more stable and also increasing stamina needed in longer singing phrases. Through greater efficiency of respiration, singers are able to hold the resonance even in long vocal lines. Watson & Hixon (1985) confirm this important role of the diaphragm engagement in professional voice use, showing that respiratory support is directly related to resonance stability.

Step 3. Jaw Relaxation

The third step is concerned with relaxing the jaw so that it doesn't constrict during phonation. Overactivity of the suprahyoid muscles can induce tension and diminish resonance. Deliberate awareness and consequent relaxation of this musculature enable singers to reach a state of vocal subsidence and enable more uniform vibration of the vocal folds.

Sundberg (1987) stresses that the relaxation of the jaw is absolutely fundamental to opening up to a natural singing voice. From the pedagogical and scientific perspective, this measure guarantees that resonance is not obstructed by unnecessary muscular tension so that the flow of acoustic energy is improved.

Step 4. Tongue Groove Formation

Formation of the tongue grooves is done by shaping the tongue longitudinally and lifting the hyoid bone at the same time. It is a structural process that guides airflow in a more accurate way, makes the articulation of vowels more stable and enhances the clarity of resonance.

Titze (2022) suggests that tongue shaping is directly linked to acoustic formant alignment, and it plays a major role in determining the acoustic intelligibility and resonance of vowels. The step consequently connects phonetic stability and resonance efficiency and further justifies the combination of physiology and acoustics in the training of the voice.

Step 5. Wide-Mouth Phonation

This stage highlights wide-mouth phonation that is realised by the triangulating of the mouth and broadening of the pharyngeal tube. Such alterations enhance the high-frequency overtones, resulting in a brighter sound projection.

The above procedure is a classical method of pharyngeal voice training in Chinese teaching (Lin, 1993), whereas Henrich et al. (2001) present acoustic data to confirm that the vocal tract configuration has a direct influence on the network of resonance. Taken together, the above observations provide a basis for assigning a function to wide-mouth phonation in the optimisation of resonance and projection.

Step 6. Humming Resonance Exercise

Humming is used to promote forward resonance placement and form nasal resonance. The mechanism entails raising the soft palate and the management of the nasal airflow to impart a bright and focused tone. Such practice increases projection via equalising oral and nasal articulatory input.

Sundberg et al., (2013) substantiated the importance of humming in resonance tuning methods, but Howard and Murphy (2008) examined the effectiveness of using humming in the instructional setting to assess and correct resonance imbalance. This step, therefore, is a useful warm-up method as well as an exercise that is based on acoustics.

Step 7. Small-Mouth Resonance Transition

Small-mouth resonance transition This concerns the smooth transition of resonance between the nasal and oral cavities. Physiologically, it involves lifting of the zygomatic muscles and slightly dropping of the larynx to put resonance in place.

According to Zhang (2016), these types of transitional methods enhance the timbral stability of vowels, whereas resonance tube modifications are important in professional vocal timbre, as Ambros and Andrada e Silva (2025) show. The experiment can be used as a demonstrative example of how close anatomic changes can lead to the quantifiable acoustic outcomes.

Step 8. Pitch and Vowel Calibration

The pitch and vowel calibration are done in such a way that resonance alignment is consistent throughout the vocal range. Singing eliminates tonal imbalance and resonance stability by utilising formants and adjusting vowel shapes.

Miller (2008) focuses on the fact that vowel modification is an absolute requirement of consistent resonance in professional voice, whereas Ternström (2023) concentrate on its

quantifiable outcomes in the acoustic quality. This action highlights the significance of the presence of vocal acoustics and pedagogy in sustaining resonance in registers.

Step 9. Pharyngeal “U” Exercise

The ninth step aims at resonance strengthening, which involves the alignment of the basic tone tube in the lower pharynx with the overtone tube in the upper tract. It is a combined resonant system that produces a richer, brighter and more penetrating voice timbre.

Titze (2022) perceives pharyngeal resonance as a key to effective voice production, whereas Echternach et al. (2024) provide biomechanical data on the positive effect of pharyngeal manipulations in creating the high-pitch sound. Such practice shows the collaboration of tradition and modern science.

Step 10. Open-Throat Resonance Integration

The last step incorporates several resonance cavities through the lowering of the larynx and widening of the pharynx. The outcome of such a timbre is an increase in expressive capability, a darker timbre, and a more rounded timbre.

According to Dimon (2018), open-throat singing is the technique with the highest potential of resonance, whereas Sundberg (1987) makes it a pillar of classical vocal training. Such a combination creates the aesthetic richness as well as strengthens sustainable vocal practice.

Summary of Findings

The ten-step framework is a resonance optimisation methodology that incorporates both the principles of pedagogic tradition and acoustic science. Each of the steps is used to produce a more resonant, projected and richer timbre. Collectively, they are useful in exposing a role that practical exercises, founded on an anatomy of knowledge and a theory of sound, might have in offering a methodological framework of vocal performance and academic study.

Discussion

This work presents a ten-step methodological framework that systematically optimises vocal resonance by integrating traditional pharynx voice training methods with recent acoustic studies. This section explains the ways in which the framework fits into the existing body of scholarship and its relevance in the research of performing arts, as well as ways it can be applied in pedagogical and interdisciplinary practices.

The correlation with contemporary acoustics research is discussed

There are several points of the ten-step model that agree with recent findings in the discipline of vocal acoustics. As an example, the tongue groove-making (Step 4) is directly analogous to the case of tongue shaping and hyoid elevation as observed by Titze (2022), who found a considerable impact of tongue shaping and hyoid elevation on the vocal tract acoustics and formant alignment. In the same way, the small-mouth resonance transition (Step 7) corresponds to the variations that Ambros and Andrada e Silva (2025) investigated, who showed that slight

changes in resonance tube length affect the formant tuning of the singer with professional tenors.

The framework also satisfies the significance of formant tuning and vowel calibration (Step 8), as demonstrated in the study by Sundberg et al. (2013) on synthetic vowel adjustment to resonance alignment. Besides that, the pharyngeal U exercise (Step 9) and open-throat integration (Step 10) are also consistent with Echternach et al. (2024), who also demonstrate the biomechanical importance of pharyngeal manipulations in high-pitched singing. All these alignments testify to the fact that not only pedagogically but also acoustically, the framework is sound.

The framework makes a significant contribution to the field of Arts in the Performing Arts

In addition to acoustics, the framework also offers contributions to the area of performing arts since it applies experiential exercises to a systematic approach. Old pedagogical models, e.g., the Eight Steps by Lin (2019), were originally written as a manual of teaching. This research takes them a step further to an informed protocol of research by framing them in a methodological and academic framework. This approach is in line with the appeal of Welch (2016), who propose using pedagogical methods that combine scientific knowledge with artistic enactment.

Furthermore, the paradigm fills the gap between pedagogy and performance studies because the concept of resonance is imagined through both physiological and performative processes. The humming resonance (Step 6) and jaw relaxation (Step 3) exercises are not offered as an act of pure technique any more but as a voice science practice related in some way to other artistic results. The practice-based research, as a part of this integration, highlights the importance of such studies for the development of the scholarship of performing arts.

Pedagogical Implications and Practical Implications

Pedagogical perspective the framework offers a gradual training process, which is modifiable to different learners. This is done by starting with fairly simple physiological activities, such as opening and closing the throat and diaphragmatic breathing in Steps 1 and 2, which eventually evolve into the more encompassing throat-opening technique in Step 10. This order makes it possible to learn gradually and, at the same time, to ensure scientific consistency.

For practitioners, the framework provides a means of formalising the teaching methods and lessening the use of metaphorical imagery, which has always prevailed in the vocal pedagogy of the historical past. The framework is based on pedagogy and acoustics, making it clearer to students and giving them measurable outcomes. The resonance training is also essential in preserving vocal health, as Rosenberg and LeBorgne (2019) mention, which makes the framework applicable to both the performance improvement and the prevention of vocal strain.

Limitations and Future Projections

In spite of the contributions, there are several limitations accepted in this study. First, the framework is literature-based, and more so practice-based, and has not been empirically validated using acoustic measurement like spectrographic analysis. Although it is not a

negative aspect of its pedagogical worth, the possibility of including acoustic data should be taken into account in future studies to determine the results of every step in quantitative terms. As emphasised by Lã and Fiuza (2022), real-time feedback technologies can provide useful tools for achieving this goal.

Second, the framework is now revolving around classical and pedagogical settings. We have yet to test its generalisability to other genres, such as popular music or musical theatre. Since the set of demands for styles varies in the traditions, further study or research might adapt and test the framework for various vocal practices.

Lastly, the framework can be interdisciplinarily used to a significant extent. Resonance strategies have already been used in speech therapy (Somanath & Ma, 2016), music psychology and voice health research. Application of the framework in these areas may widen its scope to more areas beyond performance and make it a model of interdisciplinary cooperation.

Conclusion

This research has suggested a methodology to optimise vocal resonance by combining traditional pharyngeal voice training with modern acoustic work. Based on the Eight Steps of Pharyngeal Voice Training (2019) by Lin Junqing and the latest research on formant tuning, singer's formant, and resonance tube phonation, the framework of the eight steps has been developed into a ten-step framework. They were described using the pedagogical purpose, biological action, the expected acoustic outcome and academic justification to a level that the practical activity was redesigned into an academically organised framework.

The results point out that resonance training is not only a matter of pedagogical tradition but also an object of scientific research. By recontextualising traditional methods in the language of voice science, this study shows how the knowledge built through practice can be established as methodological knowledge. By doing so, it contributes to the science of vocal pedagogy by offering a systematic approach that informs itself using a set of literature in an attempt to minimise the use of metaphorical teaching and provide better pedagogical guidelines.

The implications of the pedagogy framework extend beyond just pedagogy in performing arts research. It is an example of how practice-based research can produce academically rigorous research results with a bridge between the experiential field of vocal performance and the theoretical insights of acoustics and interdisciplinary research. By doing so, the framework makes contributions to the methodological discourse of performing arts, which makes vocal resonance a physiological phenomenon and a practice of art.

However, the research does not mention limitations. The framework was created through literature synthesis and pedagogical thinking instead of empirical testing. Future research should therefore validate the model through acoustic analysis, perceptual evaluation, and application to different vocal genres. Also, it can be expanded into other disciplines like speech therapy, psychology, and vocal health, which can make it even more relevant and useful.

In conclusion, the given paper introduces a ten-step framework of the methodology that brings tradition and science together to achieve the most balanced voice resonance. It demonstrates the possibility of integrative, practice-based methods to improve pedagogy and scholarship.

The current study contributes to a more comprehensive picture of the phenomenon of resonance and can be of beneficial use to singers, teachers and researchers in the performing arts and other areas by mediating between the knowledge gained through experience and the academic interpretation of the phenomenon.

Acknowledgement

This study was supported by the Faculty of Creative Industries, City University Malaysia. The authors gratefully acknowledge the technical and advisory support provided throughout the research process.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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FROM IDEALISM TO DISILLUSIONMENT: THE TENOR'S VOCAL EXPRESSION IN SHI GUANGNAN'S *REGRET FOR THE PAST*

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Abstract: This paper discusses the transformation of poetic tenor heroism in an opera by Shi Guangnan titled *Regret for the Past*, paying specific attention to the use of voice and interpretation technique. It examines the interaction between tenor technique (the expressive control of Tessitura, legato phrasing, dynamic nuance, and tone colour) and musical structure in the portrayal of a heroic image in a particular cultural context. Based on the analysis of the score and the practice of performance, the paper identifies idiomatic elements of Shi's composition that allow vocalists to convey the heroic determination and its gradual decadence and, thus, combine music and narrative into one expressive curve. Tracing the emotional trajectory of Juan Sheng throughout the seasonality of the opera: the sunny exuberance of youthful attraction, the philosophical depression of loss, and, lastly, the downfall of tragedy. The paper claims that the work is an inimitable lyrical subjectivity in combination with social criticism in the context of the post-socialist Chinese opera aesthetics and evolving concepts of heroism. Finally, heroism in opera is redefined to emphasise perseverance and poetic greatness, where moral self-criticism is more important than success within the boundaries of history.

Keywords: Tenor, Heroism, Tragedy, Vocal Expression, *Regret for the Past*, Shi Guangnan

Introduction

Regret for the Past is one of the key milestones in the history of Chinese national opera, a novel based on a novella by Lu Xun. The emotional and social world of post-May Fourth China is very complex and thus is deeply reflected in this work. It was written by the famous composer Guangnan Shi with a libretto by Quan Wang and Wei Han, and it first premiered in Beijing in the year 1981 (Ju, 2020). Being the first lyrical psychological opera in China, *Regret for the Past* is not only the one that sets the new artistic paradigm but also, with its rich psychological depiction and musical performance, the one that shows the conflicts and turmoil of the intellectuals then (Fu, 2012).

This opera has taken a leading role in the history of Chinese opera because it possesses the peculiar artistic value and the deeper ideological message. The tenor lead character, Juan Sheng, is an enlightened young man willing to adopt new concepts and freely indulges in love, trying to rid himself of feudal rituals. Nevertheless, in the face of real life and personal constraints, Juan Sheng finally must abandon his ideals. The struggle of idealism and real life is the essence of the character of Juan Sheng, and it permeates the entire opera (Zhang, 2015). He feels longing for a better future, but he is at the same time troubled by the societal demands and feeling of helplessness. The image of Juan Sheng does not only imply the actual image of

young intellectuals of that time but also symbolises the intense contradictions between the personal destiny and the social change.

This paper is aimed at understanding the impact of vocal expression and performance aids of a tenor on the character of Juan Sheng and the in-depth analysis of how these factors are combined to bring out themes of heroism and tragedy. The analysis of the emotional development of Juan Sheng, who started out as a cheerful young man and finished the experience being disappointed in his soul and his music, allows us to better understand this character and the spirit of his era (Wang, 1992). Furthermore, the current paper will integrate certain arias and technical information to speak about the ways in which the vocalists managed to express the intricate psychological condition through the voice variations, thus making the audience better understand and connect with the heroic and tragic moods of the opera. In a thorough analysis of Juan Sheng in *Regret for the Past*, we will make the Chinese opera genre distinguished in terms of its value of depicting the richness of human nature (Wang, 2017).

Heroic Themes within Context and Character

Contextual Heroism

The compositional style developed by Shi Guangnan combines Western harmonic concepts with national melodic idioms to form what Xu and Yang call an ethnic periodicity that the composer grounds his vocal aesthetic style in (Xu and Yang, 2025). The central theme of the *Regret for the Past* is the unrelenting way by which Juan Sheng tries to transcend the society on love. The May Fourth Movement changed his thoughts, and turning into a courageous young man, Juan Sheng tries to oppose feudal rituals and to find an equal relationship with Zi Jun based on personal choice and equality of relations. These activities show the youth's need to take control of their destinies and their idealism and rebelliousness. Juan Sheng is placed as a representative of youthful idealism and heroism; he is bold enough to challenge the conventions of the traditionalism of that time to seek freedom in love and is the embodiment of the awakening and rebellion of the thought of the time (Ju, 2014).

Nonetheless, the truth is not in line with the desires of Juan Sheng. He is exposed to social pressures, economic difficulties, and the limitations of his character, which slowly make him understand the huge gap between his ideals and reality. Faced with many problems in life, internal conflicts and struggles in Juan Sheng are even more evident. His heroism is laden with disappointments and frustrations, and he ends up not escaping the sufferings of the structure of society. This is the clash of reality and idealism, which is at the centre of the character of Juan Sheng and fills the whole opera, rendering his image more tangible and lifelike (Fu, 2012).

The story of Juan Sheng, who started as an idealistic young man and turned out to be disappointed in the real-world issues, is also applicable to the social conditions of the time. The fact that he was brave and resolute in the first place reveals the progressive essence of the young mind of the May Fourth Movement, whereas his eventual surrender reveals the restrictions and complications that people who dared to oppose tradition had to contend with (Yang & Wu, 2014). With this description, the opera explores the depths of the psyche of its characters and shows the deep contradictions in them and the society they live in (Zhao, 2018).

The pedagogical and performative implications of Shi Guangnan vocal writing also locate responses in the more general literature about expressivity in operatics in modern Asian compositions (Ni, Roongruang, and Leangsomboon, 2023), where the connection between dramatic form and vocal art is also noted as one of the essentials of interpretive art.

Vocal Incarnation of Heroism

Music-wise, *Regret for the Past* also uses the cycle of seasons to show the way from hope to the way of desperation in the life of Juan Sheng. During the spring, the duet *Wisteria Flowers* has a cheerful and gorgeous melodic line, which may be characterised by the first meeting between two characters who are full of the idealism of youth. This work is representative of the new opportunities and aspirations that the May Fourth Movement brought to the minds of young scholars (Shi, 2018). Summer is filled with passionate arias discussing the dramatic emotional exchanges of lovers in the heat of passion. The tenor makes a vivid and energetic timbre with flying melodic lines and extensive tessitura, which reflects the expectation of the future and optimism. The piano accompaniment plays an important part here and contributes to the voices playing with each other by calm and tender accompaniment, which generates an atmosphere of intimacy and exhilaration, which perfectly describes the innocence and purity of their first encounter (Guo, 2022).

When the story transitions to autumn, the atmosphere changes to one of reflection and holding back as it preempts the death of beautiful things. At this point, the voice of Juan Sheng slowly turns more introductory and lower, even melancholic. There are also parts where the tenor intentionally shifts the tessitura to lower levels, using a lower voice to depict confusion and bewilderment. The arias of this time reveal the increasing tension and confrontation in Juan Sheng as he struggles against the social demands and personal restrictions (Wang, 2017). By winter, there is a fragmented and dissonant voice of Juan Sheng, which shows the irreparable loss inside. The shift from optimism to tragedy is a descriptive depiction of the metamorphic experience in the emotional makeup of Juan Sheng, as well as a reflection of his progressive experience of disappointment in the reality (Huang, 2020).

Connection to Tragedy

The plot of *Regret for the Past* closely intertwines heroism and tragedy. As the story progresses, the voice of the tenor grows and develops, showing how Juan Sheng changes from hoping for success to being shattered. Starting as a strong and beautiful voice and ending as a deep and harsh voice, all the changes reflect the transitions in his inner world. In the latter part, when Juan Sheng has to confront life and the harshness of society, his anguished and powerless voice becomes the most emotional, which gives the overall story a strong, tragic colour (Shi, 2018).

In addition, the choral passages in the opera contribute to the tragic atmosphere to a significant extent. To give an example, there are some moments when the chorus enhances the desolate impression of Juan Sheng losing his job, which only emphasises the powerlessness of the main character. In this case, the choral music serves not only as background but also as an extension of Juan Sheng's inner world, highlighting the broader social context and its impact on personal destiny.

Musical Analysis: Vocal Expression of Tenor

This section examines the development of the vocal and musical performance in Shi Guangnan opera, *Regret for the Past*, through discussion of the tenor lead character, Juan Sheng, using the original score of the piano performance (Shi, 1993) to show how the written dynamics and tessitura help to show the expressive purpose. The three acts of the opera are divided into the metaphors of seasons, with spring and summer being the youthful idealism, autumn being the awakening and loss, and winter being the tragedy, hence explaining the gradual variations of the vocal timbre, tessitura, and psychological dimension of the character. Through an analysis of the main arias, duets, and passages with multiple voices, the paper will help us understand how the composition style of Shi contributed to a fusion of Western and Chinese operatic modes of expression, allowing the impressive and powerful voice of the tenor to at once embody both heroism and fragility (He, 2015).

Act II (Summer Season): The Weight of Realisation – "She Has Stolen My Heart"

Table 1 shows the musical structure of the Act II (Summer Season) aria, "*She Has Stolen My Heart*", which assumes a ternary (A-B-A₁) form, which is given a brief introduction and a lyrical coda.

Table 1: Act II (Summer Season), Musical Structure of Fifth Movement (Aria): *She has Stolen My Heart*

Musical Form	Introduction	A		B		A ₁		
Section		a	b	c	d	a'	b'	Coda
Bars	1-22 (22)	23-49 (27)	50-75 (26)	76-91(16)	92-113 (22)	114-130 (17)	131-146 (16)	146-162 (17)
Structural Nature	Phrase	Binary Exposition		Episodic middle section		Recapitulation (rounded binary)		Closing phrase/codetta

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

The introduction (Bars 1-22) creates a quiet atmosphere in D major and determines the lyrical colouring of the aria. The melodic line of Juan Sheng presented in the A section in two subsections, "a" (Bars 23-49) and "b" (Bars 50-75), is cheerful and light in character and contains the feeling of awe and emotional expectation of youth. The subsection "a" introduces motions of upward melodies and leggiero phrases which convey the idealistic love, and the subsection "b" broadens the scope and enhances harmonic colour, expressing the increasing emotional conflict under the face of optimism.

The B section (bars 76-91) is featured by a continuous contouring of the melody, which starts at the highest pitch at bar 79 (G5) and moves down to F4 in bars 85-86 and then up to the final pitch of the melody E5 in bars 94-95 creating a line of linear flow of the melodies. Figure 1 shows the excerpt from this aria, in which, in bar 79, the tenor sings the vowel "ah" (啊) in the highest register (G5) with a brighter tonal colour and sustained breath control, reflecting Juan

Sheng's inner solitude. The A' section (Bars 114-146) continues the previous emotions but explores greater introspection, returning to a rhythm similar to the A section and using changes in tempo to express Juan Sheng's eagerness to see Zi Jun.



Figure 1: Act II (Summer Season), Fifth Movement (Aria): *She Has Stolen My Heart*, Bars 79-95.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

Figure 2 shows the coda (Bars 147-159); the tempo alternates between fast and slow, with three successive calls building up to an emotional climax. A diminuendo precedes the final call, which preconditions the last strong cry, which adds more emotion to the piece.



Figure 2: Act II (Summer Season), Fifth Movement (Aria): *She Has Stolen My Heart*, Bars 147-159.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

The nature of tonal balance and phrasing used by Shi enables the tenor to demonstrate both vulnerability and the expressive mastery of tessitura. The emotional trajectory of the aria is a premonition of the collapse of the idealism of Juan Sheng, a motif that is repeated at various moments of the opera (Ju, 2020).

Act II (Summer Season): The Idealism of Youth

Figure 3 shows the piano accompaniment (bars 48-63) enriches the interaction among the vocal parts, which creates an atmosphere full of emotion. For instance, the soaring vocal lines of Juan Sheng are filled with restrained arpeggiations of piano accompaniment, which soften the sound and effectively describe the aesthetic aspect of love. The harmony of the piano complements the duet and adds tonal colour to the melody, creating a complementary and sublime

atmosphere that recalls the youthful and passionate love from the two characters' first encounter.



48

Zi Jun (子君)

紫藤花 紫藤花 爱情的见证 心灵的花

Juan Sheng (涓生)

紫藤花 紫藤花 爱情的见证 心灵的

Piano

mp

56

凝聚着多少 热泪欢歌 水在我记忆里垂挂

花 凝聚着多少 热泪欢歌 永在我记忆里垂

Figure 3: Act II (Summer Season), Twelfth Movement (Aria): Wisteria Flowers, Bars 48-63.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

The melodic line in the duet Twelfth movement aria: *Wisteria Flowers* from Act II of the opera *Regret for the Past* is both active and high, marking the first emotional encounter between Juan Sheng and Zi Jun. This aria gives perfect utilisation of the higher part of the tenor voice, which represents the young expectation and future expectations. High notes by Juan Sheng are not only used to emphasise his hopeful and courageous nature but also to create a positive and optimistic atmosphere throughout the opera. With this carefree and euphoric expression of voices, the audience can feel the innocence and purity between the two main characters and their hopes of a better future.

Act III (Autumn Season): The Golden Autumn Light

In Act III (Autumn Season), Twenty-Fifth Movement, Aria: "*The Golden Autumn Light*" also signifies the change in the emotional state of Juan Sheng in the fall. His voice is deeper and more disrupted; the tessitura goes lower, and the timbre changes to melancholy. Figure 4 shows that by the delicate touch of phrasing and tone colour, i.e., low-register crooning and dissonant

inflections, the internal vulnerability and disorientation of Juan Sheng are brought into clear focus; e.g., the line from bars 60-63, “the light of autumn makes the red leaves in the western mountain turn like blood” (你刚把西山红叶染得血一样浓艳), and then bars 69-75, “vanish like a shooting star” (又像飞驰的流星, 消失得这般突然), are sung in slow tempo with gradual diminuendo, which creates an impression of helplessness and lost vitality.



Figure 4: Act III (Autumn Season), Twenty-Fifth Movement (Aria): The Golden Autumn Light, Bars 60-75.

Source: Shi, G. (1993). *Opera “Regret for the Past”: Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun’s Novel of the Same Name). People’s Music Publishing House.

The autumnal imagery in *The Golden Autumn Light* is used as a musical metaphor of decline. By using descending melodic motion, and blurred tonal boundaries, Shi Guangnan transforms outside seasonal transformation into an inside emotional transformation. The subdued dynamic level and low tessitura symbolise not only the dying vitality of Juan Sheng but also the gradual decay of idealism. This scene of transition links the lyrical idealism of summer with the fatalistic despair of winter.

Act IV (Winter Season): A Sword Pierces My Heart

The coming of winter is the transition of Juan Sheng into utter hopelessness. After *Unfortunate Life*, the last aria by Zi Jun, Juan Sheng concedes dramatically, *A Sword Pierces My Heart*, his unlimited regrets and yearning. Referring to a vocal performance, this aria requires the tenor to express the multifaceted emotional environment of Juan Sheng with the help of carefully regulated dynamics, legato phrasing, and the nuances of the changes in tone colour. The tenor has to balance between the expression conflicts of suppression and discharge, whereby every musical phrase reflects the psychological breakdown of the character. In such a complicated interaction of vocal nuances and emotional depth, *A Sword Pierces My Heart* becomes not only a cry of despair but also the outcome of Juan Sheng’s tragic metamorphosis.

Figure 5 shows Act IV (Winter Season) features the Forty-Second Movement (Aria), “*A Sword Pierces My Heart*”, from bars 6-10. In bar 8, the special emphasis should be put on the pronunciation of such words as *lěng qīng qīng* (冷冷清, “desolate”) and *gū dān dān* (孤单单, “lonely”), as the means of describing the feeling of loneliness and emptiness experienced by Juan Sheng after the departure of Zi Jun. The syllables must be lengthened past the written

value, and the eighth notes should act as though they were linked in legato. The first consonants should be pronounced well and be the pivot of the continued flow of breaths so that they are clear and do not ruin the emotional tenderness of the line. The result is a slight expansion and exactness of words, which reminds the audience of the inner barrenness of Juan Sheng and makes a lyrical phrase a symbolic voice of loneliness and memory.



Figure 5: Act IV (Winter Season), Forty-second Movement (Aria): A Sword Pierces My Heart, Bars 6-10.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

Figure 6 shows bars 123-129; the lyrical "ah (啊)" rises melodically from a perfect fifth apart (C4-G4, bar 123) to a major sixth apart (C4-A4, bars 124-125) and then raises a tone higher to D4-B4 (sixth apart) in bar 126, with the phrasing being smooth and progressively louder. The passage should be presented with a wide-open mouth, expanded diaphragm breathing control, high pitch at an intensity of *f* (forte), and full utilisation of head resonance. This singing technique helps to make the emotional peak, and it actually renders the deep grief and remorse of Juan Sheng.



Figure 6: Act IV (Winter Season), Forty-second Movement (Aria): A Sword Pierces My Heart, Bars 123-129.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

The voice projection loss, which is gradually acquired, correlates with the loss of the physical and mental state of the character. The music finishes without completion, breaking down in silence—a musical realisation of spiritual death. With the expressive means of tessitura, dynamic expressiveness, and legato phrasing, Shi Guangnan makes a tragedy by Juan Sheng a universal reflection on the weakness of people and their idealism, which loses connection with reality.

Performance Analysis: Interpreting the Tenor's Heroism and Tragedy

This part of the paper analyses how the vocal technique, interpretive nuances and physical embodiment in combination create the transformation of Juan Sheng into a tragic character of youthful idealism. The tenor changes the musical notation to psychological realism using breath control, tessitura control, legato phrasing, and stage gesture. Shi Guangnan's score

provides the technical structure and expressiveness required to portray a contemporary Chinese hero caught between personal aspirations and societal constraints (Huang, 2020).

Vocal Techniques of Heroism

The singing in the opera *Regret for the Past* considers various methods of vocal expression used by the vocalists to depict heroism. Vocal power and clarity are crucial elements. Throughout the first half of the act, Juan Sheng's singing radiates strength and confidence, particularly his sustained high notes. Not only do these reflect the boldness and idealism of the character but also create a positive atmosphere for the whole opera. As an example of this, in the duet, *Wisteria Flowers* in Figure 7, Juan Sheng uses joyful expression to convey future dreams, which are the ideals and dreams of the young people.



Figure 7: Act II (Summer Season), Twelfth Movement (Aria): *Wisteria Flowers*, Bars 8-23.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

Figure 8 shows that in bars 48–64 of *Wisteria Flowers*, the legato's voice should also be given a favourable emphasis, particularly in a duet and an aria, as it clearly depicts the harmony between Juan Sheng and Zi Jun, which strengthens the beauty of the relationship between the two. The legato passages in *Wisteria Flowers* express the emotional attachment of the two, which brings about the feeling of hope and warmth. In addition, there is the physical presence of the performer (either sitting straight or with a focused look), which cannot be ignored and serves as an inseparable part of a heroic figure. At initial levels, the physical attitude of the tenor must be that of vibrancy and self-confidence that can be associated with youth, increasing the attractiveness and nature of the character. With these technical details, vocalists manage to present Juan Sheng as a courageous idealist who is seeking freedom and love.



Figure 8: Act II (Summer Season), Twelfth Movement (Aria): *Wisteria Flowers*, Bars 48-64.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

Dynamics of Tragic Realization

Figure 9 shows that in the early scenes of the opera (bars 7–13), the interaction between Zi Jun and Juan Sheng reveals a tender emotional awakening rather than overt passion. The melodic lines in the duet passage which starts with the words "Zi Jun, are you waiting for me?" ("子君，在等我吗？") are developing in a soft stepwise motion and are supported by long sustain pedal notes in the piano, developing the atmosphere of intimacy and anticipation. The subtle nature of their emotional bond is stressed by the dynamic nature of the mezzo piano and the common presence of legato phrasing. The music does not use any dramatic leaps but rather understated rhythmic breaks and expressive breathing to impart the authenticity of first love and the nervous excitement of a new relationship.

Figure 9: Act II (Summer Season), Sixteenth Movement (Recitative): *What Day is Today?*, Bars 7-13.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

As the opera reaches its climax in the aria *Sword Pierces My Heart*, especially during the tragic moment of Zi Jun's death, the power of music reaches its zenith. At this juncture, dynamic contrasts, dramatic pitch leaps, and broad tessituras become defining features. For example, when depicting Juan Sheng's overwhelming grief, the composer arranges numerous crescendos and decrescendos, making each note resonate deeply with the audience; long notes spanning several octaves pierce the heart like sharp blades.

This is an important part of the music where the contrast is dynamic. Figure 10 show that sudden shifts between mezzo piano and fortissimo do not only emphasize the heavy emotions of Juan Sheng but also enhance the emotional performance. In the line where Juan Sheng is telling how disappointed he is about Zi Jun leaving, there is a moment when the music breaks off and then bursts out giving a strong emotional impact. Bars 12-13 show the dramatic leaps from F4 to Eb5 in minor 7th, focusing the tenderness and agitation in singing interpretation. The voice of Juan Sheng switches between low and high tones so fast, it is as a scream and a quiet scream, which explains his pain and the feeling of helplessness so deeply.



Figure 10 shows a musical score for Act IV (Winter Season), Forty-second Movement (Aria): *A Sword Piercing My Heart*, Bars 9-16. The score is in G major, 4/4 time. It features a vocal line for Juan Sheng and a piano accompaniment. The vocal line starts with a long note on '只有' (only) and then has a dramatic leap to a higher note on '破碎' (shattered). The piano accompaniment features a series of chords and arpeggios that support the vocal line. The dynamics range from mezzo-piano (mp) to fortissimo (f).

Figure 10: Act IV (Winter Season), Forty-second Movement (Aria): *A Sword Piercing My Heart*, Bars 9-16.

Source: Shi, G. (1993). *Opera "Regret for the Past": Piano Score* (H. Wei & Q. Wang, Eds.; Based on Lu Xun's Novel of the Same Name). People's Music Publishing House.

It is also impossible without the use of a wide tessitura, which allows the tenor to demonstrate different emotional conditions in a short span. As an example, recalling pleasant moments in the past, the voice of Juan Sheng can be left in the high pitch, bringing out warmth, whereas when the reality hits its ugly face, the voice can carry an abrupt low pitch, which is an immense

lament. This malleable and diverse voice treatment diversifies the scene with various grades of emotion, which tremendously increases the tragic tone. In addition to the performance of the tenor, the piano is also critical in increasing the intensity of emotion in this scene. The piano enhances the volume during the most sorrowful moment of Juan Sheng making it heavier thereby increasing the tragic mood. The piano tremolos in the chromatic scale F2-Eb2-D2 and the leap of a fourth to G2 and descending leaps of a minor 6th to B2, then the ascending chromatic from B2 to C, create a suffocating emotional mood. These elements of music work together not only to enhance dramatic suspense but also to enable the audience to better understand the internal conflict and misery of Juan Sheng.

Body Movement and Stage Performance

The gestures and the physical presence of the tenor are no less important than his voice. The first stage of performance must be full of youthful vitality, and the steps should be steady and the movements agile. Nevertheless, later in the story, particularly when dealing with the tragic death of Zi Jun, body language should have some variations to show the weight that the character is experiencing in the heart. It is also possible at this point that the tenor takes on a hunched or bowed position with a deeply sorrowful face. Minor gestures are also supportive, as they include caressing the cheek of the other and even clenching fists when angry. The combination of all these creates a whole image of a character, and viewers can better feel Juan Sheng and his feelings upon the journey (Guo, 2022).

In the last part when the main character of the play, Juan Sheng, is forced to face the tragic death of Zi Jun, the composition of stage actions plays a critical role. The vocalists are required to show their inner suffering and powerlessness through posture, facial expressions, and movements. As an instance, when overwhelmed with grief, Juan Sheng would tend to clasp his head between his two hands, and his body would tremble slightly as it could not endure the tremendous blow; when remembering the good old days, he would single out a perfect look to the distance with a sad smile on his face. These little movements accompany the words spoken, and they also enhance the vision of the inner world of the character in more detail (Ju, 2020). The physical manifestation of Juan Sheng's despair does not only highlight the tragedy of the character but also the struggles of society during those days.

These layers of interpretation see the performance of the tenor making *Regret for the Past* into a story of personal love and a general study of the human struggle. Vocality, intonation and physical immobility serve not only aesthetic purposes but also moral and emotional realities. The luster of heroism at the beginning of acts is replaced by the dullness and deep self-examination that reflects the disappointment in the society. In the special mastery of tessitura, of dynamic nuances, of corporeal expression, the voice of Juan Sheng becomes the voice of idealism and tragedy, a voice that starts with passion and finishes with silence, the voice of a whole generation of dreamers (Wang, 1992).

Conclusion

Having conducted comprehensive research and examined the performance of the opera *Regret for the Past*, one has been able to attain some important lessons. To begin with, as to vocal expression, the tenor manages to represent Juan Sheng with his two sides of heroism and

tragedy. Bright high notes and high exuberance are used in the initial stages of the play to render the idealistic spirit of the character, representing the image of youth, hope and seeking free love; whereas, later on in the play, when the main character is deeply disillusioned, the tenor voice changes to be more introverted and controlled, using low tones and dissonant formations to convey disappointment. Such a conversion of the powerful into the helpless is not only a manifestation of the good and bad moments in the personal life of Juan Sheng but also a very radical exposure of the idea of idealism facing losses in the real world.

Moreover, this work contributes to much better knowledge of the position of tenor in Chinese opera. Historically, the voice has not just been an important channel for telling stories; it is also one of the most important roles for defining the emotional world of the characters. The tenor performance in *Regret for the Past* is an example of how vocal techniques can combine music and narrative to reflect the elasticity of emotions and the bravery of poetry. As an example, the legato articulation enhances the depiction of the harmonious contact between Juan Sheng and Zi Jun in the duet *Wisteria Flowers*, but the domain of sorrow, remorse, and resignation is registered in the extremes of the moping, the pity, the dramatic, and the dynamic contrasts in the climactic tragic scenes. Such subtle means of expression give the audience a better feeling of the intricate transformations of the psyche of the character, which contribute to the artistic appeal of the piece in general.

Finally, the image of a failure of idealism in *Regret for the Past* is of the utmost importance. It is not just a love story but also a true image of the broken dreams of a generation. The excellent depiction of Juan Sheng in all his emotional experience is the key to the success of this masterpiece. Each of the vocal changes reflects the deepest ideological conflicts in the main hero, occurring between the first triumphant expectation and the second inability to do anything about the reality. Because the vocalists process the technical material flawlessly, spectators can observe how idealists lose their shine while navigating social influences and personal constraints. These performances do not only present technical challenges but also deep considerations as regards the spiritual development of Chinese intellectuals at certain historical times. Thus, *Regret for the Past* is not merely a masterpiece of art but also a piece of one collective memory, which reminds us of the necessity to remember all those passions and beliefs burning so fiercely before and still existing, even after they have turned out to be short-lived illusions.

Acknowledgement

This study was supported by the Faculty of Creative Industries, City University Malaysia. The authors gratefully acknowledge the technical and advisory support provided throughout the research process.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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WORK INTEGRATED LEARNING IN DESIGN FIELD HIGHER EDUCATION: A LITERATURE REVIEW

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Abstract: *Work Integrated Learning (WIL) has emerged as a critical component of contemporary design education, bridging the gap between academic theory and professional practice. This literature review synthesizes current knowledge on WIL implementation in design field higher education, examining models, pedagogical approaches, outcomes, challenges, and future directions. Through systematic analysis of 314 academic papers from multiple databases (2015-2025), this review identifies key themes including diverse WIL models ranging from traditional internships to innovative studio partnerships, varied pedagogical frameworks emphasizing experiential and reflective learning, and significant benefits for student employability and professional competence development. However, the analysis reveals persistent challenges in scalability, assessment standardization, and equity of access. The review highlights critical research gaps, particularly the need for design-specific empirical studies and validated assessment instruments. Findings suggest that successful WIL programs in design education require multi-modal approaches, robust industry partnerships, comprehensive assessment frameworks, and institutional support systems. This review provides evidence-based recommendations for educators, administrators, and policymakers seeking to enhance WIL implementation in design programs.*

Keywords: *Work Integrated Learning, Design Education, Higher Education Pedagogy, Experiential Learning, Industry Partnerships*

Introduction

Background and Rationale

The creative industries have experienced unprecedented growth in recent decades, with design disciplines playing increasingly central roles in innovation, sustainability, and economic development (Fleischmann & Daniel, 2015). This evolution has created new demands for design graduates who possess not only technical competencies but also professional skills, industry awareness, and the ability to navigate complex workplace environments. Traditional design education models, while effective in developing creative and technical abilities, have been challenged to adequately prepare graduates for contemporary professional practice (Fleischmann, 2024).

Work Integrated Learning (WIL) has emerged as a pedagogical response to this challenge, offering structured approaches to integrate academic learning with authentic workplace experiences. WIL encompasses various models including internships, cooperative education, practicums, and studio partnerships, all designed to enhance graduate employability and professional readiness (Rowe, 2017). In design education, WIL takes on particular significance due to the inherently practice-based nature of design disciplines and the importance of portfolio development, client interaction, and professional networking in career success.

Scope and Objectives

This literature review examines the current state of knowledge regarding WIL implementation in design field higher education. The review encompasses multiple design disciplines including industrial design, graphic design, interior design, fashion design, and related creative fields. The primary objectives are to:

1. Synthesize current understanding of WIL models and approaches in design education
2. Analyze pedagogical frameworks and theoretical foundations underlying WIL implementation
3. Examine reported learning outcomes and benefits for design students
4. Identify implementation challenges and barriers
5. Review assessment and evaluation methodologies
6. Explore industry-academia partnership models
7. Highlight emerging trends and innovative practices
8. Identify research gaps and future research directions

Methodology

This review is based on comprehensive searches across multiple academic databases including Scopus, Google Scholar, PubMed, and ArXiv, conducted in August 2025. The search strategy employed both keyword and full-text searches using terms related to work integrated learning, design education, and higher education. A total of 314 papers were identified and analyzed, with studies spanning the period 2015-2025 to capture contemporary practices and recent developments in the field.

Conceptual Foundations of WIL in Design Education

Defining Work Integrated Learning

Work Integrated Learning in design education is conceptualized as a broad umbrella term encompassing curricular practices that purposefully integrate academic study with authentic workplace or practice-based experiences (Rowe, 2017). This definition extends beyond traditional workplace placements to include various forms of experiential learning that connect students with professional practice contexts.

The literature reveals several key characteristics that distinguish WIL from other forms of experiential learning:

- **Intentional Integration:** WIL experiences are deliberately designed to connect academic learning objectives with professional practice requirements
- **Authentic Context:** Activities occur within or simulate genuine professional environments and challenges
- **Reflective Practice:** Structured reflection processes help students connect experience with theoretical understanding
- **Assessment Integration:** WIL experiences are formally assessed and contribute to academic progression
- **Professional Development:** Focus extends beyond skill acquisition to include professional identity formation and career preparation

Theoretical Frameworks

WIL implementation in design education draws upon several established theoretical frameworks:

Experiential Learning Theory

Kolb's Experiential Learning Theory provides a foundational framework for many WIL programs, emphasizing the cyclical process of concrete experience, reflective observation, abstract conceptualization, and active experimentation (Heinrich & Green, 2020). In design contexts, this translates to hands-on project work, critique and reflection sessions, theoretical analysis, and iterative design development.

Situated Learning Theory

Lave and Wenger's situated learning theory emphasizes learning as a social process occurring within communities of practice. This framework is particularly relevant to design WIL, where students engage with professional design communities and gradually develop professional identities through legitimate peripheral participation (Kennedy et al., 2015).

Reflective Practice

Schön's concept of reflective practice resonates strongly with design education traditions, emphasizing the importance of reflection-in-action and reflection-on-action. WIL programs frequently incorporate structured reflection activities to help students articulate and analyze their learning experiences (Huggins, 2017).

Design-Specific Considerations

The literature identifies several factors that make WIL implementation in design education distinct from other disciplines:

- **Portfolio Development:** Design careers require strong portfolios, making authentic project work through WIL particularly valuable
- **Creative Process:** Design work involves iterative, non-linear processes that benefit from real-world application and feedback
- **Client Interaction:** Professional design practice requires client communication skills best developed through authentic interactions
- **Industry Diversity:** The creative industries encompass diverse sectors, requiring varied WIL approaches to address different career pathways
- **Technology Integration:** Rapid technological change in design tools and methods requires current industry exposure

Models and Types of WIL in Design Education

Traditional WIL Models

Internships and Placements

Traditional internships remain the most widely recognized form of WIL in design education. These typically involve 3-6 month placements within design firms, studios, or corporate design departments. Research indicates that internships provide strong workplace preparedness and direct exposure to professional culture, though quality varies significantly depending on supervision and project allocation (Jackson & Dean, 2022).

Cooperative Education Programs

Cooperative education involves longer-term, alternating work-study cycles, often integrated across multiple program years. These programs typically feature paid positions and deeper workplace immersion. While resource-intensive to coordinate, cooperative education programs demonstrate strong outcomes in terms of graduate employment and professional network development (Foster & Pierce, 2021).

Practicum Experiences

Practicum models involve faculty-supervised professional practice experiences, often occurring within controlled academic environments while engaging with external clients or projects. This approach allows for greater academic oversight and reflection integration while maintaining authentic professional challenges (Nickel et al., 2023).

Design-Specific WIL Models

Studio Partnerships

Studio partnerships involve collaboration between academic design studios and industry partners, with students working on real client briefs while remaining within the academic environment. This model provides controlled learning environments that support reflection and academic alignment while offering authentic workplace constraints (Amaral & Polson, 2022).

Client-Based Projects

Many design programs integrate client-based projects throughout the curriculum, where students work directly with external organizations on design challenges. These experiences provide authentic client interaction while maintaining academic support and assessment integration.

Design Competitions and Challenges

Participation in professional design competitions offers students exposure to industry standards and professional evaluation criteria. While not traditional WIL, these experiences provide valuable professional development and portfolio enhancement opportunities.

Emerging and Innovative Models

SME and Co-working Internships

Partnerships with small and medium enterprises (SMEs) and co-working spaces offer alternative placement opportunities that can provide entrepreneurial exposure and networking



opportunities. These models address placement capacity limitations while developing enterprise capabilities (Herbert et al., 2024).

Virtual and Global WIL

Online collaboration tools and global connectivity have enabled new forms of WIL that transcend geographic boundaries. Collaborative Online International Learning (COIL) frameworks adapted for design education allow students to engage with international partners and diverse cultural contexts (Amaral & Polson, 2022).

Non-Workplace WIL

Simulated professional experiences, community-based projects, and service learning initiatives provide WIL opportunities that don't require traditional workplace placements. These models can be more scalable and accessible while still developing relevant professional competencies (Jackson & Dean, 2022).

Pedagogical Approaches and Implementation

Instructional Design Models

The mARC Model

The mARC (motivation, activity, reflection, consolidation) instructional design model provides a framework for structuring WIL experiences to maximize learning outcomes. This model emphasizes the importance of motivational preparation, structured activities, guided reflection, and knowledge consolidation phases (Radović et al., 2021).

DIAL Remix Framework

The DIAL remix model integrates emergent learning principles with systematic design of experiential activities, advocating for stronger theoretical alignment between activity design and assessment strategies. This framework is particularly relevant for design education where creative processes and outcomes can be highly variable (Heinrich & Green, 2020).

Integration Strategies

Progressive Complexity

Research suggests implementing WIL experiences with increasing complexity and responsibility across program years. Foundation-level experiences might include short industry projects and guest lectures, while advanced students engage in semester-long internships and capstone partnerships.

Reflection Integration

Structured reflection activities are consistently identified as crucial for maximizing WIL learning outcomes. These may include reflection journals, portfolio development, peer discussion sessions, and formal presentation of learning experiences.



Assessment Alignment

Effective WIL programs align experiential learning activities with broader program learning outcomes and assessment strategies. This requires careful mapping of WIL experiences to competency frameworks and graduation requirements.

Quality Assurance

Partner Preparation

Industry partners require preparation and support to effectively supervise and mentor design students. This includes training on educational objectives, assessment criteria, and effective mentoring practices.

Student Preparation

Students benefit from pre-placement preparation including professional skills development, expectation setting, and goal establishment. This preparation enhances placement success and learning outcomes.

Ongoing Support

Regular monitoring and support during WIL experiences help address challenges and maximize learning opportunities. This may include faculty visits, regular check-ins, and problem-solving assistance.

Learning Outcomes and Benefits

Professional Competency Development

Technical Skills Enhancement

WIL placements provide opportunities for students to develop proficiency in industry-standard software, tools, and technologies that may not be available in academic settings. Exposure to professional workflows and quality standards enhances technical competence.

Design Process Understanding

Authentic project experiences help students understand professional design processes, including client briefing, research methodologies, concept development, iteration cycles, and project delivery. This practical understanding complements theoretical knowledge gained in academic settings.

Project Management Capabilities

Professional design practice requires project management skills including timeline management, resource coordination, and quality control. WIL experiences provide opportunities to develop these capabilities in authentic contexts.



Transferable Skills Development

Beyond design-specific competencies, WIL experiences contribute to broader professional skill development:

Communication and Presentation Skills

Client interaction and team collaboration in professional settings enhance students' communication abilities, including visual presentation, written documentation, and verbal articulation of design concepts.

Critical Thinking and Problem-Solving

Authentic professional challenges require adaptive problem-solving and critical thinking skills. WIL experiences provide opportunities to apply theoretical knowledge to complex, real-world problems.

Professional Identity Formation

Engagement with professional communities helps students develop professional identities and understand career pathways within the design industries.

Career Preparation and Employability Employment Outcomes

Studies consistently show higher employment rates and faster job acquisition among graduates with WIL experience compared to those without such exposure (Suresh & Ananda, 2024).

Industry Network Development

WIL experiences provide opportunities for students to develop professional networks that often contribute to career opportunities and ongoing professional development.

Portfolio Enhancement

Authentic project work through WIL provides portfolio content that demonstrates professional capability and real-world application of design skills.

Implementation Challenges and Barriers Scalability and Access Issues

One of the most significant challenges identified in the literature relates to scaling WIL opportunities to serve all students:

Placement Availability

The availability of quality placement opportunities often limits program capacity, particularly in regions with fewer design employers or during high-demand periods.



Geographic Constraints

Students in remote or regional locations may have limited access to design industry placements, creating equity concerns and limiting program effectiveness.

Financial Barriers

Unpaid or low-paid placements create financial barriers for students who need to work to support their studies, potentially excluding economically disadvantaged students from WIL opportunities.

Quality and Consistency Challenges

Variable Supervision Quality

The quality of workplace supervision varies significantly across different industry partners, affecting student learning outcomes and experience quality.

Misaligned Expectations

Differences between academic learning objectives and industry project requirements can create tensions and suboptimal learning experiences.

Assessment Standardization

Evaluating diverse WIL experiences consistently and fairly presents methodological challenges, particularly when experiences occur in different contexts with varying supervision quality.

Resource and Institutional Barriers

Faculty Workload

WIL coordination, industry relationship management, and student support require substantial faculty time and effort, often without adequate recognition or resource allocation.

Administrative Complexity

Managing diverse partnerships, placements, and assessment requirements creates administrative complexity that requires dedicated support systems.

Institutional Commitment

Successful WIL implementation requires sustained institutional commitment and resource allocation, which may compete with other academic priorities.

Assessment and Evaluation Approaches

Multi-Stakeholder Assessment Models

Student Self-Assessment



Reflection portfolios, goal-setting activities, and self-evaluation exercises help students take ownership of their learning and develop metacognitive skills.

Industry Supervisor Assessment

Workplace supervisors provide valuable perspectives on professional competency development and workplace readiness, though they require training and support to provide effective feedback.

Academic Assessment

Faculty assessment focuses on learning outcome achievement, critical reflection quality, and integration of theoretical knowledge with practical experience.

Assessment Tools and Instruments

Competency-Based Rubrics

Detailed rubrics that specify performance criteria for professional competencies provide structured assessment frameworks that can be applied consistently across different WIL experiences.

Portfolio-Based Assessment

Digital portfolios allow students to document their learning journey, showcase project outcomes, and reflect on their professional development over time.

360-Degree Feedback

Comprehensive feedback from multiple sources including supervisors, peers, clients, and self-assessment provides holistic evaluation of student performance and development.

Evaluation Challenges

Validity and Reliability

Ensuring that assessment tools accurately measure intended learning outcomes and provide consistent results across different contexts remains challenging. Evaluating creative outcomes involves inherent subjectivity that can complicate standardized assessment approaches.

Long-term Impact Measurement

Assessing the long-term impact of WIL experiences on career success and professional development requires longitudinal studies that are resource-intensive to conduct.

Industry-Academia Partnership Models

Partnership Development Frameworks

Three-Phase Collaboration Model

Research suggests implementing partnership development through three phases: relationship building, program co-design, and implementation with continuous improvement. This systematic approach helps ensure mutual benefit and sustainable collaboration (McGowan, 2020).

Mutual Value Creation

Successful partnerships require clear articulation of benefits for both academic and industry partners, including student talent development, research collaboration opportunities, and innovation partnerships.

Partnership Types and Models

Formal Partnership Agreements and Advisory Board Structures

Structured agreements that define roles, responsibilities, and expectations provide frameworks for sustainable collaboration and quality assurance. Industry advisory boards provide ongoing input on curriculum development, industry trends, and graduate competency requirements.

Mentorship Programs

Formal mentorship programs connect students with industry professionals for ongoing guidance and career development support.

Partnership Sustainability

Relationship Management, Continuous Improvement and Capacity Building

Regular communication, recognition activities, and mutual support help maintain positive relationships with industry partners. A constant evaluation and adaptation of partnership arrangements based on feedback from all stakeholders helps ensure continued effectiveness and satisfaction. Also, providing training and support for industry partners enhances their ability to effectively supervise and mentor students, improving outcomes for all parties.

Geographic and Institutional Variations

International Perspectives

Policy and Regulatory Context

National education policies, funding mechanisms, and regulatory frameworks significantly influence WIL implementation approaches and outcomes.

Industry Structure Variations

Differences in creative industry structure, size, and geographic distribution affect the availability and types of WIL opportunities in different regions.

Cultural and Educational Traditions

Educational traditions and cultural attitudes toward work-integrated learning influence implementation approaches and stakeholder acceptance.



Institutional Type Variations

Research Universities vs. Applied Institutions

Research-intensive universities may emphasize different aspects of WIL compared to institutions with stronger industry connections and applied focus.

Public vs. Private Institutions

Funding structures and institutional priorities may influence resource allocation and WIL program development approaches.

Program Size and Specialization

Smaller, specialized programs may have different challenges and opportunities compared to large, comprehensive design programs.

Current Trends and Emerging Practices

Technology Integration

Digital Collaboration Tools

Advanced online collaboration platforms enable new forms of remote and global WIL experiences that transcend geographic boundaries.

Immersive Technologies

Virtual and augmented reality technologies offer possibilities for simulated professional experiences that can complement or supplement traditional workplace placements.

AI and Automation

The integration of artificial intelligence and automation in design practice requires WIL programs to expose students to these emerging technologies and their professional implications.

Sustainability and Social Impact Focus

Sustainable Design Challenges

Industry projects increasingly focus on environmental sustainability, circular economy principles, and social impact, requiring WIL programs to address these priorities.

Community Engagement

Service learning and community-based design projects provide alternative WIL models that address social needs while developing professional competencies.

Entrepreneurship and Innovation

Startup Incubators



Partnerships with entrepreneurship programs and startup incubators provide alternative pathways for students interested in founding their own design businesses.

Innovation Challenges

Cross-industry innovation challenges and design thinking workshops provide exposure to diverse application areas and collaborative approaches.

Research Gaps and Future Directions

Disciplinary-Specific Research Needs

Limited Empirical Evidence

Most existing research on WIL in design education consists of small-scale, qualitative case studies. There is a need for larger-scale, mixed-methods investigations that provide more generalizable findings.

Discipline-Specific Outcomes

Research is needed to understand how WIL outcomes vary across different design disciplines and specializations, as current literature often treats design as a homogeneous field.

Longitudinal Studies

Long-term tracking of WIL participants is needed to understand career impacts and professional development outcomes over time.

Assessment and Evaluation Research

Validated Assessment Instruments

There is a need for psychometrically sound assessment tools specifically designed for design WIL contexts that can provide reliable and valid measurement of learning outcomes.

Competency Framework Development

Research is needed to develop comprehensive competency frameworks that reflect contemporary design practice requirements and can guide WIL program development.

Impact Measurement

More sophisticated approaches to measuring WIL impact on student learning, career outcomes, and industry benefits are needed.

Implementation and Scalability Research

Scalable Models

Research on WIL models that can be effectively scaled to serve large student populations without compromising quality is needed.



Technology-Enhanced WIL

Investigation of how emerging technologies can enhance or substitute for traditional WIL experiences requires systematic study.

Equity and Access

Research on strategies to ensure equitable access to quality WIL opportunities across diverse student populations is critically needed.

Implications for Practice

Program Design Recommendations

Multi-Modal Approaches

Programs should implement diverse WIL models rather than relying on single approaches, allowing students to experience different types of professional engagement throughout their studies.

Progressive Integration

WIL experiences should be integrated throughout the curriculum with increasing complexity and responsibility, rather than concentrated in final years.

Reflection Emphasis

Structured reflection activities should be embedded throughout WIL experiences to maximize learning outcomes and professional development.

Assessment Strategy Recommendations

Multi-Stakeholder Involvement

Assessment should involve students, industry supervisors, and academic staff to provide comprehensive evaluation of learning and performance.

Competency-Based Frameworks and Portfolio Integration

Clear competency frameworks should guide both WIL experience design and assessment approaches. Digital portfolios should be used to document learning journeys and showcase professional development over time.

Partnership Development Recommendations

Systematic Development with Partnership Support

Structured approaches to partnership development that ensure mutual benefit and sustainable collaboration. Training and ongoing support for industry partners to enhance their effectiveness as student mentors and supervisors.



Quality Assurance

Regular evaluation and improvement of partnership arrangements to maintain quality and effectiveness.

Limitations

Search Strategy Limitations

While comprehensive, the search strategy was limited to English-language publications and specific databases, potentially missing relevant research published in other languages or venues.

Temporal Focus

The focus on recent literature (2015-2025) provides contemporary perspectives but may have excluded important historical developments in WIL implementation.

Disciplinary Boundaries

The broad definition of “design education” may have included studies that are not directly applicable to all design disciplines, while potentially missing relevant research from closely related fields.

Quality Variation

The literature included studies of varying methodological quality and scope, which may affect the reliability of synthesized findings.

Conclusion

This comprehensive literature review reveals that Work Integrated Learning has become an essential component of contemporary design education, offering significant benefits for student learning, professional development, and career preparation. The evidence demonstrates that well-designed WIL programs can effectively bridge the gap between academic learning and professional practice, enhancing graduate employability and industry readiness.

However, the review also highlights persistent challenges in implementation, including scalability limitations, quality consistency issues, and assessment standardization difficulties. These challenges require systematic attention and innovative solutions to ensure that WIL benefits are accessible to all students and that program quality meets both academic and industry standards.

The literature reveals a field in transition, with emerging technologies, changing industry practices, and evolving educational approaches creating new opportunities and challenges for WIL implementation. Success in this evolving context requires adaptive approaches that can respond to changing needs while maintaining focus on core learning objectives and professional development outcomes.

Key findings from this review include:

1. Multi-modal approaches that combine different types of WIL experiences throughout the curriculum are more effective than single-model implementations
2. Industry partnerships require systematic development and ongoing support to ensure mutual benefit and sustainable collaboration
3. Assessment frameworks need to involve multiple stakeholders and focus on competency development rather than just activity completion
4. Quality assurance mechanisms are essential for ensuring consistent and effective WIL experiences across diverse contexts
5. Research gaps exist in design-specific empirical studies, validated assessment instruments, and long-term impact evaluation

Moving forward, the field would benefit from increased research attention, particularly large-scale empirical studies that can provide more generalizable findings. Additionally, continued innovation in WIL models and assessment approaches will be needed to address persistent challenges and take advantage of emerging opportunities.

For educators and administrators implementing WIL programs in design education, this review provides evidence-based guidance for program development, partnership building, and quality assurance. The synthesis of current knowledge and identification of best practices offers a foundation for informed decision-making and continuous improvement in WIL implementation.

Ultimately, the success of WIL in design education depends on sustained commitment from all stakeholders – students, faculty, industry partners, and institutional leadership – to creating meaningful learning experiences that prepare graduates for successful and fulfilling careers in the creative industries.

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UNDERSTANDING GEN Z TOURISTS' ENVIRONMENTAL AWARENESS, ATTITUDES, AND RESPONSIBLE BEHAVIOUR IN TAMAN NEGARA PAHANG

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Abstract: *Tourism in environmentally sensitive areas requires a careful balance between conservation and visitor experience, and understanding the drivers of environmentally responsible behaviour (ERB) among younger generations is critical for sustainability. This study investigates the relationships between environmental awareness, attitudes, and ERB among Generation Z tourists visiting Taman Negara Pahang, Malaysia. Drawing on the Theory of Planned Behaviour, the Knowledge–Attitude–Behaviour (KAB) model, and the Value–Belief–Norm (VBN) framework, the study conceptualises awareness as both a direct predictor of behaviour and an indirect driver through attitudes. Data were collected from 285 Gen Z tourists using a purposive sampling method and analysed with Partial Least Squares Structural Equation Modelling (PLS-SEM). Results reveal that environmental awareness significantly enhances pro-environmental attitudes and has a direct impact on ERB, with attitudes also playing a strong predictive role in shaping ERB. Moreover, awareness indirectly influences behaviour through attitudes, underscoring the central role of attitudinal change in bridging knowledge and action. However, the hypothesised moderating role of awareness on the attitude–behaviour relationship was not supported, suggesting that contextual and situational factors may shape this link. The findings enrich the sustainable tourism literature by offering empirical evidence from a Southeast Asian protected area and highlighting practical strategies for ecotourism management. Specifically, park authorities and policymakers should design interventions that inform, inspire, and enable Gen Z visitors by providing clear, place-specific messages, creating immersive conservation experiences, and ensuring that low-impact choices are convenient and affordable.*

Keywords: *Environmental Awareness, Tourist Attitude, Environmentally Responsible Behaviour*

Introduction

Tourism in environmentally protected areas like Taman Negara Pahang involves a delicate balance between visitor enjoyment and environmental preservation. Ensuring sustainability in such destinations relies heavily on tourists' environmentally responsible behaviour, which is

often linked to their awareness and attitudes toward conservation (Butnaru et al., 2022). Generation Z, born roughly between the late 1990s and the early 2010s, is emerging as a significant cohort of travellers. This group is frequently described as environmentally conscious and committed to sustainability causes (Nowacki et al., 2023). Gen Z is often noted for being more socially and environmentally oriented than previous generations, with many of its members seeing eco-friendly choices as part of their identity (Nowacki et al., 2023). This generational shift suggests that young tourists might be more open to pro-environmental practices, raising expectations that Gen Z ecotourists could play a pivotal role in promoting sustainability in destinations like Taman Negara.

However, converting environmental awareness into action is not straightforward, as research shows that simply knowing about environmental issues does not guarantee responsible tourism behaviour (Prayag et al., 2022). There is often a gap between knowledge and action, and a traveller's attitudes serve as the crucial bridge between the two. In tourism, having a pro-environmental attitude strongly predicts whether someone will engage in eco-friendly practices (Nowacki et al., 2023). Understanding environmental awareness, environmental issues, and human impacts helps shape these attitudes. For example, when visitors recognize a park's environmental vulnerability, they often develop positive attitudes toward following conservation rules or choosing low-impact activities. In turn, such attitudes make responsible actions like proper waste disposal, adherence to park guidelines, and support for conservation initiatives more likely (Butnaru et al., 2022). This awareness, attitude, and behaviour pattern is supported by frameworks like the Knowledge–Attitude–Behaviour model and the Theory of Planned Behaviour, which propose that awareness influences attitudes and attitudes then drive behaviour (Butnaru et al., 2022). Understanding this chain is crucial for ecotourism management: if raising visitors' environmental awareness can foster favourable attitudes, park authorities and tour operators can use that strategy to encourage more responsible behaviour among tourists.

Despite the logical connection between awareness, attitudes, and behaviour, there is a noticeable gap in research examining these dynamics specifically among Gen Z tourists in ecotourism settings. Most studies on tourists' environmental behaviour have been general or focused on older generations. Only recently have scholars begun to focus on Gen Z's role in sustainable tourism, highlighting this cohort's potential to make travel more sustainable. However, as Nowacki et al. (2023) point out, interest in pro-environmental tourist behaviour is growing, but research on young tourists' sustainability attitudes and behaviours remains far from exhaustive, indicating a need for further study. Some findings have even been contradictory: Cini and Passafaro (2017) found that while some young travellers show strong green values and interest in sustainability, others are ambivalent or more self-centred in their travel priorities. Such inconsistencies indicate that we cannot assume all Gen Z travellers are "green tourists"; more context-specific insights are needed, especially in natural areas where their behaviour directly impacts the environment.

Moreover, much of the research on Gen Z and sustainable travel comes from Western countries (Prayag et al., 2022). Ecotourism destinations in Southeast Asia, like Taman Negara, have different cultural, infrastructural, and educational contexts that could influence Gen Z tourists' attitudes and actions. Findings about Gen Z's eco-behaviour in Western contexts may not fully apply to developing nations, which is why researchers have called for more localised studies (Prayag et al., 2022). In Malaysia, studies of environmental attitudes in national parks have

generally surveyed visitors as a whole rather than focusing on specific age groups (Ghazvini et al., 2018). To date, almost no published research has examined Gen Z visitors to Malaysian national parks to see how their environmental awareness influences their attitudes and behaviour. This lack gap and information represents a significant knowledge gap, and addressing it is both academically important and practically valuable. For example, Taman Negara's management would greatly benefit from knowing whether young visitors with high environmental awareness actually behave more responsibly, or if certain attitudes or knowledge deficits need to be addressed through education and outreach.

The interplay between environmental awareness, attitudes, and responsible behaviour among Gen Z ecotourists remains underexplored, especially in the context of Malaysian national parks. Although Gen Z is frequently characterized as environmentally conscious, there is limited empirical evidence on how their awareness of environmental issues translates into attitudes and on-the-ground actions during nature-based travel. In fact, some studies suggest an attitude and behaviour gap, where young people's concern for the environment does not always result in consistent eco-friendly behaviour (Prayag et al., 2022). For example, Qiu et al. (2022) observed that young travellers sometimes engage in less responsible travel behaviours than older adults. Similarly, a recent review noted that further research is needed on Gen Z's motivations and attitudes toward sustainable tourism, given the mixed findings so far. In places like Taman Negara, this lack of insight means park authorities and tour operators may be operating on assumptions about Gen Z visitors, making it difficult to design effective environmental education programmes or policies for young tourists. This knowledge gap underscores an urgent need to investigate Gen Z tourists' awareness, attitude, and behaviour dynamics in ecotourism contexts.

To address this gap, the present study aims to examine how environmental awareness, tourist attitudes, and environmentally responsible behaviour relate to each other among Gen Z visitors at Taman Negara Pahang. By focusing on this specific demographic and destination, the research will clarify whether higher environmental awareness leads to more positive pro-environmental attitudes, and whether those positive attitudes, in turn, predict actual responsible behaviours such as proper waste disposal, respect for wildlife, or support for conservation efforts among Gen Z ecotourists. The findings will provide empirical evidence to guide the design of targeted environmental education and management strategies for ecotourism destinations in Malaysia. In doing so, the study will fill a key gap in the sustainable tourism literature regarding generational differences and regional context, while also offering practical insights to help Taman Negara Pahang and similar natural sites foster more environmentally responsible behaviour in their young visitors.

Literature Review

Environmentally Responsible Behaviour

Environmentally responsible behaviour (ERB) among tourists refers to actions that minimize ecological harm and foster sustainability, such as reducing waste, conserving natural resources, and supporting eco-friendly initiatives. This has become a central concern in tourism research given its role in promoting long-term destination sustainability (Fenitra et al., 2022). Empirical studies reveal that ERB is shaped by factors such as environmental awareness, perceived behavioural control, and personal norms, with tourists more likely to demonstrate responsible actions when they feel a moral duty to safeguard destinations such as national parks or eco-

lodges (Raza et al., 2024). Furthermore, positive attitudes toward sustainability, often strengthened through environmental education and destination marketing, are strong predictors of ERB. Recent findings also emphasize the role of green trust, showing that tourists who trust a destination's sustainability claims are more likely to engage in pro-environmental practices (Yu et al., 2024).

Beyond tourism contexts, consumer behaviour studies also confirm that environmental concern and values are key motivators of ERB. For instance, pro-environmental beliefs and attitudes nurture personal norms, creating a sense of moral obligation to act sustainably (Megha, 2024; Ghazali et al., 2019). The Value-Belief-Norm (VBN) theory explains this process by demonstrating how altruistic values and ecological worldviews translate into a felt responsibility to engage in environmentally conscious behaviour (Ghazali et al., 2019). Similarly, the Theory of Planned Behaviour (TPB) has been widely applied in green consumer research, showing that positive attitudes toward eco-friendly actions, perceived social expectations (subjective norms), and perceived behavioural control collectively influence sustainable intentions and behaviours (Megha, 2024). Together, these perspectives underscore that ERB is not merely the outcome of awareness but also the result of integrated psychological, social, and contextual influences.

Environmental Awareness

Research consistently demonstrates a strong and positive relationship between tourists' environmental awareness and their environmentally responsible behaviour. Aman et al. (2021) highlighted that tourists' pro-environmental behaviour is positively and significantly affected by their level of environmental awareness, implying that individuals who are more knowledgeable about environmental issues are more inclined to engage in eco-friendly actions during their travels. This aligns with the broader understanding that awareness serves as the foundation for responsible decision-making in tourism contexts. Similarly, Tang et al. (2022) confirmed that tourists' environmental knowledge exerts a significant positive effect on pro-environmental behaviour, suggesting that information and understanding about environmental consequences can translate into concrete behavioural changes. Their findings reinforce the idea that knowledge not only shapes tourists' attitudes but also directly influences their willingness to adopt sustainable practices, such as waste reduction, energy conservation, and respect for local ecosystems.

In the context of sustainable tourism, Yildirim et al. (2025) emphasized that raising tourists' environmental awareness is an essential prerequisite for fostering environmentally responsible practices. They argue that without adequate knowledge and awareness, efforts to promote sustainable behaviour may fall short, as tourists lack the cognitive basis to recognize the value of such actions. This perspective underscores the critical role of educational interventions, interpretation programs, and awareness campaigns in influencing tourist behaviour. Collectively, these studies provide consistent evidence that higher levels of environmental awareness are closely linked with stronger engagement in environmentally responsible behaviour. Therefore, these hypotheses were proposed:

H1: There is a significant relationship between tourist environmental awareness and tourist environmentally responsible behaviour.

Besides that, there is strong evidence that tourists' environmental awareness has a positive influence on their attitudes toward the environment. Studies in environmental education consistently show that when people have greater knowledge and awareness of ecological issues, they tend to develop more favourable attitudes toward protecting the environment. Dillon and Gayford (1997) were among the first to demonstrate this relationship, showing that increased environmental knowledge leads to more positive attitudes toward conservation, a finding later supported in broader contexts (Yildirim et al., 2025). This highlights that awareness is not just about having information, but about shaping the way individuals evaluate and respond to environmental challenges.

In tourism, similar patterns have been observed. Liu et al. (2020) found that tourists with higher levels of environmental knowledge showed stronger and more positive attitudes toward sustainability. These attitudes, in turn, made them more willing to adopt pro-environmental behaviours such as reducing waste, choosing eco-friendly services, and respecting local ecosystems. Their work underscores the mediating role of attitudes: awareness builds beliefs and values, which then translate into supportive behaviours. Weng et al. (2022) further confirmed this relationship by showing that raising tourists' awareness of environmental issues plays a key role in cultivating pro-environmental attitudes. These attitudes are often expressed as greater concern for conservation, a stronger appreciation of ecological integrity, and more support for sustainable tourism practices. In this sense, awareness does more than expand knowledge; it also strengthens emotional and moral commitments that influence how tourists think and feel about sustainability. Therefore, these hypotheses were proposed:

H2: There is a positive influence between tourist environmental awareness and tourist attitude.

Emerging evidence suggests that environmental awareness plays a moderating role in the relationship between attitude and behaviour, strengthening the extent to which positive attitudes are translated into responsible actions. In other words, tourists with higher levels of environmental awareness are more likely to act on their pro-environmental attitudes, thereby reducing the commonly observed gap between attitudes and behaviour. Rafiq et al. (2022) provide clear evidence of this mechanism in the context of hotel towel reuse. Their study found that travellers with strong environmental consciousness displayed a significantly smaller attitude-behaviour gap. For these individuals, positive attitudes toward towel reuse were not merely expressed as intentions but were carried out as actual behaviour. This contrasts with tourists who held favourable attitudes but lacked awareness or knowledge, who often failed to translate their attitudes into action, highlighting how awareness serves as a critical bridge.

The implication is that pro-environmental attitudes alone may be insufficient to ensure consistent behavioural outcomes. Without adequate awareness, tourists may undervalue the importance of their actions or fail to recognize opportunities to behave sustainably. Awareness, therefore, provides the knowledge and motivation needed to convert favourable attitudes into tangible practices, such as energy conservation, waste reduction, or supporting eco-friendly tourism products. Supporting evidence is also found in broader social and conservation contexts. Mkumbachi et al. (2020) observed that young people with both environmental awareness and positive attitudes were more likely to engage in conservation practices, suggesting that awareness amplifies the impact of attitudes on behaviour. Similarly, Yildirim et al. (2025) reported that awareness interacts with attitudes to strengthen sustainable

behavioural outcomes, further validating its moderating role. Therefore, these hypotheses were proposed:

H5: Tourist Environmental Awareness moderates the relationship between tourist attitude and tourist environmentally responsible behaviour.

Tourist Attitude

Prior studies in tourism consistently indicate that tourists' environmental attitudes have a significant positive impact on their environmentally responsible behaviour. Weng et al. (2023) found that visitors who held more positive attitudes toward the environment were substantially more likely to engage in responsible behaviours, providing clear evidence of the attitude-behaviour linkage. This highlights the importance of attitudes as a motivational factor that translates environmental concern into concrete action. In the context of nature-based tourism, Lee and Jan (2015) observed that strengthening tourists' pro-environmental attitudes through educational programs or immersive experiences directly encouraged greater participation in environmentally responsible behaviours. Their findings suggest that when tourists develop stronger ecological concern or appreciation for natural settings, they are more inclined to adopt practices such as recycling, energy conservation, and active support for conservation initiatives.

Similar patterns have been found in broader environmental research. Yildirim et al. (2025), for example, reported that students with positive attitudes toward environmental management were significantly more likely to engage in conservation practices. This reinforces the idea that attitudes serve as a critical bridge between awareness and action, ensuring that knowledge and values are expressed through responsible behaviours. Taken together, these findings highlight that cultivating positive environmental attitudes is essential for promoting sustainability in tourism. Therefore, these hypotheses were proposed:

H3: There is a positive influence between tourist attitude and tourist environmentally responsible behaviour.

Many theoretical frameworks and empirical studies support the notion that tourist attitudes mediate the relationship between environmental awareness and behaviour. The classic knowledge–attitude–behaviour (KAB) model (Kallgren & Woods, 1986) proposes that individuals acquire knowledge, which shapes their attitudes, and these attitudes then serve as the foundation for guiding behaviour. Put differently, environmental awareness on its own may not directly lead to responsible action; instead, it fosters attitudes that act as the key psychological driver of behaviour. Evidence from tourism research aligns closely with this model. For instance, Kim et al. (2018) demonstrated that tourists' environmental knowledge enhanced their emotional affinity toward nature, which subsequently motivated them to engage in pro-environmental behaviours.

This suggests that awareness stimulates concern, attachment, or appreciation, which in turn strengthens attitudes that encourage responsible practices such as conservation, recycling, or choosing eco-friendly services. These processes are further reinforced by the cognitive, affective, conative framework, which argues that cognitive evaluations, such as awareness of environmental issues, generate affective responses that ultimately lead to conative outcomes,

namely behaviour. In the context of tourism, this sequence explains how awareness forms the cognitive basis, attitudes provide the motivational bridge, and behaviour emerges as the final expression of these psychological processes. Taken together, these insights highlight the critical mediating role of attitudes in transforming environmental awareness into action. Therefore, these hypotheses were proposed:

H4: *Tourist attitude mediates the relationship between tourist environmental awareness and tourist environmentally responsible behaviour.*

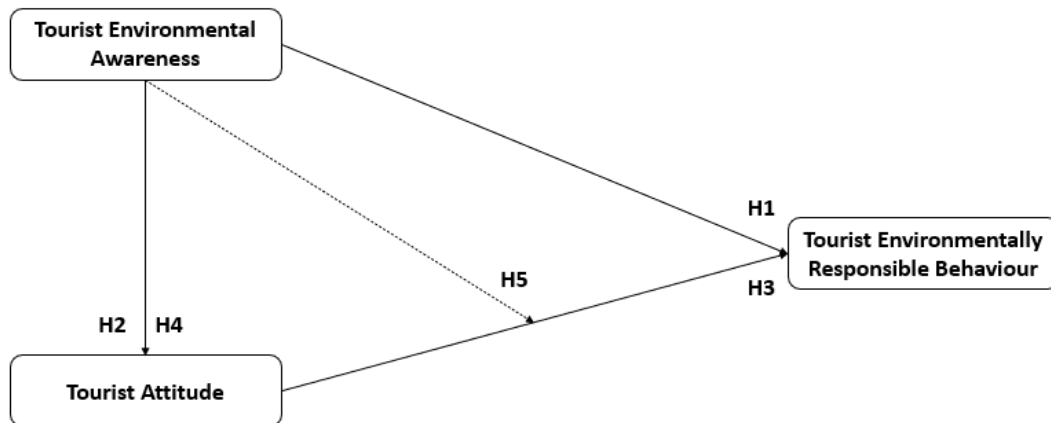


Figure 1: Proposed Conceptual Framework

Sources Adapted: Aman et al., 2021; Liu et al., 2021

Research Methodology

This study follows a positivist paradigm and applies quantitative methods to test the relationships between the proposed variables. A quantitative approach was considered appropriate because it allows researchers to examine causal relationships within a natural, non-interventionist setting (Creswell, 2010). Data was collected using a cross-sectional design over several weeks. Purposive sampling was used to focus on Generation Z tourists (aged 18 and above) who had visited Taman Negara Pahang, Malaysia (Fikree & Zerihun, 2019). Since no formal sampling frame existed, the minimum required sample size was determined using G*Power software, which indicated 107 respondents as the threshold. The study successfully obtained 285 valid responses, exceeding this requirement and ensuring adequate statistical power for hypothesis testing (Hair et al., 2017).

For data analysis, SPSS was used to conduct descriptive and preliminary tests, while SmartPLS 4.0 with Partial Least Squares Structural Equation Modelling (PLS-SEM) was applied to assess both the measurement and structural models. PLS-SEM was chosen because of its strong predictive ability and its suitability for studies with relatively small sample sizes (Dash & Paul, 2021). The questionnaire was developed based on an extensive review of prior literature and used a five-point Likert scale to enhance clarity and ease of response. Content validity was established through expert review, and reliability was confirmed with Cronbach's alpha values that exceeded recommended thresholds (Sekaran & Bougie, 2016).

Results

Table 1: Demographic Profile

Demographic	Frequency	Percentage (%)
Gender		
Male	170	59.6
Female	115	40.4
Race		
Malay	151	53
Chinese	56	19.6
Indian	17	6
Others	61	21.4
Status		
Single	232	81.4
Married	53	18.6
Level of Education		
SPM	17	6
Diploma	41	14.4
Bachelor's degree	227	79.6
Occupation		
Student	127	44.6
Employed	158	55.4
Unemployed	-	-
Level of Income		
Below RM2000	147	51.6
RM2001 to RM4000	108	37.9
RM4001 and above	30	10.5

The demographic profile of respondents shows a slightly higher proportion of males (59.6%) than females (40.4%). In terms of ethnicity, Malays formed the largest group (53%), followed by Chinese (19.6%), Indians (6%), and others (21.4%), reflecting Malaysia's multicultural setting while maintaining a Malay-majority representation. Most respondents were single (81.4%), which aligns with the study's focus on Generation Z, as this cohort is typically younger and still in the early stages of adulthood. Education levels were notably high, with nearly four out of five respondents holding a bachelor's degree, suggesting that the sample consisted of well-educated individuals who are likely to be more aware of environmental issues. Occupationally, 55.4% were employed and 44.6% were students, representing a balanced mix of young professionals and those still pursuing higher education. Income levels were modest, with more than half earnings below RM2000 and only 10.5% reporting incomes above RM4000, reflecting the financial realities of this generation. Overall, the sample was made up of young, single, and educated Malaysians with limited disposable income, making them representative of the Generation Z tourists targeted in this study. This profile is particularly relevant when exploring environmentally responsible behaviour, as Gen Z is generally more digitally connected, socially conscious, and open to sustainability messages, though their lower income levels may constrain their ability to consistently translate positive attitudes into pro-environmental actions.

Reliability and Validity

The measurement model was carefully assessed to establish the reliability and validity of the research instruments. As presented in Table 2, all constructs achieved Cronbach's alpha values above the recommended threshold of 0.60, demonstrating satisfactory to high internal consistency across the items. Furthermore, the composite reliability (CR) scores for each construct exceeded the benchmark of 0.70, confirming the stability and robustness of the measurement scales. The average variance extracted (AVE) values were also greater than the 0.50 standard, indicating that more than half of the variance in the indicators was explained by their respective constructs. Collectively, these findings provide strong evidence of convergent validity, affirming that the indicators reliably captured the intended theoretical concepts (Hair et al., 2017).

Table 2: Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Environmental Awareness	0.794	0.856	0.600
Tourist Attitude	0.869	0.906	0.661
Environmentally Responsible Behaviour	0.845	0.906	0.764

Hypotheses Testing

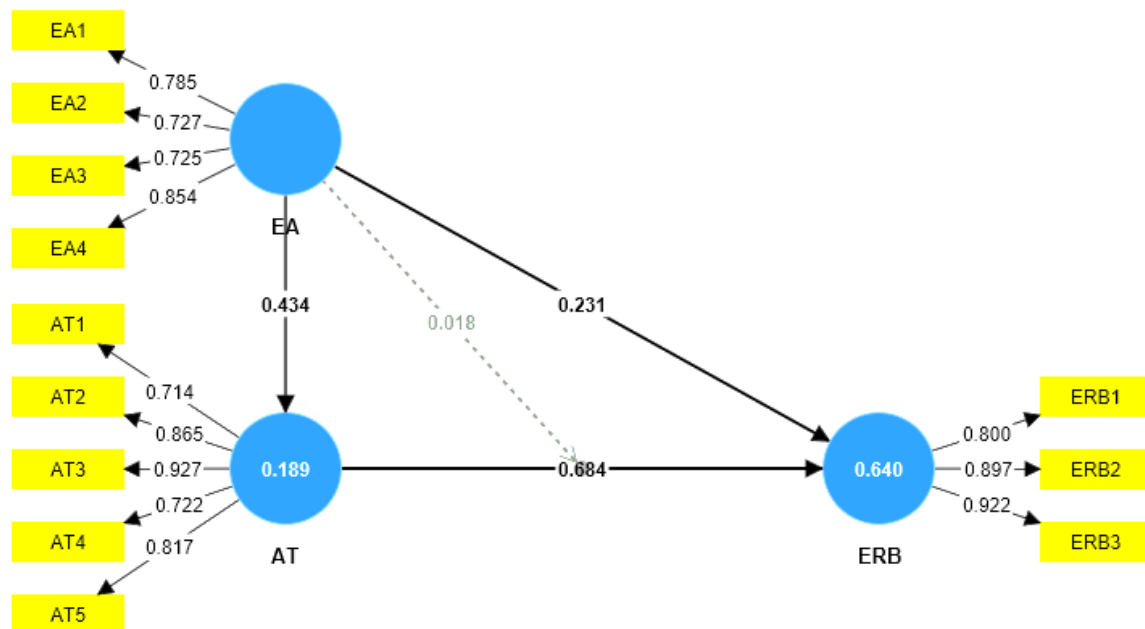


Figure 2: Structural Equation Modelling Analysis

Figure 2 presents the outcomes of the direct path hypothesis testing, which was carried out using a bootstrapping procedure with 5,000 resamples at a 95% confidence interval. This approach was adopted to strengthen the reliability and stability of the parameter estimates, ensuring that the results were not influenced by sampling error. In line with the recommendations of Hair et al. (2017), a path was considered statistically significant when the

p-value was less than 0.05 and the t-value exceeded 1.96 under a two-tailed test. Applying these thresholds provided a rigorous and transparent benchmark for assessing the hypothesized relationships between constructs. As a result, the analysis offered robust evidence for evaluating the predictive validity of the model and allowed for a confident interpretation of both the strength and significance of the identified effects.

The results in Table 3 reveal that four of the five proposed hypotheses were supported, providing strong evidence for the role of environmental awareness and attitudes in shaping environmentally responsible behaviour (ERB). H1 was significant ($\beta = 0.232$, $t = 5.437$, $p < 0.001$), showing that tourists who are more informed about environmental issues tend to develop more positive attitudes toward sustainability. This finding is consistent with earlier research in environmental education (Dillon & Gayford, 1997; Yildirim et al., 2025), which demonstrates that greater awareness leads to stronger conservation attitudes. In tourism contexts, Liu et al. (2020) and Weng et al. (2022) similarly observed that tourists with higher levels of knowledge about environmental issues display more favourable attitudes, underscoring awareness as a vital foundation for sustainability.

H2 was also supported ($\beta = 0.434$, $t = 11.242$, $p < 0.001$), confirming that environmental awareness directly predicts environmentally responsible behaviour (ERB). This suggests that knowledgeable tourists are more likely to act responsibly by conserving resources, reducing waste, and respecting local ecosystems. These results are in line with Aman et al. (2021) and Tang et al. (2022), who found that environmental knowledge consistently translates into practical, sustainable actions. Yildirim et al. (2025) further emphasized that without adequate awareness, sustainability efforts may struggle to achieve meaningful behavioural change.

The strongest relationship appeared in H3 ($\beta = 0.684$, $t = 12.783$, $p < 0.001$), which highlighted the significant role of attitudes in predicting ERB. This finding reinforces the importance of attitudes as motivational drivers, consistent with the Theory of Planned Behavior (Ajzen, 1991) and the knowledge–attitude–behaviour model (Kallgren & Woods, 1986). Empirical studies by Weng et al. (2023) and Lee and Jan (2015) also show that positive ecological concern and appreciation for natural environments encourage tourists to adopt sustainable practices, such as recycling and energy conservation. These results confirm that attitudes play a central role in bridging awareness and behaviour.

H4 further supported this relationship ($\beta = 0.299$, $t = 8.223$, $p < 0.001$), demonstrating that environmental awareness influences ERB indirectly through attitudes. This mediating effect reflects models such as the cognitive–affective–conative framework, where awareness provides the cognitive base, attitudes represent the affective response, and behaviour emerges as the behavioural outcome. Kim et al. (2018) similarly found that awareness enhances emotional attachment to nature, which in turn motivates sustainable practices. These findings highlight that awareness is not only a direct predictor of behaviour but also strengthens the attitudinal processes that encourage responsible actions.

However, H5 was not supported ($\beta = 0.015$, $t = 0.510$, $p = 0.610$), indicating that the expected mediating role of attitudes between awareness and behaviour was not significant in this study. This suggests that while awareness and attitudes both strongly predict ERB, the indirect pathway may not always be evident. Contextual factors such as situational barriers, financial constraints, or social norms may weaken this effect. As Rafiq et al. (2022) suggest, awareness

might also act as a moderator, amplifying the extent to which positive attitudes translate into behaviour, rather than mediating the relationship. This finding highlights the need for future research to explore alternative mechanisms through which awareness and attitudes interact to influence environmentally responsible behaviour among tourists.

Table 3: Results of Hypotheses Testing

Hypotheses	Path Coefficient	STDEV	t-value	p-value	Decision
H1	0.232	0.042	5.437	0.000	Supported
H2	0.434	0.039	11.242	0.000	Supported
H3	0.684	0.053	12.783	0.000	Supported
H4	0.299	0.036	8.223	0.000	Supported
H5	0.015	0.036	0.510	0.610	Not Supported

As shown in Table 4, the R^2 values indicate that the model demonstrates modest to substantial explanatory power (Hair et al., 2017). Tourist attitude recorded an R^2 of 0.186, meaning that 18.6% of the variance in attitudes can be explained by environmental awareness. This suggests that while awareness plays an important role in shaping how tourists think about sustainability, other factors are also likely to influence attitudes, such as personal values, cultural background, or social norms. In contrast, environmentally responsible behaviour (ERB) displayed a much stronger explanatory power, with an R^2 of 0.636. This indicates that 63.6% of the variance in ERB is explained by environmental awareness and tourist attitude combined. Such a high value demonstrates that the model is highly effective in predicting pro-environmental actions among tourists. It also highlights the importance of cognitive and psychological factors, showing that awareness and attitudes together are powerful drivers of sustainable behaviour. Overall, these findings confirm that the framework is robust in capturing the dynamics of ERB, particularly among Generation Z tourists. While awareness alone has a modest effect on attitudes, the combination of awareness and positive attitudes substantially enhances the likelihood of responsible behaviour. This reinforces the need for tourism managers and policymakers to focus on both awareness-building initiatives and strategies that nurture favourable attitudes toward sustainability.

Table 4: R^2 values

Construct	R^2
Tourist Attitude	0.186
Environmentally Responsible Behaviour	0.636

Discussion

This study shows that among Gen Z visitors to Taman Negara Pahang, environmental awareness fosters more favourable pro-environmental attitudes, and that both awareness and attitude independently predict environmentally responsible behaviour (ERB). Awareness also works indirectly by strengthening attitudes that then translate into everyday actions. In practical terms, when young visitors understand the park's ecological sensitivities and the consequences of their choices, they are more likely to value sustainability, and those values are reflected in what they do on site. These patterns are consistent with established theory and prior evidence. The Theory of Planned Behaviour and the Knowledge–Attitude–Behaviour model both identify attitudes as the most immediate driver of action, which helps explain why attitudinal shifts are so influential for ERB (Ajzen, 1991; Kallgren & Woods, 1986). Research in tourism

and environmental education likewise shows that awareness strengthens attitudes and encourages responsible practices, especially in nature-based settings where cause and effect are visible (Dillon & Gayford, 1997; Lee & Jan, 2015; Liu et al., 2020; Aman et al., 2021; Tang et al., 2022; Weng et al., 2022). From a Value–Belief–Norm (VBN) perspective, awareness can also activate personal norms and a sense of moral duty, adding motivational force to these cognitive and attitudinal pathways (Ghazali et al., 2019; Fenitra et al., 2022).

However, the expected moderation that awareness would strengthen the attitude and behaviour relationship was not supported. Several contextual factors may account for this. In a well-educated Gen Z sample, awareness may already be high, leaving limited scope for it to further amplify the impact of attitudes. Situational frictions at the destination, like limited recycling points, inconvenient refill access, unclear signage, and weak enforcement, can blunt positive intentions at the moment of choice. Budget and time constraints typical of this cohort can also nudge decisions toward convenience despite good intentions (Prayag et al., 2022). Although awareness can narrow the attitude and behaviour gap in some settings, this is not guaranteed (Rafiq et al., 2022). Mixed findings among young travellers suggest that enabling conditions what is easy, affordable, and socially supported, often determine whether favourable attitudes become action (Qiu et al., 2022). These insights align with the study’s demographic profile, which there are young, largely single, and well-educated Malaysians is a segment that is highly connected and receptive to sustainability messaging yet sensitive to price and convenience.

In a fragile ecosystem such as Taman Negara, the way environmental awareness and attitudes are shaped plays a critical role, and this process can be strengthened through place-specific messaging, which is more effective than generic communication. Furthermore, an immersive, emotionally engaging interpretation helps attitudes stick, and transparent sustainability practices build credibility and reinforce ERB (Butnaru et al., 2022; Yu et al., 2024). Social-norm nudges and removing small frictions can further turn good intentions into consistent behaviour. Taken together, the findings deepen understanding of Gen Z’s ERB in a Taman Negara protected area. They show that awareness and attitudes are reliable, complementary predictors of responsible conduct, with attitudes playing a particularly central role. The results indicate that awareness operates both directly and via attitudes, and caution against assuming that awareness will always intensify the attitude–behaviour link. For managers and policymakers, the key actions are to provide clear and tailored information throughout the visitor experience, create inspiring and emotionally engaging opportunities that connect personal values with conservation goals, and facilitate sustainable choices by designing environments where low-impact options are obvious, easy to choose, and affordable. (Ajzen, 1991; Lee & Jan, 2015; Weng et al., 2022; Butnaru et al., 2022).

Implication, Limitation, And Future Research

This study carries both academic and practical value. From an academic perspective, it enriches sustainable tourism research by showing how environmental awareness and attitudes work together to shape environmentally responsible behaviour (ERB) among Generation Z tourists in Malaysia. It provides evidence that supports established frameworks such as the Knowledge–Attitude–Behaviour (KAB) model and the Theory of Planned Behaviour (TPB), while also highlighting the complementary role of attitudes and awareness in ecotourism contexts. From a practical standpoint, the findings suggest that park managers and policymakers should design initiatives that go beyond simply informing visitors. Efforts such

as interactive interpretation, immersive eco-activities, and visible sustainability practices can help foster positive attitudes and translate awareness into real behavioural change, ensuring that young visitors contribute actively to conservation.

At the same time, the study has some limitations. Because it focused on a single site, which is Taman Negara Pahang, the results cannot be assumed to apply to other destinations with different cultural or infrastructural contexts. The use of self-reported surveys also carries the risk of social desirability bias, where participants may overstate their environmentally friendly actions. In addition, the sample was dominated by young, educated Malaysians, which, while appropriate for studying Gen Z, may not capture the perspectives of international visitors or other age groups. These limitations mean that while the results are valuable, they should be interpreted with caution and understood as context-specific.

Looking forward, there are several opportunities for future research. Comparative studies across generations, cultures, or destinations could reveal whether the same awareness–attitude–behaviour patterns hold more broadly. Longitudinal studies would also be useful for tracking whether environmental attitudes and behaviours change with repeated visits or targeted interventions. Combining surveys with qualitative methods such as interviews or direct observation could offer richer insights into the gap between attitudes and actual behaviour. Finally, future work should also consider the role of enabling conditions, such as affordability, infrastructure, and social norms, to understand how they help or hinder tourists in turning good intentions into consistent sustainable practices.

Conclusion

This study contributes to the sustainable tourism literature by demonstrating how environmental awareness and attitudes influence environmentally responsible behaviour (ERB) among Generation Z tourists in Taman Negara Pahang. The findings reveal that awareness directly predicts ERB and also shapes behaviour indirectly through attitudes, underscoring the importance of both cognitive and attitudinal pathways. Attitudes emerged as the strongest predictor, highlighting that knowledge alone is insufficient unless it translates into positive evaluations that motivate action.

Interestingly, the expected moderating role of awareness between attitude and behaviour was not supported, suggesting that structural or situational barriers may limit the extent to which awareness amplifies responsible conduct. This highlights the importance of considering enabling conditions such as affordability, convenience, and destination infrastructure when promoting sustainable practices among younger travellers.

Overall, the research advances theoretical perspectives such as the Theory of Planned Behaviour, the Knowledge–Attitude–Behaviour model, and the Value–Belief–Norm framework by confirming the central role of attitudes while also identifying limits to awareness as a moderating factor. Practically, the study provides evidence that sustainable tourism strategies should go beyond awareness-raising to focus on cultivating pro-environmental attitudes and creating supportive contexts that make responsible behaviour the easier choice for Gen Z ecotourists.

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AN EXTRA PAIR OF EYES AND EARS GOES A LONG WAY: A PRELIMINARY STUDY INVESTIGATING HIGHER LEARNING INSTITUTION READINESS TOWARDS INCLUSIVITY

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Abstract: *This research addresses the critical need for a systematic and comprehensive approach to evaluating the preparedness of Malaysian tertiary education institutions for inclusive education, specifically focusing on learners with sensory disabilities (visual and hearing impairments). Recognizing the limitations of existing unsystematic assessments, this study not only investigates the current state of readiness through semi-structured focus group interviews with ten English Language instructors but also innovatively develops a multi-dimensional framework for assessing institutional readiness. This framework comprises key domains including Institutional Policies and Strategic Planning; Accessibility of Learning Resources and Environment; Pedagogical Practices and Instructor Preparedness; Support Services and Resources; and Student Experiences and Feedback Mechanisms. The thematic analysis of the interview data reveals that while pockets of readiness exist (e.g., assessment flexibility), significant challenges remain, particularly in accessible learning resources and course delivery. Crucially, this study's primary innovation lies in the creation of a robust and adaptable framework, offering a structured methodology for institutions and researchers to systematically evaluate and benchmark their progress towards inclusivity. This framework serves as a vital tool for identifying areas needing targeted intervention and for guiding future research aimed at fostering more effective and equitable learning environments within Malaysian higher learning institutions. By providing a clear and comprehensive set of indices, this research contributes a novel approach to understanding and advancing inclusivity in higher education.*

Keywords: *Higher learning readiness, Inclusivity, Pedagogical preparedness, Sensory disabilities.*

Introduction

Inclusive education has emerged as a central tenet in global educational discourse, aligning with the United Nations' Sustainable Development Goal 4 (SDG 4), which advocates for inclusive and equitable quality education for all (United Nations, 2015). In Malaysia, the Ministry of Higher Education (MOHE) has increasingly emphasized inclusive practices within tertiary institutions, yet empirical evidence reveals persistent gaps in readiness, particularly for students with sensory disabilities (Ministry of Higher Education Malaysia, 2021).

While policies promoting inclusion exist, the translation of these directives into institutional practice remains inconsistent (Hashim et al., 2020). Learners with visual and hearing impairments often encounter barriers in course materials, physical accessibility, and teaching practices. Previous studies have largely assessed institutional preparedness through isolated or

descriptive measures, lacking an integrated evaluative framework (Omar et al., 2022). This study thus seeks to address this gap by (1) examining the current state of institutional readiness for inclusive education through qualitative engagement with English Language instructors and (2) developing a structured, multi-dimensional framework for assessing readiness within Malaysian higher education institutions.

Literature Review

Inclusive Education and Sensory Disabilities

Inclusive education refers to the systematic restructuring of educational systems to ensure equitable access and participation for all learners, regardless of disability (Ainscow & Miles, 2008). For learners with sensory disabilities—specifically visual and hearing impairments—barriers often manifest in communication, information access, and instructional delivery (Lynch & McCall, 2021). Globally, institutions have adopted varying models of inclusion, ranging from policy-driven integration to holistic institutional transformation (Florian & Black-Hawkins, 2011). However, the success of these models hinges on contextual factors such as resource availability, institutional culture, and instructor competencies (Trowler et al., 2021).

Inclusive Practices in Malaysian Higher Education

In Malaysia, inclusion at the tertiary level has gained policy traction since the *Malaysia Education Blueprint (2015–2025)* emphasized equitable access and diversity (MOHE, 2015). Nevertheless, implementation remains fragmented. Studies indicate that while some universities provide accommodations such as assistive technologies or sign language interpreters, others lack systematic mechanisms for supporting students with disabilities (Ahmad & Noor, 2020; Mahmud et al., 2021). Instructor preparedness is a recurring challenge. Many educators report limited training in disability awareness or adaptive pedagogy (Aziz et al., 2019). Institutional policies often remain generic, lacking specific metrics for measuring inclusivity or accountability structures for improvement.

Gaps in Existing Assessment Models

Existing frameworks for assessing readiness—such as the Index for Inclusion (Booth & Ainscow, 2016)—provide useful conceptual guidance but are often Western-centric and insufficiently contextualized for Malaysian higher education. Moreover, these tools typically evaluate inclusion at the school level rather than within tertiary contexts where academic autonomy, curriculum design, and technological infrastructure differ substantially.

Consequently, there is a pressing need for a comprehensive yet adaptable framework tailored to the Malaysian higher education context, capable of guiding institutions in systematically evaluating their inclusivity for learners with sensory impairments.

Methodology

Research Design

This qualitative study employed a phenomenological approach, seeking to understand instructors lived experiences and perceptions of institutional readiness for inclusive education.

Semi-structured focus group interviews were conducted with ten English Language instructors from three Malaysian public universities, each with at least five years of teaching experience. Data were collected via online focus groups conducted through Zoom, each lasting approximately 90 minutes. The interviews explored participants' awareness of institutional policies, classroom practices, resource accessibility, and perceived challenges in supporting learners with sensory disabilities. All sessions were transcribed verbatim and analyzed thematically following Braun and Clarke's (2006) six-phase approach. Codes were initially derived inductively from the data and then clustered under broader domains, which subsequently informed the development of the institutional readiness framework.

Ethical Considerations

Ethical clearance was obtained from the respective instructors. Participants were assured of confidentiality, and pseudonyms were used throughout the analysis.

Findings

The thematic analysis revealed four major domains influencing institutional readiness for inclusive education:

Institutional Policies and Strategic Planning

Participants highlighted inconsistencies in how inclusion was interpreted across departments. While some faculties had explicit inclusion policies, others lacked structured guidelines. One instructor noted, *"We have diversity statements, but not clear policies for students with visual or hearing impairments."*

Accessibility of Learning Resources and Environment

Accessibility emerged as the most significant barrier. Many institutions lacked accessible digital learning materials, such as screen-reader-compatible documents or captioned videos. Physical spaces were generally compliant with mobility access, but less so for sensory accessibility.

Pedagogical Practices and Instructor Preparedness

Instructors expressed uncertainty in adapting teaching materials. Few had received formal training in inclusive pedagogy. Flexibility in assessment was noted as a strength—participants often provided alternative assessments for students with visual impairments—but support for real-time interpretation or captioning was minimal.

Support Services and Resources

Institutional support services were often centralized, serving all disabilities broadly without specialization. Instructors reported the absence of sign language interpreters and limited access to assistive technologies.

Discussion

The findings underscore a fragmented readiness landscape within Malaysian higher education. While institutional goodwill exists, systematic implementation remains underdeveloped. The study's emergent framework addresses this by providing a structured approach for evaluating readiness across interdependent domains.

The Institutional Readiness Framework

Based on the analysis, a five-domain Inclusive Education Readiness Framework was developed:

Institutional Policies and Strategic Planning: Examines policy coherence, leadership commitment, and resource allocation.

Accessibility of Learning Resources and Environment: Assesses the physical and digital inclusivity of learning spaces.

Pedagogical Practices and Instructor Preparedness: Evaluates professional development, instructional flexibility, and assessment adaptation.

Support Services and Resources: Measures the availability and quality of specialized support and assistive technologies.

Student Experiences and Feedback Mechanisms: Captures lived experiences, perceptions of inclusion, and continuous improvement loops.

This framework extends existing tools (e.g., Booth & Ainscow, 2016) by integrating contextual factors specific to Malaysian higher education, emphasizing multi-stakeholder participation and evidence-based evaluation.

Implications for Policy and Practice

The study highlights the necessity for institutional leadership to operationalize inclusion through measurable indicators and transparent accountability. Continuous professional development programs are crucial for enhancing instructor preparedness. Moreover, collaborations between universities and disability advocacy organizations can facilitate resource sharing and awareness training. From a policy standpoint, MOHE could integrate the IERF into institutional audits, promoting consistency and benchmarking across universities.

Conclusion and Recommendations

This study contributes a novel framework for assessing institutional readiness for inclusive education, specifically addressing the needs of learners with sensory disabilities within Malaysian higher education. Through qualitative exploration, the research revealed both strengths—such as emerging awareness and assessment flexibility—and systemic gaps, particularly in accessible resources and staff training.

The Inclusive Education Readiness Framework provides a structured, adaptable tool for institutions to self-assess, monitor progress, and identify targeted areas for improvement.

Recommendations

1. **Institutionalization of Inclusion Policies:** Universities should integrate inclusion goals into strategic plans and performance indicators.
2. **Capacity Building:** Continuous professional development focusing on sensory accessibility and inclusive pedagogy is essential.
3. **Infrastructure and Resource Development:** Investments in assistive technology and accessible digital content are critical.
4. **Systematic Feedback Mechanisms:** Structured feedback channels should be established for students with disabilities.
5. **Further Research:** Future studies should empirically validate the IERF through mixed-methods research and longitudinal assessment.

Ultimately, inclusion must be viewed not as an act of accommodation but as a transformative process of reimagining educational equity.

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6th Penang International Multidisciplinary Conference 2025

eISSN 3036-0331

8th - 9th November 2025

Shang-Ri La Hotel, Penang, Malaysia

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HOW THE ‘PURBAYA EFFECT’ INFLUENCES CONSUMER GOODS ELASTICITIES AND ACCOUNTING PROFITS

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Abstract: *This study explores how the Purbaya Effect, a term describing a series of assertive fiscal actions under the leadership of Purbaya Yudhi Sadewa, influences consumer goods elasticities and corporate accounting profits in Indonesia. The central focus is the IDR 200 trillion liquidity transfer to state-owned banks, a policy designed to boost lending, increase liquidity, and support household spending.*

Using a qualitative, literature-based approach, the study applies the ceteris paribus framework to isolate the impact of the liquidity expansion on market behavior. The analysis examines three types of elasticity to understand how consumers respond to price and income changes. The findings show that increased liquidity raises purchasing power, lowers borrowing costs, and stimulates consumption, though the response differs across goods. Essential goods show inelastic demand, while non-essential and lifestyle products respond more strongly to price changes.

On the supply side, the study finds that higher demand must be supported by greater production capacity to prevent inflation and sustain profitability. The introduction of a complementary Business Assistant Policy can help small and medium enterprises (SMEs) improve efficiency and respond quickly to market changes, ensuring that liquidity-driven demand turns into real economic growth.

Beyond its technical findings, this study emphasizes the behavioral dimension of the Purbaya Effect. It shows that public trust and leadership credibility amplify the impact of fiscal policies. The same policy can work better under a trusted leader like Purbaya, whose decisiveness and credibility strengthen confidence, accelerate business responses, and support inclusive economic growth.

Keywords: *Purbaya Effect; Liquidity Injection; Price Elasticity of Demand; Accounting Profit; Fiscal Policy*

Introduction

In 2025, Indonesia's economy has begun to show signs of what some observers call the emerging "Purbaya Effect," following his recent appointment by President Prabowo (Investortrust.id, 2025). The term comes from Purbaya Yudhi Sadewa, Indonesia's current Minister of Finance, and it reflects his direct and assertive style in managing fiscal policy (omong-omong.com, 2025). His most talked-about decision was the IDR 200 trillion liquidity transfer to state-owned banks (Himbara) (Tempo English, 2025). That was a move aimed at

boosting lending, supporting household spending, and accelerating business recovery. This marked a sharp shift from the more cautious policy of Sri Mulyani Indrawati, who preferred to keep large cash reserves as a safeguard against crises (omong-omong.com, 2025).

The Purbaya Effect is not only about fiscal policy changes but also about a leadership style that is fast, bold, and sometimes confrontational. The media often describe it as “Purbaya versus Everybody” (Melisa, 2025), referring to his open disagreements with other senior officials and state institutions. For example, Purbaya’s criticism of Pertamina’s unfulfilled promise to build a refinery, which has yet to materialize despite being pledged long ago (Indonesia Business Post, 2025), data mismatch between Purbaya and Bahlil (Minister of Energy and Mineral Resources) on the true 3 kg LPG price and subsidy allocation, and Eighteen governors rejected Purbaya’s policy to cut regional transfer funds (TKD) (JakartaDaily, 2025). The disagreement also came from economists, such as Ferry Latuhihin, who questioned the effectiveness and impact of Purbaya’s economic policies (KedaiPena.com, 2025).

Among those breakthroughs, this study focuses on one of his most well-known policies, namely the IDR 200 trillion liquidity transfer. It applies the concept of price elasticity of demand to examine the demand-side effects of the Purbaya Effect. It also looks at the supply side, analyzing how corporate accounting profits respond to these policies. By combining both perspectives, the research explores how a mix of complementary policies can help businesses capture rising demand and improve the effectiveness of government interventions.

In short, the study aims to provide practical policy insights for supporting businesses, helping them take advantage of demand surges and improve financial outcomes in an actively managed economic environment.

Research Method

This study uses a descriptive qualitative approach to conceptually explore how the Purbaya Effect may relate to the price elasticity of demand for consumer goods in Indonesia. The analysis is based on a review of economics textbooks, academic papers, and policy reports that discuss both macroeconomic policies and consumer behavior. By combining insights from these sources, the study interprets how assertive fiscal actions, such as those under the Purbaya Effect, may influence how consumers respond to price changes in today’s Indonesian economy.

Discussion

This chapter discusses how one of Purbaya’s key fiscal policies, the Rp200 trillion liquidity transfer, may influence consumer demand through different types of elasticity. This policy represents a major component of what is commonly described as the Purbaya Effect, which refers to a broader set of assertive and coordinated government actions intended to revitalize Indonesia’s economy. The analysis explains how easier credit conditions and lower lending rates may change how people and firms respond to prices and income.

The analysis is conducted using a *ceteris paribus* framework, meaning that other macroeconomic factors such as exchange rates, global prices, and non-fiscal policies are assumed to remain constant. This approach helps isolate the possible effects of the liquidity policy on demand behavior.

Figure 1 presents the conceptual relationship between the policy mechanism and its theoretical impact on demand. It shows how the liquidity injection could lead to lower interest rates, which then stimulates demand, eventually linking to changes in price elasticity, income elasticity, and cross elasticity of demand.

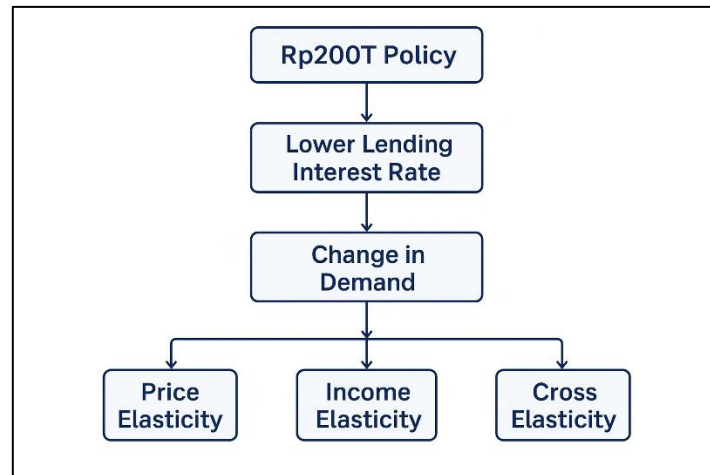


Figure 1: Conceptual Flow of the Rp200 Trillion Policy and Its Effects on Demand Elasticities

Source: Author (2025)

Price Elasticity of Demand

Price Elasticity of Demand (PED) is a measure of how much the quantity of a good demanded by consumers changes when the price of that good changes (Fibich et al., 2005). The IDR 200 trillion liquidity policy aims to reduce credit costs and strengthen household purchasing power. In theory, this policy can lower consumer goods prices through more efficient production and distribution mechanisms. However, the extent to which it affects price elasticity of demand depends on the type of goods involved and the transmission of liquidity into the real economy.

Inelastic Demand

Inelastic Demand means price changes, but demand doesn't change much (Grant & Young, 1996). Figure 1 shows that when the price decreases from P_1 to P_2 , the quantity demanded increases only slightly from Q_1 to Q_2 . This reflects the relatively small change in quantity (ΔQ) compared to the change in price (ΔP), indicating that consumer demand remains largely unresponsive even when prices fall significantly. The shaded area, representing the IDR 200 trillion liquidity support, illustrates the scale of fiscal intervention required to maintain lower prices. However, because most essential goods in Indonesia are inherently inelastic, this policy mainly helps stabilize purchasing power rather than generating substantial growth in consumption. Inelastic demand is typically observed for basic necessities such as rice and cooking oil, where consumption is driven by need rather than by price variations.

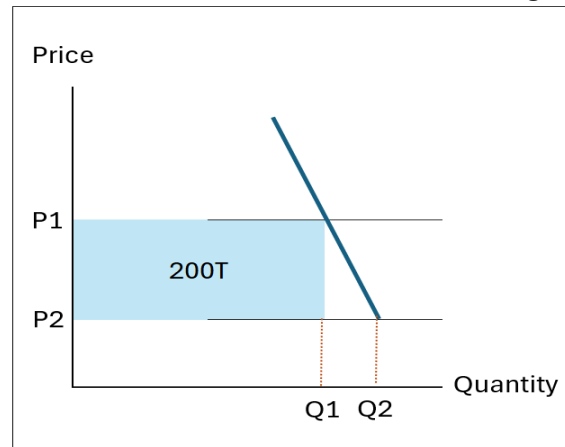


Figure 2: The Inelastic Demand Curve

Source: Author (2025)

The IDR 200 trillion liquidity injection into state-owned banks effectively increased market liquidity and credit availability. This surge in supply-side liquidity reduced borrowing costs and eased financing constraints across key sectors. As a result, producers faced lower input costs and financing pressures, which indirectly pushed overall price levels downward. However, because the goods involved—such as basic food commodities and fuel—are largely inelastic, the decline in prices did not translate into a proportionally higher demand. Instead, the policy’s main effect was price stabilization and reduced inflationary pressure rather than a stimulus to consumption growth.

Elastic Demand

Elastic Demand means a small change in price causes a big change in demand (Gonzalez & Weber, 2025; Grant & Young, 1996). Figure 3 shows that for goods with elastic demand, such as clothing, fast food, and electronics, a fall in price from P_1 to P_2 leads to a much larger increase in quantity demanded from Q_1 to Q_2 .

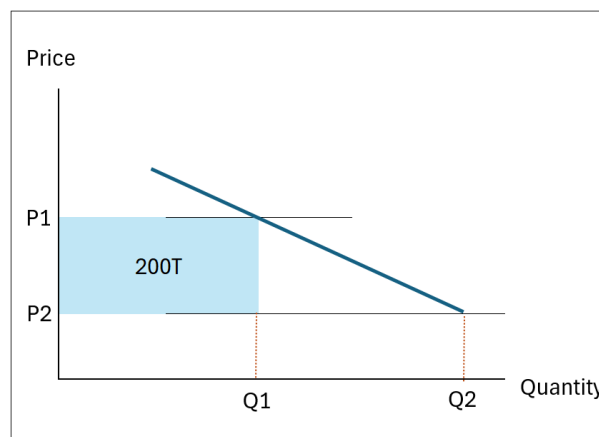


Figure 3: The Elastic Demand Curve

Source: Author (2025)

When prices fall, consumers quickly adjust their purchasing decisions, which results in a wider change in quantity relative to the change in price. In the context of the IDR 200 trillion liquidity

expansion, easier access to credit and lower borrowing costs can amplify this effect by allowing households to spend more on non-essential and discretionary items. This pattern demonstrates how liquidity-driven price reductions can boost short-term consumption growth in elastic sectors, particularly those related to lifestyle and technology products.

Income Elasticity of Demand

Income Elasticity of Demand means how much people buy changes when their income changes (Limberger & Medeiros, 2024). Figure 4 shows how the Rp200 trillion liquidity policy supports positive income elasticity. The horizontal axis represents quantity, and the vertical axis shows income. As income rises from B to A, the quantity of goods demanded increases from Q to Q₁. This upward movement along the DY curve indicates that higher income leads to higher consumption.

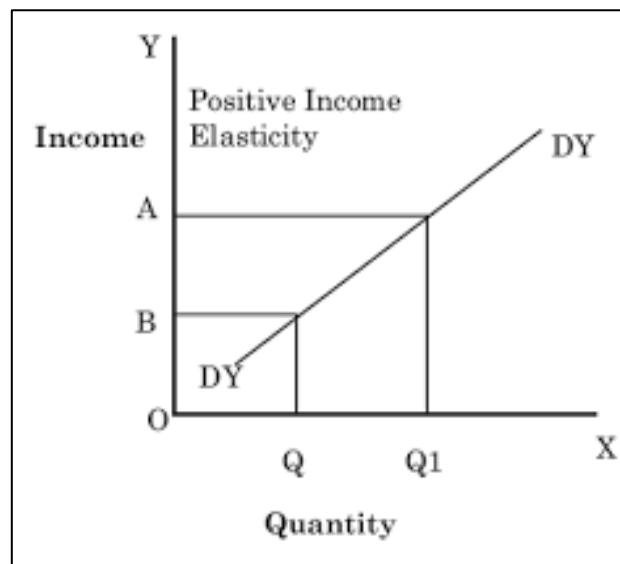


Figure 4: Positive Income Elasticity Under the Rp200 Trillion Liquidity Policy

Source: Author (2025)

The liquidity policy strengthens this relationship by increasing real disposable income through easier access to credit and lower borrowing costs. As a result, households can spend more even if their actual wages remain the same. This reflects positive income elasticity, where consumption grows as financial conditions improve.

Cross Elasticity of Demand

Cross Elasticity of Demand means how the demand for one product changes when the price of another product changes (Papastaikoudis et al., 2024). Figure 5 shows how the Rp200 trillion liquidity policy can influence related markets through cross elasticity effects. The figure illustrates the relationship between two substitute goods. When the price of good B increases from P₁ to P₂, the demand for good A rises from Q₁ to Q₂. In the context of the liquidity expansion, easier credit access allows consumers to switch more easily between related products.

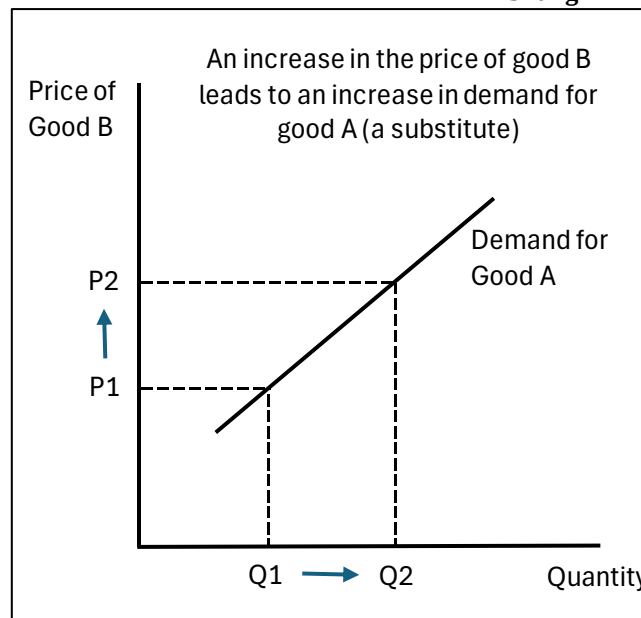


Figure 5: The Substitution Effect in Cross Elasticity Under the Rp200 Trillion Liquidity Policy

Source: Author (2025)

For example, if higher fuel prices (good B) occur while loans for electric motorcycles (good A) become cheaper, consumers may shift toward the alternative product. The same logic applies when imported goods become relatively more expensive, while local producers benefit from lower financing costs. This substitution effect helps reallocate spending within the economy, supporting domestic industries and maintaining consumption levels.

Recommendation

Figure 6 illustrates how the Rp200 trillion liquidity policy can generate a chain of positive effects on business activity, household income, and overall economic growth. The injection of liquidity into state-owned banks (Himbara) allows these banks to expand lending, which increases the availability of credit for businesses. With greater liquidity, banks are able to reduce lending interest rates, making it easier and cheaper for firms to finance their operations.

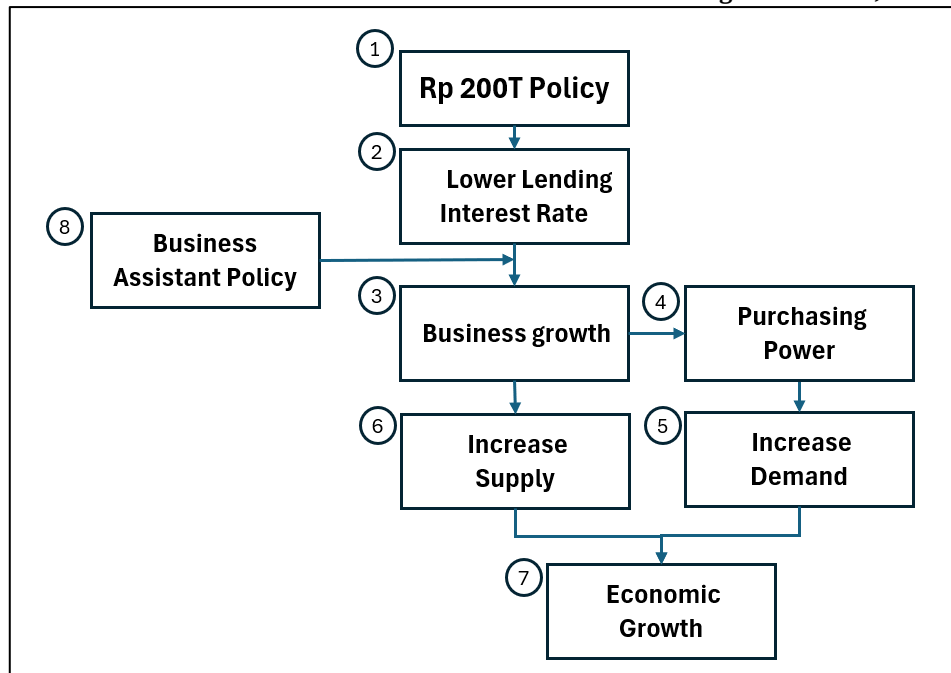


Figure 6: How Business Assistant in a Policy Mix Can Boost Economic Growth

Source: Author (2025)

The following explanations correspond to the numbered elements shown in Figure 6, which describe the step-by-step process of how the Rp200 trillion liquidity policy, together with the Business Assistant Policy, drives business growth and supports sustainable economic expansion.

1. Rp200T Policy
The IDR 200 trillion liquidity injection into state-owned banks (Himbara) allows these banks to expand lending and increase credit availability for businesses.
2. Lower Lending Interest Rate
With greater liquidity, banks can reduce lending interest rates, making it easier and cheaper for firms to access financing.
3. Business Growth
Lower borrowing costs reduce production expenses, allowing firms to lower prices while maintaining profitability. This encourages higher sales and new business formation, leading to overall business growth and job creation.
4. Purchasing Power
As employment and income rise, households have stronger purchasing power.
5. Increase in Demand
Higher purchasing power raises demand for goods and services across various sectors.
6. Increase in Supply
Rising demand creates business opportunities that encourage firms to expand production capacity. Higher supply keeps prices stable and increases corporate accounting profits through efficiency and larger sales volumes.
7. Economic Growth
Economic growth is when a country's economy produces more goods and services than before (Wirdany & Bawono, 2025). This process forms a sustainable cycle of economic

growth driven by the interaction between liquidity expansion, demand, and supply responses.

8. Business Assistant Policy

To strengthen this multiplier effect, the government can complement the liquidity policy with a Business Assistant Policy. This policy helps business owners manage their operations more effectively so they can meet loan requirements and achieve their targets (Stanger, 2004). This program helps small and medium enterprises (SMEs) respond faster to market changes through better financial planning, digital transformation, and production management.

To sum up, the Rp200 trillion liquidity policy can effectively stimulate both demand and supply when combined with complementary measures such as the Business Assistant Policy. By supporting small and medium enterprises through business assistance, the government ensures that liquidity not only increases purchasing power but also strengthens production capacity.

These economic policies could be implemented by any leader, but the results might not be the same. The same policy may work better under Purbaya because he has gained strong public trust. Figure 7 shows how this effect can strengthen both policies by increasing public confidence and encouraging faster economic growth.

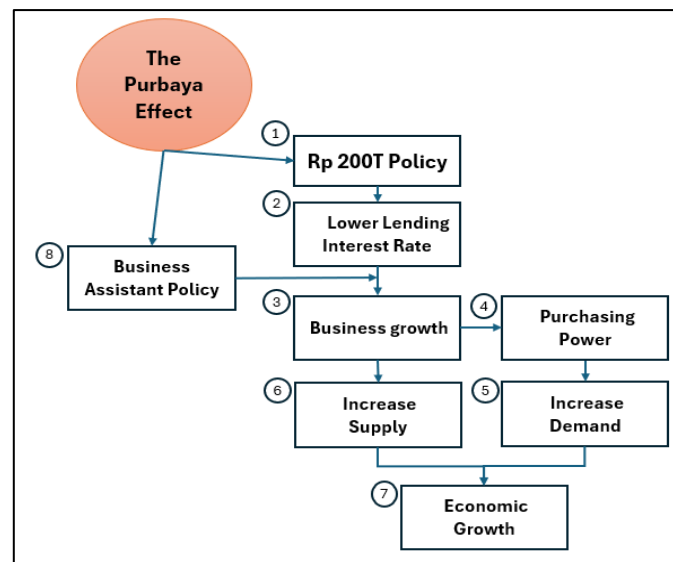


Figure 7: The Purbaya Effect Strengthening the Policies Through Public Trust

Source: Author (2025)

Conclusion

Economic policy is not only about numbers, methods, or technical instruments. It is also about how the government behaves and how it builds public trust. When people believe that their leaders are credible and act for the common good, they are more willing to support and participate in national programs. This sense of trust helps policies work more effectively and strengthens the foundation for real and inclusive growth.

The Purbaya Effect shows that leadership behavior and public confidence can turn economic measures into collective progress. Fiscal policies such as the Rp200 trillion liquidity program

and the Business Assistant Policy become more impactful when carried out by trusted leaders who communicate clearly and act decisively. In this way, economic policies not only drive growth but also encourage fairness and shared prosperity.

As Purbaya said, “Let us reach 8% economic growth by becoming wealthy together” (Prasasti, 2025). This reflects a goal of fair and inclusive growth that benefits everyone, not only a small group of rich people. True economic progress should raise national income while also improving equality and shared prosperity. Growth should come from trust, cooperation, and confidence among all parts of society.

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BEHAVIORAL DETERMINANTS OF URBAN FARMING ADOPTION IN MALAYSIA: A QUALITATIVE STUDY USING THE THEORY OF PLANNED BEHAVIOR

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Abstract: *This study explores urban citizens' behavioural intentions toward urban farming in Malaysia through the lens of the Theory of Planned Behaviour (TPB). Using a qualitative approach, semi-structured interviews were conducted with 50 participants from major urban centres in Peninsular Malaysia to understand how attitudes, subjective norms, and perceived behavioural control influence their intention to adopt urban farming. Thematic analysis using NVivo 14 revealed that positive attitudes, such as appreciation for food freshness, health benefits, and environmental contribution, strongly drive intention. Subjective norms were shaped by family encouragement, community influence, and increasing social visibility of urban farming, while perceived behavioural control was influenced by space constraints, time, and access to knowledge and technology. Participants with higher self-efficacy and community engagement demonstrated greater willingness to participate. These findings affirm the TPB framework's suitability for explaining behavioural intentions in Malaysia's urban farming context and provide a theoretical foundation for designing effective awareness campaigns, training programs, and policy interventions to promote sustainable urban agriculture*

Keywords: *Urban farming, Theory of Planned Behaviour (TPB), Food security, Sustainable agriculture, Qualitative thematic analysis*

Introduction

Rapid urbanization, climate variability, and increasing food demand have intensified global concerns surrounding the stability and sustainability of food systems, particularly in developing and middle-income nations where population growth and environmental stress place greater pressure on agricultural resources (FAO, 2017; Rahman, Rana, & Khanam, 2022; Sansika, et al., 2023). Conventional agriculture is increasingly challenged by land scarcity, soil degradation, ecological disruption, and volatile supply chains, reinforcing the need for localized, resilient, and sustainable food production strategies (Haberman, et al., 2014; Verdoliva, Gwyn-Jones, Detheridge, & Robson, 2021). Urban agriculture has consequently emerged as an innovative approach capable of enhancing food access, supporting environmental stewardship, and strengthening community participation (Croft, Hallet, & Marshall, 2017; Rezai, Shamsudin, & Mohamed, 2016).

Malaysia is among the most rapidly urbanizing countries in Southeast Asia, with an estimated 80% of its population projected to reside in urban areas by 2030 (World Bank, 2021). This demographic shift has increased dependence on imported produce and heightened vulnerability

to global market fluctuations, as reflected in low vegetable self-sufficiency ratios, rising prices, and inconsistent supply (CodeBlue, 2025; DOSM, 2025a). Nutritional gaps among urban households, including inadequate fruit and vegetable intake, have further underscored systemic fragilities (Sulaiman, Yeatman, Russell, & Law, 2021; Tan, Chen, Liew, & Kamarudin, 2023). These trends signal the urgent need for urban-based food solutions that improve affordability, accessibility, and dietary quality.

Despite its potential advantages, urban farming in Malaysia remains fragmented, underdeveloped, and marginally integrated into mainstream food systems (Hashim, Hussain, & Ismail, 2020; Mohamad & Hashim, 2022). Participation rates are low, management practices vary widely, and initiative continuity is often challenged by limited institutional support (Murdad, et al., 2022). Importantly, technical feasibility alone cannot explain this limited adoption; behavioural and perceptual factors also play a critical role. Ajzen's Theory of Planned Behaviour (1991) provides a useful framework to examine how attitudes, subjective norms, and perceived behavioural control shape citizens' willingness to engage in urban farming, with an aspect insufficiently addressed in Malaysian literature to date (Tiraieyari & Krauss, 2018; Yusuf, et al., 2024).

Understanding these behavioural determinants is timely, as Malaysia advances policies aligned with the Sustainable Development Goals and the National Agro-Food Policy 2.0 (United Nations, 2025a; Ministry of Agriculture, 2025). By examining public motivations, perceived benefits, and adoption barriers through qualitative inquiry, this study contributes empirical insights relevant to policymakers, community organizations, and urban planners. The findings support the development of practical strategies to strengthen urban food ecosystems and promote long-term national resilience.

Literature Review

Urban farming has gained prominence as a multidimensional approach to address food insecurity, environmental pressure, and socio-economic vulnerability in rapidly urbanizing nations. Malaysia's accelerated urban population growth has intensified dependence on external food supply chains, increasing household exposure to price shocks and nutrition gaps. Urban agriculture offers improvements in local food availability, affordability, and nutritional access while reducing reliance on rural logistics and long-distance transportation (Chandra & Diehl, 2019; Akintuyi, 2024). Its proximity to consumers reduces spoilage, transportation costs, and storage losses, reinforcing its importance as a localized resilience strategy.

Rapid urbanization in Malaysia has expanded significantly, with an estimated 76% of the national population living in densely populated cities such as Kuala Lumpur and Selangor (Statista, 2025). This urban shift increases pressure on land and food systems. The country's vegetable self-sufficiency ratio (SSR) remains low at 45.4%, making Malaysia highly dependent on imports and vulnerable to external fluctuations (CodeBlue, 2025). Import dependency diminishes food security stability, exposing consumers to market volatility and currency risks, particularly among low-income groups (Abd Rahman, Yasid., bin Alias, & Hamid, 2025). These conditions reinforce the urgency for supplementary urban production.

The Malaysian government has responded with structured agricultural strategies. National frameworks such as the National Agrofood Policy 2.0 (NAP 2.0) 2021–2030 and the National

Food Security Policy Action Plan 2021–2025 promote technology adoption, city-based farming integration, and community garden expansion (Ministry of Agriculture, 2025). Complementary programs, including the Urban Community Agriculture initiative (UCA) and the All-Party Parliamentary Group Malaysia on Sustainable Development Goals (APPGM-SDG), have launched thousands of community projects, increasing public awareness and participatory interest (Chong, Nawawi, Ali, Ahmad, & Juhari, 2024). The Department of Agriculture Malaysia further targets 8,800 metric tons of urban agricultural output by 2025, underscoring institutional commitment to city-based food supply systems (DOSM, 2025b).

Urban agriculture also supports social equity. Lower-income households typically allocate higher proportions of income to food purchases; thus, localized production can substantially ease financial burden (Orsini, Womdim, Kahane, & Gianquinto, 2013). Urban farming can reduce waste, improve air quality, and diversify urban ecosystems, leading to ecological benefits such as reduced carbon emissions associated with transport (Steenkamp, Cilliers, Cilliers, & Lategan, 2021; Toromade, Soyombo, Kupa, & Ijomah, 2024). Community-based risk management has also been shown to strengthen accessibility during supply disruptions, highlighting the importance of structured stakeholder collaboration (Alam, Siwar, Wahid, & Talib, 2016; Sari, Muslim, & Ameliana, 2024).

Despite these advantages, multiple barriers hinder broad adoption. Previous studies emphasize insufficient technical knowledge, ambiguous regulations, cultural stigma, and high initial investment costs as limiting factors for adoption (Hussain, Yusoff, Tukiman, & Samah, 2019; Mohamad & Hashim, 2022). Conventional soil-based agriculture struggles with drainage issues, soil-borne disease, and pests, necessitating technological modernization to enhance productivity (Khan, 2023; Limpamont, Kittipanya-ngam, Chindasombatcharoen, & Cavite, 2024). Therefore, urban farming requires not only physical space and capital but also specialized horticultural skills and community support systems.

Malaysia's urban agricultural ecosystem remains fragmented, often driven by short-term donor initiatives or hobby-level experimentation without long-term governance structures (Salim, et al., 2019; FAO, 2022). The absence of standardized operating models hampers scalability and replication across states. Consequently, urban farms frequently face discontinuity due to organizational and financial gaps rather than a lack of interest. Addressing these systemic constraints aligns with Malaysia's Twelfth Plan (2021–2025), which prioritizes smart agriculture, climate adaptation, and food sovereignty (RMKE12, 2025).

Behavioural perspectives play an equally critical role. Participation in urban farming is influenced not only by structural constraints but also by psychological readiness. Youth involvement in agricultural innovation is influenced by role models, experiential exposure, and the reframing of agriculture as a modern, technology-supported profession (Saili, Safari'ee, Saili, & Hamzah, 2018). Government support packages, providing financial incentives, technical guidance, and marketing advice with the aim of transforming the perception of agriculture into a viable enterprise (Dardak, Haimid, & Masdek, 2020).

To analyse adoption behaviour, this research employs the Theory of Planned Behaviour (TPB). TPB posits that attitudes toward a behaviour, subjective norms, and perceived behavioural control jointly predict behavioural intentions (Ajzen, 1991). This framework has been widely applied to sustainability contexts, including green purchasing and sustainable consumption

behaviours, demonstrating strong explanatory strength (Han & Hyun, 2017; Yadav & Pathak, 2016). In Malaysia, however, TPB has been underutilized in urban farming studies, which primarily focus on technical or infrastructural aspects rather than psychological determinants (Tiraieyari & Krauss, 2018; Yusuf, et al., 2024).

Several researchers have emphasized that successful urban farming requires enabling ecosystems comprising education, space accessibility, financing, and policy support (Hussain, Yusoff, Tukiman, & Samah, 2019; Mohamad & Hashim, 2022). Without these enablers, the intention-to-behaviour gap widens, resulting in inconsistent engagement. The COVID-19 pandemic illustrated this gap clearly, with urban vegetable prices rising by 30–40% due to labour shortages and import disruptions (Tan, 2022). B40 households and student populations experienced disproportionately severe food insecurity (Sulaiman, Yeatman, Russell, & Law, 2021), highlighting the value of self-production capacity.

Urban farming also aligns with broader environmental, social, and governance (ESG) aspirations. It can reduce agricultural carbon emissions, support national climate adaptation strategies, and enable investors to participate in sustainability-aligned ventures (Xi, Zhang, Zhang, Lew, & Lam, 2021; Haque, Santos, & Chiang, 2021). Community empowerment through training and guidelines tailored to tropical climates further strengthens resilience and knowledge transfer.

Despite increasing attention, substantial gaps remain. There is still limited investigation into the degree of desire among urban citizens to adopt urban farming and the nuanced factors shaping that desire. Existing studies do not capture comprehensive motivational landscapes across Malaysian urban populations. Additionally, no standardized model exists to guide sustainable implementation across city structures (Salim, et al., 2019; FAO, 2022).

Methodology

This study employed a qualitative research design to explore Malaysian urban citizens' perceptions, motivations, and challenges related to urban farming. Qualitative inquiry enabled the capture of rich and contextualized insights that cannot be obtained through quantitative instruments alone. Guided by the Theory of Planned Behaviour (TPB), the investigation centred on how attitudes, subjective norms, and perceived behavioural control shape citizens' desire and willingness to participate in urban agriculture.

A purposive snowball sampling strategy was adopted to identify individuals who possessed relevant awareness and experiential knowledge. This approach is commonly applied when populations are dispersed and when the depth of perspective outweighs statistical representativeness (Bryman, 2001; Latham, 2013). Eligible participants were required to reside in major urban centres within Peninsular Malaysia, be at least 20 years of age, and be capable of articulating opinions concerning food production, agriculture, or urban sustainability. This threshold was selected because individuals above 20 typically transition into economic independence and decision-making roles (Elder, 1998; Twenge, 2017; Arnett, 2000). A total of 50 semi-structured interviews were conducted across Kuala Lumpur, Petaling Jaya, Shah Alam, Johor Bahru, Seremban, Ipoh, Subang Jaya, and Klang. Fieldwork continued until data saturation was reached, defined as the point where additional interviews produced no substantially new insights (Baker & Edwards, 2012).

Semi-structured, open-ended interviews were used as the primary data collection method, providing flexibility while maintaining thematic focus (Noble & Smith, 2015). Interviews were conducted in accessible public locations, and informed consent was obtained before the sessions. Participants were assured of confidentiality and their right to withdraw at any time. Voice recordings and verbatim notetaking were employed to enhance accuracy, reduce interviewer burden, and sustain conversational flow (Levitt, et al., 2018). Supplementary materials, including news reports, documents, and previous studies, were also reviewed to support triangulation and contextual interpretation.

Interview guidelines were developed using insights from existing studies on Malaysian food insecurity, urban agriculture literature, regional research keywords, and constructs derived from TPB. The guideline ensured consistency, comprehensive thematic coverage, and manageable interview duration (Sandy & Dumay, 2011). Early interviews prompted iterative refinement of questions, allowing emergent concepts to be incorporated into subsequent sessions.

Qualitative data were analysed using thematic analysis guided by the six-phase framework proposed by Braun and Clarke (2006). Interview audio files were transcribed verbatim and repeatedly reviewed to achieve familiarization. A hybrid inductive–deductive coding approach was used: deductive codes were informed by TPB constructs, while inductive codes emerged organically from participant narratives. Open coding identified meaningful units of information, which were subsequently collated into broader categories through iterative comparison (Gentles, Charles, Ploeg, & McKibbin, 2015). Themes were reviewed, refined, and clearly defined with attention to conceptual meaning rather than surface content (Vaismoradi, Jones, Turunen, & Snelgrove, 2016).

NVivo 14 (64-bit Windows) was utilized to support systematic organization, clustering, and comparison of qualitative data. The software accommodates rich-text and multimedia formats and enables the visualization of relationships across coded nodes, strengthening analytical rigor and enhancing traceability of thematic development (Edhlund & McDougall, 2019; An, 2012).

Multiple strategies were employed to enhance the trustworthiness of findings. Credibility was strengthened through peer debriefing, during which colleagues reviewed methodological decisions and thematic interpretation to minimize bias (Abu Bakar & Ali, 2017). Triangulation was achieved by correlating findings with literature, secondary data, and relevant past studies, increasing reliability and consistency (Hays & McKibbin, 2021). Dependability was supported by maintaining an audit trail of coding decisions, analytical notes, and thematic revisions, allowing external scrutiny of research logic. Confirmability was addressed through reflexive journaling to document the researcher's assumptions and mitigate interpretive bias. Transferability was enhanced by recruiting participants from multiple urban regions with diverse socio-demographic backgrounds, increasing the applicability of insights to other Malaysian urban contexts.

Overall, this methodology provided a robust foundation for identifying behavioural determinants of urban farming adoption. Through purposive sampling, semi-structured interviews, NVivo-assisted thematic analysis, and trustworthiness safeguards, the qualitative procedures captured nuanced perspectives necessary for understanding the complexity of citizen participation in urban agriculture within Malaysia's evolving urban environment.

Findings

This section presents the qualitative findings derived from semi-structured interviews with 50 urban citizens residing across major cities in Peninsular Malaysia. Using a hybrid inductive–deductive thematic approach supported by NVivo 14, several interconnected themes were identified. Consistent with the Theory of Planned Behavior (TPB), the thematic structure emphasizes Attitudes, Subjective Norms, and Perceived Behavioral Control. Additional themes relating to awareness, interest, monetary and non-monetary benefits, and perceived barriers further enrich the behavioral interpretation.

Attitudes Toward Urban Farming

Attitudes captured participants' evaluative judgments regarding the desirability of urban farming. The majority expressed favorable sentiment, primarily linked to concerns over food quality, freshness, affordability, and environmental impact. Participants believed that homegrown vegetables were safer and tastier due to reduced chemical exposure. Concerns about pesticide residues in supermarket produce strengthened positive attitudes toward domestic cultivation:

“If I grow it myself, at least I know what goes into it. Supermarket veggies sometimes don't taste fresh anymore.” (Participant 12)

Environmental considerations also emerged. Participants perceived urban farming as a meaningful contribution toward urban greening and climate mitigation:

“Cities are so hot now. Having more green around us should be part of the solution.” (Participant 28)

Increased food prices served as a practical motivator:

“The price of salad leaves went up so much lately. It makes sense to grow some at home.” (Participant 9)

Collectively, attitudes emerged as a strong positive determinant of behavioral intention, aligning closely with TPB assumptions.

Subjective Norms

Subjective norms reflect social influences, cultural expectations, and perceived approval from peers, family, and community groups. Many participants reported having seen friends and relatives share urban farming activities on social media, which normalized participation and encouraged imitation:

“I see many people posting their homegrown lettuce on Instagram. It encourages me to try it.” (Participant 36)

Community gardens also functioned as social cues, demonstrating feasibility and fostering curiosity:

“Near my apartment, residents started a small garden. When I saw others doing it, I thought—why not?” (Participant 22)

Family encouragement, particularly from older generations familiar with traditional home gardening, further reinforced the intention:

“My parents always tell me to plant something at home. They think it's better than buying everything.” (Participant 7)

These findings reflect Malaysia's collectivist cultural tendencies, where social endorsement plays a meaningful role in shaping behavior.

Perceived Behavioral Control

Perceived behavioral control reflected participants' assessment of their ability to adopt and sustain urban farming practices. Several practical constraints were consistently identified. Space limitations were the most frequently mentioned barrier, especially among apartment dwellers:

"I live in an apartment. Where am I supposed to plant anything?" (Participant 4)

Time constraints associated with work commitments also undermined willingness:

"My job hours are irregular. I worry that my plants will die when I'm not home." (Participant 31)

Limited technical knowledge created uncertainty and fear of failure:

"I don't know how to start. It feels confusing, especially with pests." (Participant 14)

However, participants expressed confidence when technology was involved. Automated systems, particularly those offering monitoring or alerts, improved perceived feasibility:

"If there's an automated system with alerts, I'd be happy to try." (Participant 43)

These insights highlight the role of perceived capacity, a key construct of TPB, in shaping adoption intention.

Awareness

General awareness of national food security challenges emerged as a relevant motivator. Participants expressed growing concern about Malaysia's low vegetable self-sufficiency ratio, import dependency, and vulnerability to supply disruptions:

"We import too much food. One day, if the supply stops, we're in trouble." (Participant 3)

Media narratives and pandemic-era shortages amplified this awareness, further reinforcing interest in self-production.

Interest and Lifestyle Appeal

Urban farming was also described as a lifestyle choice that supports personal well-being and aligns with growing interest in sustainable living. Participants frequently associated gardening activities with mental relaxation, stress reduction, and emotional reward:

"When I see the plants grow, it reduces stress. It's therapeutic." (Participant 19)

Thus, interest extended beyond food production to holistic wellness.

Monetary Benefits

While financial motivations were not the dominant driver, some participants recognized potential economic value in cultivating additional produce for small-scale sales or household cost reduction:

"Maybe I can sell extra herbs to neighbors. Healthy food is in demand." (Participant 44)

This was particularly appealing among younger respondents and flexible gig-economy workers seeking supplementary income streams.

Non-Monetary Benefits

Non-monetary benefits emerged as one of the most influential predictors of willingness to adopt urban farming. Participants highlighted:

- Stress relief,
- Access to healthier meals,
- Parenting and educational values,
- Environmental responsibility, and
- Community support.

“Doing this with my kids helps them learn where food really comes from.” (Participant 2)
These intrinsic rewards often outweighed financial considerations.

Barriers and Challenges

Despite strong interest, several recurring barriers emerged:

- Limited space,
- Lack of knowledge,
- Perceived complexity,
- Heat and humidity management,
- Pest control difficulties, and
- High upfront technology costs.

As one participant noted:

“Hydroponics setups are expensive at the beginning. Not everyone can afford that.” (Participant 41)

Although interest is rising, many believe such challenges could impede adoption without institutional support.

Emerging Theme: Technology Acceptance

Technology acceptance surfaced as an important new theme. Participants expressed enthusiasm for sensor-driven systems, mobile applications, and automated irrigation, provided costs are reasonable and support is available:

“Something smart and easy, I would join immediately.” (Participant 27)

This aligns with Malaysia’s increasing orientation toward smart-city innovation and digital sustainability.

Overall Patterns

Three overarching patterns emerged across the dataset:

- **Desire for participation is increasing**, largely driven by sustainability awareness, rising food costs, and aspirations for healthier living.

- **Non-monetary benefits are more influential** than financial incentives, indicating alignment with lifestyle values rather than profit motives.
- **Barriers are predominantly practical**, not motivational, suggesting that policy, technology, and advisory interventions have strong potential to improve adoption at scale.

The findings reveal growing interest in urban farming among Malaysian urban citizens, driven by positive attitudes toward freshness, health, and environmental benefits. Social influence reinforces intention, while perceived behavioral control, particularly space, time, and knowledge, modulates feasibility. These qualitative insights provide a foundation for designing targeted interventions and inform the development of sustainable urban farming management strategies tailored to Malaysia's evolving urban landscape.

Discussion

The qualitative findings of this study provide important insights into the behavioural determinants influencing Malaysian urban citizens' intention to adopt urban farming. Interpreted through the lens of the Theory of Planned Behaviour (TPB), the results demonstrate how attitudes, subjective norms, and perceived behavioural control collectively shape willingness to participate in urban agriculture. These findings align with existing scholarship while expanding current understanding within Malaysia's evolving food security landscape.

Positive attitudes toward urban farming emerged as one of the strongest predictors of behavioural intention. Participants associated homegrown produce with improved freshness, reduced exposure to chemicals, and greater confidence in food quality. This aligns with previous research highlighting the nutritional benefits of localized agriculture and reduced reliance on long supply chains (Stewart, et al., 2013; Poulsen, McNab, Clayton, & Neff, 2015). The recent escalation in food prices further enhanced the appeal of household cultivation, reflecting broader concerns about affordability and import dependency. Such findings support the TPB proposition that favourable attitudes significantly strengthen intention (Ajzen, 1991).

Subjective norms also played a meaningful role, particularly within Malaysia's collectivist sociocultural context. Participants described being motivated by friends' social media posts, neighbourhood community gardens, and family encouragement. These sources of influence served as social proof that urban farming is both desirable and attainable, consistent with studies emphasizing the role of group perception and community expectations in determining sustainability behaviours (Rabu & Muhammad, 2015; Albab, 2025). Interestingly, intergenerational knowledge transfer, especially from parents familiar with gardening, provided emotional validation and reinforced environmental responsibility.

Despite strong attitudinal and social support, perceived behavioural control moderated feasibility. Participants frequently described space limitations, irregular work schedules, and uncertainty surrounding technical skills. These barriers are consistent with evidence indicating that Malaysian participation in urban agriculture remains constrained by resource scarcity and insufficient institutional support (Ali & Vaiappuri, 2022a; Khan, 2023; Yusuf, et al., 2024). Perceived difficulty in managing pests and the challenges of tropical humidity further diminished self-efficacy. However, participants suggested that simplified, automated, or

guided systems would enhance confidence, underscoring the potential role of technological integration in reducing operational complexity within urban farming models.

Beyond TPB constructs, additional themes surfaced that offer deeper interpretive insight. Awareness of Malaysia's low vegetable self-sufficiency ratio and dependency on imported food heightened the motivation to contribute to national resilience. Participants framed urban farming not simply as a hobby but as a responsible civic action, aligning with government priorities outlined in national food security strategies (Dardak, Haimid, & Masdek, 2020; DOSM, 2025a). As awareness increases, urban farming benefits may gain broader acceptance within community-based sustainability movements.

Non-monetary benefits emerged as particularly influential. Participants consistently associated urban farming with stress reduction, family bonding, educational value for children, and overall well-being. These findings support research demonstrating the psychosocial impact of household agriculture, which strengthens community cohesion and promotes healthier lifestyles (Steenkamp, Cilliers, Cilliers, & Lategan, 2021; Toromade, Soyombo, Kupa, & Ijomah, 2024). Such intrinsic motivations were found to outweigh purely economic incentives, suggesting that policy interventions emphasizing health and community engagement may be more effective than profit-driven messaging.

Although financial incentives were secondary, monetary interest was still relevant among younger respondents and flexible-income workers, who viewed home cultivation as a potential supplementary revenue stream. This is consistent with initiatives encouraging youth agro-entrepreneurship and innovation (Saili, Safari'ee, Saili, & Hamzah, 2018). However, high initial investment, especially for hydroponic and vertical farming systems, acted as a deterrent, indicating the need for financing models such as grants, subsidies, or rental schemes.

Barriers identified in this study were predominantly structural rather than motivational. Participants described fragmented regulatory support, high setup costs, and limited access to expert guidance. These issues align with the literature, noting that urban agriculture in Malaysia remains insufficiently integrated into broader urban planning systems (Hashim, Hussain, & Ismail, 2020; Murdad, et al., 2022). Importantly, the findings suggest that many citizens are already motivated; they simply lack enabling mechanisms. Addressing these constraints could rapidly translate latent interest into sustained participation.

The results of this study empirically reaffirm TPB's suitability for examining urban farming adoption. Favourable attitudes, supportive subjective norms, and manageable perceived behavioural control collectively enhance intention. However, the findings also extend TPB by revealing interaction effects not explicitly captured within the original model. For example, awareness amplifies attitudes, technological assistance improves perceived control, and community garden visibility reinforces social norms. These relationships suggest the value of integrated interventions that combine smart farming technologies, community training ecosystems, and accessible infrastructure.

Urban farming also aligns closely with Malaysia's national food security priorities under the National Agro-Food Policy 2.0 (NAP 2.0) and the Sustainable Development Goals (United Nations, 2025a; Ministry of Agriculture, 2025). Participants echoed concerns highlighted in national reports, including low vegetable self-sufficiency ratios, price volatility, and nutritional

disparities. This indicates increasing public awareness of systemic vulnerabilities and a willingness to mitigate them through localized participation.

A notable contradiction, however, emerged between intention and action. While the desire to participate is high, actual behavioural engagement remains limited. Participants often expressed uncertainty about how to begin, reflecting a persistent intention-behavior gap frequently recognized within TPB literature. Addressing this gap requires targeted interventions such as structured training programs, advisory support, accessible starter kits, and community demonstration farms.

Overall, five key interpretive insights emerged from the qualitative data: (1) strong attitudinal positivity indicates readiness for expansion; (2) social influence is increasing due to community visibility; (3) perceived behavioural control remains the principal bottleneck; (4) intrinsic benefits outweigh extrinsic ones; and (5) technology and education have strong potential to unlock adoption at scale.

Therefore, the findings demonstrate that Malaysian urban citizens exhibit an increasing desire and willingness to engage in urban farming. Positive attitudes and supportive social environments strongly encourage participation, while practical constraints limit behavioural feasibility. Guided by TPB, the study suggests that targeted interventions addressing knowledge gaps, space limitations, cost barriers, and technological accessibility can transform interest into consistent practice. These insights are crucial for designing integrated urban farming management strategies that contribute to food security, community resilience, and environmental sustainability within Malaysia's rapidly urbanizing landscape.

Conclusion

This study provides a nuanced understanding of the behavioural determinants influencing Malaysian urban citizens' willingness to adopt urban farming. Guided by the Theory of Planned Behaviour, the findings reveal that positive attitudes toward food freshness, health benefits, and environmental contribution serve as strong motivational drivers. Social influences that were reinforced through peer visibility, family encouragement, and community engagement further strengthen intention, reflecting Malaysia's collectivist cultural context. However, perceived behavioural control remains the principal barrier, with space limitations, time constraints, technical uncertainty, and initial investment costs reducing feasibility.

Non-monetary benefits, including stress reduction, family bonding, and educational value, emerged as some of the most compelling incentives, often outweighing financial considerations. Importantly, these barriers were found to be structural rather than motivational, suggesting that citizens are ready to participate if provided with supportive infrastructure, training, policy intervention, and accessible technology. As awareness of food security vulnerabilities increases, urban farming offers a practical, sustainable pathway to enhance community resilience, dietary quality, and environmental stewardship.

Overall, the results of this study underscore the potential for urban farming to transition from a niche lifestyle activity into a strategic component of Malaysia's urban food system. By addressing practical constraints and strengthening enabling mechanisms, policymakers and

stakeholders can harness growing public interest and contribute meaningfully to national sustainability goals.

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HUMAN RESOURCE PLANNING AMONG YOUTH WORKERS

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Abstract: *Youth employment remains a critical issue in contemporary labor markets worldwide. Despite their potential as a dynamic workforce, young workers often face challenges such as underemployment, inadequate compensation, and limited career development opportunities. Effective human resource planning, encompassing compensation and benefits, recruitment and selection, and career development for young workers, is essential to address these challenges and improve labor relations among youth. This paper examines the current problems faced by young workers in the labor market and highlights effective human resource planning strategies based on compensation and benefits, recruitment and selection, and career development to enhance youth integration and retention in the workforce.*

Keywords: *Human Resource Planning, Youth, Youth Workers*

Introduction

Youth employment plays a vital role in shaping both global economic growth and social stability. Individuals between the ages of 15 and 24, commonly categorized as youth, make up a substantial share of the global workforce and possess the capacity to stimulate innovation and enhance productivity across multiple industries (United Nations, 2022). Nonetheless, the journey from education to securing stable employment continues to pose significant challenges for many young people due to various structural, economic, and social obstacles. These difficulties are further intensified by rapid technological advancements, globalization, and evolving labor market trends that demand continuous skill development and adaptability (International Labour Organization [ILO], 2023).

Despite their potential contributions, young people consistently experience much higher unemployment rates compared to adults, with global figures indicating that youth unemployment is almost triple that of adult workers (ILO, 2023). This inequality stems from multiple factors, such as a lack of professional experience, insufficient skills aligned with market demands, and limited access to secure and high-quality job opportunities (OECD, 2022). Furthermore, many young employees encounter wage disparities and less

comprehensive benefit packages, contributing to financial instability and reduced motivation to remain active in the workforce (World Bank, 2021).

Employment relations involving young workers are further strained by challenges such as job insecurity, short-term contracts, and restricted prospects for career advancement (Eurofound, 2021). These circumstances often result in higher employee turnover rates and weakened employer–employee relations, which can negatively impact both organizational performance and overall social cohesion. Therefore, implementing strategic human resource management practices—particularly in fair compensation, effective recruitment, and structured career development—is crucial for promoting youth employment and ensuring stable workplace relations (ILO, 2023).

The purpose of this paper is to examine the key challenges currently faced by young individuals in the labor market and to identify practical human resource planning strategies focused on compensation and benefits, recruitment and selection, and career development to strengthen youth participation and retention in the workforce.

Literature Review

Human Resource Planning

Human Resource Planning (HRP) is a strategic approach used by organizations to predict and manage their future workforce requirements, ensuring that the right number of employees with the necessary skills are available when needed. Drawing from the abstract, HRP plays a vital role in tackling youth employment issues by fostering equitable compensation practices, efficient recruitment processes, and well-structured career development pathways. Through this approach, young workers are not only provided with employment opportunities but also given the necessary support to achieve their full potential and make meaningful contributions to the labor market. An effective HRP system aligns an organization's objectives with its workforce competencies, thereby enhancing job stability, employee retention, and fair labor relations among youth (Armstrong & Taylor, 2023; Dessler, 2020). Additionally, HRP serves as a crucial link between human resource management strategies and sustainable labor market outcomes by projecting labor demand, identifying skill shortages, and implementing initiatives that improve employability and job satisfaction among young employees (Boxall & Purcell, 2016; Yeon et al., 2016). Core elements such as compensation and benefits, recruitment and selection, and career development represent key components and outcomes of a well-executed Human Resource Planning process.

Challenges of Human Resource Planning (HRP)

Human Resource Planning (HRP) encounters numerous obstacles that limit its efficiency in managing youth employment. The rapid pace of technological advancement and the effects of globalization create difficulties in forecasting future skill demands (Dessler, 2020). In many cases, inaccurate projections and insufficient labor market information contribute to mismatches between available talent and organizational needs (Mathis et al., 2021). Furthermore, attracting and retaining young employees remains a persistent challenge, as many prioritize workplace flexibility, opportunities for career advancement, and equitable compensation (Noe et al., 2021). Financial limitations and the lack of strong alignment between HR planning and broader organizational strategies also restrict the success of workforce

development initiatives (Armstrong & Taylor, 2023; Boxall & Purcell, 2016). To overcome these challenges, effective Human Resource Planning must emphasize fair compensation and benefits, robust recruitment and selection processes, and continuous career development as essential outcomes of strategic HR management

Effective Strategies Human Resource Planning based on Compensation and Benefits, Recruitment and Selection and Career Development among Youth Workers
Compensation and Benefits

Compensation and benefits are the general rewards system through which an organisation compensates its employees in terms of time, skills, efforts and contribution towards reaching the organisational objectives. It includes direct financial rewards namely basic salaries, wages, commissions, incentives, and bonuses, and indirect non-financial rewards like medical insurance, paid leaves, flexible working hours, training and career development opportunities, and retirement savings (AIHR, 2024; Indeed, 2025). These components combine to make what is commonly referred to as the total rewards package which is the total value that the employees will gain out of their employment relationship. Organisational strategy, internal equity, external competitiveness, and legal or regulatory requirements are among the factors that influence the structure and composition of compensation and benefits (Aurora Training Advantage, 2023; Yeon et.al., 2016). The success of any compensation system lies on the ability of the system to balance the financial ability and the expectation of employees. Compensation and benefits are foundational elements in labor relations, serving as primary motivators for employee engagement and retention. In unionized or regulated workplaces, these elements are usually negotiated through collective bargaining, underscoring their importance in maintaining industrial peace and compliance with labor laws (Organisation for Economic Co-operation and Development [OECD], 2023). Compensation comprises wages, salaries, overtime pay, bonuses, and other monetary incentives. Transparent and equitable compensation reduces conflicts and builds trust between employers and employees.

Benefits, which extend beyond direct pay, include health insurance, retirement plans, paid leave, and other non-monetary perks. These benefits are essential for enhancing employees' overall welfare and satisfaction, often forming a central point in labor negotiations (International Labour Organization [ILO], 2023). For youth workers, competitive compensation packages not only help attract talent but also ensure equitable treatment in the workforce, which is crucial for reducing turnover and fostering loyalty.

Recruitment and Selection

Recruitment and selection are two processes applied in Human Resources Planning where recruitment is the process of finding a pool of candidates to fill for an employment in an organization. It is commonly done by identifying, attracting and encouraging potential candidates to fill for the position in the organization. Based on Armstrong (2014), recruitment is a process of “finding and engaging the right people to fill job vacancies and to meet organizational requirements”. Dessler (2017) also defines recruitment as the process of attracting qualified candidates to fill an existing or anticipated job position in the organization. The recruitment and selection process in labor relations must adhere to principles of fairness, non-discrimination, and transparency. Given that many industries operate under collective agreements, recruitment efforts often involve unions to ensure that hiring practices

respect established labor rules and seniority systems (World Economic Forum, 2023). Recruitment involves identifying job vacancies, advertising openings, and attracting suitable candidates while respecting labor standards.

Youth workers, who may lack extensive work experience, benefit from targeted recruitment strategies such as internships, apprenticeships, and campus recruiting programs (Suhaimi, & Abidin, 2022). These initiatives help bridge the gap between education and employment, increasing youth participation in the labor market. Selection procedures focus on identifying the best candidates through fair assessments, often incorporating union input to protect workers' rights (OECD, 2023). Transparent recruitment and selection promote trust between employees and management and reduce risks of discrimination claims, thereby contributing to positive labor relations. By implementing recruitment and selection systems that embrace flexibility, learning, and motivation, companies are able to not only recruit competent employees, but also contribute to decreasing youth unemployment and creating a better workforce in the future (Rajyalaxmi, 2023).

Career Development

Career development is a key element of human resource planning (HRP) that ensures organizations maintain a steady stream of capable and motivated staff prepared to occupy critical roles. This process involves systematically assessing future organizational requirements and aligning them with employees' career goals and professional growth trajectories. From an organizational standpoint, this approach is often referred to as succession planning, which focuses on cultivating internal talent to take on higher levels of responsibility over time. Programs for career development are vital for promoting employee advancement, satisfaction, and long-term loyalty to the organization. Within the context of labor relations, career development must balance organizational priorities with individual career ambitions and collective bargaining agreements, often necessitating coordination between management and employee unions (World Bank, 2022). Providing training and ongoing skill development equips employees to navigate technological advancements and enhances their job performance, which is particularly crucial for young workers entering rapidly changing industries (Suhaimi, Ibrahim & Zainol, 2025).

Promotion and succession planning must be transparent, equitable, and consistent with labor policies, frequently balancing seniority with merit-based criteria. Such fairness is key to maintaining industrial harmony and motivation among workers. Moreover, career development initiatives that involve unions can ensure that programs are inclusive and adhere to collective bargaining agreements (ILO, 2023). Investing in career development not only reduces employee turnover but also strengthens labor-management relations by aligning personal growth with organizational success.

Compensation and benefits, recruitment and selection, and career development are indispensable components of effective human resource management in labor relations. These functions collectively create a work environment where employees, particularly youth workers, feel valued, fairly treated, and motivated to contribute to organizational goals. Organizations that strategically integrate these HR functions within the labor relations framework are better equipped to foster sustainable productivity, minimize labor disputes, and promote positive industrial relations. As the labor market continues to evolve, especially with the increasing

participation of youth workers, organizations must prioritize these HR practices to ensure a skilled, satisfied, and stable workforce.

Limitations and Strengths

This study contributes to the growing body of literature on youth employment by offering a multidimensional analysis that connects human resource management practices with sustainable labor-market outcomes. It highlights the importance of aligning HR strategies with youth-specific needs and provides a framework for policymakers and organizations to implement inclusive employment practices (Boxall & Purcell, 2003; Hoque & Atheef, 2024). However, the research is limited by its reliance on secondary data, which may not fully capture regional or cultural variations in youth employment trends (Suhaimi, 2021; Kajwang, 2022; Lambon-Quayefio et al., 2023). Furthermore, the study primarily focuses on formal employment sectors, potentially overlooking the experiences and challenges of young workers in informal or gig economies (McIntosh & Zeitlin, 2022). Future research should therefore incorporate longitudinal and cross-cultural analyses to offer a more comprehensive understanding of youth employment dynamics and the long-term impact of HR practices on young workers' career trajectories (Omoju et al., 2023).

Future Applications and Recommendations

Enhancing human resource planning (HRP) for youth is essential to address persistent employment challenges such as skills gaps, underemployment, and job instability. As the labor market evolves, several forward-looking strategies can improve youth integration and retention. First, leveraging technology like AI and digital platforms can streamline recruitment and match youth with suitable roles (ILO, 2023). Online learning tools also offer flexible training opportunities that help young workers gain marketable skills. Second, public-private partnerships between employers, educators, and governments are crucial. These collaborations can align education with job market needs through apprenticeships and internships (OECD, 2022). Third, promoting lifelong learning and upskilling is vital. Continuous training helps youth remain adaptable in fast-changing industries (World Bank, 2021). Fourth, HR practices must be inclusive, ensuring fair access to opportunities for marginalized groups through mentoring and equitable recruitment (Eurofound, 2021). Lastly, HRP should include mental health support to foster resilience and improve job satisfaction among youth (ILO, 2023). In sum, future-focused HRP must be adaptive, inclusive, and supportive to build a skilled and motivated youth workforce.

Conclusion

Employment among youth remains a significant challenge in labor markets globally, with young workers often facing issues such as insufficient pay, limited career advancement, and underemployment. To overcome these obstacles, organizations must adopt strategic human resource planning that specifically addresses the needs of young employees. Emphasizing fair compensation and benefits, effective recruitment and selection, and structured career development can help integrate youth into the workforce, enhance their motivation, and improve retention. Such targeted HR strategies not only empower young workers to reach their full potential but also promote positive labor relations, organizational stability, and long-term workforce sustainability. Prioritizing youth-focused HR practices is therefore essential for fostering economic growth and ensuring a skilled, committed, and resilient labor force.

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RISK-BASED PREDICTIVE MODELLING FOR HIGHWAY PROJECT DURATIONS IN NIGERIA USING MULTIPLE LINEAR REGRESSION AND ARTIFICIAL NEURAL NETWORK

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Abstract: Globally, highway infrastructure development has been prioritised as one of a country's most crucial infrastructure projects, as it remains a vital mode of transporting people and goods. Therefore, the timely completion of highway infrastructure is paramount due to its socioeconomic importance and the huge budgetary allocation that is needed for its development. In the past, attempts have been made to forecast the actual duration of highway projects in Nigeria using conventional modelling techniques. This study used contemporary and conventional techniques, i.e., the artificial neural network and multiple linear regressions, to develop forecast models for improving highway project schedule estimates. The study identified core highway project schedule risks. The models were developed using 103 completed highway projects between 2002 and 2022. The projects were selected using the snowballing technique on a list of federal highway projects that were issued by the Federal Ministry of Works and Housing (FMWH) in 2017. Additionally, a list of completed projects was also gathered from highway or civil engineers and quantity surveyors throughout Nigeria. A key participant was purposively selected for each highway project in order to complete a questionnaire on the delay risk variables that affected the project. Critical schedule risk factors and historical data on highway project schedules were used as independent and dependent variables for developing the models. The results showed that the ANN model performed better than the MLR model in terms of accurately forecasting the future durations of Nigeria's highway projects. This study presents an accurate schedule estimation and predictive methodology or tool for government representatives, consultants, and contractors who are implementing highway construction projects.

Keywords: Artificial Neural Network, Time Forecast, Highway Projects, Multiple Linear Regression, Schedule Risk, Time Estimation

Introduction

A firm construction plan provides the background for generating project budgets and schedules. For consultants and bidders, the production of project time estimates is a vital phase in project planning. In reality, the true duration of a project can only be ascertained at its completion; Johnson and Babu (2018) identified cost overruns, timeline delays, scope modifications, inadequate contingencies, and inflation as recurrent barriers impacting a project's success. The

delay in the delivery of construction projects has negative impacts on their performance, leading to increased project initial budgets and a decrease in productivity (Idowu & Aligamhe, 2023). Disputes, arbitration, and conflict between contractual parties could also result from this.

Highway construction requires huge capital, which makes diligent planning indispensable to achieve good project performance. Cost, quality, and time performance are the main determinants of construction project success. These indices further measure the construction sector performance of a country (Yaseen, Ali, Salih & Al-Ansari, 2020). Highway construction projects are complex with non-linear feedback processes; thus, there is a need for an efficient and accurate tool for estimating highway project duration that can factor in the project's complexities. According to Changali et al. (2015), 98% of megaprojects experience overruns in their initial estimates; Love, Edwards, and Iran (2012) reports that actual time and cost performance sometimes average 183% and are 70% over their planned estimates. Correspondingly, developed and developing nations experience time overruns in their highway projects, leading to various studies seeking better ways to minimise these occurrences. Highway projects' poor time performance is more common in developing nations due to the lack of formalised risk management techniques (Tar, and Carr, 2000) and the scarcity of highway project data (Mousavi et al., 2011).

It is therefore paramount to take a step further beyond the conventional estimating approach, with adequate priority given to risk factors impacting project planning and implementation. Highway projects are exposed to enormous risk due to prevailing underground conditions, coupled with their extensive regional and geographical spread (Okate and Kakade, 2019). According to Creedy et al. (2010), risk is the occurrence of an unplanned situation that alters the sequence of a planned event. Schedule risks frequently affect the effective completion of construction projects significantly (Sambasivan and Soon, 2007). Hence, keeping track of schedule overruns based on historical data presents the potential for accurately estimating future project performance using modern trend analysis techniques.

Studies conducted by Aligamhe et al. (2024); Debnath and Mourshed (2018) used trend analysis to track cost and time variances (historical data) for predicting future outcomes. Organisations creating cost and schedule plans can utilise this technique as a guide. Also, the lists of prevailing critical risk factors from previous projects can be properly documented and standardised in order to guarantee accurate estimates for future similar projects. Discrepancies in the initial schedule estimate and actual project duration could have unintended effects on the project's stakeholders. To overcome some of the most prevalent issues, new methods must be developed and innovations must be adopted (Cabuñas and Silva, 2019). Artificial neural networks can conceivably present improved results using new training, given that they are built to train data (Manahan Malasan et al., 2021; Waziri et al., 2017). Also, resulting from the findings in an extensive literature review conducted by Kulkarmi et al. (2017), ANN applications were found suitable in the development of hybrid models as well as for modelling unit rates, costs, schedules, risk analysis, productivity, safety, and disputes. According to Alaloul et al. (2018), an ANN has good learning ability and can produce accurate pattern recognition results.

This study aims to develop predictive models based on ANN and MLR techniques to compare the accuracy of both models in predicting the actual duration of highway construction projects.

The importance of federal roads in Nigeria, which make up 54% of the country's total bituminous road network, provides the basis for the study's significance. Moreover, Nigerian roads convey over 90% of goods and people (Anigbogu et al., 2019). Furthermore, there is little or no evidence in the literature indicating the use of ANN in developing schedule predictive models for Nigeria's highway projects.

Methodology

This section discussed data collection, data organisation, and data analysis for the research.

Data Collection

The snowballing technique was used in identifying and administering pro forma and questionnaires to respondents (highway engineers and quantity surveyors) involved in the execution of the identified projects across the study area as consultants, contractors, or clients. Data collection instruments for the study were distributed in hardcopy and electronically. The choice of these professionals is based on their roles as construction managers, project managers, and consultants who often manage highway project schedules and costs during project execution. Table 1 below presents the respondents' characteristics of this study.

The historical data that have been used to develop the model consists of 103 completed federal highway projects. The process of identifying the projects commenced with the examination of a publication by FMWH in 2017. The publication consists of 229 ongoing and completed highway projects. The list formed the basis for extracting completed projects at the time of publication and tracking those that were later completed before January 2022. An initial number of 68 projects were identified, however, adequate information could not be sourced from 5 of the projects. Therefore, they were excluded, leading to 63 completed projects from this source. In order to include more recently completed projects in the study, a pilot study was conducted, yielding an additional 40 completed highway projects, totalling 103, as shown in Table 3.

Table 1: Characteristic of Respondents

Variables	Grouping	Distribution (n)	Percentage (%)
Years of post-qualification experience	0-5	9	8.70
	6-10	19	18.40
	11-15	43	41.70
	16-20	27	26.20
	>20	5	4.90
	Total	103	100
Occupational category	Client organisation	49	47.57
	Consulting	26	25.25
	Contracting	28	27.18
	Total	103	100
Locations	South-West	19	18.45
	South-East	17	16.50
	South-South	18	17.48

North-East	17	16.50
North-West	13	12.62
North-Central	19	18.45
Total	103	100

Identification of Highway Risk Factors

A comprehensive list of highway schedule risk factors was adopted from the review of the literature conducted by Aligamhe (2024), leading to the identification of 154 highway risk factors. The identified risk factors were then subjected to expert judgment (those with 15-25 years of experience) for the purpose of extracting only highway schedule risk from the initial comprehensive analysis. This procedure involved 10 experts in the field of project and construction management, which led to the identification of 85 schedule risk factors. The process also helped to ensure construct validity by eliminating repeated variables in the questionnaire.

Relative Importance Index (RII)

Primary data on the impacts of highway schedule performance were solicited from respondents on a Likert scale of 5 points, with 1 (very low), 2 (low), 3 (moderate), 4 (high), and 5 (very high), as shown in Figure 2. The respondents' responses were analysed using RII, as had been previously used in similar studies (Oboirien, 2019; Thaseena and Vishnu, 2017). The level of risk impact was determined by the RII values of each risk factor and ranked from the highest RII downwards. The categorisation of the risk factors adopted a similar approach as the Likert scale (very low = $RII < 1.5$, low = $1.5 \leq RII < 2.5$, moderate = $2.5 \leq RII < 3.5$, high = $3.5 \leq RII < 4.5$, and very high = $4.5 \leq RII \leq 5.00$). El-Sayegh and Mansour (2015) used a similar classification in their study.

Furthermore, the critical schedule risk factors for developing the predictive models were derived using the 80:20 Pareto rule (see Equation 1). The principles state that 80% of outcomes emanate from 20% of causes (Grosfeld-Nir et al., 2007). The application of Pareto by firms aids in the development of speedy models using fewer activities in determining the firm's overall productivity (Pandey et al., 2013).

$$CR = \frac{20}{100} \times N \quad (1)$$

Critical Schedule Risk Factors/Independent Variable for Model Development

Factors impeding the time performance of federal highway projects in Nigeria are analysed and presented in Table 2 below. The independent variables that are used for the model development are presented in Table 2 below. These variables represent the critical risk factors impacting the time performance of the identified highway projects being 20% of the schedule risk factors analysed. The dependent variables that are used for the model development consist of historical data on highway time performance.

Table 2: Independent Variables for Model Development

S/No.	REF/Variables	RII	RII classification	Ranking
1	TR 1: Delay in payment by clients	4.53	V. H	1
2	TR 37: Non-availability of spare parts for construction equipment	4.52	V. H	2
3	TR 42: Non-availability of desired plant and equipment	4.39	H	3
4	TR 36: Unavailability of special equipment	4.32	H	4
5	TR 39: Shortage of construction material in the market	4.31	H	5
6	TR 18: Incomprehension of the requirements of the owner by the design team	4.27	H	6
7	TR 53: Lack of communication and coordination between contractor and the other parties	4.25	H	7
8	TR 43: Conflicts	4.2	H	8
9	TR 9: Forced selection of inexperienced contractors	4.16	H	9
10	TR 35: Failure of major construction equipment	4.14	H	10
11	TR 61: Change in government/political changes	4.12	H	11
12	TR 56: Resource management problems	4.12	H	12
13	TR 12: Complexity in project design	4.11	H	13
14	TR 33: Delay in the delivery of materials	4.11	H	14
15	TR 63: Government lack of political will	4.06	H	15
16	TR 66: Lack of legal regulatory framework	4.06	H	16
17	TR 11: Change in design	4.04	H	17

Historical Data/Dependent Variable for Model Development

Table 3 presents the historical data (highway time-performance data) for developing the models. The table also contained computed time overruns as derived from Equation 2. The values of the schedule overruns (in percentage) were divided by 100 to obtain a comparable value with that of Likert scales 1–5, which was used in measuring the schedule risk impact (independent variables).

$$Pto = \frac{icd - fcd}{icd} \times 100 \quad (2)$$

Table 3: Dependent Variables for Model Development

S/No.	Project ID NO.	Length of road (km)	Initial contract duration (Weeks)	Final construction duration (Weeks)	Percentage time overrun (%)	Time performance data (% ÷100)
1	SW 1	19.20	103	165	60.39	0.6039
2	SW 2	31.00	226	343	51.66	0.5166
3	SW 3	22.00	217	344	58.15	0.5815
4	SW4	10.50	182	295	61.90	0.6190
5	SW 5	5.60	62	95	52.67	0.5267



6	SW 6	7.20	221	341	54.09	0.5409
7	SW 7	84.00	204	319	56.08	0.5608
8	SW 8	72.70	169	263	55.53	0.5553
9	SW 9	166.02	156	259	65.42	0.6542
10	SW 10	24.00	228	374	63.77	0.6377
11	SW 11	27.60	193	310	60.89	0.6089
12	SW 12	16.90	139	234	67.98	0.6798
13	SW 13	52.00	227	371	63.73	0.6373
14	SW 14	30.00	287	462	61.14	0.6114
15	SW 15	75.00	182	307	68.33	0.6833
16	SW 16	5.20	104	167	60.05	0.6005
17	SW 17	52.00	226	367	62.37	0.6237
18	SW 18	32.20	78	131	67.21	0.6721
19	SW 19	46.00	35	67	93.54	0.9354
20	SS 1	0.82	26	50	94.81	0.9481
21	SS 2	51.00	187	315	68.71	0.6871
22	SS 3	21.00	104	191	83.34	0.8334
23	SS 4	33.49	130	230	76.38	0.7638
24	SS 5	25.00	130	228	74.67	0.7467
25	SS 6	30.00	130	236	80.64	0.8064
26	SS 7	25.50	96	182	90.14	0.9014
27	SS 8	337.00	17	34	95.99	0.9599
28	SS 9	105.60	104	188	79.99	0.7999
29	SS 10	3.68	57	98	72.90	0.7290
30	SS 11	83.01	156	259	65.40	0.6540
31	SS 12	0.50	9	16	86.53	0.8653
32	SS 13	30.00	35	67	93.14	0.9314
33	SS 14	55.44	130	223	70.99	0.7099
34	SS 15	6.60	52	99	89.91	0.8991
35	SS 16	338.47	113	204	79.93	0.7993
36	SS 17	470.32	113	204	79.93	0.7993
37	SS 18	18.70	109	173	58.99	0.5899
38	SE 1	46.00	70	70	0.000	0.000
39	SE 2	59.50	182	290	58.97	0.5897
40	SE 3	7.00	26	50	93.40	0.9340
41	SE 4	10.00	26	51	95.64	0.9564
42	SE 5	49.00	130	225	72.37	0.7237
43	SE 6	49.00	130	226	73.70	0.7370
44	SE 7	10.50	26	50	93.73	0.9373
45	SE 8	17.00	70	131	88.23	0.8823
46	SE 9	10.00	26	51	96.58	0.9658
47	SE 10	13.50	39	74	90.35	0.9035
48	SE 11	36.00	78	145	85.84	0.8584
49	SE 12	26.00	61	109	79.20	0.7920
50	SE 13	75.00	104	191	83.38	0.8338
51	SE 14	40.27	130	226	73.73	0.7373
52	SE 15	39.00	78	144	84.26	0.8426
53	SE 16	58.00	17	33	96.52	0.9652



54	SE 17	22.00	104	185	77.81	0.7781
55	NC 1	76.00	78	144	84.43	0.8443
56	NC 2	25.80	52	98	87.61	0.8761
57	NC 3	19.50	287	424	47.60	0.4760
58	NC 4	42.00	235	381	62.20	0.6220
59	NC 5	19.20	9	18	94.47	0.9447
60	NC 6	31.00	96	177	84.45	0.8445
61	NC 7	22.00	104	178	70.76	0.7076
62	NC 8	10.50	235	382	62.98	0.6298
63	NC 9	5.60	104	173	66.06	0.6606
64	NC 10	7.20	52	87	66.73	0.6673
65	NC 11	84.00	104	181	73.44	0.7344
66	NC 12	72.70	61	116	90.60	0.9060
67	NC 13	166.02	78	144	84.69	0.8469
68	NC 14	24.00	78	149	91.02	0.9102
69	NC 15	27.60	39	74	89.32	0.8932
70	NC 16	16.90	104	183	76.11	0.7611
71	NC 17	52.00	130	222	70.63	0.7063
72	NC 18	30.00	130	218	67.05	0.6705
73	NC 18	75.00	209	278	33.33	0.3333
74	NE 1	5.20	65	123	89.11	0.8911
75	NE 2	52.00	78	140	80.09	0.8009
76	NE 3	32.20	174	302	73.49	0.7349
77	NE 4	46.00	182	313	71.80	0.7180
78	NE 5	0.82	78	138	76.98	0.7698
79	NE 6	51.00	174	310	78.02	0.7802
80	NE 7	21.00	78	144	84.57	0.8457
81	NE 8	33.49	65	123	89.90	0.8990
82	NE 9	25.00	78	147	87.49	0.8749
83	NE 10	30.00	104	190	81.83	0.8183
84	NE 11	25.50	130	217	66.72	0.6672
85	NE 12	337.00	126	229	81.46	0.8146
86	NE 13	105.60	34	64	85.84	0.8584
87	NE 14	3.675	107	175	62.77	0.6277
88	NE 15	83.01	148	269	82.19	0.8219
89	NE 16	0.50	107	180	68.64	0.6864
90	NE 17	30.00	104	193	85.37	0.8537
91	NW 1	55.44	139	235	69.27	0.6927
92	NW 2	6.60	52	97	86.23	0.8623
93	NW 3	338.47	52	100	92.16	0.9216
94	NW 4	470.32	236	370	56.85	0.5685
95	NW 5	18.70	404	629	55.56	0.5556
96	NW 6	46.00	156	255	62.87	0.6287
97	NW 7	59.50	209	334	60.02	0.6002
98	NW 8	7.00	279	469	68.33	0.6833
99	NW 9	10.00	330	539	63.22	0.6322
100	N-W 10	49.00	182	294	60.97	0.6097

101	NW 11	49.00	287	465	61.85	0.6185
102	NW 12	10.50	209	325	55.71	0.5571
103	NW 13	17.00	209	337	61.63	0.6163

Data Partitioning and Model Performance Criteria

Outliers were removed prior to data partitioning to ensure model stability; hence, 102 projects were utilised as dependent variables for the study. In line with previous similar studies Oboirien (2019), the data were partitioned into 80:20 ratios for training and testing, respectively. This led to 82 projects (training datasets) and 20 projects (test datasets) used for the MLR and ANN model developments; the selection was randomly conducted. The mean absolute percentage error (MAPE), mean square error (MSE) and root mean square error (RMSE) were used to evaluate the model's accuracy (both ANN and MLR models) by comparing the training output and the validation output (Glymis et al., 2017). The model(s) with the lowest error value is considered to be more accurate.

Multiple Linear Regression (MLR)

The MLR model development based on Equation 3 (regression equation), as presented below, was aided by the SPSS software package. Schedule critical time risk factors and highway project historical data derived from Tables 2 and 3 were used as the independent and dependent variables, respectively, for the development of the model.

$$Y = \alpha + \beta_1 XT_1 + \beta_2 XT_2 + \beta_3 XT_3 + \dots + \beta_n XT_n \quad (3)$$

Where: Y = Dependent variable; α = Regression constant; $\beta_1, \beta_2, \dots, \beta_n$ = Regression estimates; $XT_1, XT_2, XT_3 \dots XT_n$ = Independent variables.

Artificial Neural Network (ANN)

For solving non-linear relationship issues, artificial neural networks (ANNs) are a useful predictive tool (Datt, 2012). ANN's ability to learn from examples and the generalisation of the information learned to new instances is one of its key features (Glymis et al., 2017; Jasim et al., 2020). The steps in ANN modelling are network architecture determination, learning, network training, and network testing. The nature of the problem, the properties and complexity of the data, and the quantity of samples influence the neural network architecture selection. Before an appropriate ANN architecture is achieved, it is typical to conduct a number of trials. Determining the architecture of an ANN is not a straightforward process. According to Hegazy et al. (1994), to determine a stable ANN architecture, the number of hidden nodes should be estimated as half of the total input and output nodes; this served as a guide for determining a suitable ANN architecture for this study.

Results and Discussion

Critical Schedule Risk Factors

As previously shown in Table 2, seventeen critical schedule risk factors were established based on the 80:20 Pareto rule. Both payment delays by clients and the non-availability of spare parts for construction equipment have high RIIs of 4.53 and 4.52, suggesting that they are major

schedule risk factors. Most contractors halt work on the construction site when delays in payments are prolonged, which affects the project timeline. Highway building operations require a large input of machinery and equipment, which are very expensive to hire or procure. Additionally, because replacement parts for equipment are imported, delays frequently arise from the difficulties in locating and ordering spare parts. Other risk factors have high RII values within the range of RII 4.50 to RII 4.00 (see Table 2).

Multiple Linear Regression (MLR)

The developed MLR schedule model retained 10 critical risks as independent variables, while seven critical risk factors were eliminated indicating a significant level of correlation among the variables. The outcome of the analysis, as shown in Table 4 below, indicates that values of VIF are high; low tolerance values indicate a high degree of multicollinearity among the variables, in addition, only 9.4% of the risk factors for time overruns are defined through the ten selected variables. The MLR models and their coefficients are presented in Table 6, while Equation 4 represents the MLR model equation when the variables are replaced in Equation 3:

$$Yt = 0.581 + 0.071XT_1 + 0.137XT_2 + 0.035XT_3 - 0.045XT_4 - 0.016XT_5 - 0.012XT_6 - 0.115XT_7 + 0.033XT_8 - 0.059XT_9 + 0.042XT_{10} \quad (4)$$

Where Yt = forecast time overrun (dependent variables); $XT_1, XT_2, XT_3 \dots XT_{10}$ = critical risk (independent variables).

Table 4: MLR Model Development Output

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95.0% CI of B		Collinearity Statistics	
	B	Std. Error				Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	.581	.674		-.863	.391	-1.924	.761		
Delay in payment by client (XT ₁)	.071	.176	.274	.407	.685	-.279	.421	.028	35.476
Forced selection of inexperienced contractor (XT ₂)	.137	.145	.359	.946	.347	-.152	.427	.088	11.301
Change in design (XT ₃)	.035	.090	.285	.392	.696	-.145	.215	.024	41.250
Complexity in Project design (XT ₄)	-.045	.089	-.176	-.503	.617	-.222	.133	.104	9.583
Incomprehension of the requirements of the owner by the design team (XT ₅)	-.012	.063	-.162	-.250	.803	-.141	.110	.030	33.104
Failure of major construction equipment (XT ₆)	-.016	.089	-.072	-.137	.891	-.190	.165	.046	21.642
Non-availability of spare parts for construction equipment (XT ₇)	.115	.090	.442	1.276	.206	-.065	.295	.106	9.390
Unavailability of special equipment (XT ₈)	.033	.108	.230	.306	.761	-.183	.249	.023	44.413

Change in government/political changes (XT9)	.059	.119	-.366	.498	.620	-.296	.177	.024	42.381
Lack of legal regulatory framework (XT10)	.042	.074	.235	.563	.575	-.106	.189	.073	13.673

Validation of MLR Model

The test dataset of 20 projects was fed into Equation 4, which was initially used to develop the model, and the predicted duration was computed and compared to the actual or observed duration (see Table 7). The results of the MLR model validation, as illustrated in Table 5 below, indicate that the predictive values are expected not to deviate beyond or below 15.00% of the actual values. However, the R² of the developed model (training) is 0.094, implying that only 9.40% of the dependent variables can be explained by the independent variable. This buttressed the inability of MLR models to precisely pattern the relationships between the variables (dependent and independent variables).

Table 5: Model Performance

Model	Partitions	R ²	MSE	MAE	RMSE
Duration (Yt)	Train	0.094(9.4%)	0.015	0.109	0.124
	Validate	0.280(28.0%)	0.033	0.150	0.182

ANN Model Development

After numerous attempts, an appropriate ANN model was created (see Table 6). Two hidden layers with nine nodes (17-6-3-1) make up the network with the least amount of error (see Figure 1). 17 inputs and 1 output function, denoted by Yt, are included in the estimate, with TR serving as the independent variable and Yt as the dependent variable. There were 20 test datasets and 82 training datasets produced. The model was constructed using a feed-forward neural network of two hidden layers, each consisting of nine nodes, as presented in Table 6. Equation 5 illustrates the mathematical presentation upon which the model is built.

```
Build the Neural model. NeuralModel3neuralnet(YtTR1 + TR37 + TR42
+ TR36 + TR39 + TR18 + TR53 + TR43 + TR9 + TR35
+ TR56 + TR61 + TR12 + TR33 + TR66 + TR63
+ TR11, data = train, hidden = c(6,3), err.fct
= "sse, threshold = 0.05, linear.output
= T) plot(NeuralModel3, rep = "best")
```

(5)

Table 6: Determining Suitable ANN Architecture Through Trials-Sensitivity Analysis

Models	Model Architecture	Partition	R ²	MSE	MAPE	RMSE
1	17-10-5-1	Training	0.49	0.01693	11.424	0.13011
		Validation	2.00	0.02271	12.221	0.15070
2	17-8-4-1	Training	2.41	0.01660	11.432	0.12883
		Validation	1.20	0.02312	12.158	0.15205
3	17-6-3-1	Training	0.21	0.01700	11.429	0.13038
		Validation	13.18	0.02207	12.065	0.14855
4	17-5-2-1	Training	2.10	0.01665	11.375	0.12901
		Validation	4.70	0.02361	12.731	0.15365

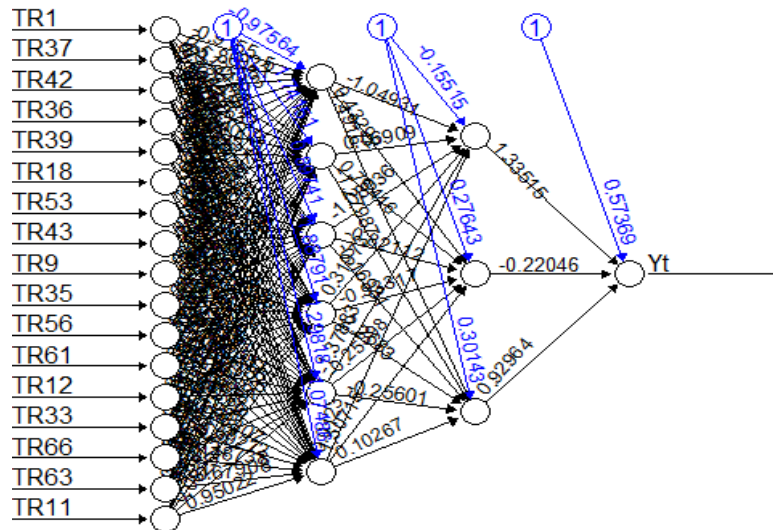


Figure 1: Most Suitable ANN Model Architecture

ANN Model Validation

In research, the validation of a developed ANN is typically done by comparing the outcomes to actual performance, with test performance being recorded. One of the most important phases in the construction of a model, according to Dysert (2001), is the verification of the validity and precision of the model. The datasets utilised for the model's training and validation should be different. Outputs are treated as the model, which may later be expanded and abstracted for usage upon the attainment of model stability, and the output data is then established. Twenty out of the one hundred and two projects in Table 2 were used for the model validation. The actual or observed duration of the validation dataset was then predicted using the ANN model. To assess the network's performance, the estimated percentage error (Equation 4) was then compared (see Table 7).

ANN and MLR Model Validation Results Compared

The results in Table 7 and Figure 2 show that the ANN model has better prediction accuracy than the MLR model. The prediction values are more closely related to the observed values when compared with the MLR model. Furthermore, only four points out of twenty deviated from the observed data pattern; thus, the output of the ANN model closely resembles the observed data. The inadequate relationship mapping expressed in the MLR model graph shows the presence of a non-linear or unknown relationship between the dependent and independent variables.

$$Pe = \frac{(apt - ppt)}{apt} \times 100 \quad (6)$$

Where Pe = percentage error; apt = actual project time; ppt = predicted project time.

Table 7: Comparison of Actual, MLR (Predicted) and ANN (Predicted) Schedule Overruns

Test S/N	data (see Table 2)	Actual schedule overrun/Test dataset	MLR-Predicted	MLR-Percentage Error (%)	ANN-Predicted	ANN-Percentage Error (%)
1		0.6039	0.8898	-47.3477	0.6458	-6.9306
4		0.6190	0.7616	-23.0341	0.6217	-0.4299
6		0.5409	0.7876	-45.6166	0.7058	-30.4790
9		0.6542	0.6911	-5.6405	0.6633	-1.3976
10		0.6377	0.7876	-23.5126	0.6358	0.3050
18		0.6721	0.7746	-15.2564	0.7008	-4.2645
29		0.7290	0.7746	-6.2604	0.7257	0.4527
45		0.8823	0.7616	13.6823	0.7958	9.8083
53		0.9652	0.7275	24.6283	0.7458	22.7351
60		0.8445	0.7746	8.2726	0.7997	5.3107
69		0.8932	0.6514	27.0708	0.8622	3.4680
70		0.7611	0.7026	7.6898	0.7588	0.3043
73		0.3333	0.7876	-136.3156	0.7457	-123.7456
77		0.7180	0.7876	-9.6992	0.7272	-1.2780
78		0.7698	0.7616	1.0677	0.7568	1.6938
82		0.8749	0.6868	21.4958	0.8755	-0.0736
83		0.8183	0.7026	14.1424	0.8003	2.2026
86		0.8584	0.6868	19.9868	0.8556	0.3299
90		0.8537	0.7616	10.7906	0.8558	-0.2414
97		0.6002	0.7616	-26.8879	0.6248	-4.0921

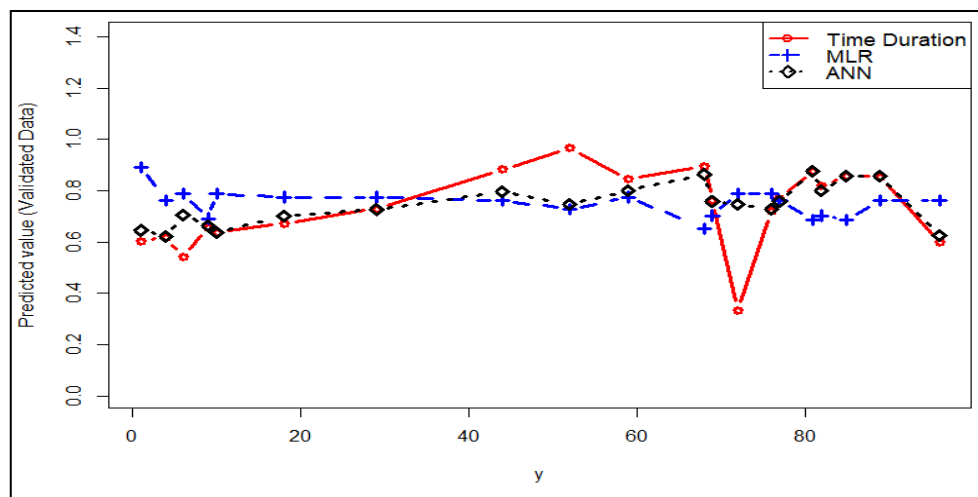


Figure 2: Graphical Comparison of Actual, MLR (Predicted), and ANN (Predicted) Schedule Overruns

Results and Discussion

As previously shown in Table 2, seventeen critical schedule risk factors were established based on the aim of this study is to create a precise predictive model for estimating highway project duration, which will allow for the estimation of future project schedules based on schedule risk

variables. This study offered a mathematical method for predicting the actual-to-planned schedule ratio, which will help clients, consultants, and contractors make judgments about how best to plan future highway projects. It provides a valuable tool for consultants and project managers to enable them to comprehend the impact of multiple risk configurations on highway projects. The model has the potential to improve decision-making in project management. Likewise, highway contractors will find the model useful in determining the duration to insert in their bid, given a set risk parameter. The following conclusion was drawn for the study:

The result of this study has further clarified the superiority of the ANN model over the MLR forecast model. The findings of this study will guide researchers in exploring the application of ANN in highway projects. The study identified major causes of highway projects to include delays in payment by clients, shortages of spare parts, and shortages of equipment. This is due to the high reliance of highway projects on machines. Also, highway projects are capital-intensive and are usually executed with the state's funds. Hence, prompt payment for work properly executed is paramount for the timely completion of projects. These findings should spur policymakers to delegitimise indebtedness to highway contractors, which will in turn encourage them to invest in construction equipment.

MLR and ANN were the two techniques utilised to create the duration prediction estimation models for future highway construction. A total of 102 datasets, divided in a ratio of 80/20 between training and test datasets, were used to create the models. Seven independent variables were eliminated from the developed mathematical equations of the MLR model, suggesting that all seventeen variables were not very dependable due to their significant correlation. However, the ten factors that are chosen only explain 9.4% of the variation in time overrun (i.e., $R^2 = 0.094$). The ANN model retained all seventeen independent variables, thereby demonstrating its capacity to resolve intricate, non-linear issues. Furthermore, the model's mean absolute error (MAE) is 0.1207, meaning that its accuracy is 87.93% (or 100% -12.07%). This finding shows that a good predictive models have good predictive abilities, as the MAPE does not exceed 20% (Lewis 1982). The validation result indicates the accuracy of the ANN model in predicting the actual duration of Nigeria's future federal highway construction projects.

Future studies could explore more risk factors and gather data from different types of highway projects. Also, the effect of external factors such as weather conditions on the accurate prediction of highway project schedules could be investigated. Moreover, highway experts should be involved in developing an ANN predictive model to enhance its performance and real-world application.

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EXPLORING THE INTERSECTION OF IMMERSIVE VR/AR TECHNOLOGIES AND CULTURAL IDENTITY IN CHINESE VARIETY SHOWS

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Abstract: *This study explores how VR/AR immersive variety shows contribute to the construction of audience cultural identity through the lens of cultural identity theory. Specifically, it investigates how the key features of immersive media—embodiment, interactivity, and cultural symbolism—facilitate the identity-forming process. Employing a qualitative multi-case study approach, this research combines semi-structured interviews (with producers, performers, and viewers), participant observation, content analysis of program materials, and examination of audience discussions on social media platforms. Three representative cases are selected for analysis: VR headset-based formats, mobile AR formats, and live hybrid formats. This comparative design enables both cross-case insights and theoretical development. Preliminary expectations suggest that audiences form stronger emotional connections with content rich in cultural elements. Embodied experiences enhance memory of cultural symbols, while the viewing context and audience composition jointly shape meaning-making processes. The study aims to contribute to media identity theory and offer practical implications for content design and audience engagement strategies in the rapidly evolving XR environment.*

Keywords: *VR/AR; Immersive Media; Cultural Identity; Cross-Media Storytelling; Presence; Embodiment*

Introduction

Due to the rapid development of Virtual Reality and Augmented Reality, these two kinds of technology are also blending together. Compared with audiences just appreciating the media actively, these two kinds of technology provide more interactive way for audiences to contact with content. These two kinds of technology allow audiences to transcend at the time of appreciating content. For Chinese variety show, these two kinds of technology enable audience to explore the cultural identity more directly. They can experience and create the story by enjoying the better environment with these two kinds of technology. If these two kinds of immersive technology combined with traditional media, it will probably change the way of

displaying and discussing cultural identity in Chinese popular culture.

Cultural identity is generally considered as a dynamic, layered concept which is constantly constructed and transformed through social, historical and cultural processes (Hall, 2015). In the process of studying media, scholars generally agree that media plays a significant role in shaping how people and groups recognize their own cultural roots, communities and selves (Anderson, 2020). Media is both the mirror and the medium for human cultural representation. Through the media, people are constantly exposed to the cultural representations that reflect their own real-life experiences and feelings. Such representations reinforce or challenge people's sense of self and identity. Since the influence of media on public discussion is getting bigger and bigger, it is important for us to explore how the immersive media like VR and AR would influence the formation of cultural identity. It is especially true when these two kinds of technology are used more and more in entertainment field.

For Chinese audience, blending traditional cultural theme with immersive technology opens new opportunity to explore their cultural identity. Specifically, placing cultural symbol, folk story, myth and historical tale into VR/AR field can allow people to explore Chinese culture in a richer way and more immersive way.

Although the previous studies have found out that the immersive media can strengthen the audience's feeling of being emotionally engaged with the content and a feeling of being "there" (Slater & Wilbur, 1997; Lombard & Ditton, 1997), how these two kinds of immersive technology can help to build and discuss the cultural identity in Chinese variety show is still a blank in academic field.

This research aims to bridge this gap. This research investigates how VR/AR immersive variety shows affect the formation and change of Chinese audiences' cultural identity. This study adopts a qualitative multi-case research method. This research method enables scholars to explore the cultural, technological and social factors related to immersive media forms in detail. The three types of immersive variety shows are explored in this study. These three types are variety shows that use headset VR, mobile AR variety shows and live mixed variety shows. These three types of shows display the diversity of immersive technologies and the ways these technologies are used on different media platforms.

The researchers conduct semi-structured interviews with key persons. These persons are producers, performers and viewers. They also do content analysis and say what audiences say on social media and online discussions. Through these processes, it is hoped that scholars can gain some insights into the relationship between immersive media and the formation of cultural identity in Chinese popular culture.

This study refers to the literature of cultural identity (Hall, 2015), cultural signaling (Anderson, 2020) and presence embodiment (Kilteni et al., 2012; Slater, 1997). This study uses these literatures to analyze how immersive technologies influence how audiences consume cultural content. By studying how VR/AR technologies help people connect better with Chinese cultural heritage, this study will not only enrich academic research on media and identity but also provide practical suggestions to those who create content. These persons want to design immersive experiences that are connected to cultural themes more. As VR and AR technologies are used more and more on China's entertainment platforms, it is becoming more and more

important to understand how these technologies shape and redefined cultural identity for both media scholars and professionals.

Literature Review

Cultural Identity and Media Consumption

Most people think of cultural identity as something that never stops happening or being mentioned. That's what Hall (1990) once said. Then people added on to his idea for today's digital situations. Now, people build their identity across various situations in today's digital situations. In these digital situations, people's identity exploration, commitment, and interpretation cycles repeat more often (Soh et al., 2024; Avci et al., 2024). In Chinese and overseas Chinese communities, creators build their identity on social media based on their language styles, local aesthetics, and algorithm visibility. This research shows how creators alternate between displaying cultural differences and similarities to gain recognition in different audiences (Liu, 2024). Other broader studies have discussed how Chinese social media functions as a special kind of space for cultural expression and creativity (Fitzgerald, 2022). With globalization as background, although Anderson's (1983) idea of "imagined communities" still can explain how media can give audiences a sense of belonging, recent researches provide new additions to this old picture. That's because, as mentioned before, the media-driven building of shared culture now often happens in mixed online-offline spaces and mixed-reality experiences. In these kind of experiences, audiences participate in meaning making with media's help through its interactive features and social chat channels (Van Laer et al., 2019; Soh et al., 2024). In short, media does not simply show culture to audiences. Media also gives audiences opportunities to participate in culture building through systems that shape attention, feelings, and interpretation. And immersive formats (VR/AR) can make all these conditions even stronger (Liu, 2024; Van Laer et al., 2019).

Immersive Technologies and Audience Engagement

Presence and embodiment are key to explaining why immersive media can boost engagement. Today's models all focus on two main features: presence and agency. Immersive virtual reality (IVR) uses these two features to affect how people feel and think, which leads to different results (Makransky & Petersen, 2021; Petersen et al., 2022). Over the past few years, meta-reviews and scoping reviews have pulled together ways to measure presence and its limits. They tell the difference between "place illusion" and "plausibility". They also explain when sensory accuracy and interactivity matter. And they list tested tools for measurement (Souza et al., 2021; Bareišytė et al., 2024; Slater, 2022). Studies on embodiment show that avatars can let people "own" and control a virtual body. This can change people's attitudes and sense of identification. The techniques to measure and adjust this are getting more mature (Gonzalez-Franco & Peck, 2018; Peck et al., 2021; Jung et al., 2021). At the same time, reviews and program-based studies stress that presence and agency are not goals themselves. They are middle steps that connect design choices (like immersion, control and representational accuracy) to other factors. These factors include interest, motivation, self-confidence, mental workload and self-control. They are the key parts of the Cognitive Affective Model of Immersive Learning (CAMIL; Makransky & Petersen, 2021; Petersen et al., 2022). Beyond single-person immersion, recent studies point out that social interaction is a main reason people use VR. Social presence, rules for being together in virtual spaces and non-

verbal signals help explain why people see virtual meetings as important for themselves and their groups (Han & Bailenson, 2024; Son et al., 2025).

Overall, this research sees immersive design features as variables that people can adjust. These variables shape how strong and good audience engagement is. They also provide clear links to questions about how people make sense of culture.

Cultural Signaling and Identity Construction

In media studies, cultural signaling encompasses the encoding and decoding of symbols, rituals, language and memory that create belonging (Hall, 2015). Over the last 8 years, there has been a boom in the use of XR applications for cultural heritage and museums. This body of work provides robust support for the hypothesis that augmented and virtual reality can scaffold learning, perceptions of authenticity and affective engagement with heritage content (Boboc et al., 2022; De Paolis et al., 2022; Ramtohul et al., 2024). Systematic reviews and domain syntheses report that AR/VR enhance display richness and supports narrative and gamified engagement, and can increase perceptions of authenticity and emotional engagement - outcomes that plausibly mediate identity outcomes (Wang, 2022; Boboc et al., 2022; Lin et al., 2025). Empirical work in a Chinese museum context shows increasing adoption and continuance intention for AR guidance and interaction; presence, aesthetics authenticity and interactivity influence satisfaction and reuse for heritage digitisation; empirical work in China shows that presence, aesthetics authenticity and interactivity influence satisfaction and reuse (He et al., 2025; Xu et al., 2025; Zhang et al., 2025). Heritage Science contributions such as Dunhuang fresco colour reconstruction as a VR serious game illustrate how carefully designed XR pipelines can orchestrate situated, emotion laden encounters with tangible cultural artefacts (Heritage Science, 2024), while broader decadal reviews of Chinese museum digitisation illustrate how XR is part of longer term changes to curation, access and public engagement (Chunlan et al., 2025). Complementary work on emotional design and ICH argues that gamification and affective cues are poor levers for enhancing long term engagement and cultural confidence (Lin et al., 2025; Qiu et al., 2024). Taken together the body of recent work reviewed here suggests that XR do not simply display symbols, but choreograph embodied participation in cultural experiences that can make cultural rituals and narratives experientially vivid - it is in these circumstances that identity work is most likely to take place (Boboc et al., 2022; Lin et al., 2025; Zhang et al., 2025). The role of VR/AR in shaping cultural identity.

The Role of VR/AR in Cultural Identity Formation

Immersive formats can speed up identity-forming processes in three ways:

- (a) making narrative transportation stronger;
- (b) letting people take part in environments full of symbols through their virtual bodies;
- (c) helping people share interpretations through connected, co-present audiences.

Narrative transportation is a robust link between story engagement and attitudinal and identity-relevant outcomes (Van Laer et al., 2019), and immersive displays may enhance transportation by offering greater vividness, interactivity, and opportunities for perspective-taking (Makransky & Petersen, 2021; Petersen et al., 2022). Social VR research charts how avatar embodiment, customization mode, and first-person control shift identification and bias, and

how multi-user norms and self-expansion dynamics among users in platforms like VRChat transfer to self-esteem and life satisfaction—effects that are directly relevant to identity formation (Jung et al., 2021; Yang et al., 2024; Son et al., 2025). For cultural belonging, museum and heritage XR studies in China find that AR/VR boost presence and authenticity judgments, and engage audiences who judge the experiences as more participatory, all of which downstream influence their cultural dissemination behaviors (He et al., 2025; Xu et al., 2025; Anwar et al., 2025). In sum, the evidence base suggests that VR/AR may be providing, precisely, the experiential and social conditions under which cultural identity is most likely to be activated and reinforced—through the attention and affect facilitated by presence, through the personal relevance enabled by embodiment, and through social affordances that help coordinate interpretation and recognition (Han & Bailenson, 2024; Lin & Latoschik, 2022; Zhang et al., 2025).

Research gaps

More and more studies are focusing on how immersive technologies (such as VR and AR) are connected with cultural identity. However, there are still large gaps in these studies, especially in Chinese mass media.

Most of the current studies focus on how immersive mass media influence people's feeling and thinking. They concentrate on education use and entertainment (Makransky & Petersen, 2021; Van Laer et al., 2019). Very few studies focus on how these immersive experiences influence people's cultural identity. It is even more rare when it comes to the special stories and themes of Chinese culture. Very few studies focus on how immersive technologies change how cultural heritage is shown and how they make people feel like they belong in non-Western places (such as China). Most of the related studies were conducted in Western countries or they combined all cultures together, without distinguishing them (such as how immersive technologies make people feel like they belong and how local Chinese cultural symbols and practices were used and felt in VR/AR) (Anwar et al., 2025; Zhang et al., 2025). What's more, people are more and more interested in how VR/AR help with cultural signaling and building identity. However, researchers haven't talked about how VR/AR interact with the changing nature of Chinese identity.

Very few studies focus on real-time interactive participation through immersive media formats (such as VR headset experiences, mobile AR mini-series). These formats provide new ways for people to build their identity, both as a whole group and as an individual. However, how this is achieved through embodiment, presence, and social interaction in digital space is still a gap in research (Soh et al., 2024; Son et al., 2025). Finally, most of the current research focuses on how the VR/AR experience influence people's emotion and psychology in separate, single settings. Very few studies focus on how these media work in different situations, such as mixed live and virtual environment. It is important to know how these formats (especially the formats that mixed the expression of traditional culture and advanced VR/AR technology) influence how Chinese viewers feel about their heritage and how they feel about belonging to their culture. This knowledge will influence the future of cultural media in China (Han & Bailenson, 2024; Lin & Latoschik, 2022).

So this study will focus on how these immersive media formats (VR headset experience, mobile

AR mini-series, live hybrid event) help Chinese audience build and discuss their cultural identity.

Research Questions

RQ1: How do VR/AR immersive variety shows incorporate Chinese cultural elements, and how do viewers interpret these elements?

This question explores how cultural symbols, rituals, and language are embedded in the shows and how viewers interpret them within their social and cultural contexts.

RQ2: Which immersive design features (e.g., presence, embodiment, interactivity) most influence viewers' sense of cultural belonging?

This question examines how specific immersive features enhance viewers' emotional connection to the content and contribute to their cultural identity.

RQ3: How do audience demographics and prior cultural exposure affect the relationship between immersion and cultural identity?

This question investigates how individual differences and cultural background influence the impact of immersive experiences on cultural identity formation.

Methodology

This study uses qualitative multi-case study research method. The research question is: How do immersive VR/AR variety shows help Chinese audiences build their cultural identity?

Fast track of development of immersive media technologies (e.g., VR and AR) in China's entertainment industry provides us a unique opportunity to explore how these immersive media technologies are utilized to construct Chinese audiences' cultural identity.

This study discusses three kinds of immersiveness: VR headset shows, mobile AR format, and live hybrid events. This study provides a detailed exploration of how these three kinds of immersiveness help audiences to establish a connection with cultural stories. And this study bridges the gap between viewers and traditional and modern cultural expressions. The methodology of this study has three parts: case selection, data collection methods, and data analysis methods.

Case Selection

We chose three representative cases. We did this to cover the diversity of immersive media formats and production sizes in China's entertainment industry. These cases let us take a thorough look at how VR and AR technologies are used in different types of variety shows. They also let us see how the technologies are applied on different media platforms and with different ways to get audiences involved. The selected cases are as follows:

Case A: VR Headset-Based Immersive Variety Show on a Popular Streaming Platform

Example: *2024 Chinese Poetry Conference*

This well-known cultural show integrates AI and XR. This experience named "Dunhuang Spring" brings the famous Dunhuang frescoes to life digitally. Viewers enter an environment where the history of ancient Chinese art is brought to life. The past merges with the present. This immersive experience revives Chinese cultural heritage. It engages viewers in interacting with culture in ways that static formats cannot (Boboc et al., 2022; Zhang et al., 2025).

Case B: Mobile AR-Based Variety Mini-Series Designed for Social Media Engagement

Example: *All Members Accelerate 2023*

This reality-style variety show integrates AR, VR, and AI. The show blends real-life locations, story-based narration, and digital space. The show contains AR tasks to complete at the location. The viewers are invited to complete the tasks on the show and social media as well. The viewers participate online and offline to complete the tasks which provide an interactive experience of the real and virtual world. By letting the viewers participate in real time and providing a platform to interact and engage on social media, the interaction and involvement of the audience is strengthened (Son et al. 2025; Anwar et al. 2025).

Case C: Live Hybrid Variety Show Blending On-Stage Performances with Virtual Audience Interaction

Example: *2060*

The hybrid show *2060* uses green screen and VR headset. It is made in virtual technology. In this landscape, there is live performance. This digital landscape is not fixed. In this virtual environment, the live audience can interact with the virtual landscape in real time. It breaks the border between physical and virtual space. The show is filled with futuristic themes. It is also a traditional story. This is a new type of performance. It is advanced in terms of technology. It is also filled with cultural elements (Lin & Latoschik, 2022; Ramtohul et al., 2024). We picked these cases. This shows how different type of format use immersive technology. We also wanted to see how it help audience to connect with Chinese cultural elements. Our aim is to analyse how these immersive media experiences help to shape our cultural identity. We also want to analyse what audiences think about cultural content.

Data collection

This study is exploratory. So we will use different qualitative data collection methods. We want to get a full understanding of how audiences interact with immersive media content. This way, we can use multiple data sources (called “data triangulation”). It will make our analysis rich and cover different sides. The main data collection methods are as follows:

Semi-structured Interviews

We will do interviews with people. These people make the immersive variety shows or watch them. They are producers, performers and watchers. These interviews will tell us three things: first, why do they want to put immersive technology into the shows; second, how will the cultural things be and how do people interact with them; third, what do they think immersive technologies influence the cultural identity will be. We will interview them because they can help make the content or watch the shows. These interviews will tell us how the technology helps present the cultural heritage; how the technology will influence the identity formation (Jenkins, 2006; Van Laer et al., 2019).

Participant Observation

We will do participant observation. We want to see how audiences behave in live shows and virtual viewing times. This way we can know better how the audiences behave with the immersive parts of the shows. The researcher will observe the following three parts: how do the audiences behave, how do they interact with the interactive parts, how do they feel. The

observation data will be collected in two following situations: people watch in person at live shows (Case C) and people watch in virtual viewing occasions (Cases A and B). This way we can see how the immersive experience makes audiences be connected to cultural content. We can also see how it affects their cultural identity (Liu & Zhang, 2025; Xu et al., 2025).

Content Analysis

We will do a content analysis of the shows. We'll be looking particularly at cultural symbols, themes, and stories in the scripts, pictures, and performance. The analysis will focus on, how we can see and tell cultural heritage through immersive media forms, particularly, things like, how cultural symbols can be visible through VR/AR technologies, and how people will feel in relation to the past, a change, or a break to the past? Understand how the addition of VR, AR, and other immersive technologies affects how culture is shown. Compare this to traditional media forms (Makransky & Petersen, 2021; Zhang et al., 2025).

Audience Discourse Analysis

We are interested in knowing how viewers make sense of and mention cultural content. Thus we will do audience discourse analysis in social media, online forums and viewers' comments. In this way, we can see how viewers share their ideas and how they feel about the show. It will be helpful to know how the content reaches the viewer. For this reason, discourse analysis will be seeking for themes such as cultural identity, how do they feel related to the content and what kind of control viewers have. In addition, we will explore how audiences use the digital medium to share what they think about how culture is represented and immersed (Han & Bailenson, 2024; Anwar et al., 2025).

Data Analysis

We will analyze the data with thematic analysis. Thematic analysis is a common method to find and analyze patterns in qualitative data (Braun & Clarke, 2006). This method will help us find recurring themes related to cultural identity, immersion, and audience engagement.

Specifically, our analysis will focus on the following key themes:

Cultural heritage and its virtual representation: We will look at how traditional Chinese cultural elements are shown via immersive technologies.

Emotional engagement and immersion: We will check how VR/AR technologies make viewers' emotional reactions to cultural content stronger.

Audience agency: We will study how viewers interact with the content. We will also study how this affects their connection to cultural identity (Slater, 2022; Zhang et al., 2025).

Findings and Discussion

In this section, we will watch three immersive variety shows. They are all using Virtual Reality (VR), Augmented Reality (AR) and combined live performance technologies to help Chinese people understand cultural concepts. We would like to investigate how these immersive media technologies can help to reinforce and give new life to Chinese cultural identity? They make cultural heritage more accessible, more engaging, and more interactive (Boboc et al., 2022; Zhang et al., 2025). With the help of these technologies, people have new opportunities to

engage with both traditional and contemporary cultural expressions. These engagements are significant and let people take an active role.

Case A: VR Headset-Based Immersive Variety Show

This case studies a high-budget VR variety show. It is on a popular streaming website. It uses VR technology. It builds an immersive environment. It allows viewers to interact with both virtual world and live-action drama. It enables the audience to enter the virtual world. The virtual world combines traditional Chinese cultural contents with modern tech breakthroughs (Makransky & Petersen, 2021; Van Laer et al., 2019). The show borrows concepts from significant Chinese folk stories, myths and historical figures. It transforms cultural narratives of these stories into digital space. We can find this in how the show puts one of the Four Great Classical Novels (Journey to the West, Water Margin, Romance of the Three Kingdoms, and Dream of the Red Chamber) into VR space. It allows the audience to enter the world and meet the characters. It enables them to fully enjoy these classic stories. In addition, the show emphasizes traditional Chinese festivals. It is about the Spring Festival and Mid-Autumn Festival. It recreates the rituals and the celebration of these festivals in virtual space. This interactive VR experience doesn't allow viewers to just watch. It allows viewers to participate in these activities. It deepens viewers' feelings and minds about their Chinese roots (Slater, 2022; Zhang et al., 2025).

Case B: Mobile AR-Based Variety Mini-Series

This case studies a mobile AR mini-series. It is designed for short form viewing. It is also about encouraging people to interact with it on social media. The series employs AR technology. It embeds digital content into viewers' real-world spaces through their phones to promote real-time interaction. The format is designed to attract young people who are savvy with technology and also heavily use social media. It builds on how a virtual experience can seamlessly fit into people's everyday lives (Anwar et al. 2025).

The series features elements of contemporary Chinese youth culture, local dialects and social media language. It makes it very relevant for today's Chinese audiences. Through interaction with AR, they engage with the city's traditions. These are street culture, food and fashion. Meanwhile they also learn the cultural significance of these traditions.

The series also features different types of Chinese language. It showcases a range of local dialects. This allows audiences to enjoy the diversity of China's language heritage. What is more, the series touches on youth subcultures. It represents the latest trends in fashion, digital media and online communities. By providing these interactive experiences through AR, the series allows younger viewers to take pride in their culture. It enhances their cultural identity. It encourages them to be actively involved and develop an emotional connection with modern Chinese culture (Boboc et al. 2022; Zhang et al. 2025).

Case C: Live Hybrid Event

This case study is about a live hybrid variety show. It incorporates physical audience participation and virtual participation through AR technology. This is a hybrid event that blends

live performances and virtual participation through AR technology. It allows on-site and remote audience members to interact with performers and virtual figures in real time. This new format provides audiences with a new experience of enjoying cultural performance. They can interact with the physical and virtual aspects of the performance (Han & Bailenson, 2024; Son et al., 2025); This live hybrid event incorporates traditional Chinese arts. These include peking opera and martial arts. But it also blends these traditional aspects with a modern performance style. It uses AR technology to enhance these live performances. It adds digital elements to these physical live performances. This creates a new and immersive viewing experience for the audience. Peking opera performance has an added AR visualization. These AR visuals animate costumes, stage setting, and choreography of Peking opera. This makes this ancient art easier to consume and more attractive to young people. Martial arts performance has digital effects added. These effects emphasize the historical and cultural significance of martial arts. They also highlight the physical fitness and athletic qualities of performers. Dance and music, modern expressions of culture are also incorporated into this show. These are put together with traditional Chinese art.

This case shows that in China, the cultural landscape is constantly changing. Old meets new everywhere all the time. Sometimes it is modern vs. traditional. Other times it is different types of traditions (Slater & Wilbur, 1997; Lin & Latoschik, 2022); By allowing the audience to take part in the performance, this live hybrid event enhances audience's emotional connection to traditional and modern Chinese culture. Blending virtual and physical worlds makes the live performance a more immersive experience. It encourages the audience to interact with cultural traditions in a way that is more than just watching (passively). This interactive experience allows them to feel a stronger sense of belonging and connection to their culture. This is a new possibility in how we express and experience culture in the digital age (Makransky & Petersen, 2021; Anwar et al., 2025).

Conclusions

We did this study based on cultural identity theory (Hall, 2015). We did this study based on how immersive VR/AR variety shows like VR Headset Experience, Mobile AR Mini-Series, Live Hybrid Events change the ways we connect with cultural stories. We use XR technologies in variety shows. With those shows, viewers feel more "there". Viewers are no longer only viewers. Viewers become people who take an active part in cultural worlds (XR, Slater & Wilbur, 1997; Boboc et al., 2022). Shows are interactive. Viewers need to finish tasks with different paths and use social chat channels in shows. Those designs make shows more personal. Those designs also make viewers feel more emotionally connected with both traditional cultural stories and city rituals (Makransky & Petersen, 2021; Anwar et al., 2025). The findings could be helpful for content creators. Content creators should match the "world" they build with cultural signs (such as costumes, festivals). This way, viewers get good results when they make choices based on their cultural knowledge.

Institutions could help us reach more people. They could help by making the content easy to get and true to its cultural originators. For people who make rules and give money: it's important to support XR systems that work together. It's important to make ethical rules to protect people's data. This could help encourage new ideas while also protecting the public (Son et al., 2025; Han & Bailenson, 2024). This study just looked at some cases. But we hope

future research could use long-term and comparative methods. They could follow how identity would develop on different platforms. We could use both qualitative and quantitative methods to help we understand better. We could connect what people say and what they do (Anwar et al., 2025). Overall, immersive VR/AR variety shows are an important combination of technology and cultural signaling. They give us frameworks that we could use broadly. They give us frameworks that we could use to make media that is not only entertaining, but also that helps build a strong cultural identity (Zhang et al., 2025; Anwar et al., 2025). These formats make our traditional cultural experiences better and different. They give viewers the power to connect with their cultural heritage in the digital age.

Acknowledgments

The authors would like to thank the reviewers for providing comments in helping this manuscript to completion.

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THE MODERATING ROLE OF EMOTIONAL VALUE IN THE RELATIONSHIP BETWEEN SOCIAL MOTIVATION AND SATISFACTION: AN EMPIRICAL STUDY OF CHINESE AUDIENCES OF DATING REALITY SHOWS

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Abstract: With the rise of dating reality shows in the Chinese media market, exploring the psychological mechanisms of their audiences is crucial to understanding the reasons for their success. Grounded in the Uses and Gratifications Theory (UGT), this study aims to investigate the relationships between social motivation, emotional value, and audience satisfaction, with a specific focus on testing the moderating role of emotional value. A questionnaire survey was administered to 591 Chinese audiences of dating reality shows, and the data were analyzed using hierarchical regression analysis. The results indicate that: (1) viewers' social motivation (e.g., discussing with others, gaining conversation topics) has a significant positive impact on their satisfaction; (2) emotional value (e.g., emotional resonance, pleasure) has a significant positive impact on satisfaction; and (3) emotional value positively moderates the relationship between social motivation and satisfaction. That is, for audiences with high emotional value, the positive impact of social motivation on satisfaction is stronger. This study reveals the critical "amplifier" role of emotional experience in translating viewing motivation into final satisfaction, providing important theoretical and practical implications for program producers and streaming platforms in content creation and marketing strategies.

Keywords: *Dating Reality Shows; Social Motivation; Emotional Value; Audience Satisfaction; Moderating Role*

Introduction

Dating reality shows have achieved phenomenal success in the Chinese media market in recent years, with a series of popular programs such as *Heart's Signal*, *Elderly Romance*, and *I Am Also In Love With You*. These shows have not only generated high viewership ratings and online discussions but have also become a notable socio-cultural phenomenon. Against this backdrop, investigating the intrinsic psychological mechanisms that drive Chinese audiences to watch, engage with, and derive satisfaction from such programs holds significant academic and practical value.

Existing research, often based on the Uses and Gratifications Theory (UGT), has explored various motivations for watching variety shows, such as entertainment, social interaction, and information seeking, and has verified the direct impact of these motivations on satisfaction or continuance intention. However, a key question that remains insufficiently answered is: Why do audiences with similar social motivations exhibit significant differences in their ultimate

levels of satisfaction? This suggests that there may be a key conversion mechanism between "motivation" and "satisfaction."

This study proposes that emotional value is precisely this key mechanism. The emotional resonance, sense of involvement, pleasure, and empathy experienced by viewers during watching may significantly enhance the satisfaction they derive from social interactions. In other words, deep emotional investment can amplify the positive effects of social motivation. Therefore, this study constructs a moderated theoretical model, targeting Chinese audiences of dating reality shows, to empirically examine: (1) the direct effect of social motivation on satisfaction; (2) the direct effect of emotional value on satisfaction; and (3) the moderating role of emotional value in the relationship between social motivation and satisfaction. The findings will deepen our understanding of media consumption psychology and provide precise guidance for industry practices.

Literature Review and Hypothesis Development

Social Motivation and Audience Satisfaction

The Uses and Gratifications Theory views audiences as active media users whose consumption behaviors aim to fulfill specific social and psychological needs. Social motivation is a key driver for audiences watching reality shows. It refers to viewers using the program to facilitate social interaction, such as gaining common topics for conversation with friends, family, or colleagues, participating in online community discussions, and perceiving a sense of group belonging. Prior research indicates that programs capable of providing rich social topics and interaction opportunities better satisfy audiences' social needs, thereby enhancing their viewing satisfaction. Based on this, we hypothesize:

H1: Social motivation has a significant positive impact on the satisfaction of dating reality show audiences.

Emotional Value and Audience Satisfaction

Emotional value originates from the field of consumer behavior, referring to the feelings and affective states consumers derive from a product or service. In the context of media consumption, emotional value denotes the emotional benefits viewers experience during watching, such as pleasure, relaxation, excitement, resonance, and a sense of involvement. Dating reality shows, through carefully crafted narratives, character relationships, and emotional conflicts, aim to evoke strong emotional responses from viewers. When viewers feel excitement over a couple's ("CP") sweet interactions or empathize with a guest's situation, they obtain high emotional value. This positive emotional experience is itself a significant source of satisfaction. Therefore, we hypothesize:

H2: Emotional value has a significant positive impact on the satisfaction of dating reality show audiences.

The Moderating Role of Emotional Value

This study further argues that emotional value is not merely a direct antecedent but also plays the role of a moderator in the relationship between social motivation and satisfaction. The

theoretical logic is as follows: When audiences derive high emotional value from a program (e.g., deep investment in a particular guest relationship, experiencing strong emotional resonance), their viewing experience transcends simple information acquisition or superficial socializing.

This profound emotional investment amplifies the effect of social motivation in two ways: First, it *enhances the desire and depth of social sharing*. Viewers with high emotional value are not only more willing to discuss the show but their discussions are more passionate and in-depth, moving from "what happened" to "how it felt." Second, it *improves the quality of social interaction*. Communication based on strong emotions is more likely to elicit mutual understanding and establish deeper social connections, thereby yielding social gratification far beyond superficial chatter. Thus, emotional value provides more fertile "emotional ground" for the realization of social motivation. Based on this reasoning, we hypothesize:

H3: Emotional value positively moderates the relationship between social motivation and audience satisfaction. That is, the higher the audience's emotional value, the stronger the positive impact of social motivation on satisfaction.

Research Methods

Data Collection and Sample

This study employed an online questionnaire survey, collecting data via the Credamo platform within mainland China. Respondents were screened based on having watched any Chinese dating reality show in the past three months. A total of **591** valid questionnaires were collected. The sample composition was as follows: 56.8% female, 43.2% male; age was primarily concentrated between 18-35 years old (87.2%); education level was predominantly undergraduate degree or higher (78.1%). The demographic characteristics of the sample generally align with the primary audience of dating reality shows.

Measures

All constructs were measured using 7-point Likert scales (1="Strongly Disagree", 7="Strongly Agree").

Social Motivation: Adapted from Rubin et al.'s scale, comprising 4 items (e.g., "I watch dating reality shows to have common topics with friends").

Emotional Value: Adapted from the emotional value dimension of Sweeney & Soutar's PERVAL scale, comprising 4 items (e.g., "Watching this show makes me feel happy," "I resonate with the experiences of the guests on the show").

Audience Satisfaction: Adapted from Oliver's satisfaction scale, comprising 3 items (e.g., "Overall, I am very satisfied with watching this program").

Data Analysis

Data were analyzed using SPSS 26.0 and the Process macro. Reliability and validity analyses were first conducted to ensure scale quality. Hierarchical regression analysis was then employed to test the main and moderating effects. Prior to analysis, both the social motivation and emotional value variables were mean-centered, and their interaction term was created to test the moderating effect (H3).

Results

Reliability and Validity

Confirmatory Factor Analysis indicated a good fit for the measurement model ($\chi^2/df = 2.58$, CFI = 0.98, TLI = 0.97, RMSEA = 0.052). All item factor loadings were greater than 0.7, and the Composite Reliability (CR) for all constructs exceeded 0.86, with Average Variance Extracted (AVE) values all above 0.68, demonstrating excellent reliability and convergent validity.

Hypothesis Testing

The results of the hierarchical regression analysis are presented in Table 1. Model 1 included control variables and the independent variable (Social Motivation). Model 2 added the moderator (Emotional Value). Model 3 added the interaction term (Social Motivation $\times$ Emotional Value).

Table 1: Hierarchical Regression Analysis Results (Dependent Variable: Satisfaction; N=591)

Variable	Model 1	Model 2	Model 3
Social Motivation	0.36***	0.23***	0.22***
Emotional Value		0.47***	0.46***
Interaction Term			0.13**
R ²	0.130	0.338	0.354
ΔR^2		0.208	0.016

Note: *p < .05, **p < .01, ***p < .001

The analysis results show:

Social motivation had a significant positive impact on satisfaction (Model 1, $\beta = 0.36$, $p < 0.001$). **Thus, H1 is supported.**

Emotional value had a significant positive impact on satisfaction (Model 2, $\beta = 0.47$, $p < 0.001$). **Thus, H2 is supported.**

The interaction term had a significant positive impact on satisfaction (Model 3, $\beta = 0.13$, $p < 0.01$), and the ΔR^2 was significant, indicating that **H3 is supported.**

To illustrate the moderating effect more intuitively, a simple slope plot was generated (Figure 1). Simple slope analysis showed that for audiences with high emotional value (mean +1 SD), the positive impact of social motivation on satisfaction ($\beta_{\text{simple}} = 0.35$, $p < 0.001$) was stronger than for those with low emotional value (mean -1 SD) ($\beta_{\text{simple}} = 0.09$, $p < 0.05$). This confirms the positive moderating role of emotional value.

The moderating effect of Emotional Value on the relationship between Social Need and Satisfaction

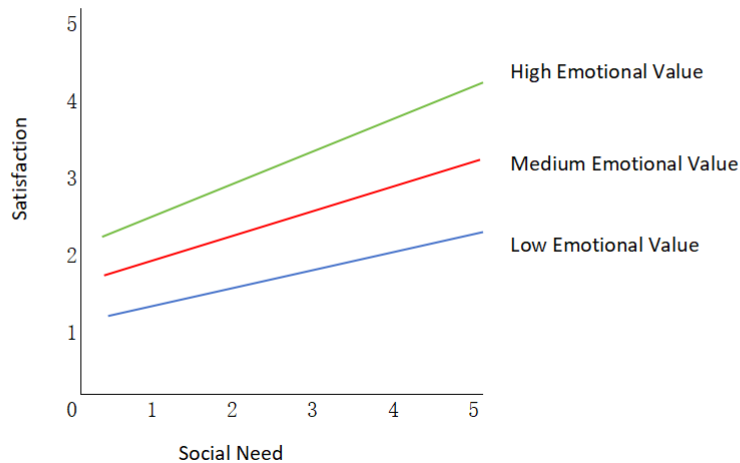


Figure 1: The Moderating Role of Emotional Value in the Link between Social Motivation and Satisfaction

Discussion and Conclusion

Key Findings

This study, based on a sample of 591 Chinese dating reality show audiences, empirically examined the critical role of emotional value in the relationship between social motivation and satisfaction. The results confirm that both social motivation and emotional value are direct drivers of audience satisfaction. More importantly, this study reveals the "effect amplifier" role of emotional value: when audiences develop strong emotional resonance and investment in the program content, the satisfaction they derive from social discussion and interaction is significantly enhanced. The larger sample size enhances the stability and reliability of our findings.

Theoretical Contributions

The main theoretical contributions of this study are threefold: First, it systematically introduces the concept of "emotional value" from consumer behavior into the UGT research framework, enriching our understanding of the formation mechanism of satisfaction. Second, by verifying the moderating role of emotional value, it moves beyond traditional direct-effect models, revealing the internal boundary conditions of how "motivation" is translated into "satisfaction" through the key situational factor of "emotional experience," thereby deepening the UGT.

Practical Implications

For producers and broadcasters of dating reality shows, this study offers the following practical implications:

Go Beyond Topic Creation, Cultivate Emotional Narratives: Producers must not only focus on creating controversy and topics (stimulating social motivation) but also commit to building authentic, touching character arcs and storylines that evoke deep emotional resonance

(enhancing emotional value). This is the core of maintaining long-term audience satisfaction and loyalty.

Emotionalize Marketing Guidance: When conducting social media marketing, platforms should guide users to share their "heartbeat moments," "touching instances," and emotional stories, rather than merely initiating polls and topic discussions. This effectively activates the sharing desire of high emotional value viewers, thereby forming more powerful word-of-mouth effects.

Identify and Serve High Emotional Value Users: Identifying the audience segment with high emotional value through data analytics and providing them with deeper interaction opportunities (e.g., micro-interviews with participants, exclusive behind-the-scenes content) can maximize their satisfaction and community influence.

Limitations and Future Research

This study has several limitations. First, the sample was sourced from an online platform, which, while representative, was not randomly selected. Second, the use of cross-sectional data prevents strict causal inference. Future research could employ longitudinal designs or experimental methods to further verify causal relationships among variables and explore other potential moderators (e.g., parasocial interaction) or mediators (e.g., continuance intention).

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EMERGING AND CONVENTIONAL APPROACHES FOR PETROCHEMICAL WASTEWATER TREATMENT: A MINI REVIEW

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Abstract: *The petrochemical industry is a cornerstone of modern manufacturing but generates large volumes of wastewater characterized by high concentrations of organic and inorganic pollutants, including hydrocarbons, phenols, sulphides, and heavy metals. These complex effluents pose serious threats to aquatic ecosystems and human health if inadequately treated. This review summarizes the composition, environmental impacts, and treatment technologies applied to petrochemical wastewater. Conventional physical and chemical methods such as oil–water separation, coagulation–flocculation, adsorption, and precipitation are effective in reducing suspended solids and organic loads but often produce excessive sludge and cannot remove refractory contaminants completely. Biological processes, including activated sludge, anaerobic digestion, and biofilm-based reactors, further reduce COD and BOD through microbial degradation but face inhibition from toxic compounds. Advanced and hybrid technologies such as membrane bioreactors (MBRs), advanced oxidation processes (AOPs), and electrocoagulation (EC) achieve up to 95% COD, 98% oil and grease, and 94% heavy-metal removal, enabling partial effluent reuse. Integrating these technologies with digital monitoring and sustainable materials offers a promising pathway toward efficient, cost-effective, and environmentally responsible petrochemical wastewater management.*

Keywords: *Petrochemical Wastewater Treatment; Coagulation–Flocculation; Biological Treatment; Electrocoagulation; Hybrid Treatment System*

Introduction

The petrochemical industry serves as a crucial foundation for modern economies, providing essential feedstocks for plastics, fuels, and numerous chemical products. However, its complex operations such as catalytic cracking, distillation, and polymerization generate substantial volumes of wastewater characterized by persistent organic pollutants, heavy metals, and toxic inorganic compounds. This wastewater is among the most challenging industrial effluents to treat due to its chemical complexity and variability (Muhaba et al., 2022).

With the rapid expansion of global petrochemical production, wastewater generation has increased dramatically, amplifying both its environmental and regulatory implications. For instance, global plastic production has risen from merely 2 million tons in 1950 to more than 380 million tons in 2015, mirroring the sector's exponential growth. Despite this surge, many discharge regulations remain outdated, often based on standards established decades ago, resulting in widespread non-compliance and escalating ecological risks. Weak enforcement mechanisms continue to exacerbate these problems, particularly in industrialized nations where petrochemical outputs are highest (Mokhtar et al., 2024).

Untreated or poorly treated effluents from petrochemical plants pose significant threats to ecosystems and public health. Organic contaminants such as phenols, hydrocarbons, and polyaromatic hydrocarbons (PAHs) induce acute and chronic toxicity in aquatic species, causing bioaccumulation and trophic transfer (Priyadarshini et al., 2022). Heavy metals including lead, mercury, and chromium persist in the environment, migrating through soil and water systems and contributing to carcinogenic and neurological health effects in humans. Additionally, inorganic compounds such as sulfides, ammonia, and nitrates promote eutrophication, leading to oxygen depletion and large-scale aquatic mortality (Bargah, 2024).

Recent pollution events further highlight the gravity of petrochemical wastewater discharge. Nutrient-rich effluents, particularly those containing nitrogen and phosphorus, have been linked to harmful algal blooms and hypoxic “dead zones” in major waterways. Likewise, microplastic leakage from petrochemical facilities has emerged as a growing global issue, contaminating sediments and aquatic food webs. Beyond routine discharges, accidental releases such as hydrocarbon pipeline leaks can irreversibly degrade groundwater quality, demonstrating the urgent need for effective and sustainable treatment technologies (Mokhtar et al., 2024).

Composition of Petrochemical Wastewater

Petrochemical wastewater is one of the most complex industrial effluents due to its highly variable composition, influenced by feedstock type, processing route such as catalytic cracking, distillation, polymerization, and plant operation conditions (Jia et al., 2019). These factors lead to wide fluctuations in both contaminant concentration and nature, requiring flexible and robust treatment strategies.

Organic pollutants dominate petrochemical wastewater, mainly comprising aliphatic and aromatic hydrocarbons such as benzene, toluene, ethylbenzene, and xylene, along with phenols, aldehydes, ketones, alcohols, and surfactants. These compounds originate from various refining stages and are typically toxic, refractory, and responsible for the high Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) values observed in effluents (Al-Khalid & El-Naas, 2018). COD levels can range from 3,500 mg/L in purified terephthalic acid units (Verma et al., 2014) to over 50,000 mg/L in refinery effluents (Mirshafiee et al., 2024). Phenolic compounds are particularly corrosive and impart unpleasant odor and taste even at trace levels (Ahmaruzzaman et al., 2024). Oil content can vary widely from 700–900 mg/L in influents to more than 8,000 ppm in oilfield wastewater yet can be reduced to below 400 ppm following treatment (Yi-Chun, 2007).

Inorganic pollutants such as sulfides, cyanides, ammonia, nitrates, chlorides, and phosphates arise mainly from desulfurization and cooling processes. High ammonia and nitrate concentrations accelerate eutrophication, while chloride levels reaching 200,000 mg/L elevate salinity and hinder water reuse. Sulfates may reach 1,650 mg/L, further stressing aquatic systems (Hintz et al., 2017).

Heavy metals form another critical component, typically including Pb, Zn, Cr, Ni, Hg, and Cd, derived from catalysts, corrosion, or feedstock additives. These non-biodegradable metals accumulate in sediments and biota, posing severe ecological and health risks (Bouafia et al., 2023). Concentrations reported in petrochemical wastewater include chromium up to 80 mg/L,

cadmium 0.004 mg/L, and lead up to 300 ppm (Long et al., 2022). In sludge, metal buildup can be extreme, with zinc at 2970 mg/kg, lead 406 mg/kg, and cadmium 20 mg/kg (Uwem & Sunday, 2018). The discovery of PFAS partitioning predominantly into solids further complicates sludge disposal (Cai et al., 2023).

Physicochemical characteristics such as high Total Suspended Solids (TSS > 50 mg/L), extreme pH, elevated temperatures, and inconsistent flow rates aggravate treatment complexity (Ariff & Bakir, 2018). The diversity and persistence of these pollutant, often far exceeding municipal wastewater concentrations demand specialized, integrated treatment systems that account for both aqueous and sludge phases (Jafarinejad & Jiang, 2019).

Environmental Impact

The improper discharge of untreated or partially treated petrochemical wastewater poses profound ecological and health consequences. The effluents contain a mixture of toxic organic compounds, heavy metals, and inorganic pollutants that disrupt aquatic, terrestrial, and atmospheric systems (Muhaba et al., 2022).

Aquatic ecosystems are particularly vulnerable. Hydrocarbons, phenols, and polyaromatic hydrocarbons (PAHs) cause acute and chronic toxicity, leading to impaired respiration, growth inhibition, and reproductive failure in fish and invertebrates. The persistence and bioaccumulation of these pollutants across trophic levels endanger higher predators and humans who consume contaminated seafood. High COD and BOD levels from petrochemical effluents rapidly deplete dissolved oxygen, creating hypoxic zones that result in mass fish mortality and biodiversity collapse (Bhuyan & Giri, 2020). Excess nitrogen and phosphorus promote eutrophication and harmful algal blooms, which release toxins hazardous to aquatic life and humans (Hooda et al., 2024).

Heavy-metal pollution notably from lead, mercury, chromium, and cadmium results in their accumulation in sediments, where they can be remobilized under changing redox conditions, exerting long-term ecological stress (Khushbu et al., 2022). Petrochemical microplastics and plastic pellets ("nurdles") further exacerbate ecosystem degradation by suffocating benthic habitats and acting as vectors for persistent organic pollutants. Soil infiltration of petrochemical wastewater alters physicochemical properties, reduces fertility, and introduces toxins into groundwater, rendering it unsafe for consumption (Pichtel, 2016).

Human-health impacts are equally severe. Communities living near petrochemical complexes face elevated risks of cancers, respiratory disorders, and developmental diseases. Chronic exposure to benzene, PAHs, and dioxins is linked to leukemia and liver cancer (Otitolaiye & Al-Harethiya, 2022). Moreover, petrochemical pollutants can modify microRNA expression, contributing to cardiovascular and neurotoxic effects (Mozzoni et al., 2023). Vulnerable populations, especially children, are at higher risk of skin diseases, diarrhea, and stunted growth due to contaminated water (Arnold, 2024). Globally, pollution from industrial wastewater is among the largest environmental causes of disease and premature death.

The cumulative impacts of petrochemical wastewater pollution extend beyond environmental degradation to significant socioeconomic losses such as declining fisheries, diminished

agricultural productivity, and increased healthcare costs, underscoring the urgency of sustainable wastewater management strategies.

Treatment Methods

The complex and variable nature of petrochemical wastewater necessitates a multi-stage approach to treatment, often integrating various technologies to achieve stringent discharge standards.

Physical Methods

Oil–water separation is commonly achieved through gravity separation, skimming, and centrifugation. The American Petroleum Institute (API) separator remains widely used for removing free oil and grease based on density differences (Essahlaoui et al., 2024). Although effective for large oil droplets, these systems perform poorly for emulsified oils or dissolved hydrocarbons. Coalescers and dissolved air flotation (DAF) units enhance oil removal by promoting droplet aggregation and flotation. Modified DAF systems have achieved over 90% oil and grease removal, yet their efficiency declines under high surfactant or salinity conditions (Bargah, 2024).

Filtration and sedimentation are essential for reducing Total Suspended Solids (TSS) and turbidity. Conventional sand filtration effectively removes particulates larger than 20 µm, while membrane-based microfiltration (MF) and ultrafiltration (UF) systems provide superior clarity and pathogen removal (Bouafia et al., 2023). However, membrane fouling remains a major operational challenge, especially when treating high-strength petrochemical effluents (Mokhtar et al., 2024). Fouling is exacerbated by the presence of oil droplets, surfactants, and fine colloidal matter.

Adsorption is another vital physical approach used to remove residual hydrocarbons, dyes, and phenolic compounds from wastewater. Activated carbon, bentonite clay, and synthetic polymeric resins are the most common adsorbents (Ahmaruzzaman et al., 2024). Recently, natural adsorbents derived from agricultural waste such as coconut shells, rice husks, and banana peels have gained attention due to their high surface area and low cost (Ramachandran & Sathishkumar, 2023). Despite promising results, adsorption efficiency often decreases after multiple reuse cycles, necessitating regeneration or combination with biological polishing units. While physical processes alone cannot meet discharge standards for petrochemical wastewater, they are indispensable as pretreatment or polishing steps, effectively reducing organic load and protecting downstream systems from overload or fouling (Jafarinejad & Jiang, 2019).

Chemical Methods

Chemical treatment processes play a pivotal role in removing refractory and toxic pollutants from petrochemical wastewater, particularly those resistant to physical methods. These techniques rely on the transformation, destabilization, or neutralization of contaminants through chemical reactions, allowing easier separation and removal from the effluent stream.

Among the most widely applied chemical techniques, coagulation–flocculation utilizes metal salts and polymers to destabilize colloidal particles and promote aggregation. Common coagulants include aluminum sulfate (alum), ferric chloride, and polyaluminum chloride (PAC) (Ho et al., 2020). Optimal conditions for coagulation depend strongly on pH, coagulant dosage, and mixing intensity (Galiassi et al., 2023). For alum, pH 6–8 typically provides high efficiency, while ferric chloride performs best near pH 9 (Hamzah et al., 2022). Laboratory studies have demonstrated over 90% turbidity and 70% COD removal, emphasizing the importance of precise control to avoid under- or overdosing and to minimize sludge generation.

Neutralization and precipitation processes complement coagulation by adjusting pH to precipitate heavy metals and inorganic pollutants as insoluble hydroxides, sulfides, or carbonates. The typical operating range of pH 6.5–8.5 ensures compliance with discharge limits and protects subsequent biological units (Benalia et al., 2022). Although effective for ions such as Pb^{2+} , Cd^{2+} , and Cr^{3+} , these methods face challenges in sludge management, often necessitating integration with filtration or sedimentation for better solid–liquid separation.

Advanced oxidation processes (AOPs), which employ highly reactive hydroxyl radicals ($\cdot\text{OH}$) generated from oxidants such as ozone, hydrogen peroxide, or Fenton’s reagent and activated by UV or catalytic energy, provide powerful degradation of complex organics into simpler compounds, effectively reducing COD and toxicity (Ghime & Ghosh, 2020). For instance, ozonation– H_2O_2 systems can achieve more than 70% total organic carbon (TOC) removal in synthetic petrochemical wastewater, although their high energy demands and operational costs often restrict full-scale deployment.

Another promising approach, electrocoagulation (EC), integrates chemical and electrical principles by dissolving sacrificial Fe or Al electrodes to release in-situ coagulant ions while concurrent gas evolution enhances pollutant flotation. EC has achieved removal efficiencies exceeding 90% COD, 98% oil and grease, and 94% heavy metals under optimized conditions typically 25 V, 30 min treatment, 150 rpm stirring, and 1 g/L NaCl (Ale-Tayeb et al., 2023). Despite its advantages of lower sludge production and minimal chemical usage, EC faces challenges related to electrode passivation and energy consumption, which require further optimization for sustainable large-scale application.

Biological Methods

Biological treatment methods exploit microbial metabolism to degrade organic pollutants in petrochemical wastewater, offering an environmentally friendly and cost-effective approach. Properly designed and optimized systems can achieve significant reductions in BOD, COD, and hazardous organics despite the complex and often toxic nature of petrochemical effluents.

The activated-sludge process remains the most common aerobic method, where a microbial consortium in aeration tanks oxidizes organic pollutants, forming flocs that settle in clarifiers. Operational parameters such as sludge retention time, aeration rate, temperature, and pH critically influence efficiency, with reported COD removal ranging from 80 to 97.9 % (Waqas et al., 2023).

Anaerobic systems, including upflow anaerobic sludge blanket (UASB) reactors, are well suited for high-strength wastewater, converting organic matter to methane and carbon dioxide

while minimizing sludge and energy demand, though they are less stable under toxic or low-strength conditions (Prablin Kaur, 2018). Constructed wetlands provide a sustainable tertiary option by combining plant uptake, microbial degradation, and sedimentation, though their large land requirements limit industrial use (de la Varga et al., 2017).

Biofilm-based technologies such as trickling filters, rotating biological contactors (RBCs), and moving-bed biofilm reactors (MBBRs) enhance resilience against hydraulic and organic shocks, maintaining high biomass density and stable operation for fluctuating petrochemical flows (Abdelfattah et al., 2020). Sequencing Batch Reactors (SBRs) integrate aeration and sedimentation in timed cycles, enabling flexible control of reaction and settling periods suitable for variable industrial discharge (Askari et al., 2024). Advances in microbial consortia, bioaugmentation, and engineered microorganisms such as *Aspergillus spp*, *Proteobacteria*, and *Firmicutes* have markedly improved hydrocarbon degradation, achieving over 93 % removal in polyaromatic hydrocarbon-contaminated systems (Pandolfo et al., 2023). Bioaugmentation using tailored bacterial consortia has boosted hydrocarbon removal up to 95 % and COD reduction from 23 % to 94 % in constructed wetlands, while enhancing methane yield in anaerobic digestion (Al-Baldawi et al., 2017). Despite these achievements, microbial inhibition by heavy metals or toxic organics remains a concern, emphasizing the importance of integrating biological treatment with physical and chemical pretreatment to reduce toxicity and ensure process robustness.

Advanced and Hybrid Technologies

Advanced and hybrid treatment technologies represent the cutting edge of petrochemical wastewater management, addressing the shortcomings of conventional physical, chemical, and biological methods by achieving superior removal of refractory and toxic pollutants.

Membrane-based systems such as ultrafiltration (UF), nanofiltration (NF), and reverse osmosis (RO) rely on pressure-driven separation to remove suspended solids, dissolved salts, and complex organic matter, producing high-quality effluent suitable for reuse. Membrane bioreactors (MBRs), which integrate biological degradation with membrane filtration, demonstrate exceptional performance with reported efficiencies of 95.7% COD, 98.3% BOD, and over 99.9% ammonium removal (Ramachandran & Sathishkumar, 2023). Despite their compact footprint and robust effluent quality, challenges such as membrane fouling, scaling, and high energy consumption remain major limitations.

Photocatalysis, an advanced oxidation approach employing semiconductor catalysts like TiO₂ under UV or solar activation, effectively mineralizes persistent pollutants such as phenols and PAHs, though industrial applications are constrained by catalyst recovery and limited light penetration (Enesca, 2021).

Adsorption innovations, including biochar and Metal-Organic Framework (MOF) composites, have also gained traction for removing heavy metals and steroidal compounds, achieving up to 93% removal efficiency with strong regeneration potential (Isaeva et al., 2021). Hybrid treatment systems integrate complementary processes to exploit synergistic effects. For example, AOP-biological integration improves biodegradability and reduces toxicity by transforming recalcitrant organics before microbial treatment, achieving 93–95% overall removal efficiency (Gopalakrishnan et al., 2023).

Electrochemical advanced oxidation processes, such as electro-Fenton and anodic oxidation, combine electrochemical generation of radicals with oxidation, providing compact designs and high reactivity with minimal reagent use (Moreira et al., 2017). Similarly, constructed wetlands coupled with electrochemical enhancement effectively remove heavy metals and persistent organics (Fang et al., 2022). The multi-stage combination of MBR–RO–ozonation achieves near-complete removal, including 99.8% BOD, 99.0% COD, and over 93% TSS and sulfide reduction, while enabling 98% effluent reuse (Phan et al., 2024). Furthermore, the integration of Artificial Intelligence (AI) and real-time monitoring technologies supports predictive control, adaptive optimization, and fault detection in hybrid systems, markedly improving treatment reliability and operational sustainability (Essahlaoui et al., 2024). Although these advanced and hybrid systems demand higher capital investment and skilled operation, their capacity to meet stringent discharge limits and facilitate water reclamation positions them as indispensable elements of next-generation sustainable wastewater treatment.

Conclusion

Petrochemical wastewater remains one of the most challenging industrial effluents to manage due to its high load of refractory organics, toxic inorganics, and heavy metals. While conventional physical, chemical, and biological methods each play a crucial role in pollutant removal, their standalone applications often fall short of meeting stringent discharge regulations and ensuring long-term environmental protection. Physical and chemical treatments effectively reduce initial contaminant loads and toxicity, whereas biological processes provide sustainable degradation of biodegradable fractions. However, the growing complexity of petrochemical effluents necessitates the integration of advanced and hybrid systems that combine these methods to achieve higher efficiencies and greater process stability. Recent innovations such as membrane bioreactors, electrochemical oxidation, and AOP–biological coupling have demonstrated exceptional performance in removing persistent contaminants and enabling water reuse, aligning with global sustainability goals. Moreover, the incorporation of digital monitoring, Artificial Intelligence (AI), and automation further enhances process reliability and operational optimization. Going forward, research should focus on developing cost-effective, energy-efficient, and eco-friendly technologies, including the use of natural coagulants, biosorbents, and fouling-resistant membranes. A holistic approach integrating technological innovation, circular economy principles, and smart management will be essential for realizing a sustainable and resilient future for petrochemical wastewater treatment.

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EXPLORING KNOWLEDGE AND ATTITUDES ON GENETIC TESTING FOR BREAST CANCER AMONG UNDERGRADUATE STUDENTS AT UNIVERSITI SULTAN ZAINAL ABIDIN (UNISZA)

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Abstract: Genetic testing for breast cancer offers crucial benefits for early detection and risk assessment. However, awareness and understanding among young adults remain limited. This empirical study aimed to explore the actual knowledge, perceived knowledge, and attitudes toward genetic testing for breast cancer among undergraduate students at Universiti Sultan Zainal Abidin (UniSZA). A cross-sectional design using a structured questionnaire was employed among students from multiple faculties. Data were analyzed using XLStat 2024 with Chi-square tests to assess associations between demographic factors and variables. Results revealed significant associations between gender and both actual ($\chi^2 = 17.78$, $p = 0.00014$) and perceived knowledge ($\chi^2 = 8.11$, $p = 0.017$). Faculty type also significantly influenced actual knowledge ($\chi^2 = 29.50$, $p = 0.0000488$), while family history of genetic disease showed no significant effect. Attitudes were positive across all groups. These findings highlight the need for targeted educational interventions, especially for male and non-health students, to enhance genetic literacy and informed decision-making.

Keywords: Breast Cancer, Genetic Testing, Knowledge, Attitude, University Students

Introduction

Breast cancer remains a major global health challenge and is the leading cause of cancer-related deaths among women. With the increasing recognition of genetic predispositions, such as BRCA1 and BRCA2 mutations, genetic testing has become an essential tool in early detection, prevention, and personalized treatment planning. Despite these advances, awareness and attitudes toward genetic testing, particularly among young adults and university students, remain underexplored in Malaysia. Understanding their level of knowledge and attitudes can inform strategies to improve genetic literacy and promote proactive health behaviors.

Literature Review

Genetic Testing and Breast Cancer Risk

Breast cancer remains the most prevalent malignancy among women worldwide, contributing to significant morbidity and mortality (Sung et al., 2021). The discovery of genetic susceptibility genes, particularly BRCA1 and BRCA2, has transformed cancer prevention and management through predictive genetic testing (King, 2014). Such testing helps identify individuals at high risk, allowing early surveillance and targeted preventive strategies (Hampel & de la Chapelle, 2021). In Malaysia, breast cancer accounts for nearly one-third of female cancers, emphasizing the need for genetic literacy and accessible testing (Htay et al., 2024).

Knowledge and Awareness among University Students

Despite advances in genomic medicine, awareness of genetic testing among the public, including university students, remains limited. Studies across various populations have shown inconsistent levels of knowledge, often influenced by educational background and exposure to health sciences (Norliana & Hussin, 2021; Sindi et al., 2022). A study in Saudi Arabia found that only 39% of university students understood the purpose of genetic testing (Al-Kubaisi et al., 2020). In Malaysia, similar findings were reported among health science students who displayed higher knowledge compared to those in non-health disciplines (Hassan et al., 2023).

Perceived Knowledge and Its Influence on Health Behaviour

Perceived knowledge — one's self-assessed understanding — is a strong predictor of health-related decision-making (Lin et al., 2020). Individuals who believe they are knowledgeable about genetic testing are more likely to consider undergoing the test (Patenaude et al., 2021). However, perceived knowledge often does not align with actual understanding, potentially leading to misconceptions about test results and implications (Mwaka et al., 2020). Among university students, confidence without accuracy may hinder appropriate health-seeking behavior, underscoring the need for validated educational interventions (Lim & Mahmud, 2021).

Attitudes Toward Genetic Testing and Screening

Attitudes toward genetic testing are influenced by perceived benefits, ethical beliefs, and emotional responses (Haga & Willard, 2021). Generally, students express positive attitudes toward genetic testing, viewing it as an empowering tool for early detection (Sindi et al., 2022). However, ethical concerns such as privacy, discrimination, and cost often moderate willingness

to participate (Cheah et al., 2020). Cultural and religious beliefs can also influence perceptions, particularly in conservative societies (Yusof et al., 2019). Therefore, understanding attitudinal factors is crucial for developing culturally sensitive awareness programs.

Gender and Academic Background Differences

Gender differences in health knowledge are well-documented, with female students generally demonstrating higher awareness of breast cancer risks and screening methods (Htay et al., 2024). This trend has been attributed to both biological relevance and social exposure to women's health education (Al-Kubaisi et al., 2020). Academic background also shapes knowledge: students in health sciences consistently outperform peers from non-health disciplines (Hassan et al., 2023; Norliana & Hussin, 2021). These findings suggest that incorporating basic genetic concepts into general education could bridge knowledge gaps across faculties.

Gaps in the Malaysian and Southeast Asian Context

In Malaysia and neighboring Southeast Asian countries, genetic testing remains underutilized due to limited awareness, high costs, and lack of local genomic data (Yusof et al., 2019; Htay et al., 2024). Cultural perceptions of fatalism and fear of discrimination further deter participation (Manaf et al., 2020). Studies emphasize the importance of integrating genetics education into tertiary curricula and public health initiatives to improve acceptance and understanding (Cheah et al., 2020). Addressing these gaps aligns with Malaysia's Precision Medicine initiative, which aims to promote genetic literacy and equitable access to genomic services (Kamarudin et al., 2023).

Methodology

A cross-sectional study was conducted among undergraduate students at Universiti Sultan Zainal Abidin (UniSZA) from four faculties: Medicine, Health Sciences, Islamic Contemporary Studies, and Applied Social Science. Participants were recruited through convenience sampling, and data were collected via a structured questionnaire distributed using Google Forms.

The instrument was adapted from Jaya et al. (2023) and comprised 51 items divided into four parts:

- Part 1: Nine items on sociodemographic characteristics (gender, faculty, family history of genetic disease, etc.).
- Part 2: Sixteen items assessing actual knowledge of genetic testing and disease-related concepts.
- Part 3: Thirteen items measuring perceived knowledge of genetics and genetic testing.
- Part 4: Thirteen items evaluating attitudes toward genetic testing for breast cancer.

All items were reviewed by subject matter experts for content validity and piloted among a small group of students to ensure clarity. Responses were analyzed using XLStat 2024. Descriptive statistics summarized demographic characteristics, and Chi-square (χ^2) tests were used to determine associations between categorical variables (gender, faculty, family history)

and outcomes (actual knowledge, perceived knowledge, and attitude). A p-value of <0.05 was considered statistically significant.

Results

Actual Knowledge

A significant association was found between gender and actual knowledge ($\chi^2 = 17.78$, $df = 2$, $p = 0.00014$), with female students demonstrating higher actual knowledge levels. A significant association was also observed between faculty and actual knowledge ($\chi^2 = 29.50$, $df = 6$, $p = 0.0000488$). Students from the Faculty of Medicine had the highest proportion of high knowledge scores (28 out of 35 students). No significant association was found between family history of genetic disease and actual knowledge ($\chi^2 = 0.56$, $df = 2$, $p = 0.76$).

Perceived Knowledge

Perceived knowledge showed a significant association with gender ($\chi^2 = 8.11$, $df = 2$, $p = 0.017$), with females reporting higher self-perceived understanding of genetic testing. However, faculty ($\chi^2 = 4.70$, $df = 6$, $p = 0.58$) and family history ($\chi^2 = 1.47$, $df = 2$, $p = 0.48$) were not significantly related to perceived knowledge.

Attitude

Overall, students exhibited positive attitudes toward genetic testing across all groups. There were no significant associations between attitude and gender ($\chi^2 = 1.605$, $df = 2$, $p = 0.448$), faculty ($\chi^2 = 4.27$, $df = 6$, $p = 0.64$), or family history of genetic disease ($\chi^2 = 1.58$, $df = 2$, $p = 0.45$). Notably, medical students again showed the highest proportion of positive attitudes (34 out of 39 students).

Discussion

This study explored the knowledge, perceived knowledge, and attitudes of UniSZA undergraduate students toward genetic testing for breast cancer. The results reveal significant variations in actual and perceived knowledge across gender and faculty, highlighting the influence of educational exposure and gendered health awareness. Female students consistently scored higher in both actual and perceived knowledge, aligning with previous findings by Htay et al. (2024) and Norliana and Hussin (2021), who noted that women tend to engage more with breast cancer-related information due to perceived personal relevance.

Students from health-related faculties demonstrated stronger factual understanding, consistent with prior research showing that curriculum exposure enhances comprehension of genetics and screening (Lim & Mahmud, 2021). Conversely, students from non-health disciplines displayed lower levels of awareness, suggesting a gap in general scientific literacy that warrants targeted outreach.

Interestingly, despite differences in knowledge, attitudes toward genetic testing remained uniformly positive, echoing the findings of Cheah et al. (2020) and Sindi et al. (2022). This indicates a strong baseline acceptance of genetic testing as a preventive tool, even among those with limited understanding. The lack of association between family history and knowledge or

attitude suggests that awareness is more strongly influenced by education and exposure rather than personal experience.

The findings emphasize the need for university-level educational programs to integrate genetic literacy across faculties. Interactive awareness campaigns, interdisciplinary seminars, and inclusion of genetic health topics in general education could help bridge knowledge gaps. This aligns with Malaysia's national Precision Medicine framework, which aims to enhance public understanding and equitable access to genomic technologies (Kamarudin et al., 2023).

Conclusion

This study provides empirical evidence that gender and academic discipline significantly influence knowledge about genetic testing for breast cancer, whereas attitudes remain broadly positive. The findings highlight the need for educational initiatives targeting male and non-health faculty students to strengthen awareness and support informed decision-making. Integrating genetic literacy into university health education could foster proactive engagement with preventive health measures.

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SUSTAINABLE LOYALTY BOOST: INFLUENCE OF SUSTAINABILITY ON ECOTOURIST LOYALTY: THE ROLE OF TOURIST EXPERIENCE AS A MEDIATOR

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Introduction

Tourist loyalty is vital for the sustained success of ecotourism, guaranteeing stable revenues, positive recommendations, and enhanced support for local economies and conservation efforts. Loyal ecotourists also demonstrate a higher commitment to environmentally responsible behaviors, reinforcing the sector's core principles (Hoang et al., 2023). Globally, ecotourism faces rising demand for authentic, meaningful experiences aligned with tourists' environmental and social values. However, this is undermined by scepticism regarding greenwashing and inconsistent sustainability standards, which erode trust and loyalty (Rahayu et al., 2023). Eco-tourists are increasingly conscious of their carbon footprint, fueling a preference for responsible travel. The central challenge is the divergence between tourist expectations and actual experiences, often driven by inconsistent service quality and sustainability practices (Kusumah, 2024). Overcoming perceptions of greenwashing and ensuring genuine, impactful experiences are crucial for fostering lasting loyalty. Research needs to better understand factors like local community involvement, cultural differences, and the role of digital platforms in building loyalty (Amit et al., 2025). This study offers significant implications: policymakers can use loyalty drivers to inform sustainability regulations, operators can enhance authenticity and service quality, and tourists can be guided toward responsible choices. Ultimately, fostering loyalty is essential for aligning economic growth with conservation goals worldwide.

Underpinning Theory

The theoretical foundation for ecotourism loyalty integrates the Stimulus-Organism-Response (S-O-R) model with the Expectancy-Disconfirmation Theory (EDT). The S-O-R model posits that external Stimuli (economic, environmental, and social sustainability practices) affect tourists' internal states, the Organism (experience and satisfaction), which drives behavioral Responses (loyalty) (Mehrabian & Russell, 1974). EDT clarifies the role of satisfaction by stating that it results from comparing pre-visit expectations with experience (Oliver, 1980). When sustainability efforts meet or exceed expectations (positive disconfirmation), satisfaction is high. In this integrated framework, satisfaction and experience act as critical mediators. This dual approach captures the indirect pathways: sustainability stimuli shape internal evaluations,

which collectively influence behavioral intentions, providing a robust basis for understanding long-term tourist loyalty in ecotourism.

Hypotheses Development

Tourist loyalty, a fundamental precursor to economic sustainability, relies on providing compelling experiences. Research shows that memorable, value-for-money experiences, including educational and escapism elements, drive "sustainability-oriented loyalty." Affordability and ensuring local economic benefits enhance tourist satisfaction, which mediates the path to loyalty, securing sustained economic activity (Naparin, 2025a; Naparin, 2025b). Environmental sustainability is vital, as eco-centred experiences, such as biodiversity education or immersive VR, foster responsibility and loyalty (Irfan & Azli, 2023). Conservation efforts and safety measures influence experience quality and loyalty intentions. Social sustainability is integral, with community involvement, cultural authenticity, and quality social interactions significantly enhancing the tourist experience and loyalty (Sarangi & Ghosh, 2025). Co-creation of experiences and visible community initiatives boost satisfaction, which is a vital driver of destination attachment. Collectively, these points confirm that enriching tourist experiences and ensuring satisfaction, derived from feelings of well-being, perceived value, and authenticity, are essential for cultivating long-term loyalty in sustainable tourism (Zhu & Wang, 2025).

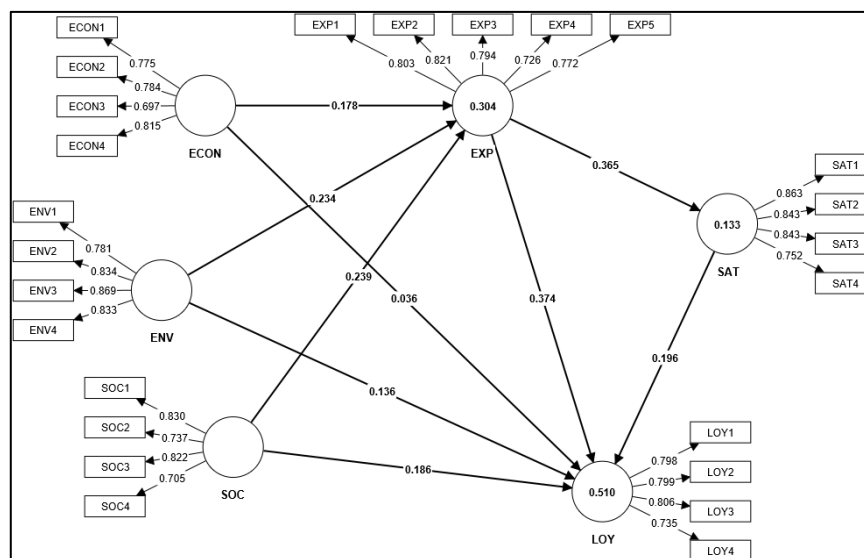


Figure 1: Research Model

Notes: ECON=Economic Sustainability ENV=Environmental Sustainability SOC=Social Sustainability, SAT=Tourist Satisfaction EXP=Tourist Experience LOY=Tourist Loyalty

Methodology

This study investigated rural tourists' perceptions of the relationships among economic, environmental, and social sustainability, tourist experience, satisfaction, and loyalty within Malaysian ecotourism. Data were gathered via email surveys using a purposive sampling method. The study involved six latent variables and 25 observed variables, measured on a 5-point Likert scale, drawing items from established literature. Out of 381 distributed surveys, 308 responses were received, yielding an 81% response rate. After screening, 289 valid

responses were used for analysis. SmartPLS 4 structural equation modelling (SEM) was employed for hypothesis testing and detailed evaluation of the measurement and structural models, ensuring robust data analysis.

Findings

The analysis of the structural model confirmed that all three dimensions of sustainability, economic, environmental, and social, significantly influence the tourist experience. Crucially, while environmental and social sustainability both showed a direct positive effect on tourist loyalty, economic sustainability did not demonstrate this direct link. Instead, the positive impact of economic factors on loyalty was confirmed only when fully channeled indirectly through the tourist experience, highlighting the experiential role of economic efforts. Furthermore, social sustainability emerged as a powerful construct, affecting both experience and loyalty directly and indirectly. The core relationships driving loyalty were strongly validated: the tourist experience is a robust direct predictor of loyalty, and it also positively influences tourist satisfaction. In turn, satisfaction significantly boosts loyalty and serves as a vital mediator in the relationship between experience and long-term behavioral intentions.

Discussion

The core finding of the study is that the ecotourism sector must prioritize integrated sustainability strategies to secure tourist loyalty, with both the tourist experience and satisfaction acting as crucial intermediaries. All three pillars of sustainability, economic, environmental, and social, significantly influence a visitor's experience. However, a key distinction emerged: while environmental and social sustainability directly and positively drive loyalty, economic sustainability does not have a significant direct impact. Instead, the positive effect of economic efforts relies entirely on enhancing the quality of the tourist experience, such as through community-based tourism initiatives. The data confirms that experience is the strongest direct factor determining loyalty, which is further amplified by its positive effect on satisfaction. Therefore, the industry must adopt a holistic approach, actively communicating conservation and community efforts while enriching experiential offerings, to foster satisfied, loyal visitors.

Theoretical Implications

This study significantly advances existing theoretical frameworks by integrating the economic, environmental, and social dimensions of sustainability with tourist experience, satisfaction, and loyalty. It empirically refines the classic S-O-R theory, showing that sustainability acts as a stimulus influencing loyalty primarily through the internal perceptual processes of experience and satisfaction. A key finding is that while economic sustainability affects the experience, it lacks a direct link to loyalty, highlighting the crucial mediating roles of experience and satisfaction. The research also strengthens the importance of social sustainability, explicitly linking community involvement to behavioral loyalty. By integrating the Expectancy-Disconfirmation Theory (EDT), the model emphasizes that satisfaction, based on expectation confirmation, is a vital mediator. This offers a more comprehensive sustainability-tourism framework, providing a basis for future studies on loyalty mechanisms.

Practical Implications

To foster long-term tourist loyalty, the ecotourism industry must adopt a holistic and strategic approach to sustainability. Operators should prioritize enhancing tourist experiences through eco-friendly activities, cultural immersion, and personalized services, as these directly boost satisfaction and loyalty. Emphasis must be placed on environmental conservation by clearly communicating ecological benefits to strengthen emotional connections with visitors. Simultaneously, integrating social sustainability initiatives, such as community involvement and inclusive practices, elevates tourist attachment. To maximize economic sustainability, operators should develop community-based projects that link local livelihoods to authentic, memorable experiences, thereby contributing indirectly to loyalty. Finally, marketing strategies should ensure transparent communication about conservation and social responsibility, building trust and value perception for sustained growth and resilience.

Suggestions for Future Studies

Future studies should explore how moderating variables, like cultural differences, environmental awareness, and personal values, influence the link between sustainability practices and tourist loyalty. Longitudinal research is needed to track how tourist perceptions and loyalty evolve as sustainability becomes integrated into destination branding. Promising avenues include investigating the role of digital platforms, social media, and virtual reality in enhancing sustainable experiences. Researchers should also compare different ecotourism settings, such as rural versus coastal destinations, to identify context-specific loyalty strategies. Additionally, examining the impact of specific initiatives, like community involvement or waste reduction, provides more targeted insights. Finally, integrating behavioral or psychological theories could deepen understanding of the processes underlying sustainable tourism loyalty decisions.

Conclusion

This study confirms the critical role of economic, environmental, and social sustainability in driving ecotourism loyalty, primarily through enhanced experience and satisfaction. Environmental and social efforts directly foster loyalty, but economic sustainability must work indirectly via a positive experience. The findings demand an integrated, holistic approach emphasizing immersive experiences, transparent communication, and community involvement. Practical strategies should prioritize eco-friendly activities and social initiatives to strengthen satisfaction and long-term loyalty. Ultimately, effective sustainability provides a competitive advantage by creating satisfied, loyal visitors committed to conservation.

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THE MALAY KNOWLEDGE OF PTSD QUESTIONNAIRE (MKPQ): A VALIDATION STUDY AMONG MALAYSIAN ADULTS IN JOHOR

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Abstract:

Keywords:

Introduction

Post-traumatic stress disorder (PTSD) is a psychiatric condition that can develop after traumatic events (Benjet, et al., 2016). In Malaysia, 7.4% of motor vehicle accident survivors (Bahari, Mohamad Alwi, Ahmad, & Mohd Saiboon, 2017) and 25% of healthcare workers post-COVID-19 (Mohd Noor, Ariffin, Silim, & Md Said, 2022) were diagnosed with PTSD. Beyond psychological effects, PTSD is also linked to physical health issues (Schincariol, Orrù, Otgaar, Sartori, & Scarpazza, 2024), underscoring the importance of early recognition through increased public awareness. However, accurate diagnosis is often hindered by a lack of validated screening tools in Bahasa Malaysia (Syed Jaapar, Abidin, & Othman, 2014). While English is widely spoken, not all Malaysians are fluent. Several PTSD tools have since been translated and validated in Malay, showing good reliability and validity (Syed Jaapar, Abidin, & Othman, 2014) & (Bahari R. , Mohamad Alwi, Ahmad, & Mohd Saiboon, 2015). helping to reduce language barriers and improve early detection. This study aims to validate the Malay PTSD Knowledge Questionnaire (MKPQ) for use among Malaysian adults

Methods

The 28-item English PTSD Knowledge Questionnaire, previously validated (Wan Ahmad, Mohamad, & Abdul Rohim, 2021), underwent a standard translation process. Two independent

translators performed forward translation into Malay, followed by synthesis into a single version. Backward translation was then conducted by two others. Face validity was assessed with 20 individuals who reviewed the Malay version for clarity and comprehensibility. Content validity was not reassessed, as it had been established in Phase 1.

Construct validity was evaluated through convenience sampling of adult Malaysians at Klinik Kesihatan Johor Bahru and Klinik Kesihatan Benut, Pontian (15 April–15 June 2025). Reliability was assessed using a parallel forms design at Klinik Kesihatan Johor Bahru, involving bilingual participants who completed both the Malay and English versions with a 10-minute interval to reduce recall bias. Due to limited English proficiency in Benut, the reliability study was limited to Johor Bahru. Questionnaire order was based on participants' language preference to minimise order effects. Internal consistency was measured using Cronbach's alpha, while reliability between forms was assessed using the intraclass correlation coefficient (ICC) with a two-way mixed-effects model.

Results

A total of 97 participants were recruited for the main study (Table 1).

Table 1: Participant's Characteristics

Total participants=97		N	(%)
Gender	Male	43	46.7
	female	49	53.3
Age group	<25	19	20.7
	26-40	45	48.9
	40-65	25	27.2
	>65	3	3.3
Marital Status	Married	49	53.3
	Single	39	42.4
	Others	4	4.3
Occupation	Managers	5	5.4
	Professionals	16	17.4
	Technicians	5	5.4
	Administrative staff	12	13.0
	Service and sales workers	12	13.0
	Construction workers	13	2.2
	Factory workers	11	14.1
	Elementary occupations	8	8.7
	Self-employed	11	12.0
	Student	3	3.3
	Unemployed	5	5.4
Highest level of education	Postgraduate	7	7.6
	Undergraduate	21	22.8
	Diploma	18	19.6
	Skills certificate	5	5.4
	STPM/SPM	32	34.8
	SRP/PMR/PT3	7	7.6
	Others	2	2.2

Face Validity

The overall FVI score was 0.97, exceeding the recommended threshold of 0.90. This indicates that the adapted Bahasa Malaysia version demonstrates strong face validity and is appropriate for progression to subsequent stages of validation.

Construct validity

Exploratory Factor Analysis (EFA) was conducted to evaluate the construct validity. The data were suitable for factor analysis, as demonstrated by Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy of 0.850, and statistically significant Bartlett's Test of sphericity ($p < 0.001$). The analysis revealed two distinct components within each of the questionnaire's three sections (Table 2).

Table 2: Outcome of exploratory factor analysis with all items included.

		Components	
		1	2
Section 1	Being in a war	.900	
	Being in a serious car accident	.762	
	Being raped or sexually assaulted	.901	
	Seeing someone else get killed	.918	
	Being physically abused	.812	
	Learning that a loved one was seriously injured in an accident		.384
	Getting fired from a job		.870
	Learning that your spouse or partner had an affair		.738
	Having serious financial problems		.867
Section 2	Nightmares about the trauma	.835	
	Feeling very upset when reminded of the trauma	.887	
	Avoiding places or people that remind you of the trauma	.819	
	Feeling irritable or having angry outbursts	.530	
	Avoiding thinking or talking about the trauma	.802	
	Being very alert, watchful, or on guard	.378	
	Having negative feelings about the trauma, such as anger or shame	.662	
	Getting addicted to alcohol or drugs		.479
	Experiencing decreased appetite		.606
	Feeling hyper, extremely happy or excited for several days straight		.793
	Sleeping too much		.436
	Having chronic chest pain		.444
	Hearing voices that tell you to harm others		.667
	Washing your hands again and again		.714
	Cognitive Behavioural Therapy (CBT)		.401
Section 3	Antidepressants medications		.804
	Eye-movement desensitization and reprocessing (EMDR)		.922
	Support groups	.924	
	Family therapy	.912	

Internal Consistency

The internal consistency was assessed using Cronbach's alpha. A Cronbach's alpha value above .8 is considered indicative of good internal consistency (Wan Ahmad & Mohamad, 2021). The overall Cronbach's alpha for MKPQ was excellent at .949.

Parallel Form Reliability

Parallel form reliability of the MKPQ was evaluated using the interclass correlation coefficient (ICC). The analysis yielded a single-measure ICC of 0.98 ($p < 0.001$), indicating excellent reliability.

Conclusion

The Malay Knowledge of PTSD Questionnaire demonstrated strong psychometric properties, confirming its reliability and validity for use among Malaysian adults. It addresses a critical gap in culturally and linguistically appropriate mental health tools, supporting efforts to improve PTSD literacy, reduce stigma, and promote early intervention among trauma-exposed populations in Malaysia.

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THE USA AND CHINA'S AI-DRIVEN MILITARY TRANSFORMATION: STRATEGIC IMPLICATIONS AND SECURITY CHALLENGES FOR SOUTHEAST ASIA'S STABILITY

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Abstract: The integration of artificial intelligence (AI) into military strategies by the United States and China is reshaping global security dynamics, with profound implications for Southeast Asia. This study examines the AI-driven military modernization of these two major powers, focusing on their strategic intentions, technological advancements, and the resulting effects on regional security and geopolitical balance. Employing a qualitative methodology, the research draws on document analysis of official defense white papers, policy reports, academic literature, and expert commentaries to investigate how military AI is influencing threat perceptions and strategic postures in Southeast Asia. Findings reveal that both the United States and China are investing extensively in AI-enhanced capabilities, including autonomous weapons, advanced surveillance systems, and cyber warfare tools. These developments are intensifying strategic competition, thereby heightening risks of miscalculation, regional destabilization, and the erosion of ASEAN's strategic autonomy. Moreover, Southeast Asian states face structural challenges such as limited technological capacity, cyber vulnerabilities, and economic dependencies, which constrain their ability to mitigate emerging security risks. The study concludes that ASEAN member states must adopt proactive and cooperative strategies to address the challenges posed by military AI. Policy recommendations include strengthening regional security frameworks, investing in technological resilience, and promoting dialogue aimed at enhancing transparency and reducing tensions arising from AI-related military competition.

Keywords: Artificial Intelligence (AI); Military Modernization; Southeast Asia Security; U.S.-China Strategic Competition; ASEAN Regional Stability

Introduction

The Fourth Industrial Revolution has elevated artificial intelligence (AI) to the status of a pivotal general-purpose technology that is redefining global economic structures, social interactions, and the strategic dimensions of warfare and national defense. The integration of AI into contemporary military systems encompasses multiple domains—ranging from intelligence collection, surveillance, and reconnaissance (ISR) to operational decision support, predictive logistics, and the orchestration of autonomous platforms. Collectively, these developments constitute what has increasingly been referred to as algorithmic warfare (RAND,

2024; U.S. Department of Defense, 2023). In the context of U.S. defense policy, AI functions as a critical capability aimed at strengthening command performance and operational precision through human–machine collaboration, intersectoral cooperation, and innovation driven by data analytics (U.S. Department of Defense, 2023).

Literature Review

Recent scholarship underscores that the evolution of artificial intelligence (AI) is reshaping the very basis of strategic power by transforming data, computational capability, and technical proficiency into critical assets for national defense (Jenkins et al., 2025). However, researchers such as Batool, Zowghi, and Bano (2023) caution that the accelerated adoption of AI in military applications brings forth intricate ethical and governance dilemmas—particularly surrounding issues of accountability, algorithmic bias, and transparency across the entire AI development and deployment cycle. These challenges transcend technical design, extending into the legal, moral, and policy spheres of defense governance.

China’s strategic trajectory, meanwhile, is guided by its military-civil fusion (MCF) framework, which seeks to unite research institutions, private technology firms, and defense industries to expedite the modernization of the People’s Liberation Army (PLA). Evidence from procurement analyses reveals the PLA’s expanding engagement with a broad spectrum of AI suppliers, including commercial enterprises, demonstrating the spread of dual-use technologies throughout China’s defense sector. Although this model promotes efficiency and scalability, it complicates global monitoring and the regulation of technology transfers. Comparative assessments suggest that while the United States primarily leverages private-sector innovation, China relies on centralized state coordination to foster technological independence and gain a strategic edge (Cools & Maathuis, 2024). Despite their differing institutional structures, both countries face parallel challenges: the automation of combat functions, the convergence of civilian and military technologies, and enduring questions of accountability and governance in AI-enabled warfare (Jenkins et al., 2025).

For Southeast Asia, the military integration of AI carries diverse strategic consequences. From a technological standpoint, AI enhances the Observe–Orient–Decide–Act (OODA) cycle, accelerating operational tempo but simultaneously diminishing human oversight and increasing the volatility of battlefield decision-making (Horowitz, Scharre, & Velez-Green, 2019). Politically, the expanding influence of great powers in defining AI standards and technological dependencies risks constraining the strategic flexibility of regional governments. Recent policy analyses highlight the need to strengthen ASEAN’s institutional capacity for ethical and coordinated AI governance (Keith, 2024; Putra, 2024). This entails building regional mechanisms for trust formation, oversight of defense technologies, and shared risk-management frameworks. Both scholars and policymakers advocate a multidimensional ASEAN strategy emphasizing domestic capacity building, robust data governance, interoperability standards, and transparency measures to reduce escalation risks and misuse (Putra, 2024). Through such collective efforts, ASEAN can play a pivotal role in shaping responsible AI norms that prevent militarized competition and support long-term peace and stability in the Indo-Pacific.

Methodology

This research adopts a qualitative methodological approach to explore how artificial intelligence (AI) influences the strategic competition between the United States and China, as well as its broader effects on stability within Southeast Asia. The analysis focuses on interpretive examination of secondary materials such as government policies, defense white papers, academic studies, and reports from strategic research institutions. By applying thematic and discourse analysis, the study identifies recurring patterns in decision-making behavior, governance mechanisms, and defense narratives that shape each country's approach to AI integration in the military sphere. Instead of relying on numerical data, this qualitative design allows for an in-depth exploration of underlying motivations, ethical considerations, and the geopolitical implications of AI-driven military transformation across the Indo-Pacific region.

United States: Commercial Collaboration and Doctrinal Adaptation

The United States' approach to integrating AI into military capabilities is characterized by the fusion of two principal elements: (1) a strategic reliance on commercial innovation, and (2) institutional efforts to incubate, scale, and regulate the use of AI across defense structures. Organizationally, the entities coordinating these initiatives have undergone structural evolution, for instance, the Joint Artificial Intelligence Center (JAIC), established in 2018, was later consolidated into the broader office of the Chief Digital and Artificial Intelligence Officer (CDAO). This reorganization was part of a wider effort to streamline the Department of Defense's (DoD) digital transformation (U.S. Department of Defense, 2023; ai.mil, 2024). The approach reflects the institutional need to align policy, data management, and technical architecture prior to the large-scale deployment of AI systems in operational theaters.

In practice, the DoD emphasizes a public-private partnership model: large-scale contracts and procurement mechanisms that enable commercial firms—including leading LLM/AI companies, to provide models, cloud services, and analytical solutions to defense clients (DoD, 2023). A recent empirical example is the series of contracts awarded in mid-2025 to several major AI firms, including OpenAI, Google/Alphabet, Anthropic, and xAI, as part of the DoD's initiative to access frontier model capabilities and integrate them into defense workflows. These contracts, each reportedly valued at up to approximately USD 200 million, illustrate the DoD's dependence on the commercial market as a driver of rapid capability enhancement and scalability. However, adopting commercial methods also raises governance issues: supply chain security, export control, ethical compliance (e.g., sensitive data protection), and the reliability of commercial models in high-risk operational contexts (Reuters, 2025; Politico, 2025).

Doctrinal and operational practices have also been adjusted. The DoD outlines a strategy of "accelerating decision advantage," positioning AI in functions that enhance the decision-making cycle while emphasizing the necessity of human oversight—through human-in-the-loop or human-on-the-loop mechanisms—and governance structures to mitigate systemic failure risks (U.S. Department of Defense, 2023). Academic literature and think-tank analyses highlight that the U.S. advantage lies in its access to commercial expertise, high-scale computational resources, and a dynamic startup ecosystem. Nevertheless, these strengths are accompanied by regulatory challenges, public concerns, and vulnerabilities stemming from

market competition and dependence on private-sector innovation (RAND, 2024; Horowitz et al., 2019).

China: Military–Civil Fusion and the Scale of Development

China's model differs structurally and procedurally from that of the United States. The *military–civil fusion (MCF)* approach emphasizes deliberate coordination among government agencies, university research institutions, and the corporate sector, including major technology companies and non-traditional suppliers to accelerate the transfer of dual-use technologies to the People's Liberation Army (PLA). Recent contract data analyses indicate that between 2023 and 2024, China issued thousands of AI-related procurement notices, with suppliers ranging from traditional defense entities to new entrants not necessarily originating from the classical defense sector. This pattern reflects the multi-sourced nature and high diffusion rate of technology across China's defense–industrial ecosystem (CSET, 2025).

The principal advantage of this model lies in the state's ability to coordinate investments, mobilize research resources, and implement targeted industrial policies tailored to defense needs. In the context of the PLA, this translates into the rapid development of autonomous systems (such as autonomous drones), enhanced ISR analytical capacity, and the integration of information networks capable of supporting large-scale command decision-making (Kania, 2021; CSET, 2025). At the policy level, Beijing provides incentives such as funding, government contracts, and domestic market access, thereby reducing the financial risks for technology firms participating in the defense supply chain.

However, the MCF model also presents several constraints. First, the accelerated integration between the civilian and military sectors poses transparency challenges, making it difficult for external observers to distinguish between civilian and defense allocations within China's technological ecosystem (CSET, 2025). Second, the rapid pace of technological acquisition may compromise certain quality standards or lead to interoperability issues among systems developed by different suppliers—a problem that contrasts with more centralized, standards-based models in other contexts. Finally, while MCF accelerates diffusion, it also raises geopolitical concerns, as it facilitates the potential transfer of capabilities to non-state actors through extensive commercial networks (Kania, 2021; Stokes, 2024).

Theoretical Framework: Realism and the Technological Security Dilemma

This study applies realism, particularly its structural and neoclassical variants to examine how artificial intelligence (AI) reshapes the U.S.–China strategic rivalry and affects Southeast Asian stability. Realism posits that states operate in an anarchic international system where no central authority guarantees security, compelling them to pursue power and self-preservation (Waltz, 1979; Mearsheimer, 2001).

Within this context, AI functions as a strategic enabler rather than a neutral tool. Comparable to past military revolutions such as nuclear and space technologies, AI enhances speed, precision, and situational awareness, transforming the balance of power through “algorithmic warfare.” These capabilities, however, intensify the security dilemma—where one state's defensive modernization provokes others to respond in kind, heightening instability (Jervis,

1978). The automation of detection and response reduces human oversight, raising risks of miscalculation, particularly in contested areas like the South China Sea (UNODA, 2025).

Neoclassical realism links these systemic pressures to domestic factors, explaining why the U.S. relies on private-sector innovation and alliances, while China employs a state-driven Military-Civil Fusion strategy (Rose, 1998; Schweller, 2004). For Southeast Asia, these dynamics compel states to balance, bandwagon, or hedge between major powers. Ultimately, realism warns that AI's militarization magnifies competition and asymmetry, rather than ensuring regional security.

Table 1: AI and the Realist Security Dilemma Framework

Realist Concept	Core Principle	AI Military Implications	Southeast Asian Impact
Anarchy	Absence of a central authority compels self-help behavior.	States independently develop AI for defense without binding norms or global governance.	Weak regional institutions struggle to manage great-power AI competition.
Security Dilemma	Defensive measures appear offensive to others, fueling mistrust.	AI-enabled surveillance, targeting, and autonomous systems increase escalation risks.	Heightened tension and miscalculation in maritime disputes (South China Sea).
Balance of Power	Stability depends on preventing any single power's dominance.	U.S. uses alliances and tech networks; China consolidates state-led AI power.	ASEAN states hedge to avoid overdependence on either power.
Relative Gains	States seek advantages over rivals rather than mutual benefit.	Both powers prioritize AI superiority in intelligence and decision-making systems.	Smaller states assess partnerships based on security leverage, not shared progress.

Source: Author's own work, 2025.

Comparative Dynamics and Risk Profiles

A comparative assessment of the U.S. and Chinese models highlights two principal dimensions of risk that are particularly relevant to regional stability:

Speed vs. Governance

The United States gains an advantage in innovation speed and a robust commercial ecosystem like having access to generative models and global-scale computational capacity. However, these operations are constrained by governance challenges, export controls, ethical concerns, and public confidence regarding the military application of such technologies (DoD, 2023; RAND, 2024). China, through its *military-civil fusion (MCF)* framework, achieves policy coordination and national-scale integration that accelerates adoption, yet faces difficulties in system interoperability, transparency deficits, and potential quality issues due to the participation of numerous non-traditional suppliers (CSET, 2025).

Diffusion of Dual-Use Technologies

Both nations have effectively lowered the barriers to dual-use technology dissemination. The DoD's commercial procurement facilitates allied access to advanced capabilities, while China, through sales, cooperative ventures, and the MCF ecosystem, enables technological access for states with economic and security ties to Beijing. The implication for the region is a faster diffusion of AI-related capabilities, such as ISR, autonomy, and advanced analytics across multiple actors. This reduces entry barriers and increases the likelihood of acquisition races and crisis-management complexities (Horowitz et al., 2019; RAND, 2024).

Overall, this comparison underscores that technological superiority should not be viewed unilaterally; it must be analyzed in conjunction with institutional, governance, and supply-chain dimensions. For policymakers in Southeast Asia, a nuanced understanding of both models is essential in formulating acquisition strategies that minimize strategic dependencies while maximizing incident-management capacity and operational interoperability.

Strategic Implications for Southeast Asian Stability

The artificial intelligence (AI) race between the United States and China is not merely a technological phenomenon, it represents a new manifestation of great-power competition that is reshaping the security dynamics of Southeast Asia. The region, situated at the heart of global trade routes and constituting a geopolitical pivot within the Indo-Pacific, now serves as a strategic arena where technological influence, military doctrine, and security diplomacy of both powers intersect. The implications of AI for regional stability extend beyond the military dimension to encompass economic, political, and normative spheres of security, domains that have historically been guided by the principles of *ASEAN centrality* and *strategic neutrality* (Acharya, 2022).

Shifting Balance of Power and Regional Strategic Dynamics

The integration of AI into the military capabilities of the United States and China has significantly altered the regional balance of power. Both nations are enhancing their situational awareness, offensive and defensive capabilities through autonomous systems, real-time analytics, and predictive intelligence—technologies that drastically shorten the strategic decision-making cycle. In the Southeast Asian context, these advancements translate into expanded maritime surveillance presence, unmanned operations, and intensified electronic data collection (ELINT and SIGINT) across the South China Sea and the Strait of Malacca (International Institute for Strategic Studies [IISS], 2024).

The United States, through its Indo-Pacific Command (INDOPACOM), has broadened the deployment of AI-based systems for maritime monitoring, notably under the *Joint All-Domain Command and Control (JADC2)* initiative, which interlinks assets across land, sea, air, cyber, and space domains into a unified digital intelligence network (U.S. Indo-Pacific Command, 2024). Conversely, China is advancing its *intelligentized warfare* capabilities through the development of autonomous systems within the PLA Navy (PLAN), capable of operating in shallow waters and around artificial islands in the South China Sea. These systems are supported by the *Gaofen* satellite network and real-time AI image processing systems (Kania, 2021; CSET, 2025).

These developments have generated an *action–reaction dynamic*, heightening the risk of an arms race within the region. ASEAN, which has traditionally relied on collective diplomacy as a mechanism for maintaining stability, now faces a strategic dilemma: whether to enhance its technological readiness for defense purposes or to uphold its *non-alignment policy* to avoid entanglement within the competing spheres of influence of the major powers (Goh, 2024).

Threats to Digital Sovereignty and Regional Cybersecurity

AI has also introduced increasingly complex non-traditional security challenges, particularly in the realms of cybersecurity and digital sovereignty. AI technologies developed for defense purposes can be easily repurposed for surveillance or information control functions, thereby posing significant risks to data privacy and national information security.

China, through its *Digital Silk Road* initiative under the broader *Belt and Road Initiative (BRI)* framework, has directed substantial investments into regional digital infrastructure including 5G networks, data centers, and smart surveillance systems in countries such as Cambodia, Malaysia, and Laos (Chen & Cheong, 2023). While these infrastructures enhance efficiency and digital connectivity, they simultaneously raise critical concerns regarding data ownership, third-party access, and the risks of *data dependency* on external technology providers (Thuzar, 2024).

Conversely, the United States promotes the *Clean Network Initiative* and the *Indo-Pacific Digital Strategy* to counter China's technological dominance, particularly in telecommunications and information security sectors. Although these initiatives aim to safeguard data integrity, several ASEAN member states perceive them as manifestations of geopolitical pressure that could strain their economic relations with China (ASEAN Secretariat, 2024).

Both approaches which is the infrastructural dominance of China's digital networks and the security-driven digital containment strategy of the United States are contributing to an increasingly polarized cybersecurity environment. This polarization complicates ASEAN's efforts to construct a regional cybersecurity framework that is neutral, secure, and inclusive.

Interoperability and ASEAN's Military Dilemma

ASEAN member states face both technical and strategic dilemmas in adapting to the wave of AI-driven military transformation. For instance, Singapore and Vietnam have begun investing in AI defence capabilities, with Singapore establishing the Digital and Intelligence Service (DIS) in 2022 to strengthen cyber defence and military analytics (Ministry of Defence Singapore, 2023). The Philippines, meanwhile, has received AI technology support and digital security training from the United States through the Enhanced Defense Cooperation Agreement (EDCA), including the deployment of autonomous maritime surveillance systems to monitor Chinese activities in the South China Sea (U.S. Department of State, 2024).

However, the main challenge for ASEAN lies in the uneven technological capabilities among its member states. Countries such as Laos, Myanmar, and Cambodia remain significantly behind in AI defence capacity and digital security infrastructure. This creates an interoperability gap that could undermine ASEAN's collective response effectiveness against

transnational threats, including cyberattacks and disinformation warfare (ASEAN Defence Ministers' Meeting [ADMM], 2024).

Furthermore, the proliferation of AI-based defence technologies to ASEAN states through major powers risks creating strategic dependency. In international relations theory, this mirrors the phenomenon of technology entrapment, where recipient states lose strategic autonomy due to dependence on systems, software updates, and maintenance controlled by the supplier nation (Kaplan & Wright, 2023).

Risks of Escalation and Misinterpretation in Regional Conflicts

The most critical implication of employing AI systems in military operations lies in the potential for unintended escalation. In the context of the South China Sea, the use of autonomous surveillance systems and unmanned assets increases the likelihood of misinterpreting tactical signals or triggering automated responses that could escalate into military confrontation.

A RAND study (2024) indicates that the deployment of autonomous systems in high-risk maritime situations carries significant danger, as short response times and the absence of direct human control can lead to incidents that are difficult to manage diplomatically. Moreover, AI systems operating with incomplete or biased data may make decisions that diverge from the strategic intentions of policymakers, thereby undermining political control over military actions.

This situation becomes even more precarious as both major powers intensify the use of maritime drones and unmanned surface vessels (USVs) in disputed waters. Such incidents are no longer merely hypothetical; in 2023, several reports highlighted the growing presence of AI-based surveillance systems around the Spratly Islands and Scarborough Shoal, heightening diplomatic tensions between China and the Philippines (Asia Maritime Transparency Initiative [AMTI], 2024).

ASEAN's Response and the Challenges of Regional Governance

ASEAN now faces an urgent need to strengthen its mechanisms for governing advanced security technologies. Although the organization has established several security platforms such as the ASEAN Regional Forum (ARF), the ASEAN Defence Ministers' Meeting (ADMM), and the ASEAN Cybersecurity Cooperation Strategy, none have yet developed a specific framework to address the implications of AI use in military and digital security contexts.

Several member states, including Malaysia and Indonesia, have emphasized the need to develop ASEAN Guiding Principles on AI Governance and Military Ethics, aimed at ensuring that the use of such technologies remains consistent with international law and the principles of responsible innovation (Ministry of Foreign Affairs Malaysia, 2024). Meanwhile, Singapore has proposed the implementation of regional confidence-building measures (CBMs) to mitigate the risks of misinterpretation in AI military operations, including communication protocols between naval forces and strategic command centers (ADMM, 2024).

However, differences in technological capacity and strategic priorities among member states make ASEAN cautious in pursuing collective policy alignment. This situation reflects the classic dilemma of the “ASEAN Way”—a consensus-based and non-binding approach that may prove inadequate in responding to the rapidly evolving risks posed by emerging technologies (Thuzar, 2024).

Conclusion

The AI-driven military transformation undertaken by the United States and China marks the beginning of a new era in international security strategy and architecture. Both great powers are not only competing in the development of AI-based weapon systems and autonomous technologies but are also shaping the global norms, ethics, and governance surrounding the use of such technologies in defense. Within the context of Southeast Asia, this rivalry generates complex strategic implications for the regional balance of power, stability, and the security of smaller states.

For the United States, the integration of AI into military strategy represents an evolution toward algorithmic warfare, an approach emphasizing the use of big data, machine learning, and autonomous systems in combat operations, logistics, and intelligence analysis. Although much of America’s AI innovation is driven by the private sector, companies such as Google, Microsoft, and Palantir, the effectiveness of this integration depends heavily on the defense establishment’s ability to align civilian technological innovation with military strategic objectives. Conversely, China, through its Military-Civil Fusion policy, has optimized national technological resources to accelerate the development of military AI systems capable of rivaling those of the United States, including autonomous drones, intelligent air defense systems, and real-time strategic analytics.

From a geopolitical standpoint, the U.S.–China rivalry in military AI is not merely a technological contest but also a struggle over values and influence. The United States emphasizes principles of openness and ethical governance, while China prioritizes digital sovereignty and information control as integral components of national security. This divergence in values risks deepening strategic mistrust, including within forums such as the ASEAN Defence Ministers’ Meeting Plus (ADMM-Plus), where Southeast Asian states strive to maintain a delicate balance between the two powers without overt alignment.

For Southeast Asia, the central challenge lies in ensuring that the global military AI transformation does not precipitate a security dilemma that heightens regional tensions. ASEAN member states must strengthen normative and governance frameworks for defense technologies to prevent the proliferation of uncontrolled autonomous weapons systems, which could threaten regional stability. Initiatives such as confidence-building measures (CBMs), information sharing, and ethical military AI research collaboration between ASEAN and external powers should serve as the foundation for a renewed collective security strategy.

Ultimately, AI transformation in the military domain demands a careful balance between strategic necessity, ethics, and security. The U.S.–China competition in this arena will continue to shape the global security landscape, placing Southeast Asia in a pivotal position to adapt without becoming ensnared in technological bipolarity. The region’s stability and prosperity

will depend on the prudence of its diplomatic and strategic engagement in navigating this new era defined by intelligent technologies, data, and algorithmic power.

Acknowledgement

The authors wish to express sincere appreciation to the National Defence University of Malaysia conference committee for the opportunity to present this work.

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DISCONFIRMED EXPECTATIONS IN DISRUPTION RESPONSE AMONG POTENTIAL USERS OF AIRPORT-RAIL SERVICE: AN INTEGRATION OF EXPECTANCY DISCONFIRMATION AND VISUAL APPROACH

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Abstract: *This study investigates the role of normative expectations on disconfirmation judgments of response actions during unexpected airport-rail link (ARL) disruptions, with a focus on potential users without prior experience. Drawing on Expectancy Disconfirmation Model (EDM) and Justice Theory, the study examines whether these expectations directly affect disconfirmation or do so through perceived performance. The justice-based EDM includes three constructs: recovery expectations (EXP, referring to users' anticipated fairness in recovery), perceived performance actions (PCV, users' evaluation of fairness in actions taken) and Disconfirmation (DSC, the extent to which expectations are unmet or exceeded). All constructs were measured using a five-point Likert scale ranging from strong disagreement to strong agreement. To present a realistic sequence of recovery actions during ARL service disruptions and to help respondents assess the performance of these actions against their expectations, the study utilised a comic strip-based questionnaire. Data from 267 respondents were analysed using a two-stage approach in PLS-SEM. All reflective measurement models achieved high reliability through Composite Reliability values above 0.80 and demonstrated convergent validity through Average Variance Extracted values exceeding 0.50 and satisfied discriminant validity requirements through Fornell-Larcker and Heterotrait-Monotrait ratio criteria. PLS-SEM results show that EXP significantly influences PCV ($\beta = 0.688$, $p < 0.001$), and PCV predicts DSC ($\beta = 0.7559$, $p < 0.001$). However, the direct path from EXP to DSC is not significant, indicating that recovery expectations influence disconfirmation only indirectly through PCV. The absence of a significant direct relationship between expectations and disconfirmation suggests that potential users may not have sufficient knowledge of response options in the event of service disruptions. This finding emphasizes the importance of clearly communicating disruption management plans and policies to the public, aiming to increase confidence in ARL service. Furthermore, the study highlights the value of visual methodologies in enhancing the utility of stated preference methods in transport research.*

Keywords: *Expectancy Disconfirmation Model, Justice Theory, Visual Approach, Disruption Management, Airport Rail Link*

Introduction

An airport-rail link (ARL) is a rail service that connects train stations directly to an airport. This service is often the preferred choice for air travellers who want to avoid traffic congestion. However, unexpected service disruptions can pose a significant challenge. These delays can cause passengers to miss their flights. These high stakes elevate passenger expectations for immediate and effective response actions. Existing ARL users have a frame of reference for how operators might handle such events and therefore have certain expectations about the response. In contrast, potential users, who lack direct experience, depend on normative expectations that are often abstract, idealised and derived from second-hand information (Hjortskov, 2020). These expectations may be overly optimistic, unduly pessimistic, or reasonably aligned with actual conditions.

To empirically evaluate the state of these initial expectations, the Expectancy Disconfirmation Model (EDM) provides a robust framework (Schiebler, Lee, & Brodbeck, 2025). EDM operates on the premise that, following an experience with a product or service, individuals evaluate whether the provider's performance aligns with, exceeds or falls short of their initial expectations. Hypothetically speaking, two individuals can experience the exact same objective service delivery but form different perceptions (Liu et al., 2024). In the context unexpected events, the stated preference methodology proves effective for eliciting responses on perceived performance (Auld et al., 2020). This method typically employs hypothetical scenarios, which in transport surveys are often conveyed through purely textual descriptions.

However, text-only descriptions impose excessive cognitive demands on survey participants due to insufficient contextual detail (Cherchi & Hensher, 2015). To address this limitation, the present study utilizes a comic strip to visually represent a realistic disruption scenario. By visually depicting a realistic unexpected disruption embedded in a questionnaire, the emotions and sequence of events are much clearer, making it easier for participants to articulate their expectations and judgments.

Accordingly, this study adopts an innovative comic strip questionnaire to elicit responses from potential ARL users, aiming to explore the effects of normative expectations in the disconfirmation process. We specifically examine whether these expectations directly influence disconfirmation or if this relationship is mediated by perceived performance of response actions. By focusing on potential users, the findings are expected to yield actionable recommendations for enhancing response strategies during unexpected service disruptions, thereby strengthening public confidence and increasing the likelihood of future engagement with ARL services.

Literature Review

Service users develop expectations based on the confidence gained from past experiences (Schiebler et al., 2025), allowing them to assess service delivery with greater familiarity. They are also more likely to make precise cognitive judgments and generate strong expectancy disconfirmation. In contrast, potential users, who lack direct experience, rely on normative expectations that are often abstract and ideal, or based on second-hand information (Meirovich & Little, 2013; Schiebler et al., 2025). These expectations may not accurately reflect actual conditions and can be either overly optimistic or pessimistic. For example, the public may not

be aware that ARL operators face time constraints (approximately 90 minutes) and logistical challenges in arranging shuttle buses for stranded train passengers (Itani, Aboudina, Diab, Srikukenthiran, & Shalaby, 2019).

It's methodologically challenging to ask the public what actions they would expect from a (train) service provider during an unexpected disruption, as these events happen unpredictably (Osman, Kaewunruen, Ann, & Dindar, 2016). The unpredictable nature of such disruptions makes it impossible to use a revealed preference (RP) survey (Currie & Muir, 2017) on those who have not experienced them. To collect and evaluate public responses to an unpredictable event like this, researchers adopted a stated preference (SP) survey (Lu et al., 2025). Generally, the public is asked to answer questions about a hypothetical scenario, which is usually presented in written form. However, the effectiveness of text is limited, especially for non-service users who may struggle to grasp abstract concepts. This could then affect their responses. To overcome this limitation, researchers adopt a visual approach in their surveys for data collection, primarily by integrating explanatory images. For example, a transit trip disruption response question was visually presented, showing options like waiting for service restoration or using a shuttle bus (Auld et al., 2020). Kalyanpad et al. (2020), on the other hand, used Google Maps API to integrate maps into their website for both RP questionnaires and SP experiments. These visual approaches aimed to enhance the accuracy and reliability of the collected data, facilitate a better understanding of the survey questions, and provide a more interactive user experience.

The EDM model offers a useful framework for measuring the discrepancy between the perceived performance of a product or service and the initial expectations. According to this model, individuals tend to experience negative disconfirmation if the service provided falls below their expectations, leading to dissatisfaction. In the context of service disruptions, the operator's response to these disruptions is crucial. Efficient communication and compensation can reduce negative disconfirmation, while poor responses may increase passengers' dissatisfaction. In particular, a lack of transparency and communication during a service disruption can exacerbate passenger dissatisfaction (Wang, Jin, & Sun, 2022). Moreover, passengers may feel ignored or undervalued if the service provider fails to take prompt actions or explain the disruption adequately (Saydam, Olorunsola, & Rezapouraghdam, 2023). This negative perception of performance can lead to a loss of trust in the service provider and decreased loyalty (Naohiko, Osamu, Shigeru, Hitoshi, & Norio, 2017).

While the EDM offers a cognitive framework for assessing whether response actions meet user expectations, justice theory provides a basis for evaluating the fairness of service disruption management and resolution (Yim, Gu, Chan, & Tse, 2003). Justice theory comprises three dimensions: distributive justice, procedural justice, and interactional justice. Distributive justice concerns the fairness of outcomes or compensation provided to users during or after service failures. Procedural justice addresses the fairness of the processes or policies employed by the service provider to manage disruptions and implement responses. Interactional justice evaluates the fairness of interpersonal treatment received by passengers during recovery interactions, emphasizing respect, empathy, and dignity. Figure illustrates the relationship between the constructs of EDM, viewed through the perspective of justice theory.

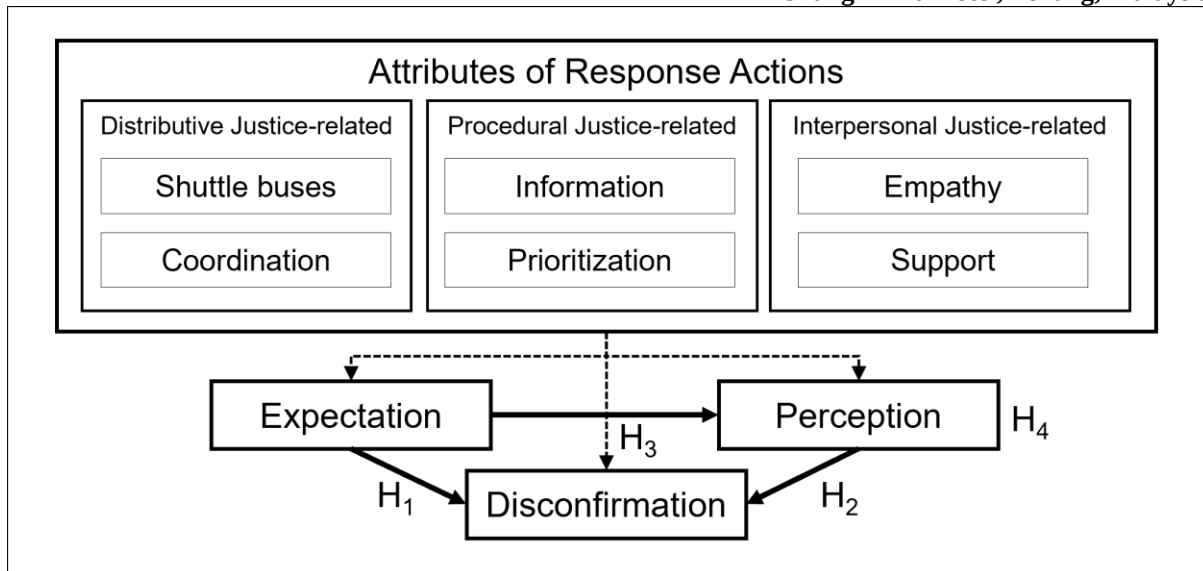


Figure 1: The Expectancy Disconfirmation Model Incorporates Attributes of Response Actions Based on Justice Theory

Methodology

This section outlines the methodology employed in this study. It begins with the research design and then provides a description of the development of the comic-based questionnaire. Finally, it provides the procedures for data collection and a PLS-SEM method used for data analysis.

Research Model

In the context of ARL service disruptions, justice theory highlights the fairness of response actions across three dimensions: distributive (ensuring a timely ride to the airport), procedural (emphasizing speed, reliability, and transparency), and interpersonal (treating customers with kindness and respect). Accordingly, the descriptions of the three primary constructs of EDM are tailored through the lens of justice theory to align with the context of this study, as outlined below:

- **Justice-Based Expectations (EXP):** This construct represents a potential user's pre-formed beliefs about what constitutes a fair and just response from a service provider during an unexpected service disruption.
- **Perceived Justice of Response Action (PCV):** This construct reflects how potential users evaluate the fairness and appropriateness of the ARL operator's response actions as portrayed in the comic strip scenario.
- **Disconfirmation of Response Action (DSC):** This construct reflects the extent to which the perceived recovery actions (PCV) differ from what potential users expected (EXP). It indicates whether the operator's actions were better, worse, or about the same as expected during the disruption.

Hypotheses

The disconfirmation process requires an individual to compare their pre-formed expectations with the post-experience performance of a product or service to form a disconfirmation judgment. Previous studies reported that prior experience is the most significant factor influencing people's expectations (Meirovich & Little, 2013; Morgan, Attaway, & Griffin, 1996). Individuals with limited experience often struggle to develop strong pre-formed expectations. This limitation forces them to depend solely on brand reputation or marketing (Belakhdar, 2025; Fregne & Gustafsson, 2019). Consequently, they tend to form expectations that are more abstract and normative (Bellizzi, dell'Olio, Eboli, & Mazzulla, 2020).

To empirically assess how expectations influence perceived performance and the subsequent disconfirmation in response actions for potential users, this study deconstructed the disconfirmation paradigm into a series of testable relationships. To test these relationships, which are hypothesised based on the expectation disconfirmation theory, the following hypotheses are established:

H1: Expectation (EXP) has a significant effect on disconfirmation (DSC).

H2: Perceived performance (PCV) has a significant positive effect on disconfirmation (DSC).

H3: Expectation (EXP) has a significant positive effect on performance perception (PCV).

H4: Perceived performance (PCV) significantly mediates the relationship between the expectation (EXP) and disconfirmation (DSC).

Development of The Comic-Based Questionnaire

Presenting a hypothetical scenario aligns with SP approach used to assess how people perceive and value scenarios in transportation (Román, Martín, & Espino, 2014). Previous applications in SP often relied on text-heavy questionnaires, which were insufficient for accurately depicting complex scenarios. This approach risked misinterpreting textual descriptions, which could result in a lack of realism (Cherchi & Hensher, 2015). Therefore, this study designed the comic strip questionnaire to address these limitations.

The use of comic strip allows participants to visualize the unexpected service disruption and the operator's actions more clearly, which can result in more thoughtful and reliable responses. Previous study demonstrates that visual narratives provide insights into public perceptions of transportation experiences (Salomon & Singer, 2011). Such narratives can align with respondents' prior experiences and increase engagement by enabling them to process information at their own pace (Nordin, 2021).

The design of the comic strip questionnaire was guided by a model from (Salomon & Singer, 2011) that illustrates the interplay between three elements: transportation issues, people, and information flow. In the context of this study, the 'transportation issue' refers to unexpected ARL service disruptions, while 'information flow' represents the response actions deployed by the ARL operator. The 'people' are potential users of ARL services, who responded to items designed to measure three constructs of justice-based EDM after processing the events depicted in the comic.

Using a comic strip as a research instrument, we can expect that the study participants will have a better understanding of the disruption scenario. Achieving this goal requires proper implementation of essential design principles, including scenario selection, visual storytelling elements and depiction of operators' responses during service disruptions

Agency reports were referenced to create a narrative that outlines what occurred, who was involved, how the response actions were carried out, and when these actions were taken for stranded passengers during unplanned service disruptions (Itani et al., 2019; Piner & Condry, 2017). A hybrid workflow that combined artificial intelligence (AI) with a human illustrator was employed to visually depict this narrative and capture the environment of the scenario. The AI tools used text prompts to create graphic content which enabled fast visualization of intricate scenes. Still, these preliminary images often lack emotional depth and contextual accuracy. The human illustrator worked on the AI-generated content to add emotional depth while verifying the context and adding character expressions that matched the story and conversation. Figure presents the six pages of a comic strip used in the questionnaire.



Figure 2: A Six-Page Comic Strip Illustrating the ARL Operator's Sequential Response Actions During a Service Disruption

Questionnaire items measuring the constructs of justice-based EDM were strategically anchored to specific points within the comic strip's narrative. This integration was designed to capture expectations, perceptions and disconfirmation sequentially and contextually, with all items structured around the three dimensions of justice theory. All items measuring the justice-

based EDM constructs use a five-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree." The scale's midpoint is contextually labelled as either "Neutral" or "Okay" to best suit the nature of the question. Appendix 1 lists the questionnaire items adapted from recovery service literature (Chih, Wang, Hsu, & Cheng, 2012; Matikiti, Mpinganjira, & Roberts-Lombard, 2018; Mccollough, Berry, & Yadav, 2000) to ensure their validity.

Panels pretested the comic-based questionnaire to ensure that EDM constructs and their respective measurement items were interpreted as intended. Following the pretest, a pilot study was conducted with 30 randomly selected train passengers to assess the time required to complete the questionnaire.

Data Collection

Small, coupon-sized cards featuring QR codes linked to the comic-based questionnaire were distributed at the entrances of various train stations throughout Kuala Lumpur. This approach was intentionally chosen to prevent recipients from feeling forced to complete the survey on the spot, as many often rush to catch their trains. By allowing recipients to access the survey at their own convenience, the method aims to encourage more thoughtful participation and reduce instances of straightlining in the responses.

This study seeks responses from individuals who have not yet used ARL services. As a result, the enumeration team refrained from distributing the QR code to individuals carrying luggage, as they are likely travelling to the airport by train. Additionally, participants must indicate at the end of the questionnaire whether they have used a train to get to the airport.

Data Analysis

The data collected were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with the aid of SmartPLS 4 software. This analytical approach is well-suited for the exploratory nature of this study, focusing on how EXP influences DSC and PCV among potential ARL users. PLS-SEM implementation follows a two-stage approach, as recommended by Hair et. al (Hair, Hult, Ringle, & Sarstedt, 2022).

- **Measurement model assessment:** The first stage evaluates the measurement model's reliability and validity, including indicator reliability, internal consistency reliability, convergent validity and discriminant validity.
- **Structural model assessment:** The second stage evaluates the structural model by examining the significance of the path coefficients (via bootstrapping), the coefficient of determination and the model's predictive relevance.

Following the completion of the model assessments, we proceeded with an Importance-Performance Map Analysis (IPMA). The primary objective here was to validate the relative importance and performance of EXP and PCV in influencing DSC among potential ARL users.

Results

Of the 650 invitation cards distributed, 557 individuals participated in the study, resulting in a participation rate of 86%. Among these, only 267 individuals (about 40%) had no prior

experience with ARL services, which is the relevant sample for this study. Importantly, the 267 participants in the study possess enough statistical power for SEM analysis. The power analysis indicates that 90 participants are needed to achieve 80% statistical power at a 5% significance level for detecting R^2 values of 0.10. Therefore, the structural model (based on **Error! Reference source not found.**) can demonstrate sufficient power to detect minimal effects which guarantees reliable statistical outcomes.

Assessment of Measurement Models

Prior to the structural model assessment, the reliability and validity of the reflective measurement models for the three latent constructs; EXP, PCV and DSC were assessed.

Table 2 results show that all measurement constructs achieved high internal consistency levels. Cronbach's alpha values range from 0.800 to 0.907, and composite reliability (CR) values range between 0.870 and 0.928—both exceeded the 0.70 threshold. The constructs achieved convergent validity through their AVE values which exceeded 0.50 at 0.532 (EXP), 0.684 (PCV) and 0.716 (DSC). In other words, each construct accounts for over half the variance in its indicators. Moreover, the indicators in Figure show statistical significance at p -value < 0.05 and most values surpass 0.7. The structural model retained indicators Exp6 and Pcv4 and Dsc3 even though their outer loadings fell below 0.7 because their constructs showed strong internal consistency and convergent validity according to Hair et al. (Hair et al., 2022).

Next, discriminant validity was confirmed using two methods. First, the Fornell-Larcker criterion is satisfied since each construct's AVE square root (the diagonal values in **Error! Reference source not found.**) is higher than its correlations with the other constructs. Second, HTMT ratio analysis in **Error! Reference source not found.** shows all values below 0.9, supporting that the constructs are distinct from each other. Given the strong performance of the measurement models, the analysis proceeds to assess the structural model.

Table 2: Reflective Measurement Model Results

Construct	Outer loadings range	Cronbach's alpha	CR	AVE
EXP	0.534-0.806	0.827	0.870	0.532
PCV	0.697-0.903	0.907	0.928	0.684
DSC	0.681-0.940	0.800	0.881	0.716

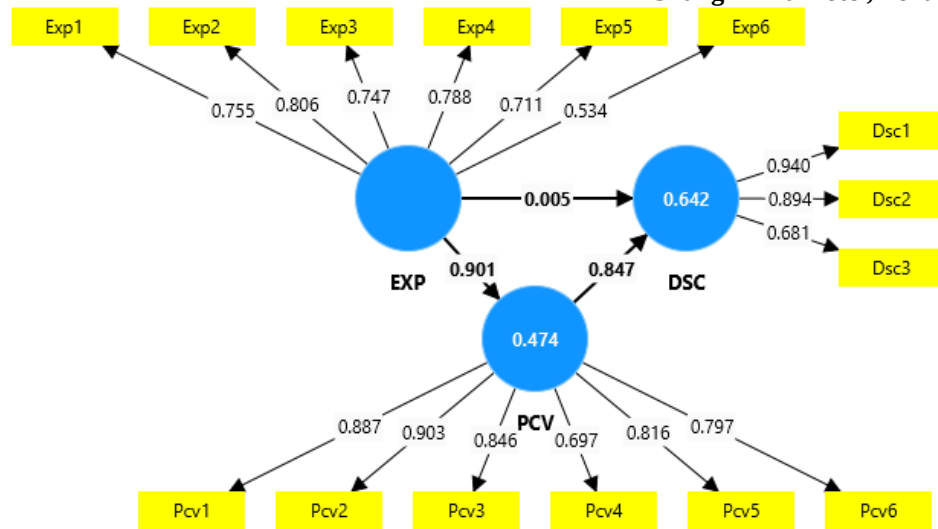


Figure 3: PLS-SEM results including outer loadings of all indicators, f^2 value (depicted on the arrow between two constructs) and R^2 in the endogenous construct

Table 3: Discriminant Validity by Fornell-Larcker Criterion

Construct	EXP	PCV	DSC
EXP	0.729		
PCV	0.688	0.827	
DSC	0.582	0.729	0.846

Table 4: HTMT Ratio Results

Construct	EXP	PCV
PCV	0.748	
DSC	0.632	0.887

Structural Model Assessment and Hypothesis Testing

The proposed structural model was evaluated through several steps to determine its explanatory power and to test the hypothesised relationships. First, all the VIF values of our model (shown in Table 5) are well below the conservative threshold of 3.0. This suggests that multicollinearity is not a concern in the structural model. Moreover, the low VIF values suggest that EXP and PCV are not redundant, and the path coefficients estimated in the path analysis can be considered reliable.

The explanatory power of EXP and PCV on the variability in DSC is given by the coefficient of determination (R^2). The R^2 value for DSC is 0.642 in Table 5, meaning that EXP and PCV explained 64.2% of the variability in this endogenous variable. The remaining 35.8% variability is attributed to other unaccounted variables. Meanwhile, an R^2 value of 0.474 for PCV means that 47.4% of its variance is explained by EXP. In addition to R^2 values, we also examined Stone-Geisser's Q^2 value, obtained using a blindfolding procedure, to gauge its out-of-sample predictive power. Table 5 shows that the Q^2 values for PCV and DSC are well above 0.15, confirming that the structural model has predictive relevance for both endogenous constructs.

The effect size (f^2) was then examined to determine the strength of the influence of predictor constructs in the structural model, **Error! Reference source not found.** shows that EXP has a f^2 value of 0.005 about DSC, below the 0.02 threshold for a small effect. It indicates that the direct effect of EXP on DSC is negligible. In contrast, PCV exerts a powerful influence on DSC with an f^2 value of 0.847, exceeding the threshold for an intense effect (≥ 0.35) as defined by Cohen (Cohen, 1998).

Next, the results of path analysis (in Table 6) obtained by running the bootstrapping procedure (with 5000 resamples) were examined to test the hypotheses. At a 5% significance level, a hypothesis was considered supported by the evidence when the t -value was greater than 1.96 and the p -value was less than 0.05. The path analysis shows that the direct path from EXP to DSC was non-significant (t -value = 0.641, p -value = 0.522). Therefore, H1 is not supported. In contrast, the path from PCV to DSC was positive and highly significant (t -value = 7.985, p -value < 0.001). The effect size (f^2) was very large at 0.847. Therefore, H2 is supported. The path coefficient from EXP to PCV was also positive and significant (t -value = 9.104, p -value = 0.000). The effect size (f^2) was large at 0.901. Therefore, H3 is supported.

Finally, the test for the mediating effect of PCV (H4) revealed a significant indirect effect. As shown in

Table 7, the direct effect of EXP on DSC was non-significant (p -value > 0.05), while the indirect effect was significant (*Indirect Effect* = 0.523, t -value = 5.869, p -value < 0.01). The 95% confidence interval for the *Indirect Effect* [0.361, 0.709] did not contain zero, confirming its significance. This pattern indicates full mediation. Therefore, H4 is supported.

Table 5: Endogenous Variable VIF, R^2 and Q^2

Endogenous variable	VIF	R^2	Q^2
PCV	1.000	0.474	0.310
DSC	1.901	0.642	0.422

Table 6: Statistical Hypothesis Test

Structural path	Path coefficient, β	t -value	p -value	Decision
EXP -> DSC	0.059	0.641	0.522	Not support H1
EXP -> PCV	0.688	9.104	0.000	Support H2
PCV -> DSC	0.759	7.985	0.000	Support H3

Table 7: Significance Analysis of Direct and Indirect Effects

Structural path	EXP -> DSC
<i>Direct effect</i>	0.059
<i>t</i> -value	0.641
Significance ($p < 0.05$)?	No
<i>Indirect effect</i>	0.523
95% CI of the Indirect Effect	[0.361, 0.709]
<i>t</i> -value	5.869
Significance ($p < 0.05$)?	Yes

IPMA Results

An IPMA was conducted to validate the results presented in Tables 5 and 6, specifically focusing on the significance of potential users' expectations in explaining the disconfirmation with response actions. Based on Table 8, the IPMA results show that PCV is the most influential driver, with an importance score of 0.759. EXP follows as the second most important driver, scoring 0.582. The performance scores for both constructs are moderate and relatively close, with PCV at 65.560 and EXP at 68.698, indicating that the average user response was positive and leaned towards agreement.

Table 8: Importance and Performance Scores for EXP and PCV Constructs

Construct	Importance	Performance
EXP	0.582	68.698
PCV	0.759	65.560

Discussion

The primary finding of this study was that the direct influence of potential users' expectations on the disconfirmation was non-existent ($\beta = 0.059$, $p\text{-value} > 0.05$). No direct effect exists between relationship EXP and DSC, contrasting prior studies (Hien, Long, Liem, & Luu, 2024; Matikiti et al., 2018; Yim et al., 2003) on the impact of user expectations on disconfirmation. Service users who have developed a degree of loyalty to a brand or service through past travel experiences possess an understanding of what to expect from the service provider during disruptions. Meanwhile, for potential users, their expectations appear to be shaped by best practices in disruption management from other service sectors, such as airlines, e-commerce, or food delivery. The initial expectations do not align with the operational challenges inherent in managing disruptions within ARL services. For example, the public may not be aware that ARL operators face limited time and ground challenges in arranging shuttle buses for stranded train passengers (Itani et al., 2019).

Instead, the entire influence of potential users' expectations is channelled through their perception of the operator's response actions ($\beta = 0.523$, $p\text{-value} < 0.05$). This finding indicates a full mediation, underscoring that perception is the indispensable bridge between expectation and disconfirmation. The strong, positive, and significant path from EXP to PCV ($\beta = 0.688$) indicates that potential users with higher expectations for the ARL service perceived the operator's response actions more favourably. This newly formed perception becomes the primary driver of the disconfirmation judgment. The significant and powerful path from PCV to DSC ($\beta = 0.759$) indicates that the more positively the user perceived the performance of response actions, the more likely they were to feel that the ARL operator's response had exceeded their expectations. IPMA further reinforces this, identifying perceived performance (PCV) as the most important construct for explaining disconfirmation (Importance = 0.759), far more so than the expectation (EXP) (Importance = 0.582). This finding is consistent with the disconfirmation literature (McCollough, 2000).

From a managerial perspective, the study's findings offer actionable guidance for ARL operators, demonstrating how to leverage effective response actions as a marketing opportunity to attract new ARL users. The core of this strategy is to handle all three justice theory components to achieve effective results. The delivery of shuttle buses represents an example of distributive justice because it provides users with visible and effective solutions during service interruptions. People need timely and transparent information delivery to avoid

confusion according to the principles of procedural justice. Staff members need to demonstrate genuine empathy and professional behaviour when interacting with users since performing tasks mechanically will not suffice. The failure to address these justice components will drive away potential users who will choose to use private transportation instead of ARL services. The way operators handle disruptions determines how public will decide about the ARL service and their overall impression of it.

Conclusion

The study examined how normative expectations shape the disconfirmation of response actions from the perspective of potential service users. The study employed EDM to analyse perceived justice, revealing that user expectations do not directly determine their disconfirmation judgment. Instead, these expectations are channelled indirectly through the performance perception of response actions. This finding establishes the pivotal role of performance perception as a full mediator in the disconfirmation process for potential users. For ARL operators, this insight is vital as it underscores the necessity of effective response actions in managing service disruptions.

While the study was not designed to compare the comic strip methodology against a traditional text-only format empirically, its effectiveness in this study is directly linked to its ability to immerse respondents in a realistic disruption scenario. This quality made comic strip methodology more than just a data collection tool. It was a psychological tool that drove potential users' disconfirmation judgments, thereby validating its application in Stated Preference research for complex service scenarios.

One direction for future work is to conduct comparative analyses between existing and potential ARL users using the same visual methodology. These distinct user groups of ARL services may hold varying perspectives on an unexpected service disruption and subsequent recovery actions. By conducting a comparative study, we can gain a deeper understanding of how journey experience and prior knowledge of disruption management influence their expectations, perception and disconfirmation judgments.

Acknowledgements

This study was funded by Universiti Kebangsaan Malaysia under Grant No. GGPM-2023-002. Special thanks to Miss Khaleeda Aleesa Kamaruzaman for her significant contributions in developing the questionnaire and collecting data.

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Appendix

Measurement items used for three latent constructs in the justice-based expectancy disconfirmation model.

Dimension	Construct	Code	Statement on the questionnaire (Item)
Distributive	Expectation	Exp1	The train company should arrange shuttle bus services to the airport.
		Exp2	I want the train company to coordinate with traffic authorities to prioritize shuttle bus routes and minimize delays.
	Performance Perception	Pcv1	The train company made every effort to arrange shuttle buses for passengers to reach the airport.
		Pcv2	The train company's coordination with traffic authorities led to a remarkably smooth shuttle bus experience.
	Disconfirmation	Dsc1	The train company went beyond my expectations in arranging shuttle buses to the airport.
Procedural	Expectation	Exp3	I want to receive timely updates on the arrival times of shuttle buses to the airport.
		Exp4	Passengers with urgent flight schedules should be prioritized in shuttle bus arrangements.
	Performance Perception	Pcv3	Information about shuttle bus arrivals was communicated regularly.
		Pcv4	Passengers with imminent flight departures were given priority by the train company.
	Disconfirmation	Dsc2	I was impressed by how effectively the train company used various channels to communicate information about shuttle bus arrivals.
Interactional	Expectation	Exp5	I want the train company to demonstrate empathy and understanding towards the frustrations and concerns of passengers.
		Exp6	I want the train company to offer prompt and effective support to passengers affected by disruptions.
	Performance Perception	Pcv5	I felt that the staff genuinely cared about passengers' need to reach the airport and not miss their flight.
		Pcv6	The train company's support was timely and resolved immediate issues.
	Disconfirmation	Dsc3	The staff's empathy and understanding were even greater than I expected.

THE MINDSET-6 FRAMEWORK: A CURRICULUM BLUEPRINT FOR CULTIVATING INDUSTRY 6.0-READY ENTREPRENEURIAL MINDSETS IN MALAYSIAN UNDERGRADUATES

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Abstract: *Malaysia continues to grapple with a persistent misalignment between graduate capabilities and the rapidly evolving demands of the workforce, particularly in entrepreneurial readiness and digital adaptability. Although the Ministry of Higher Education reports graduate employability rates above 80%, many employers remain concerned about graduates' limited creativity, risk appetite, and technological fluency. This paradox reveals a deeper structural issue: higher education institutions are producing academically competent yet entrepreneurially hesitant graduates. This critical review synthesizes empirical and conceptual studies published between 2019 and 2025 to identify key enablers, pedagogical innovations, and policy implications for cultivating an entrepreneurial mindset among Malaysian undergraduates. Findings suggest that attitude, perceived behavioural control, and ecosystem support are dominant predictors of entrepreneurial intention, while experiential, digital, and sustainability-oriented pedagogies strengthen mindset development. However, significant gaps persist, particularly in translating entrepreneurial intention into behaviour, integrating AI and data literacy, and embedding sustainability ethics into curricula. To address these limitations, this paper introduces the MINDSET-6 Framework, a curriculum blueprint encompassing Mindfulness and Ethics, Interdisciplinary AI and Data, Networked Learning, Design and Making, Sustainability, Entrepreneurial Finance, and Transversal 4Cs competencies. The framework positions entrepreneurship education not as a business module but as a transformative, human-centred process aligned with Malaysia's transition toward a sustainable and digital Industry 6.0 economy.*

Keywords: *Entrepreneurial Mindset; Industry 6.0; Malaysian Undergraduates; 21st-Century Skills; Entrepreneurship Education*

Introduction

As Malaysia accelerates its transformation toward a digital, innovation led, and sustainability driven economy, the need for graduates who can recognise opportunities, mobilise resources, and create ethical value, either through entrepreneurship or intrapreneurial roles, has become increasingly critical. The entrepreneurial mindset, characterised by creativity, resilience, opportunity recognition, and ethical judgement, has evolved from being a desirable graduate trait into an indispensable national asset (Isa et al., 2024). Despite strong policy support for entrepreneurship education, Malaysia continues to face a worrying employability skills divide. Reports by the Ministry of Higher Education (MOHE, 2023) indicate that while graduate employment rates exceed 80%, many employers still highlight the lack of creativity,

adaptability, and critical problem-solving skills among young graduates. This situation suggests that universities may be producing academically capable individuals but not necessarily innovation-oriented graduates with the cognitive agility to navigate rapidly changing, technology intensive environments.

This issue becomes even more pressing in the context of Industry 6.0, a human centred evolution of Industry 4.0 and 5.0 that merges artificial intelligence (AI), robotics, and digital ecosystems with emotional intelligence, ethics, and sustainability consciousness (Verma., 2025). Industry 6.0 envisions an economic landscape where human creativity coexists with machine intelligence, fostering a symbiotic relationship between technology and humanity (Fernández-Miguel., 2024). To thrive in this ecosystem, graduates must possess not only technical and digital competence but also an entrepreneurial mindset that balances innovation with responsibility and social impact. In this regard, higher education institutions (HEIs) in Malaysia face an urgent need to redesign their approach to entrepreneurship education. Traditional pedagogies such as static lectures or business plan competitions have proven insufficient to inspire innovation, digital literacy, and adaptive leadership. As Isa et al., (2024) argued, entrepreneurial education mediates the relationship between students' attitudes, perceived behavioural control, and mindset development, illustrating that experiential and reflective learning are essential catalysts for transformation. Likewise, Degefu (2024) emphasised that many existing frameworks still neglect the integration of digital fluency and sustainability literacy, revealing a conceptual and pedagogical gap in preparing graduates for Industry 6.0 realities.

Against this backdrop, this study adopts a critical review approach to provide a timely synthesis of empirical and conceptual evidence, capturing emerging patterns and policy implications more dynamically than a traditional systematic review would allow. By integrating insights across multiple studies published between 2019 and 2025, this review deepens understanding of how Malaysian HEIs can cultivate entrepreneurial mindsets that are adaptive, innovative, and ethically grounded. It seeks to identify the main determinants that shape entrepreneurial mindset formation among undergraduates, evaluate pedagogical approaches that effectively promote entrepreneurial behaviour and innovation, and explore the broader policy implications for embedding human centred entrepreneurship within higher education. Through this analysis, the paper contributes to ongoing scholarly and policy conversations on transforming entrepreneurship education from mere knowledge transmission into a dynamic, mindset-oriented process. Ultimately, it argues for a paradigm shift that empowers Malaysian graduates to become not just employable workers but visionary leaders capable of driving innovation, sustainability, and social progress in the 21st century workforce.

Literature Review and Critical Synthesis

Industry 6.0 and the Redefinition of the Entrepreneurial Mindset

Recent scholarship conceptualises Industry 6.0 as a transformative stage that transcends efficiency driven automation by prioritising human centricity, sustainability, and intelligent data ecosystems. Verma et al., (2025) describe Industry 6.0 as the harmonisation of human creativity and machine intelligence, extending the humanistic ethos of Industry 5.0 through deeper environmental accountability and interconnected digital supply chains. This evolution implies that graduates must integrate entrepreneurial agility with AI and data literacy, alongside awareness of environmental, social, and governance imperatives. In the context of

organisational design, Fernández Miguel et al., (2024) introduce the concept of conscious intelligence, embedding ecological and social reasoning within innovation processes. Such an orientation demands graduates who exhibit systems thinking, ethical reflexivity, and socio technical adaptability rather than mere risk taking or opportunity recognition. Although much of the industrial literature continues to reference Industry 5.0, emerging reviews such as Ghobakhloo (2024) and Rame et al., (2024) consistently emphasise resilience and human centred innovation as foundational to Industry 6.0. For Malaysian higher education institutions, this redefinition signals a necessary paradigm shift. Entrepreneurial mindset development must move beyond the narrow Theory of Planned Behaviour lens that focuses only on attitude and intention to include AI and data fluency, sustainability orientation, and cross disciplinary collaboration skills aligned with the Industry 6.0 agenda.

Determinants of Entrepreneurial Intention among Malaysian Undergraduates

Empirical evidence from Malaysia between 2023 and 2025 refines understanding of how attitude, perceived behavioural control, education, and social norms interact to shape entrepreneurial intention. Teoh et al., (2024) found that attitude and perceived behavioural control remain the strongest predictors of entrepreneurial intention among business undergraduates, while subjective norms play a weaker role. This suggests that Malaysian students' entrepreneurial drive is grounded more in self-efficacy and internal motivation than in external social validation. Complementary findings by Chin et al., (2024) further show that entrepreneurial self-efficacy mediates the relationship between institutional support and intention. Across ASEAN studies, motivation and self-regulation also emerge as key factors in differing institutional contexts (Ridwan et al., 2025; Nawaz, 2024), implying that mindset development must nurture goal setting, reflection, and self-directed learning. Additionally, financial literacy has proven vital. Malaysian studies such as Sufian and Wen (2024) report a positive link between financial capability and entrepreneurial aspiration, aligning with regional findings connecting technological innovativeness to entrepreneurial behaviour (Pham et al., 2023). Collectively, the evidence suggests that internal capability beliefs reinforced by financial and digital literacies and authentic experiential learning exert greater influence on entrepreneurial intention than social norms alone.

Pedagogies that Transform Mindset and Behaviour

The literature consistently highlights experiential, reflective, and problem based learning as effective pedagogical strategies for fostering entrepreneurial mindsets. Malaysian research identifies immersive components such as internships, simulations, service learning, and real client projects as vital in bridging the gap between theoretical knowledge and entrepreneurial action (Sulaiman et al., 2024; Yusoff & Hassan, 2025). These experiences cultivate the four Cs, namely creativity, critical thinking, collaboration, and communication, which underpin entrepreneurial success in Industry 6.0 contexts. Digital learning environments also play a central role. Studies show that team based online learning, WhatsApp groups, and learning analytics platforms can enhance creativity, engagement, and collaboration (Cojocariu et al., 2024; Bahari et al., 2023; Lee et al., 2023). Digital integration is therefore a key enabler for entrepreneurial behaviour in hyperconnected environments. However, the design quality of these learning experiences remains uneven. Dumitru et al., (2023) reveal that structured interventions improve higher order thinking only when accompanied by consistent scaffolding and assessment. For genuine Industry 6.0 readiness, entrepreneurship education must embed

AI infused, sustainability-oriented challenge studios where students ideate, prototype, test with stakeholders, and reflect ethically. These models translate the human centred ideals of Industry 6.0 into actionable learning experiences.

Persistent Gaps and Measurement Deficits

Despite encouraging advancements, several structural gaps continue to characterise Malaysian and regional scholarship on entrepreneurship education. The first is the intention behaviour gap, where most studies stop at measuring entrepreneurial intention without examining the actual transition to entrepreneurial behaviour such as start-up formation, prototype validation, or intrapreneurial initiatives. Scholars such as Xanthopoulou et al., (2024) emphasise the need for longitudinal research designs to capture behavioural translation over time. The second issue is measurement inconsistency. Many instruments used to assess entrepreneurial mindset still omit AI, digital, and sustainability dimensions (Degefu, 2024). Consequently, these constructs fail to represent the Industry 6.0 paradigm that integrates data intelligence and ethical innovation.

The third gap concerns unequal ecosystem access. Entrepreneurial ecosystems remain unevenly distributed, where access to mentorship, maker spaces, incubators, and micro funding is limited, particularly in non-urban universities (Sulaiman et al., 2024). This disparity undermines inclusivity and equitable participation among students. The fourth challenge lies in outdated assessment focus. Assessment practices still prioritise business plan competitions and theoretical examinations rather than evidence of innovation, reflection, or social impact. Recent micro credential initiatives by Gamage et al., (2025) suggest that modular, skills verified pathways can serve as more credible and portable measures of entrepreneurial competence. Taken together, these structural gaps highlight that while attitude, self-efficacy, and education quality drive entrepreneurial intention, their conversion into meaningful entrepreneurial behaviour depends on ecosystem readiness, equitable access, and modernised assessment frameworks. Addressing these gaps is essential to realise the human centred and data intelligent vision of Industry 6.0 and to ensure that Malaysian graduates evolve into resilient, innovative contributors to a sustainable digital economy. Table 1 presents a summary of key empirical and conceptual studies conducted between 2019 and 2025 that illustrate these persistent gaps and emerging pedagogical trends in entrepreneurship education.

Table 1: Summary of Key Studies on Entrepreneurial Mindset, Pedagogy, and Industry 6.0 (2019–2025)

Author(s) & Year	Focus of Study	Methodology Sample	Key Findings	Implications
Isa et al., (2024)	Mediating role of entrepreneurship education mindset intention	Quantitative (SEM) among Malaysian public and university students	Experiential and reflective learning strengthen the links between attitude, perceived behavioural control, and entrepreneurial intention	Curriculum reform should integrate experiential learning and digital tools for mindset transformation

Teoh et al., (2024)	Determinants of entrepreneurial intention among business undergraduates	Cross-sectional survey using TPB model	Attitude and perceived behavioural control remain dominant predictors, while subjective norms are weaker	Pedagogy should emphasise self-efficacy and risk management rather than social pressure
Chin et al., (2024)	Institutional support, efficacy entrepreneurial intention	self- Mixed-method; and university students	Mentorship and incubator access mediate intention; practical experience crucial	Strengthen campus ecosystems with mentorship and prototype-based learning
Verma et al., (2025)	Conceptualisation of Industry 6.0 and its relevance to mindset	Critical synthesis of industrial and educational literature	Industry 6.0 merges AI, ethics, and sustainability with human creativity	Frameworks must include empathy, digital literacy and sustainability literacy
Fernández Miguel et al., (2024)	Concept of “conscious intelligence” innovation processes	in Conceptual paper	Integrates ecological and social reasoning into innovation	Entrepreneurship education should embed socio-technical and ethical reasoning
Sufian & Wen (2024)	Role of financial literacy in entrepreneurial aspiration	Quantitative regression; Malaysian youth	Financial knowledge and confidence predict higher entrepreneurial intention	Incorporate financial literacy modules in entrepreneurship curriculum
Bahari et al., (2023)	Digital learning and creativity among students	Experimental study using online collaboration tools	Team-based digital platforms improve creativity, engagement and collaboration	Digital pedagogy supports Industry 6.0 readiness and teamwork skills
Cojocariu et al., (2024)	Online teamwork and entrepreneurial learning	Case-based study	Learning analytics tools enhance creative performance and digital confidence	Foster digital collaboration and self-directed learning
Sulaiman et al., (2024)	Experiential entrepreneurship programmes in HEIs	Multi-case institutional review	Real client projects and mentoring improve problem solving and communication skills	Unequal access limits inclusivity; need equitable ecosystem support

Degefu (2024)	Review of entrepreneurial mindset frameworks	Systematic regional review	Lack of AI, digital Redesign mindset and sustainability instruments aligned dimensions in with Industry 6.0 current constructs competencies
Gamage et al., (2025)	Micro-credential pathways in entrepreneurship education	Qualitative and pilot implementation	Modular, skills-verified credentials Integrate micro-enhance credentials for employability and flexible, industry-competency relevant learning recognition

Source: Scopus Database

The fourth challenge lies in outdated assessment focus. Assessment practices still prioritise business plan competitions and theoretical examinations rather than evidence of innovation, reflection, or social impact. Recent micro credential initiatives by Gamage et al., (2025) suggest that modular, skills verified pathways can serve as more credible and portable measures of entrepreneurial competence. Taken together, these structural gaps highlight that while attitude, self-efficacy, and education quality drive entrepreneurial intention, their conversion into meaningful entrepreneurial behaviour depends on ecosystem readiness, equitable access, and modernised assessment frameworks. Addressing these gaps is essential to realise the human centred and data intelligent vision of Industry 6.0 and to ensure that Malaysian graduates evolve into resilient, innovative contributors to a sustainable digital economy

Method (Rapid Critical Review)

This study employed a rapid critical review design to synthesise emerging empirical and conceptual insights concerning entrepreneurial mindset development among Malaysian undergraduates within the evolving context of Industry 6.0. This design was chosen for its ability to deliver a structured yet timely synthesis of contemporary evidence within a defined timeframe (2019–2025), enabling the study to capture relevant patterns that directly inform higher education policy and practice. Unlike systematic reviews, which prioritise methodological exhaustiveness, a critical review lens interrogates the conceptual coherence, theoretical framing, and practical implications of existing studies. It moves beyond description to evaluate how well current research aligns with the human-centred, technologically integrated principles of Industry 6.0, while simultaneously challenging the over-reliance on the Theory of Planned Behaviour (TPB) as a dominant explanatory model. This approach allows for deeper reflection on whether entrepreneurial mindset scholarship adequately addresses emerging dimensions such as AI fluency, sustainability literacy, and ethical reflexivity.

Search Strategy

The review adopted a structured search strategy across major Scopus-indexed and peer-reviewed databases, including ScienceDirect, SpringerLink, Taylor & Francis Online, MDPI, Emerald Insight, and Wiley Online Library. Boolean operators were used to ensure both breadth and precision, combining key phrases such as: ("entrepreneurial mindset" OR "entrepreneurial intention") AND ("Malaysia" OR "Malaysian undergraduates") AND ("Industry 4.0" OR "Industry 5.0" OR "Industry 6.0" OR "digital skills" OR "21st century skills"). To ensure conceptual consistency and methodological rigour, only English-language

journal articles, reviews, and conceptual papers published between 2019 and 2025 were included. Conference proceedings, editorials, and non-refereed reports were excluded to maintain credibility. In addition to database searches, reference lists of seminal works, such as Chin et al., (2024), Isa et al., (2024), and Verma et al., (2025), were manually screened to identify supplementary studies relevant to the Malaysian higher education context. The overall search and screening process is illustrated in Figure 1, which summarises the stages of identification, screening, eligibility assessment, and final inclusion of studies. This iterative process ensured comprehensive coverage of both direct and peripheral contributions to entrepreneurial mindset scholarship.

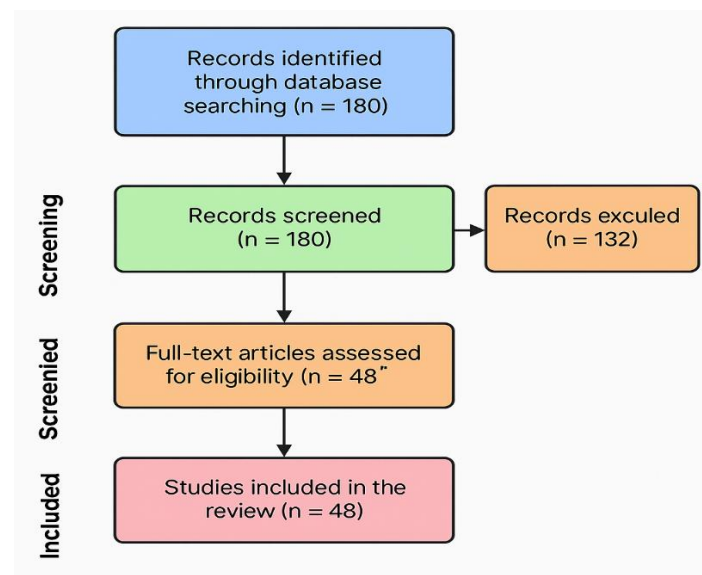


Figure 1: PRISMA-style Flow Diagram of the Review Process

(adapted for rapid critical review design)

Figure 1 illustrates the sequential stages of the review process based on PRISMA guidelines. A total of 180 records were initially identified through database searches. After screening and removal of duplicates, 132 records were excluded, leaving 48 full-text articles that met the inclusion criteria. These studies were subsequently appraised and synthesised for conceptual and methodological coherence with Industry 6.0.

Inclusion and Exclusion Criteria

Studies were included based on their relevance to higher education and their empirical or theoretical engagement with entrepreneurial mindset formation. Eligible papers examined at least one of the following:

- Entrepreneurial intention or mindset among Malaysian or ASEAN undergraduates.
- Entrepreneurship pedagogy or learning design in university contexts.
- Integration of Industry 4.0–6.0 competencies or 21st-century skills such as creativity, critical thinking, collaboration, communication, digital literacy, and sustainability.

Studies focusing exclusively on secondary education, vocational or informal training, or macroeconomic entrepreneurship trends unrelated to pedagogy were excluded. This selection

ensured that the synthesis concentrated on pedagogical, psychological, and policy dimensions most relevant to higher education outcomes in Malaysia.

Screening and Appraisal

The initial search identified approximately 180 records. After title and abstract screening, followed by full-text evaluation, 48 studies met the inclusion criteria for final synthesis. Each article was appraised for methodological robustness (sample adequacy, instrument validity, and reliability) and contextual relevance to Malaysian or Southeast Asian higher education. The review also evaluated each study's theoretical alignment, identifying whether it drew upon frameworks such as the Theory of Planned Behaviour, human-centred design, or Industry 6.0 paradigms. This multi-layered appraisal distinguished studies that demonstrated both empirical credibility and conceptual depth. The process ensured that evidence included in the synthesis genuinely advanced understanding of entrepreneurial mindset development in technologically advanced and human-centred educational settings.

Analytical Approach

Guided by Grant and Booth's (2009) typology for evidence synthesis, the review adopted a thematic critical synthesis rather than a meta-analytic approach, as the diversity of research designs and outcome measures did not permit quantitative aggregation.

The analysis organised studies into four interconnected thematic strands:

1. Determinants of entrepreneurial mindset and intention.
2. Pedagogical approaches and learning environments.
3. Integration of Industry 6.0 and 21st-century skill development.
4. Systemic and measurement-related gaps.

Through iterative reading, coding, and cross-referencing, the synthesis prioritised interpretive depth and cross-contextual comparison. Malaysian empirical evidence was triangulated with regional and global studies to highlight shared trends and contextual differences. Key contributions were drawn from Chin et al. (2024) on entrepreneurial intention, Isa et al. (2024) on the mediating role of entrepreneurial education, and Sufian and Wen (2024) on financial literacy as a behavioural antecedent of entrepreneurship. Together, these studies provided a cohesive foundation for examining how mindset formation intersects with pedagogy, policy, and Industry 6.0 imperatives.

Ethical and Quality Considerations

The review included only open-access or institutionally subscribed articles with transparent methodological disclosures. Each selected paper was assessed for theoretical consistency, instrument reliability, and contextual applicability to mitigate publication bias and overrepresentation of positive findings. While this review does not claim exhaustive coverage of all available literature, it prioritises conceptual validity and applied relevance to Malaysian higher education. The ultimate objective is to generate evidence-based, actionable recommendations for curriculum design, institutional practice, and policy reform that support the nation's transition toward a human-centred, innovation-driven Industry 6.0 economy.

Findings and Thematic Synthesis

What the Entrepreneurial Mindset for Industry 6.0 Must Include

Recent conceptual and empirical studies agree that Industry 6.0 represents not merely a phase of technological advancement but a holistic human-centred transformation that integrates artificial intelligence, sustainability, and emotional intelligence into organizational and societal systems. Verma et al., (2025) describe this paradigm as a production and service ecosystem that is hyper-connected, ethically grounded, and environmentally conscious, where human creativity complements machine precision in a dynamic relationship between technology and humanity. According to Fernández-Miguel et al., (2024), Industry 6.0 introduces a stage of conscious intelligence that aligns human, social, and ecological systems. This transformation requires entrepreneurs to redefine value creation beyond efficiency and profit, focusing instead on social purpose, environmental responsibility, and collective well-being. Cultivating an entrepreneurial mindset for this new era involves nurturing ethical and sustainability literacies that emphasise responsible innovation and planetary health as highlighted by Ghobakhloo (2024). It also requires the development of systems and network thinking so that graduates can perceive enterprises as components of interconnected ecosystems rather than isolated economic actors. Equally vital is the mastery of digital, AI, and data literacy, enabling individuals to identify, interpret, and act upon opportunities arising from data-driven innovation, intelligent automation, and the Internet of Things (Verma et al., 2025). Alongside these literacies, the core competencies of creativity, critical thinking, collaboration, and communication remain essential for solving complex problems and driving cross-disciplinary innovation (Dumitru et al., 2023). Without these integrated literacies and dispositions, entrepreneurship education risks remaining confined within the mechanistic orientation of Industry 4.0 rather than advancing toward the human-driven innovation demanded by Industry 6.0.

Determinants of Entrepreneurial Intention among Malaysian Undergraduates

Empirical research in Malaysia consistently shows that entrepreneurial intention, which serves as a psychological antecedent to entrepreneurial behaviour, is influenced by both individual cognition and the surrounding ecosystem. Chin et al., (2024) reported that attitude and perceived behavioural control are the strongest predictors of entrepreneurial intention among Malaysian business undergraduates, while subjective norms exert limited influence. This outcome aligns with the Theory of Planned Behaviour (Ajzen, 1991), which suggests that belief in one's capability has a more powerful motivational effect than social approval. Sufian and Wen (2024) further demonstrated that financial literacy, including budgeting, saving, and investment knowledge, significantly enhances students' entrepreneurial intention, implying that mindset development should integrate both cognitive and practical literacies. In a broader analysis, Fadzil, et al., (2025) synthesised findings from fifty empirical studies and identified four major domains influencing entrepreneurial intention, namely cognitive factors such as attitude and perceived feasibility, personality traits including creativity, resilience, and self-efficacy, social influences encompassing family and peer support, and educational elements such as experiential and project-based learning. Collectively, these findings indicate that nurturing an entrepreneurial mindset requires a balanced approach between internal capacity building and external environmental support. Confidence, creativity, and resilience must be fostered through learning environments that offer mentorship, authentic experiences, and institutional encouragement. This combination mirrors the holistic principles of Industry 6.0,

where innovation depends equally on technical competence and socio-emotional intelligence guided by ethical awareness.

Pedagogies That Move the Needle

Pedagogical innovation represents one of the most decisive levers for transforming entrepreneurship education into genuine mindset cultivation. Research from Malaysian universities confirms that project-based, problem-based, and digital entrepreneurship pedagogies are particularly effective in promoting creativity, self-efficacy, and innovation (Sulaiman et al., 2024). Within the Malaysian TVET system, (Sulaiman et al., 2024) colleagues observed that community-oriented projects and experiential learning improved both entrepreneurial intention and social engagement, suggesting that practical exposure fosters mindset development more effectively than conventional classroom lectures. Digital creativity has also proven to be a significant catalyst for mindset change. Cojocariu et al. (2024) found that integrating digital tools such as Canva, analytics platforms, and online content creation stimulated innovation and reflective learning among higher-education students. Similarly, Lee et al., (2023) showed that collaborative digital platforms like WhatsApp enhanced teamwork, adaptability, and communication, all of which are fundamental for entrepreneurial resilience. Ridwan et al., (2025) concluded that self-regulation and intrinsic motivation are powerful predictors of entrepreneurial intention, indicating that pedagogical approaches should prioritise reflective and autonomous learning rather than teacher-centred instruction. Despite these positive outcomes, Teoh et al., (2024) found that institutional endorsement and social norms remain relatively weak motivators compared with self-efficacy and perceived control. Hence, future pedagogical frameworks should emphasise internal empowerment through AI-infused projects, sustainability-oriented studio learning, and cross-disciplinary collaboration. Such initiatives would position Malaysian entrepreneurship education at the forefront of Industry 6.0 by uniting human creativity, ethical responsibility, and intelligent systems integration (Verma et al., 2025).

Persistent Gaps

Despite notable progress in entrepreneurship education, several enduring challenges prevent Malaysia's higher education institutions from fully realising the potential of Industry 6.0. One of the most significant issues is equity and access. Many universities still classify entrepreneurship courses as elective modules, resulting in unequal access to mentoring, incubation programmes, and digital learning infrastructure, especially in rural or under-resourced institutions (Sulaiman et al., 2024). A second limitation involves the measurement of outcomes, which continues to rely heavily on self-reported entrepreneurial intention rather than observable behaviour. Gamage et al., (2025) suggest that adopting micro-credential frameworks could improve assessment by recognising applied competencies and offering verifiable records of achievement. The conversion of entrepreneurial intention into tangible action also remains limited. Although students often display interest in entrepreneurship, few progress to concrete outcomes such as business creation, prototype validation, or intrapreneurial innovation, largely due to insufficient support ecosystems, limited funding, and weak industry linkages (Fadzil, et al., 2025). Another persistent gap lies in the inconsistent incorporation of Industry 6.0 literacies across entrepreneurship programmes. Degefu (2024) observed that many curricula continue to focus primarily on traditional business acumen while neglecting essential elements such as AI literacy, sustainability ethics, and human-centred

collaboration. Without deliberate integration of these emerging literacies, entrepreneurship education risks stagnating at a transitional phase between Industry 4.0 and Industry 6.0, thus falling short of Malaysia's aspirations for a digitally advanced and sustainable innovation economy.

Persistent Gaps and Summary of Key Studies

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Another persistent gap lies in the inconsistent incorporation of Industry 6.0 literacies across entrepreneurship programmes. Degefu (2024) observed that many curricula continue to focus primarily on traditional business acumen while neglecting essential elements such as AI literacy, sustainability ethics, and human-centred collaboration. Without deliberate integration of these emerging literacies, entrepreneurship education risks stagnating at a transitional phase between Industry 4.0 and Industry 6.0, thus falling short of Malaysia's aspirations for a digitally advanced and sustainable innovation economy. Overall, the synthesis of evidence suggests that while attitude, self-efficacy, and education remain fundamental drivers of the entrepreneurial mindset, greater emphasis must be placed on embedding Industry 6.0 competencies, improving inclusivity, and strengthening the translation of intention into action. Achieving these goals requires Malaysian higher education to cultivate ecosystems that are human-centric, digitally intelligent, and ethically grounded, ensuring that graduates evolve not only as employable professionals but also as transformative leaders within a sustainable digital economy. A summary of key studies related to Industry 6.0 and entrepreneurial mindset is presented in Table 2.

Table 2: Summary of Key Studies Related to Industry 6.0 and Entrepreneurial Mindset

Author(s) & Year	Country Context	Focus / Contribution
Verma et al. (2025)	India	Defined Industry 6.0 as a human-centred evolution integrating AI, robotics, sustainability, and emotional intelligence into entrepreneurial systems.
Fernández-Miguel et al., (2024)	Spain	Introduced the concept of conscious intelligence in Industry 6.0, aligning human, social, and ecological

		systems while emphasising ethical entrepreneurship and systems thinking.
Ghobakhloo et al., (2024)	Iran	Highlighted ethical and sustainability literacies as core components of Industry 6.0 entrepreneurship.
Dumitru et al., (2023)	Romania	Emphasised the 4Cs (creativity, critical thinking, collaboration, and communication) as key competencies for innovation in digital and entrepreneurial education.
Chin, et al., (2024)	Malaysia	Found attitude and perceived behavioural control as key predictors of entrepreneurial intention among business undergraduates.
Sufian & Wen (2024)	Malaysia	Demonstrated that financial literacy significantly strengthens students' entrepreneurial intention.
Fadzil, et. al., (2025)	Malaysia	Conducted a systematic review identifying cognitive, personality, social, and educational factors influencing entrepreneurial intention.
Sulaiman, et. al., (2024)	Malaysia	Found that project-based and community-linked pedagogies enhance entrepreneurial self-efficacy and social engagement in TVET settings.
Cojocariu et al., (2024)	Romania	Reported that digital creativity tools such as Canva and analytics platforms enhance innovation and entrepreneurial learning outcomes.
Lee et al. (2023)	Malaysia	Showed that networked learning through WhatsApp projects improves teamwork, communication, and adaptability among students.
Ridwan et al., (2025)	Indonesia	Identified self-regulation and intrinsic motivation as strong predictors of entrepreneurial intention.
Teoh et al., (2024)	Malaysia	Found that subjective norms are weaker drivers than internal attitudes and perceived behavioural control, calling for mindset-oriented pedagogy.
Gamage et al., (2025)	Sri Lanka	Proposed that micro-credentials can quantify behavioural competencies and serve as verifiable proofs of competence.
OECD (2023)	Global	Framed micro-credentials as essential tools for lifelong learning, employability enhancement, and workforce adaptability.
Degefu (2024)	Ethiopia	Critiqued global entrepreneurship programmes for insufficient integration of AI and sustainability literacies within mindset measurement frameworks.

Resource: Scopus Database

Proposed Framework: MINDSET-6

Drawing from the thematic synthesis, this study proposes the MINDSET-6 Framework, a curriculum design model that operationalises entrepreneurial mindset development within

Malaysia's transition toward Industry 6.0. The framework bridges two domains that are often treated separately:

- (1) the internal levers of entrepreneurial cognition—attitude, perceived control, and self-efficacy, and
- (2) the external levers of the learning ecosystem—mentorship, collaboration, and infrastructural support.

It positions entrepreneurship education as a transformative and human-centred learning experience integrating ethics, sustainability, and digital fluency, as highlighted by Verma et al. (2025) and Fernández-Miguel et al. (2024). While earlier models emphasised business-plan writing and venture creation, MINDSET-6 reframes entrepreneurship as a process of co-creation and systemic problem-solving, aligned with the human-machine symbiosis envisioned in Industry 6.0 (Ghobakhloo, 2024). The framework also aligns with the United Nations Sustainable Development Goals (SDGs 8 and 9) and Malaysia's MyDIGITAL Blueprint, ensuring that entrepreneurial education contributes not only to economic resilience but also to social progress, ethical innovation, and environmental stewardship.

Importantly, MINDSET-6 addresses two persistent gaps identified in the literature:

- the intention-action gap, by embedding hands-on, project-based, and community-linked activities that move students from theoretical aspiration to tangible entrepreneurial behaviour; and
- the measurement gap, by integrating assessable, skill-verified rubrics (e.g., micro-credentials and reflective portfolios) that capture learning outcomes beyond self-reported intention.

A detailed overview of the framework and its components is presented in Table 3, followed by Figure 2, which visualises their interconnections.

Table 3: The MINDSET-6 Framework

Component	Description	Implementation Resources	Industry 6.0 Link
M – Mindfulness & Ethics	Reflective practice, ethical decision-making, and sustainability literacy integrated into e-portfolios. ESG-based sustainability dashboards, reflective innovation projects.	Ethics case repositories, ESG-based sustainability dashboards, reflective innovation projects.	Anchors entrepreneurial action in responsible innovation and planetary consciousness (Fernández-Miguel et al., 2024).
I – Interdisciplinary AI / Data	Hands-on engagement with open datasets, prompt engineering, and data storytelling.	Public datasets (e.g., AI Kaggle, Data.gov.my), open-source AI tools (TensorFlow, ChatGPT, Tableau Public).	Builds AI fluency and critical data-interpretation skills essential for digital entrepreneurship (Verma et al., 2025).
N – Networked Learning	Online mentorship by industry experts and alumni, platforms	Online mentorship platforms	Expands social capital and strengthens industry

	collaborative projects with community partners, hackathons, and challenge studios.	LinkedIn ADAX), industry alumni hubs.	Mentor, connectivity, university– collaborative innovation networks, (Teoh et al., 2024).
D – Design & Making	Rapid prototyping, design sprints, user-centred product creation, and iterative testing.	Maker spaces, Embeds design thinking prototyping labs, 3D and experimentation in printers, AR/VR entrepreneurial learning simulation studios.	(Sulaiman et al., 2024).
S – Sustainability	Circular-economy projects, life-cycle analysis, and impact assessment within local ecosystems.	Sustainability labs, innovation hubs, aligned with Industry 6.0’s sustainability projects.	Cultivates green innovation mindsets with Industry 6.0’s sustainability agenda (Ghobakhloo, 2024).
E – Entrepreneurial Finance	Training in bootstrapping, crowdfunding, micro-funding, and financial-model simulation.	University crowdfunding platforms, fintech simulators, entrepreneurship grants.	Strengthens financial literacy and resilience in venture creation (Sufian & Wen, 2024).
T-6 – Transversal 4Cs	Assessable growth in creativity, critical thinking, collaboration, and communication through reflective rubrics.	Capstone projects, peer rubrics, competencies that transcend disciplinary boundaries (Dumitru et al., 2023).	Reinforces adaptive, human-centred storytelling that transcend disciplinary boundaries (Dumitru et al., 2023).

Resource: Scopus Database

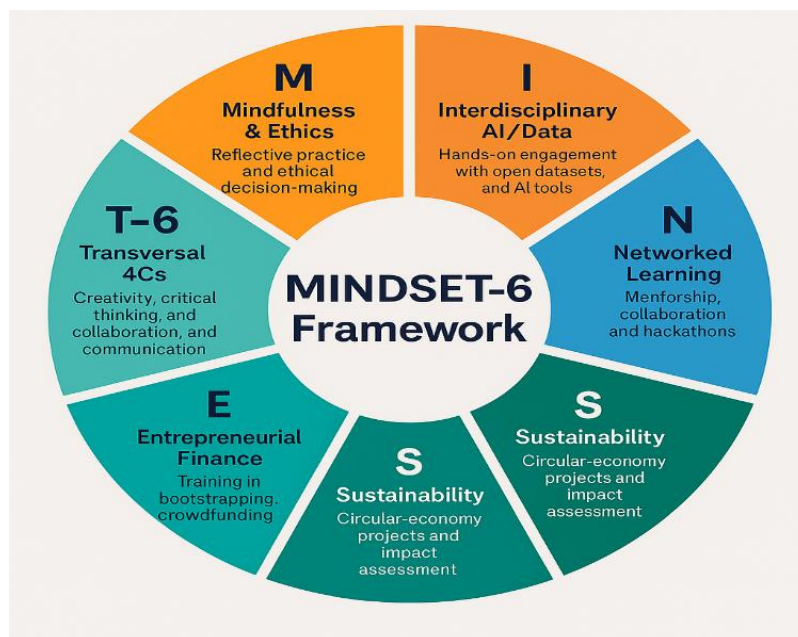


Figure 2: The MINDSET-6 Framework: A Human-Centred Approach to Industry 6.0-Ready Entrepreneurship Education

The figure depicts seven interconnected components—Mindfulness & Ethics, Interdisciplinary AI/Data, Networked Learning, Design & Making, Sustainability, Entrepreneurial Finance, and Transversal 4Cs—arranged in a circular formation to symbolise their interdependence. The internal cognitive elements (mindfulness, ethics, and data fluency) interact dynamically with the external ecosystem supports (networked learning, design, and finance), all anchored by sustainability. Together, these dimensions cultivate graduates who are technologically proficient, ethically grounded, and capable of transforming entrepreneurial intention into meaningful action within Malaysia's Industry 6.0 landscape.

Framework Design and Delivery

Each MINDSET-6 module typically runs for between eight and fourteen weeks and is structured around a live or simulated Industry 6.0 challenge. Examples include AI-assisted circular waste management, digital health for rural communities, or blockchain-enabled supply-chain transparency. Students work in multidisciplinary teams to identify real-world problems, co-create prototypes, and validate their solutions through iterative testing and stakeholder engagement. Assessment within this model integrates artefacts such as prototypes and process documentation, partner feedback from mentors or industry collaborators, measured growth in the four core competencies through rubric-based reflection, and behavioural indicators such as entrepreneurial initiative, intrapreneurial improvement, or start-up progress. This comprehensive evaluation system reflects a shift from knowledge acquisition to knowledge application and aligns with global calls for experiential entrepreneurship education, as discussed by Isa et al., (2024). It also directly addresses the gap identified by Fadzil, et al., (2025), who noted the weak linkage between educational design and behavioural outcomes in traditional programmes.

Pedagogical and Ecosystem Alignment

MINDSET-6 is grounded in the principle that entrepreneurial mindset development emerges when cognitive challenge, social engagement, and ethical reflection are seamlessly integrated. Pedagogically, it draws from Kolb's experiential learning cycle comprising experience, reflection, conceptualisation, and application, but extends it into the digital era through design sprints, AI-driven analytics, and sustainability metrics. The ecosystem layer, encompassing mentors, alumni networks, incubators, and community partners, functions as a living bridge between academic learning and industrial realities. This integration addresses structural gaps long observed in Malaysian research, where entrepreneurship education has been criticised for weak institutional linkages and limited engagement with real-world practice, as highlighted by Yusoff et al., (2015) and Sulaiman et al., (2024). Strengthening these connections is essential for converting entrepreneurial intention into actionable innovation and sustainable enterprise creation. Institutional adoption of this framework would also advance the University–Industry 6.0 nexus by promoting joint studios, co-certified micro-credential modules, and collaborative innovation hubs recognised by both academia and industry as discussed by Gamage et al., (2025).

Expected Outcomes and Indicators

Implementation of the MINDSET-6 framework is expected to lead to measurable improvements across several domains. These include stronger entrepreneurial self-efficacy and

behavioural intention, enhanced AI and data literacy combined with ethical reasoning, improved sustainability and systems thinking through the integration of circular-economy projects, and an increased capacity for collaborative innovation and intrapreneurial practice. Progress can be monitored using validated entrepreneurial-mindset instruments and behavioural rubrics adapted from Degefu (2024) and Gamage et al., (2025). Over time, the data generated from these assessments could provide empirical grounding for broader policy reforms in Malaysia's entrepreneurship curriculum, offering a model for scaling human-centred innovation competencies across the higher education sector.

Strategic Implications

Embedding MINDSET-6 into Malaysian higher education systems provides a strategic pathway for aligning entrepreneurship education with the national Industry 6.0 transformation agenda. The framework supports the Higher Education 4.0 Blueprint and the National Entrepreneurship Policy 2030 by equipping graduates with the digital, ethical, and sustainability competencies required for the next phase of economic evolution. Beyond enhancing employability, MINDSET-6 aims to humanise digital transformation by nurturing graduates who are both technologically proficient and ethically conscious. This integration of innovation with integrity advances the vision articulated by Fernández-Miguel et al., (2024) which views entrepreneurship as a vehicle for social responsibility and environmental stewardship. Ultimately, MINDSET-6 transforms the entrepreneurial mindset from an abstract intention into a tangible socio-technical capability. It empowers Malaysian graduates to lead innovation ecosystems that harmonise economic competitiveness with moral purpose, sustainability, and collective well-being, marking a decisive shift toward a future-ready, human-centred Industry 6.0 society.

Policy and Curriculum Implications for Malaysia

The implementation of the MINDSET-6 Framework requires Malaysian higher education institutions (HEIs) to embrace a phased, systemic, and inclusive approach to entrepreneurship education that moves beyond technical training and business knowledge. Universities must embed ethical awareness, sustainability literacy, and Industry 6.0 readiness as central pillars of curriculum design. The synthesis of evidence indicates that this transformation demands close alignment between policy, pedagogy, and institutional culture, ensuring that entrepreneurial learning functions as a catalyst for human-centred and sustainable innovation rather than an isolated academic subject.

Phased Implementation Strategy

To facilitate structured adoption and ensure sustainable transformation, a three-phase national implementation plan is proposed:

- Phase 1: Faculty Training and Assessment Reform (2025–2027)
Focus on capacity building among educators through workshops in AI literacy, data analytics, design thinking, and challenge-based learning. Universities should establish MINDSET-6 Teaching Hubs to train lecturers in experiential pedagogy and integrate portfolio-based assessments that capture innovation, reflection, and ethical reasoning.

This phase also involves embedding micro-credential indicators within course rubrics to measure Industry 6.0 competencies.

- Phase 2: Infrastructure and Ecosystem Investment (2027–2029) Strengthen entrepreneurship ecosystems through the establishment of maker spaces, innovation studios, and virtual mentorship networks. Universities should collaborate with the Ministry of Higher Education (MOHE), local industries, and social enterprises to provide equitable access to these facilities, particularly in rural and under-resourced institutions. Investment in digital infrastructure and mentorship platforms ensures inclusivity and addresses the rural–urban gap in innovation resources.
- Phase 3: National Credentialing and Policy Integration (2029–2031) At the national level, MINDSET-6 indicators should be incorporated into Malaysia’s higher education quality assurance and credentialing systems, supported by the Malaysian Qualifications Agency (MQA) and industry partners. This phase aligns institutional micro-credentials with national recognition frameworks, ensuring that graduates’ competencies are verifiable, portable, and valued by employers across sectors.

Through this phased roadmap, the MINDSET-6 framework transitions from pilot implementation to system-wide adoption, ensuring coherence between curriculum design, faculty development, and national innovation policy.

Re-Designing Assessment and Credentialing

Existing assessment models that rely on theoretical examinations or business-plan competitions are insufficient for producing innovation-ready graduates. As Isa et al., (2024) argue, such methods prioritise memorisation over creative problem-solving. Universities should therefore transition to portfolio-based assessment that documents students’ practical outputs and reflective growth. This includes prototypes, user-testing results, validation reports, and ethical impact reflections. Gamage et al., (2025) highlight that micro-credentials and competency portfolios can effectively track behavioural outcomes such as creativity, collaboration, and ethical reasoning. Embedding MINDSET-6 assessment rubrics ensures students are evaluated based on applied innovation and responsibility rather than theoretical recall, supporting a national credentialing ecosystem that connects academic learning with employable innovation skills.

Investing in Ecosystem and Equity

Equitable implementation of MINDSET-6 hinges on closing the resource gap between urban and rural institutions. Research by Sulaiman et al., (2024) shows that many students from rural universities lack access to mentors, digital labs, and innovation funding. To address this, universities and policymakers must jointly invest in:

- Digital laboratories and maker spaces accessible to all faculties;
- Online mentorship networks linking students with alumni and industry experts; and
- Innovation micro-grants and incubator partnerships for early-stage projects.

These initiatives align with the Higher Education Blueprint 2025 and MyDIGITAL Blueprint 2021–2030, both of which emphasise digital empowerment and inclusivity. As Fernández-

Miguel et al., (2024) emphasise, inclusivity is not only a social responsibility but a driver of creativity and system resilience within human-centred innovation ecosystems.

Strengthening Faculty Capacity

The successful integration of MINDSET-6 depends on faculty readiness to implement experiential, interdisciplinary, and AI-enhanced pedagogies. Many Malaysian academics were trained in conventional lecture-based systems, limiting their ability to facilitate innovation-oriented learning (Fadzil et al., 2025). Universities must therefore establish Faculty Development Tracks focusing on:

- AI and data literacy for educators;
- Design thinking and human-centred innovation;
- Challenge-based and interdisciplinary teaching; and
- Collaboration with industry mentors for co-teaching.

Ghobakhloo (2024) underscores that human-centric education depends on educators who can foster adaptive, reflective, and collaborative learning cultures. Viewing lecturers as co-learners and facilitators rather than mere transmitters of content is essential to cultivating Industry 6.0-ready graduates.

Embedding Real-World Industry 6.0 Challenges

Entrepreneurship education should directly address Malaysia's strategic development priorities in digital transformation and sustainability. Curricula must embed real-world challenges related to circular economy innovation, smart agriculture, health tech, logistics, and sustainable manufacturing. Collaborations with government agencies, social enterprises, and industry laboratories can convert classrooms into innovation ecosystems. Teoh et al. (2024) found that authentic project exposure significantly boosts self-efficacy and confidence, helping students translate intention into action. Aligning these projects with SDG 8 (Decent Work) and SDG 9 (Industry, Innovation, and Infrastructure) reinforces Malaysia's dual commitment to economic resilience and global sustainability goals.

Converting Intention into Action

Bridging the intention–action gap remains a major challenge. Although many students show entrepreneurial interest, few transition into venture creation or sustained innovation after graduation (Chin et al., 2024; Fadzil et al., 2025). To close this gap, HEIs should establish structured entrepreneurial pathways, such as:

- Credit-bearing internships and incubation programmes;
- Seed-funding competitions and innovation grants;
- Industry-mentored start-up challenges; and
- Longitudinal mentoring beyond graduation.

Sufian and Wen (2024) demonstrated that financial literacy and practical exposure significantly enhance entrepreneurial persistence. Continuous mentorship and feedback loops (Gamage et al., 2025) are equally critical to sustain motivation and performance. Embedding these

pathways within the MINDSET-6 ecosystem will ensure that entrepreneurship becomes a lifelong practice of creation, reflection, and innovation.

Synthesis

Implementing the MINDSET-6 framework thus requires systemic coordination among policymakers, educators, and industry. A phased national rollout, coupled with equitable infrastructure and sustained faculty development, ensures both inclusivity and long-term impact. By aligning assessment reform, ecosystem investment, educator training, and national credentialing, Malaysian universities can transform entrepreneurial education from an academic exercise into a measurable and sustainable driver of Industry 6.0 readiness. This integrated approach not only enhances Malaysia's global competitiveness but also realises its vision of human-centred innovation and inclusive growth in the digital era.

Limitations and Future Research Directions

This review integrates recent Malaysian and international scholarship on entrepreneurial mindset development within the context of Industry 6.0. However, several limitations restrict the depth and generalisability of its findings. The first limitation concerns data accessibility. Many Malaysian studies remain unpublished or stored in institutional repositories, creating an evidence gap between conceptual arguments and measurable outcomes. This limited access to comprehensive, peer-reviewed data constrains the capacity to draw robust, generalisable conclusions (Fadzil et al., 2025). Moreover, most empirical work continues to focus on entrepreneurial intention rather than actual post-graduation outcomes such as venture establishment, intrapreneurial innovation, or long-term community engagement (Chin et al., 2024). This narrow focus limits understanding of how intention translates into tangible entrepreneurial behaviour—a transition central to Malaysia's Industry 6.0 transformation agenda (Verma et al., 2025).

Another limitation arises from the methodological approach. While the rapid critical review enables timely synthesis, it cannot capture the full complexity of regional and institutional variations across Malaysia's higher education system. Differences in infrastructure, digital resources, and faculty readiness may influence the extent to which entrepreneurship education can be effectively implemented (Sulaiman et al., 2024). In addition, few studies have examined how AI and data literacy intersect with sustainability ethics in shaping the entrepreneurial mindset, a gap that persists not only in Malaysia but also internationally (Fernández-Miguel et al., 2024). Measurement constraints also remain evident. Many instruments used to evaluate the entrepreneurial mindset still rely on the Theory of Planned Behaviour (Ajzen, 1991) and related intention-based frameworks that do not adequately reflect contemporary literacies such as digital agility, ethical reasoning, and systems thinking (Degefu, 2024). These tools are insufficient for capturing the multidimensional characteristics of the entrepreneurial mindset in the context of Industry 6.0, which demands socio-technical adaptability and sustainability awareness. To advance this field, future research should pursue several interrelated directions. There is a need for longitudinal and multi-institutional studies that trace Malaysian undergraduates from the stage of intention formation to venture creation, intrapreneurial innovation, and community-based entrepreneurship. Such longitudinal evidence would provide valuable insights into behavioural persistence and the long-term effectiveness of educational interventions (Isa et al., 2024).

The development of contextually relevant measurement instruments is also crucial. Future studies should design and validate tools that incorporate AI and data literacy, sustainability consciousness, and network collaboration as integral dimensions of entrepreneurial mindset assessment (Degefu, 2024; Gamage et al., 2025). Furthermore, experimental and quasi-experimental studies should be prioritised to evaluate the MINDSET-6 framework in authentic educational environments. These investigations should measure both cognitive outcomes (knowledge acquisition, ethical reasoning, and digital fluency) and behavioural outcomes (prototype creation, start-up participation, intrapreneurial improvement, and collaboration), providing rigorous evidence of the framework's effectiveness (Teoh et al., 2024). Cross-disciplinary and regional collaborations are equally important. Establishing research networks that include universities from East Malaysia and rural regions would enrich data diversity and foster inclusivity in entrepreneurial education research. Such collaborations would also enhance methodological robustness and policy relevance, ensuring that findings accurately reflect Malaysia's diverse educational landscape. By pursuing these directions, future scholarship can move beyond descriptive analysis toward empirically validated, evidence-based models of entrepreneurship education that are inclusive, technologically responsive, and socially sustainable. This evolution will strengthen Malaysia's capacity to produce graduates who are not only digitally competent but also ethically grounded, innovative, and resilient in the face of Industry 6.0 transformations.

Conclusion

Preparing Malaysian undergraduates for the competitive and rapidly evolving workforce of the 21st century requires more than cultivating entrepreneurial intentions. It necessitates the development of holistic mindsets that integrate digital fluency, ethical reasoning, systems thinking, and collaborative creativity. In an economy increasingly shaped by intelligent technologies and sustainability imperatives, the ability to innovate responsibly has become a defining attribute of future-ready graduates (Verma et al., 2025; Fernández-Miguel et al., 2024). Empirical evidence from Malaysia demonstrates that attitude and perceived behavioural control remain the strongest predictors of entrepreneurial intention (Chin et al., 2024; Sufian & Wen, 2024). However, intention alone does not guarantee meaningful entrepreneurial behaviour. As highlighted by Fadzil et al., (2025) and Isa et al., (2024), the key challenge lies in transforming intention into sustained entrepreneurial action, through start-up ventures, intrapreneurial initiatives, and community-based innovations that contribute directly to Malaysia's Industry 6.0 development goals. The MINDSET-6 framework proposed in this review offers a coherent and actionable pathway to achieving this transformation. By embedding mindfulness, interdisciplinary AI and data competencies, networked learning, design and making, sustainability awareness, and entrepreneurial finance, supported by the transversal 4Cs of creativity, critical thinking, collaboration, and communication, MINDSET-6 bridges the gap between theoretical instruction and practical innovation. It provides a strategic blueprint for aligning pedagogy, assessment, and institutional ecosystems with Malaysia's policy priorities and the broader objectives of sustainable economic progress.

If widely implemented, the MINDSET-6 framework can transform entrepreneurship education from a traditional business-oriented discipline into a dynamic, human-centred innovation process. This transformation would produce graduates who are not only technologically proficient but also ethically responsible and socially conscious. In doing so, Malaysian higher education can position itself as a global model for integrating human values with digital

intelligence, contributing to an inclusive and sustainable innovation ecosystem. Ultimately, MINDSET-6 envisions a generation of graduates who do not merely participate in Industry 6.0 but actively shape it through innovation, empathy, and moral purpose, driving Malaysia toward a future that harmonises economic growth with ethical and environmental stewardship. By validating and scaling the MINDSET-6 framework across Malaysian universities, entrepreneurship education can evolve into a national model of human-centred innovation aligned with Industry 6.0.

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ENHANCING ESL STUDENTS' ARGUMENTATIVE WRITING THROUGH TOULMIN'S MODEL

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Abstract: *Argumentative writing is a vital skill for university students, yet many English as a Second Language (ESL) learners struggle with organising ideas, providing evidence, and articulating logical reasoning. This study analysed 140 essay samples (70 pre-test and 70 post-test) from Malaysian undergraduates, using Toulmin's Model as a framework to evaluate the presence and effectiveness of argumentative elements. Findings revealed that while claims, grounds, warrants, and backing were consistently present, they often lacked depth and relied heavily on personal experience. A notable improvement was observed in the inclusion of rebuttals, which increased from 3.9% in the pre-test essays to 29.2% in the post-test essays, suggesting that Toulmin-based instruction promotes a more balanced argumentative approach. However, qualifiers declined in usage, indicating ongoing challenges in applying nuance and hedging. Overall, the results confirm that Toulmin's Model supports structural development in argumentative writing, but highlight the need for more extended instructional periods, explicit instruction on advanced elements, and the integration of scaffolding tools. The study highlights the value of Toulmin's framework while recommending more sustained and varied approaches to help ESL learners develop stronger critical thinking and rhetorical sophistication.*

Keywords: *Toulmin's Model; argumentative writing; ESL learners; critical thinking; Malaysia*

Introduction

Argumentative writing is not only a fascinating genre which allows words to be used to accomplish a goal (Van Dijk, 1989; Henderson, 2016), but it is also something vital for university students to learn, especially for those enrolled in English as a Second Language (ESL) courses. The Malaysian Ministry of Higher Education (MOHE) strongly emphasises that students master argumentative writing (Malaysian Education Blueprint, 2015). This is the consensus of numerous researchers who agree that mastering argumentative writing is essential in multiple academic settings (Zakaria & Hashim, 2020; Nemeth & Kormos, 2001; Heidari, 2019).

An effective argument relies on logical organisation, critical thinking and strong language proficiency. Unfortunately, many ESL students struggle in these areas (Ramli, Abdul Kadar, & Rafek, 2024). This is because argumentative writing is quite challenging to master, even for native English speakers (Zainuddin & Rafik-Galea, 2016), and especially so for Malaysian students, as they are only exposed to the genre in their final secondary school years (Rashid & Chan, 2017). Additionally, during that time, they are also required to master other genres of

writing for their exams, leaving them insufficient time to master argumentative writing. As a result of limited exposure and the complexity of argumentative writing (Sundari & Febriyanti, 2021; Siregar, Syarif & Amri, 2021), ESL students continue to struggle with mastering it, while still experiencing challenges when planning, structuring their arguments, providing evidence and expressing their ideas clearly (Sabri et al., 2021; Joannes & AlSaqqaf, 2022), even at the university level where they are required to write research papers (Hays & Brandt, 1992; Salig, Epting & Rand, 2018).

One study has shown that students often employ only the most basic elements in their arguments (Abdul Aziz, 2021). Fortunately, Toulmin's Model (Toulmin, 2003) is regarded as the most practical, accurate, and flexible model for improving argumentative writing (Hitchcock, 2017), allowing students to generate new ideas and structure their arguments effectively (Karch, 1981; Nimehchisalem & Mukundan, 2011; Zainuddin & Rafik-Galea, 2016). Moreover, the Toulmin Model provides a solid foundation for enhancing critical thinking skills, which are vital for academic writing (Aziz & Ahmad, 2017). Therefore, a framework based on Toulmin's Model should be implemented to help students master argumentative writing.

For this research, the features of Malaysian university students' argumentative writing will be examined according to Toulmin's Model. This research will also determine if exposure to Toulmin's Model can improve the students' ability to compose their written arguments.

This paper aims to justify the need for a new model to help students develop, improve, and master argumentative writing skills by analysing essay samples from degree-level students, both from pre-test and post-test samples, which will highlight their weaknesses and show that exposure to Toulmin's Model can help the students improve their argumentative writing skills.

Literature Review

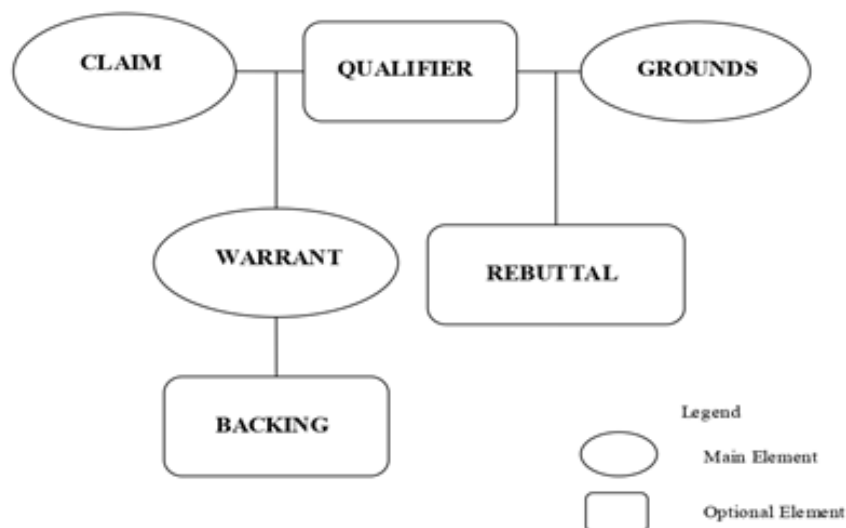


Figure 1: Toulmin's Model of Argumentation (Toulmin, 2003)

For years, numerous models and strategies have been designed and developed as solutions to address argumentative writing challenges and enhance argumentative writing skills (Flower & Hayes, 1981; Fei-Wen, 2010; Harris & Graham, 2018; Sampson et al., 2013; Manz, 2015). However, the Toulmin's Model (Toulmin, 2003; Hitchcock, 2017) is widely considered the most definitive framework for argumentative writing due to its practicality and potential to enable students to structure effective arguments, build logical, evidence-based arguments, and generate ideas (Abdul Aziz, Salam & Mat Said, 2023; Aziz & Mat Said, 2020; Hitchcock, 2017; Zainuddin & Rafik-Galea, 2016; Okmarisa, Lestari, & Ariani, 2025).

According to Toulmin (2003), an argument is composed of two sets of elements. The first set of elements includes claim, grounds and warrants, which provide the foundation of the argument.

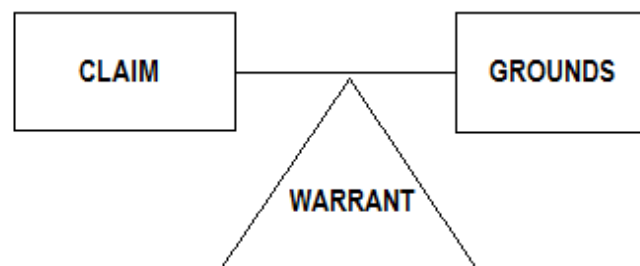


Figure 2: Claim, Grounds and Warrant

The second set of elements helps strengthen the foundation. These comprise backing, qualifiers, and finally, rebuttals, or counterarguments. Previous research using Toulmin's Model have shown that students often struggle with advanced elements of persuasion, such as rebuttals, and tend to use simpler vocabulary and shorter sentences (Stapleton, 2001; Osman & Januin, 2021; Sundari & Febriyanti, 2021).

As a tool for content analysis, Toulmin's Model is capable of discerning the deficiencies within written arguments. In one study, Toulmin's Model was used to analyse essays written by 15 second-year ESL undergraduates from a public university in East Malaysia, revealing that rebuttals were largely absent from their arguments (Osman & Januin, 2021). In another study by Novianti (2021), the response essays from 29 undergraduate students enrolled in a compulsory Composition II course were examined. The students were from different faculties and cohorts, all of whom were enrolled in the same compulsory course. Through purposive sampling, the essays of 16 students who had received grades of A, B, or C were selected for analysis. The findings of these studies revealed that fewer than seven of these students incorporated warrants, and only three included rebuttals in their essays, indicating that the majority still demonstrated limited analytical skills.

Over the past several decades, numerous studies have demonstrated the effectiveness of Toulmin's Argumentation Model in enhancing students' persuasive writing abilities (Ghoneam & Badawy, 2023), particularly in structuring arguments and fostering critical thinking. Early research by Varghese and Abraham (1998) applied explicit Toulmin-based instruction in a writing class for 30 undergraduate students in Singapore. By the end of the course, students showed marked improvement in formulating specific claims, developing their grounds, and

applying warrants effectively. Similarly, Lunsford (2002) implemented the model during a six-week summer composition program at a Midwestern university, finding that participating high school students significantly improved their ability to produce well-structured argumentative essays. In Malaysia, Zainuddin and Rafik-Galea (2016) trained 21 rural high school students using Toulmin's framework and reported notable gains in their critical thinking skills, further underscoring the model's instructional value.

More recent work has continued to confirm these benefits while also identifying persistent challenges in applying the full range of Toulmin's elements. Osman and Januin (2021) examined 15 Malaysian ESL undergraduates in an English writing course, where persuasive writing was one of five genres taught. Analysis of their essays revealed that while students could apply all six elements of Toulmin's Model, rebuttals were seldom used, and several argumentative features remained underdeveloped. Similarly, Siregar, Syarif, and Amri (2021) observed 30 students whose essays primarily relied on claims and grounds, with limited use of other structural components. Sundari and Febriyanti's (2021) study at a Jakarta university found that although students' essays were generally well-organised when guided by Toulmin's framework, they often contained irrelevant information and ineffective arguments. These findings led the authors to recommend that writing instruction should not only emphasise organisational structure but also motivate students to develop arguments that are coherent, relevant, and fully elaborated.

Methodology

Research Design

The research study adapted this framework, which illustrates the stages of argumentative writing instruction.

The study used a qualitative, content analysis framework, comparing the results of the pretest and posttest essay samples. The participants were selected from students of four Reading and Writing for English classes at a local university in the Federal Territory of Labuan, Malaysia. Essay samples were collected at the beginning and end of the semester. Between the pretest and post-test essay collection, the classes were introduced to Toulmin's Model and taught about the argumentative elements. Both sets of essays were analysed using Toulmin's Model and evaluated using a rubric specifically designed for critical thinking.

Initially, 76 essays were collected at the beginning of the semester. Since then, four students have dropped the course, resulting in 72 essays being collected at the end of the semester. To make sure the data is consistent, 70 essays from each batch were analysed. The essays were individually graded and then analysed using Toulmin's Model, with elements identified and tagged.

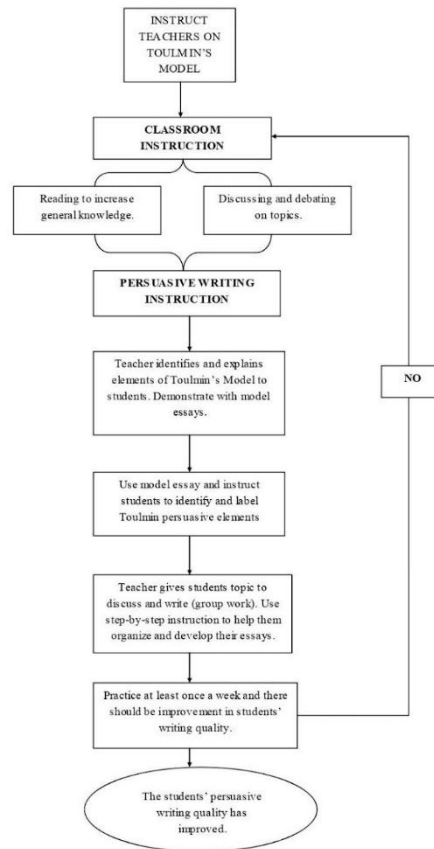


Figure 3: Argumentative Writing Instructional Framework (Aziz & Mat Said, 2019; 2020b)

Findings

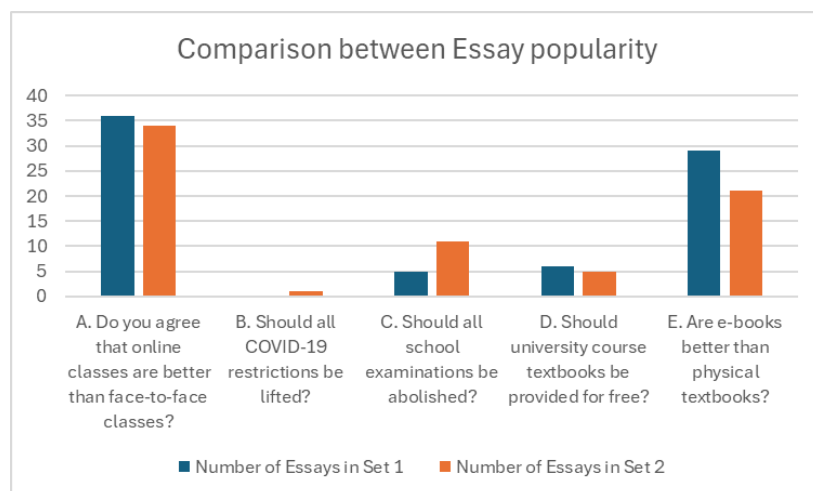


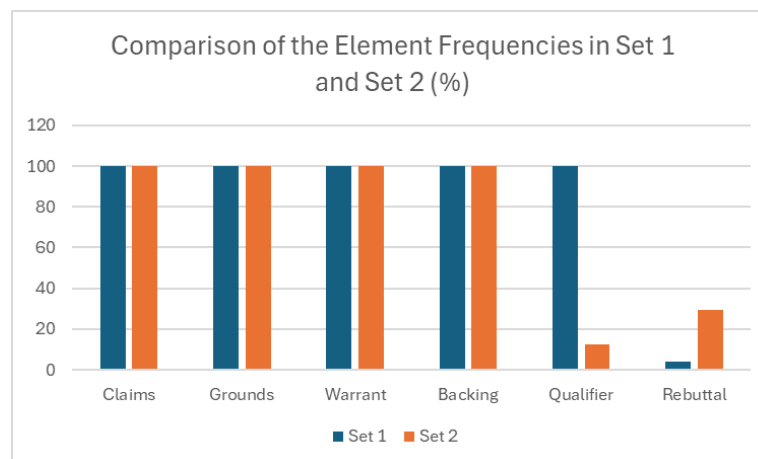
Figure 3: Comparison between Essay Popularity

In both sets of essays, Prompt A and Prompt E are still the most popular. While none of the respondents selected Prompt B in the pre-test stage, one essay was written based on it.

Table 1: Comparison of Means Cores Between Set 1 and Set 2

Sets	Organisation (12)	Content (20)	Language & Vocabulary (18)	Total
Set 1 (pretest)	4.99	9.55	6.47	21.01
Set 2 (posttest)	7.58	12.22	11.06	30.86
Difference in Mean	2.59	2.67	4.59	9.85

The difference in mean scores in the table shows that the students' argumentative skills have improved in terms of 'organisation', 'content' and 'language & vocabulary'. However, the mean scores are still quite low due to content containing irrelevant information and ineffective arguments (Sundari & Febriyanti, 2021).


Figure 4: Comparison of Element Frequencies in Set 1 and Set 2

The chart shows the frequency of the elements within both sets of essays. Set 1 (pre-test) and Set 2 (post-test). The evidence of claims, grounds, warrants, and backing is consistent between both sets, as all the essays employ them. While the essays in Set 1 all consistently include qualifiers, the essays in Set 2 have a low number of them (12.5%). However, while the frequency of rebuttals was very low in the Set 1 essays (3.9%), there has been an increase in their usage in the Set 2 essays (29.2%).

Table 2 provides a more in-depth summary.

Table 2: Summary of the Comparison Between the Argumentative Essays in Set 1 and Set 2

Element	Set 1	Set 2	Overall Notes
Claim	Present in all essays. Clear, usually in the introduction/conclusion. Strength: consistent. Weakness: often just opinion (e.g., “I’m agree”).	Present in all essays. Clear, but repetitive and with grammar errors.	Claims are strong in presence but weak in sophistication.
Grounds (Reasons)	2–3 reasons per essay, relevant and practical (student life). Weakness: shallow, reliant on personal experience.	100% presence. Multiple reasons, but vague (“easy,” “cheap”).	Students give reasons but lack depth and elaboration.
Warrant	Always present but mostly implicit. Strength: logical. Weakness: rarely explained.	Present in all essays. Logical but assumed rather than stated.	Warrants are valid but underdeveloped.
Backing	Present in all essays. Often specific (smartphones, library access). Weakness: repetitive, overlaps with grounds.	100% presence. Drawn from real-life, but mostly anecdotal.	Backing is relatable but lacks broader justification.
Qualifier	Present in all (implied “I think/believe”). Weakness: simplistic and absolute.	Rare (12.5%). When used, shows nuance (e.g., “depends,” “in most situations”).	Over-reliance on personal opinion; nuance largely absent.
Rebuttal	Very rare (3.9%). When present, adds balance.	Some presence (29.2%). Often vague, not deeply explored.	Weakest element overall; essays lack counterarguments.

Discussion

A comparative analysis of the pretest essays (Set 1) and the posttest essays (Set 2) reveals both consistencies and notable developments in students’ application of Toulmin’s Model in argumentative writing. In both sets, claims, grounds, warrants, and backing were consistently present across all essays, with students demonstrating the ability to articulate clear positions supported by relevant reasons and personal examples. It is observed from this that the essays generally rely on strong claims and grounds (Syarif & Amri, 2021). However, these elements were often expressed in repetitive or straightforward forms, with warrants largely implied rather than explicitly articulated, and backing frequently drawn from anecdotal or personal experience rather than broader or more authoritative evidence.

The most significant improvement observed between the two sets was the increased use of rebuttals. While only 3.9% of essays in Set 1 acknowledged counterarguments, 29.2% of essays in Set 2 incorporated some form of rebuttal, demonstrating a growing awareness of argumentative balance and complexity, even if such rebuttals were often vague or

underdeveloped (Osman & Januin, 2021). The results align with previous studies that propose Toulmin's Model can improve argumentative writing (Zainuddin & Rafik-Galea, 2016; Varghese & Abraham, 1998; Lunsford, 2002; Ghoneam & Badawy, 2023).

Conversely, the use of qualifiers declined between sets. In Set 1, nearly all essays contained implied qualifiers (e.g., "I think," "I believe"), albeit in limited or simplistic forms, whereas only 12.5% of essays in Set 2 included explicit qualifiers, though these demonstrated a more mature recognition of nuance where they appeared. Overall, the posttest essays demonstrated structural growth, particularly in students' recognition of opposing views, they continued to exhibit weaknesses in the depth of reasoning, explicit warrant articulation, and nuanced use of qualifiers. These findings suggest that while instruction based on Toulmin's Model fostered improvements in argumentative structure, further pedagogical emphasis is needed on developing students' ability to elaborate grounds and backing, as well as to apply qualifiers with precision and sophistication.

Conclusion

This study demonstrated that Malaysian university students could consistently state claims and provide grounds in their argumentative essays, with notable improvement in the use of rebuttals after exposure to Toulmin's Model. However, weaknesses persisted in the depth of reasoning, reliance on personal experiences for backing, implicit use of warrants, and limited sophistication in qualifiers. The study's limitations include its small sample from a single institution, the short instructional timeframe, and the absence of triangulated data such as interviews or classroom observations. Future improvements could involve extending Toulmin-based instruction across multiple semesters, providing explicit instruction on advanced elements such as qualifiers and rebuttals, incorporating digital tools or peer review to scaffold argumentation, and adopting a more holistic approach. Further research should include larger, more diverse samples, longitudinal designs to test lasting effects, and mixed methods to capture both textual outcomes and students' learning processes. Overall, while Toulmin's Model clearly enhances argumentative writing, more sustained and varied pedagogical strategies are needed to help ESL learners achieve greater critical thinking and rhetorical sophistication.

Acknowledgement

We would like to express our sincere gratitude to all the students who participated in this inquiry and the evaluator who assisted in grading and analysing the essay samples. This study was also supported by a research grant (SLB2260) provided by the Research Management Centre of Universiti Malaysia Sabah.

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CONFIGURATIONAL APPROACH TO SERVICE QUALITY, AND LOYALTY IN MALAYSIAN PRIVATE HIGHER EDUCATION INSTITUTIONS

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Abstract: *This study investigates the relationships between service quality (SQ), student satisfaction, perceived value, and loyalty within Malaysian private Higher Education Institutions (HEIs). While service quality research has been extensive, the mediating roles of satisfaction and perceived value, alongside the moderating influence of trust, remain underexplored in the Malaysian private HEI context. Utilizing the SERVQUAL framework, this pilot study surveyed 113 students to validate the research instruments and refine the methodology for a full-scale study of 1,000 participants. Structural Equation Modeling (SEM) using SmartPLS revealed that SQ dimensions—tangibility, reliability, assurance, and empathy—significantly influence satisfaction, with satisfaction serving as a critical mediator in the SQ-loyalty relationship. Perceived value showed limited mediating effects, and trust did not significantly moderate loyalty relationships. These findings provide actionable insights for private HEIs to improve service delivery and highlight critical theoretical implications for understanding service quality dynamics.*

Keywords: *Loyalty, Configurational, Service, Satisfaction.*

Introduction

This “student as consumer” mindset shift stems from pressure to improve enrolment, intensified competition, and growing demands for quality education. In this new environment, service quality is no longer a performance indicator. Now, it plays a crucial role in securing HEIs long-term sustainability by influencing satisfaction, perceived value, and ultimately loyalty.

In the context of Malaysia, both public and private HEIs fall under the purview of the Department of Higher Education, Malaysia (JPT) and are accredited by Malaysian Qualifications Agencies (MQA). While public HEIs meet global standards in many areas, private HEIs often struggle to keep pace with the benchmark. This is quite concerning given that over 200,000 new students enroll Malaysian HEIs each year which place a significant pressure on private HEIs to enhance their offering amid saturated market of well-informed student-consumer.

Despite extensive research on service quality in HEIs, there is a notable gap in understanding the mediating roles of student satisfaction and perceived value, as well as the moderating

influence of trust on student loyalty. Furthermore, the integration of these constructs in the Malaysian private HEIs context remains underexplored. This pilot study, part of a larger research initiative, aims to address these gaps within the context of private HEIs in Malaysia. Employing the SERVQUAL framework, the study explores these relationships to provide actionable insights for improving institutional strategies and contributing novel insights to the academic discourse.

Higher Education Institutions (HEIs) worldwide are increasingly adopting market-driven strategies, treating students as customers to remain competitive. In Malaysia, private HEIs face unique challenges in meeting global benchmarks while maintaining student satisfaction and loyalty. Although the SERVQUAL framework has been widely applied to assess service quality, limited research integrates satisfaction, perceived value, and trust as mediators and moderators in the Malaysian HEI context. This study addresses these gaps by exploring the relationships between service quality, satisfaction, perceived value, and loyalty. It aims to provide actionable insights for private HEI managers and contribute to theoretical discourse on service quality in education.

Literature Review

This literature review seeks to conceptualize the relationship between service quality and student loyalty, while exploring the mediating role of Student Satisfaction and Perceived Value, and moderating role of trust.

Context of the Study

Marketization of higher education in Malaysia intensifies following the introduction of Private Higher Educational Institution Act in 1996, which now, regulate about 400 institutions. Unlike their public counterpart, Malaysian private HEIs generally operates without government funding and primarily relying on tuition fee for survival. In this market-oriented environment, students are viewed as customers. Therefore, deep understanding of market dynamic such as service quality and customer loyalty is crucial for long-term sustainability. This underscore the importance of adapting consumer behavior theories into higher education literature to better predict and manage student loyalty.

Service Quality and Student Loyalty

Over the years, various models have been introduced to measure service quality in higher education. SERVQUAL (Parasuraman et al., 1988) set the foundation, followed by HedPERF (Abdullah, 2006), HiEduQual (Annamdevula & Bellamkonda, 2016), HESQUAL (Teeroovengadum et al., 2016), and UnivQual (Marimon et al., 2019). This study adopts SERVQUAL's dimensions (RATER) as proposed by (SERVPERF Model) due to its parsimony and avoidance of the complexities associated with measuring expectation.

Student Loyalty

Student loyalty refers to the commitment and allegiance of students to their educational institution. This translates into behavior such as continue their study at the same institution and advocates such institution to others. In private HEIs, these behaviors contribute to financial

sustainability, as observed by Sarmawa et al. (2021) and Rashid et al. (2020) in other for-profit organization. Hence, achieving student loyalty is one of the critical aims of private HEIs. Past studies suggested that loyalty is affected by among others, service quality (Joshi, 2023), satisfaction (Joshi, 2023) (Sugant, 2020), and perceived value (Mbango, 2022).

Student Satisfaction

Student satisfaction refers to the level of contentment a student feels from their educational experience. Student satisfaction translated into student loyalty and effected by service quality (Sohail & Hasan, 2021). This study position student satisfaction as mediator between service quality and student loyalty as observed in Jie et al. (2023) and Borishade et al. (2021). Study in this area is current and extensive. Table 10.1 list a few of such studies in recent years.

Perceived Value and Research Gap

Perceived value, defined as the trade-off between benefits received by the students from educational experience and what they gave-up such as tuition fee, time, and effort. Various studies established link between perceived value and loyalty (Hassan et al., 2018). However, from the literatures, we notice that study on perceived value in private HEIs context is quite limited. Therefore, in this study, we overserve service quality-perceived value-student loyalty chain.

This study adds value by examining the moderating role of perceived value, a critical yet often neglected factor in similar research. By focusing on these dynamics, this study contributes to the theoretical and practical understanding of service quality in HEIs. The findings aim to bridge gaps in existing literature and offer a robust framework for future research.

Research Methodology

Research Design

This pilot study adopts a quantitative research design rooted in the positivist paradigm, emphasizing objectivity, empirical validation, and hypothesis testing. The primary objective of the pilot study is to evaluate the reliability and validity of the measurement instruments and refine the research methodology for the full-scale study.

A cross-sectional survey method was employed to collect data from 113 students enrolled in a private higher education institution (PHEI) in Malaysia. The selected institution represents the broader population of PHEIs within Malaysia's educational landscape, ensuring relevance and contextual alignment with the full study's objectives. This approach enables a structured examination of the relationships between service quality, satisfaction, perceived value, and loyalty, addressing the identified research gaps and providing a foundation for subsequent analysis.

Population and Sampling

The target population for this study comprises undergraduate and postgraduate students enrolled in private HEIs located in Malaysia's Klang Valley. The pilot study includes 113 students to validate the research instruments, ensuring their reliability and suitability for the

main study. For the full-scale study, a sample size of 1,000 students is determined using stratified random sampling to ensure representation across different demographics, academic levels, and programs. This stratified approach enhances the generalizability and robustness of the findings, reflecting the diversity of Malaysia's private higher education sector.

Data Collection Instruments

A structured questionnaire, adapted from validated scales in previous research, is used for data collection. The SERVQUAL framework is employed to measure service quality across its five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Additional constructs capture student satisfaction, perceived value, loyalty, and trust. The questionnaire underwent pre-testing during the pilot study to evaluate internal consistency, content validity, and construct validity. Adjustments based on pilot feedback ensured that the instruments were clear, reliable, and aligned with the research objectives.

Data Analysis

Structural Equation Modelling (SEM) via SmartPLS were employed to test the hypothesized relationships. The analysis will focus on examining direct, mediating, and moderating effects to provide comprehensive insights into the dynamics of service quality, satisfaction, perceived value, and loyalty. This two-phase analysis ensures methodological rigor, allowing the pilot study to refine measurement instruments and the full-scale study to deliver robust and actionable findings.

Ethical Consideration

Approval for this study was obtained from the surveyed institution before the survey was digitally distributed. Participation in the study was voluntary, and informed consent was secured from all respondents prior to data collection. Confidentiality and anonymity were strictly maintained throughout the research process. These ethical safeguards uphold the integrity of the research, ensuring compliance with ethical standards and reinforcing the credibility of the findings.

Data Analysis

Demographic Characteristics

The demographic characteristics of the respondents are presented in Table 1. Among the 113 respondents, 42 (37.2%) were male and 71 (62.8%) were female. Of these, 54 respondents (47.8%) were current students, while 59 (52.2%) had graduated in 2024. All respondents were either currently enrolled in or had completed undergraduate programs at the private higher education institution (PHEI). This diverse demographic representation ensures robust insights into service quality perceptions from both active students and recent graduates, enhancing the generalizability of the findings.

Table 1: Respondent Demographic Characteristic

Age	Male	Female	Active	Graduated	Total
Under 18	1	0	1	0	1
18 – 24	40	68	53	55	108
25 – 34	0	2	0	2	2
35 – 44	1	0	0	1	1
Above 44	0	1	0	1	1
Total	42	71	54	59	113

Common-Method Bias

A full collinearity assessment was conducted to address potential common-method bias (CMB). Variance Inflation Factor (VIF) values for all constructs were calculated and categorized as minimal (<3.3), moderate (3.3–5.0), or high (>5.0). While several indicators exceeded 5.0, they were retained due to theoretical justification and their exploratory relevance in pilot studies. These results affirm the dataset's validity for hypothesis testing and highlight the need for further refinement in the full-scale study.

The collinearity diagnostics for the measurement model revealed that several indicators exceeded the conservative threshold of 3.3, and a subset surpassed the threshold of 5.0. In the context of PLS-SEM, where prediction is emphasized over explanation, moderate collinearity is generally acceptable, particularly in exploratory research. This is expected in pilot studies, where smaller sample sizes are used, and conceptual overlap between constructs is more likely. The indicators exceeding the VIF threshold of 5.0 were retained in this study, with theoretical justifications provided in Table 2.

Table 2: Inner VIF Values

Multicollinearity	Low			Moderate			High		
Frequency	20			25			8		
Indicator	AE01	AE02	AE03	EY03			LY01	LY02	LY03
	EY01	EY02		LY03	LY04	LY05	SN06	SN10	SN13
	LY09			LY06	LY07		TT03		
	RS03			RS01	RS02	RS04	VE02		
	RY01	RY02	RY03	RS05	RS06				
	RY04			SN01	SN02	SN03			
	SN04			SN05	SN07	SN08			
	TY01	TY02	TY03	SN09	SN11	SN12			
	TY04	TY05		SN14					
	VE01			TT01	TT02				
	TrustXValue			VE03	VE04				
	TrustXSatisfaction								

Hair et al. (2021) posit that VIF values below 5 do not pose a significant threat to PLS-SEM models, particularly in predictive research. Similarly, Kock and Lynn (2012) argue that moderate collinearity, indicated by VIF values below 5, does not distort results in variance-based SEM, provided theoretical justification exists for retaining collinear variables. In exploratory research, moderate multicollinearity is often unavoidable due to the inherent overlap in measuring complex constructs. This overlap does not necessarily compromise the

validity of the model if grounded in robust theoretical foundations (Diamantopoulos & Siguaw, 2006).

The collinearity assessment revealed that while some indicators showed high VIF values (e.g., LY02, VE02, and SN06), these levels are acceptable for a pilot study aimed at validating constructs and relationships. High collinearity indicators were evaluated against their theoretical importance and retained for further analysis (Hair et al., 2021). Such decisions are essential for ensuring the integrity of the measurement model without prematurely discarding potentially valuable indicators.

In conclusion, the collinearity diagnostics affirm that the presence of moderate collinearity does not invalidate the findings of this study. The focus on predictive relevance in PLS-SEM and the exploratory nature of this research justify retaining indicators with VIF values exceeding the conservative thresholds, provided they align with the study's theoretical framework and objectives. Future research, particularly in the full-scale study, should aim to further refine these indicators to minimize collinearity without compromising theoretical validity.

Measurement Model Assessment

The measurement model was evaluated for factor loadings, reliability, and validity. All factor loadings exceeded 0.7, except RY03 (0.691) and TY03 (0.684), which were retained for theoretical significance. Internal consistency was confirmed through composite reliability ($CR > 0.7$), and convergent validity was established with $AVE > 0.5$ for all constructs. Discriminant validity was assessed using the HTMT ratio, where most constructs met thresholds of < 0.85 , except for a few pairs (e.g., Assurance-Empathy, Responsiveness-Empathy), suggesting conceptual overlap consistent with prior literature (Parasuraman et al., 1988). Future refinement of overlapping constructs is recommended.

Descriptive Analysis

The descriptive analysis provides an overview of respondents' perceptions across key service quality dimensions and related constructs. The constructs measures on a 7-point Likert scale (1=Strongly Disagree, 7= Strongly Agree). The summary statistics reveal central tendencies, dispersion, and response range as shown in Table 3. All constructs utilized the full scale, with minimum scores of 1 and maximum scores of 7, reflecting diverse responses across the sample.

Table 3: Descriptive Analysis

Construct	Mean	Std. Dev.	Min.	Max.
Tangibility	4.926	1.197	1	7
Reliability	4.838	1.257	1	7
Responsiveness	5.257	1.166	1	7
Assurance	5.684	1.096	1	7
Empathy	5.265	1.227	1	7
Satisfaction	5.236	1.179	1	7
Value	4.951	1.525	1	7
Trust	4.914	1.525	1	7
Loyalty	4.973	1.374	1	7

Hypotheses Testing

A total of 8 hypotheses were proposed to answer the 7 research questions (Table 4). All hypotheses were tested using SmartPLS-4.

Table 4: Research Question and Hypothesis

Research Question (RQ)	Hypothesis (H)
RQ1: How does perceived service quality affect student satisfaction in higher education?	H1: Service quality positively affects student satisfaction.
RQ2: How does perceived service quality affect perceived value among students?	H2: Service quality positively affects perceived value.
RQ3: How do student satisfaction and perceived value influence student loyalty?	H3: Student satisfaction positively influences student loyalty. H4: Perceived value positively influences student loyalty.
RQ4: Does student satisfaction mediate the relationship between service quality and student loyalty?	H5: Student satisfaction mediates the relationship between service quality and student loyalty.
RQ5: Does perceived value mediate the relationship between service quality and student loyalty?	H6: Perceived value mediates the relationship between service quality and student loyalty.
RQ6: Does perceived trust moderate the relationship between student satisfaction and student loyalty?	H7: Perceived trust moderates the relationship between student satisfaction and student loyalty, such that the relationship is stronger at higher levels of trust.
RQ7: Does perceived trust moderate the relationship between perceived value and student loyalty?	H8: Perceived trust moderates the relationship between perceived value and student loyalty, such that the relationship is stronger at higher levels of trust.

Structural Equation Modeling (SEM) Analysis

This study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships between various constructs and evaluate the proposed hypotheses. The analysis incorporated direct effects, mediating effects, and moderating effects, assessed using path coefficients, t-values, and p-values.

The analysis of direct effects revealed significant findings in specific relationships. Among the service quality dimensions, Tangibility, Reliability, Assurance, and Empathy had significant positive effects on Satisfaction. Conversely, Responsiveness did not demonstrate a significant relationship with Satisfaction. For the direct effects on Perceived Value, only Reliability and Empathy were supported, while Tangibility, Responsiveness, and Assurance did not show statistically significant relationships. The direct relationship between Satisfaction and Loyalty was significant, supporting H3. Perceived Value was also found to have a significant positive direct effect on Loyalty, confirming H4. Overall, the results suggest that while specific service quality dimensions influence Satisfaction and Perceived Value, Satisfaction and Value are critical drivers of Loyalty. The results are summarized in Table 5.1.

Table 5.1: Hypothesis Evaluation: Direct Effect

Hypothesis	Path Coefficient	t-Value	p-Value	f ²	Q ² Construct	Acceptance
TY → SN	0.258	3.212	0.001	0.160	0.559 (SN)	Yes
RY → SN	0.263	2.183	0.029	0.134	0.559 (SN)	Yes
RS → SN	-0.016	0.124	0.901	0.000	0.559 (SN)	No
AE → SN	0.288	4.121	0.00	0.178	0.559 (SN)	Yes
EY → SN	0.258	2.614	0.009	0.105	0.559 (SN)	Yes
TY → VE	0.211	1.885	0.059	0.045	0.537 (VE)	No
RY → VE	0.403	2.746	0.006	0.132	0.537 (VE)	Yes
RS → VE	-0.081	0.509	0.611	0.004	0.537 (VE)	No
AE → VE	0.073	0.659	0.510	0.005	0.537 (VE)	No
EY → VE	0.305	2.174	0.030	0.061	0.537 (VE)	Yes
SN → LY	0.499	4.693	0.000	0.396	0.678 (LY)	Yes
VE → LY	0.245	2.577	0.010	0.065	0.678 (LY)	Yes
TT → LY	0.241	2.101	0.036	0.100	0.678 (LY)	Yes
TTVE→LY	-0.100	1.255	0.210	0.029	0.678 (LY)	No
TTSN→LY	0.117	1.339	0.181	0.038	0.678 (LY)	No

The mediating role of Satisfaction and Perceived Value was examined to understand their role in the relationship between service quality dimensions and Loyalty. Satisfaction significantly mediated the relationships between Tangibility, Reliability, Assurance, and Empathy with Loyalty. These findings highlight the importance of customer satisfaction as a mechanism to translate service quality into customer loyalty. However, the mediation effect for Responsiveness was not significant. The analysis revealed that Perceived Value did not mediate the relationship between any service quality dimensions and Loyalty. This indicates that while Perceived Value is important, it does not act as a bridge between service quality dimensions and customer loyalty in this context. Thus, H5 was partially supported, and H6 was rejected. The results are presented in Table 5.2.

Table 5.2: Hypothesis Evaluation: Mediating Effect

Hypothesis	Path Coefficient	t-Value	p-Value	Acceptance
TY → SN → LY	0.129	2.647	0.008	Accepted
RY → SN → LY	0.131	2.099	0.036	Accepted
RS → SN → LY	-0.008	0.125	0.901	Rejected
AE → SN → LY	0.143	3.327	0.001	Accepted
EY → SN → LY	0.129	2.332	0.020	Accepted
TY → VE → LY	0.052	1.391	0.164	Rejected
RY → VE → LY	0.099	1.751	0.080	Rejected
RS → VE → LY	-0.020	0.449	0.653	Rejected
AE → VE → LY	0.018	0.580	0.562	Rejected
EY → VE → LY	0.075	1.579	0.114	Rejected

The moderating role of Trust (H7 and H8) was tested to assess whether it strengthens the relationship between Satisfaction, Perceived Value, and Loyalty. The analysis showed that Trust did not significantly moderate the relationship between Satisfaction and Loyalty. Similarly, Trust did not significantly moderate the relationship between Perceived Value and Loyalty. These findings suggest that while Trust is an important construct, its role as a moderator in this model was not supported. Both H7 and H8 were rejected. The results are summarized in Table 5.3.

Table 5.3: Hypothesis Evaluation: Moderating Effect

Hypothesis	Path Coefficient	t-Value	p-Value	f ²	Acceptance
SN x TT → LY	0.117	1.255	0.210	0.029	Rejected
VE x TT → LY	-0.100	1.339	0.181	0.038	Rejected

The SEM analysis highlights the critical role of Satisfaction and Perceived Value as direct predictors of Loyalty. While specific service quality dimensions such as Tangibility, Reliability, Assurance, and Empathy significantly influence Satisfaction, only Reliability and Empathy impact Perceived Value. The absence of significant mediating effects through Perceived Value and moderating effects of Trust suggests that alternative mechanisms may influence these relationships. These findings provide valuable theoretical and practical insights into the dynamics of service quality, satisfaction, value, and loyalty.

Discussion and Conclusion

Discussion on Key Findings

The findings shed light on the complex interplay between service quality, satisfaction, perceived value, and loyalty. Tangibility, Reliability, Assurance, and Empathy emerged as key drivers of Satisfaction, while Responsiveness did not exhibit a significant relationship with this construct. In terms of Perceived Value, Reliability and Empathy demonstrated significant direct effects, underscoring their importance in shaping customer perceptions of value. The direct effects of both Satisfaction and Perceived Value on Loyalty were confirmed, highlighting their central roles in fostering customer loyalty. However, the mediating effects analysis revealed that only Satisfaction serves as a mediator between specific service quality dimensions (Tangibility, Reliability, Assurance, and Empathy) and Loyalty. In contrast, Perceived Value

did not mediate any of these relationships. Finally, the moderating role of Trust was not supported, suggesting that its influence on the Satisfaction-Loyalty and Perceived Value-Loyalty relationships is limited in this context.

Theoretical Implication

This study contributes to the theoretical understanding of service quality by integrating mediators and moderators within the Malaysian Private HEI context, addressing gaps in prior research. It underscores the multidimensional nature of service quality and highlights the differential impact of its dimensions on satisfaction and perceived value. By identifying satisfaction as a pivotal mediator, the study reinforces its critical role in translating service quality into loyalty. However, the findings challenge the universality of trust and perceived value as mediators, calling for alternative frameworks to explore loyalty dynamics in educational settings. The lack of significant mediating effects through perceived value and the absence of moderating effects of trust suggest that nuanced relationships among these constructs may require additional exploration. These insights provide a robust foundation for future research to investigate alternative mediators and moderators that influence customer loyalty in service contexts, contributing to the growing body of literature in service quality and its practical implications.

Practical/Managerial Implication

The findings provide actionable insights for Private HEI managers aiming to enhance customer satisfaction and loyalty. Managers should prioritize improving tangible aspects of service delivery, such as facilities and reliability, while fostering assurance and empathy in interactions. These dimensions have been shown to significantly influence satisfaction, which, in turn, drives loyalty. Personalized services and streamlined administrative processes should be central to service delivery strategies to ensure a positive and engaging customer experience.

Although perceived value and trust demonstrated limited roles as mediators and moderators, efforts to enhance these dimensions remain essential. Transparent communication and value-driven propositions can strengthen the perceived value of services and align them with customer expectations. Furthermore, while trust did not moderate loyalty relationships, building loyalty may require strategies that go beyond fostering trust, such as consistent service quality and personalized engagement. These findings underscore the importance of adopting a holistic approach to service delivery that integrates key service quality dimensions with innovative engagement strategies to meet and exceed customer expectations.

Limitation and Future Research

This pilot study, characterized by its cross-sectional design and limited sample size, restricts the generalizability of findings and the ability to infer causal relationships among constructs. Future research should adopt longitudinal designs to capture dynamic relationships over time, offering deeper insights into the evolving interplay between service quality, satisfaction, perceived value, and loyalty.

The study's focus on Malaysian private HEIs presents a contextual limitation, potentially reducing the broader applicability of its findings. Future studies could explore diverse HEIs

across varying cultural contexts and industries to enhance generalizability and provide comparative insights. Additionally, investigating alternative moderators, such as cultural values or digital engagement, could enrich the understanding of loyalty formation in HEIs. Similarly, exploring additional mediators or alternative theoretical models may address the observed limitations regarding Perceived Value and Trust, which did not yield significant effects in this study.

Three additional research directions emerged during the analysis. First, given that one dimension of service quality was not significant, future studies should reconsider the conceptualization of service quality as an aggregated construct. Comparing its predictive power against models where dimensions are individually tested could offer critical insights into the efficacy of aggregated versus dimensional approaches. Second, adopting a necessity and sufficiency logic could identify indispensable dimensions or combinations critical for loyalty formation. This approach would contribute to the identification of essential service quality components. Finally, configurational analysis, such as fuzzy-set Qualitative Comparative Analysis (fsQCA), could provide nuanced insights into how combinations of service quality dimensions interact to influence satisfaction and loyalty. Given the resource-intensive nature of adhering to all five service quality dimensions, understanding which dimensions yield the highest impact on loyalty could inform cost-effective, targeted strategies for service delivery.

These research directions not only address the current study's limitations but also offer a roadmap for advancing theoretical and practical understanding of service quality dynamics. By exploring the predictive value of aggregated constructs, uncovering necessary and sufficient dimensions of service quality, and leveraging configurational methods like fsQCA, future studies can provide richer insights into how service quality influences satisfaction and loyalty. These approaches would help HEIs prioritize service quality dimensions that deliver the greatest impact while optimizing resources.

Conclusion

This study underscores the pivotal role of satisfaction as a mediator between service quality and loyalty in Malaysian private HEIs. Specific service quality dimensions such as Tangibility, Reliability, Assurance, and Empathy were found to significantly influence Satisfaction, highlighting its centrality in driving customer loyalty. While Reliability and Empathy also impact Perceived Value, its role as a mediator was not significant, suggesting that Satisfaction remains the primary mechanism linking service quality to loyalty. Additionally, the absence of moderating effects of Trust indicates that its influence in this context may be limited.

These findings provide valuable theoretical insights by reinforcing the multidimensional nature of service quality and its relationship with loyalty. They also offer practical guidance for HEI managers to prioritize enhancing Satisfaction through targeted improvements in key service quality dimensions. The study's contributions lay the groundwork for further research to explore alternative pathways and mechanisms influencing loyalty, fostering a deeper understanding of service quality dynamics in competitive educational environments.

Acknowledgements

Funding: This research is funded by Geran Penyelidikan UKM-GSB 2025, research code: GSB-2025-004.

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SEISMIC ANALYSIS OF STRUCTURES EQUIPPED WITH FRICTION DAMPERS UNDER VERTICAL EARTHQUAKE EFFECTS

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Abstract: *This study investigates the seismic performance of moment-resisting frames equipped with rotational friction dampers under simultaneous horizontal and vertical earthquake components. A 3-story steel moment frame was analyzed using nonlinear dynamic time history analysis with five high-magnitude earthquake records. The dampers were designed with a capacity equal to 30% of the base shear force at each story level. Results demonstrate that implementing rotational friction dampers reduces maximum roof displacement by an average of 31% and maximum base shear by 32%. The analysis was performed using OpenSees software, considering both horizontal and vertical earthquake components simultaneously. The friction dampers effectively dissipate seismic energy while maintaining the main structural elements in the elastic range, proving to be an efficient passive energy dissipation system for seismic retrofitting of structures.*

Keywords: *Friction Damper, Seismic Analysis, Moment Frame, Passive Energy Dissipation, Earthquake Engineering*

Introduction

Modern seismic design philosophy allows structures to undergo controlled inelastic deformation during strong earthquakes, primarily through plastic hinge formation in beams and columns. While this approach ensures life safety, it often results in significant structural and non-structural damage, leading to high repair costs and extended downtime. To address these limitations, passive energy dissipation systems have gained popularity as effective alternatives for seismic protection. Friction dampers represent one of the most practical and cost-effective passive control systems. These devices dissipate seismic energy through friction between sliding surfaces, offering several advantages including stable hysteretic behavior, independence from loading frequency and temperature, and minimal maintenance requirements. The concept of friction damping was first introduced by Keightley in the 1970s, followed by significant developments by Pall and Marsh in the 1980s. Rotational friction dampers (RFD), developed by Mualla, represent an advanced form of friction-based energy dissipation systems. These devices consist of central and side steel plates with friction pad materials sandwiched between them, connected through high-strength bolts and spring washers. The damper rotates about its central axis when subjected to lateral forces, dissipating energy through friction. This research aims to evaluate the effectiveness of rotational friction dampers in reducing seismic response parameters of steel moment frames under combined horizontal and vertical earthquake excitations.

Literature Review

The concept of friction damping for seismic applications was first introduced by Keightley in the late 1970s at Montana State University, focusing on using Belleville washers and steel plates to create friction connections for building damping systems (Keightley, 1977). Building on this foundation, Pall and Marsh developed the Limited Slip Bolted (LSB) connection in the early 1980s, utilizing brake lining materials between steel plates and offering more predictable and stable behaviour (Pall & Marsh, 1982). Their extensive experimental studies demonstrated that friction dampers could significantly reduce structural response while maintaining the main structure in the elastic range.

Mualla introduced rotational friction dampers (RFD) at the Technical University of Denmark in 2000, representing a significant advancement in friction damper technology (Mualla, 2000). These devices consist of a T-shaped central plate rotating between two side plates with special friction pad materials, demonstrating stable energy dissipation characteristics and frequency-independent behavior over hundreds of loading cycles. Mualla and Nielsen conducted parametric studies identifying key design parameters affecting RFD performance, including the geometric shape ratio, bolt clamping force, friction material properties, and damper size, revealing that optimal performance could be achieved with equivalent damping ratios of 15-50% of critical damping (Mualla & Nielsen, 2002).

Recent developments have introduced innovative configurations such as elliptic-braced frames with rotational friction dampers (ELBRF-RFD), which serve as displacement-restraint bracing techniques (Daemi et al., 2024). This study introduces the quantification of seismic performance factors through incremental dynamic analysis, demonstrating significant improvements in seismic resilience. Comprehensive experimental studies involving 27 friction pad material comparison tests found that fiber-reinforced resin-based composite (FRRC) material outperformed traditional materials in achieving high friction coefficient and stable performance (Li et al., 2024). This research addressed three main challenges in RFD performance: avoiding strength fluctuation, enhancing strength, and ensuring uniform pressure distribution.

Advanced friction damper configurations have emerged, including rotational friction dampers with restoring force, consisting of rotational friction pads with heavy-duty torsional springs (Naeem & Kim, 2020). Non-preload variable friction dampers (NVFD) have been developed, which do not require preloading and combine inerter elements, featuring an amplification effect that results in more significant damping performance (Liu et al., 2024). Motion amplified rotational friction dampers (RAFD) have been proposed, which can realize several times amplified friction force for a given normal load due to the adopted amplification system (Chen et al., 2023). Analytical and experimental results demonstrate that RAFD showcases superior seismic control effectiveness compared to traditional friction dampers.

Recent comparative studies have evaluated friction, self-centering and hybrid self-centering dampers, with superelastic friction dampers operating on a parallel mechanism of shape memory alloy cables and frictional components (Yang et al., 2024). These hybrid systems demonstrate excellent performance in reducing interstory drift ratio, residual interstory drift ratio, and absolute acceleration responses, with 90% of damper deformations recovered.

Limited research has been conducted on friction damper performance under combined horizontal and vertical earthquake components. Most studies have focused primarily on horizontal excitation effects, leaving a gap in understanding the influence of vertical ground motion on damper effectiveness. Recent studies indicate that the ground motion vertical component is typically ignored in analysis, even though damage observed in recent earthquakes suggests that vertical accelerations may significantly influence structural response (Di Michele et al., 2020). The analysis of current provisions indicates that the absence of clear guidelines on the use of the vertical seismic component can be strongly non-conservative for certain structures.

Recent developments in machine-learning technology have rapidly progressed in earthquake seismology, achieving great success in catalog development, seismicity analysis, and ground-motion prediction (Mousavi & Beroza, 2024). Artificial intelligence has emerged as a powerful tool for structural health monitoring that considerably improves accuracy, robustness, and operational efficiency. These advances are being integrated with traditional finite element modeling approaches using platforms like OpenSees for enhanced seismic analysis capabilities.

Recent multi-hazard studies have investigated the effectiveness of friction dampers for connected steel buildings under uncorrelated seismic ground motion and wind excitations (Malhotra et al., 2020). Results show that friction dampers are more effective for low-rise buildings under seismic ground motions, whereas the same control devices show effectiveness for high-rise buildings under wind effects. Comprehensive assessments have been conducted on damper performance in mainshock-aftershock sequences, demonstrating stable performance over multiple cycles.

The integration of optimization algorithms with finite element analysis has enabled optimal damper placement strategies. Genetic algorithms implemented in MATLAB with nonlinear time-history analyses performed in OpenSees have been used to determine optimal placement of energy dissipation devices in steel moment-resisting frames. These computational advances, combined with improved understanding of damper mechanics and material properties, have significantly enhanced the practical application of friction dampers in seismic protection systems.

Current research gaps include the need for more comprehensive studies on vertical earthquake component effects, advanced material development for improved friction properties, integration of artificial intelligence for optimal design and placement, and understanding multi-hazard performance under combined loading scenarios. The present research addresses the gap in understanding vertical earthquake effects by investigating the seismic performance of steel moment frames equipped with rotational friction dampers under simultaneous horizontal and vertical earthquake excitations, providing insights into the actual effectiveness of these systems under realistic loading conditions (Chopra, 2007).

Egor (Egor et al., 1995) investigated slotted bolted connections as an alternative friction damper configuration, demonstrating good energy dissipation characteristics and practical implementation advantages for steel frame applications.

Performance under Vertical Ground Motion

Limited research has been conducted on friction damper performance under combined horizontal and vertical earthquake components. Most studies have focused primarily on horizontal excitation effects, leaving a gap in understanding the influence of vertical ground motion on damper effectiveness and overall structural response.

Chopra (Chopra, 2017b) emphasized the importance of vertical ground motion effects in earthquake engineering, particularly for structures with long spans or specific dynamic characteristics. However, systematic studies on friction damper performance under combined loading scenarios remain limited in the literature. Recent analytical studies have begun to address this research gap. When horizontal and vertical components act simultaneously near causative faults, larger plastic rotations in structural beams are obtained compared to those resulting from considering only horizontal components. Furthermore, vertical ground motion might increase or decrease horizontal maximum displacement depending on axial load ratios of structural elements and will increase maximum inter-story drift while changing its distribution. The challenge becomes more complex for friction dampers due to their velocity-dependent and pressure-sensitive nature. Ground motion parameters including spectral response acceleration, peak ground acceleration, and effective peak velocity correlate well with displacement demand, though friction damper response cannot maintain optimality when subjected to different seismic excitations owing to passive properties. The interaction between vertical motion-induced axial load variations and friction interface behavior represents a critical research area requiring comprehensive experimental and analytical investigation.

Research Gaps and Motivation

While extensive research has been conducted on friction dampers under horizontal excitation, the combined effects of horizontal and vertical earthquake components on damper performance require further investigation. Most existing studies focus on single-component loading, potentially underestimating or overestimating the actual performance under realistic earthquake scenarios.

The present research addresses this gap by investigating the seismic performance of steel moment frames equipped with rotational friction dampers under simultaneous horizontal and vertical earthquake excitations, providing insights into the actual effectiveness of these systems under realistic loading conditions.

Methodology

This study employed a comprehensive numerical investigation to evaluate the seismic performance of steel moment frames equipped with rotational friction dampers under simultaneous horizontal and vertical earthquake excitations. A three-story steel moment frame was modeled using the OpenSees finite element platform, incorporating nonlinear material properties with Steel02 constitutive models and fiber-based cross-sections to accurately capture the inelastic structural response. The rotational friction dampers were strategically positioned in the central bay of each floor to maintain structural symmetry and minimize torsional effects. The damper capacity was determined as 30% of the story shear force, following established design guidelines for optimal energy dissipation performance.

Five ground motion records were carefully selected from the PEER Strong Motion Database based on specific criteria including magnitude range (6.0-7.0), epicentral distance (20-45 km), and soil conditions (Type III with shear wave velocity 175-375 m/s). Each record was scaled according to FEMA 356 procedures to ensure compatibility with the design response spectrum. The analysis protocol consisted of nonlinear time history analyses performed on both the bare frame and the damper-equipped frame configurations under simultaneous application of horizontal and vertical earthquake components. Rayleigh damping with 5% critical damping ratio was implemented for the first and third modes to represent inherent structural damping. Key response parameters including maximum roof displacement and base shear were extracted and compared between the two configurations to quantify the damper effectiveness. The methodology incorporated geometric nonlinearity and P-Delta effects to ensure realistic representation of large displacement behavior under severe seismic excitation.

Analysis Procedure

The nine-story steel moment frame was modeled using OpenSees finite element software, beginning with geometric specifications as shown in Figure 1. The structure featured 4-meter bay spans and 3.2-meter story heights, designed according to Iranian Standard 2800 (4th edition) with regular configuration to permit two-dimensional modeling. Steel material properties were defined using Steel02 constitutive models with yield strength of 2400 kg/cm² and elastic modulus $E = 2 \times 10^6$ kg/cm², as illustrated in Figure 2. The material model employed a bilinear stress-strain relationship with gradual transition from elastic to inelastic behavior, avoiding the abrupt yielding characteristic of Steel01 models.

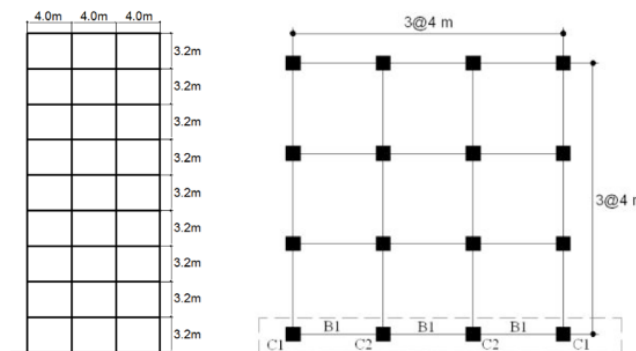


Figure 1: Three-Dimensional View and Geometric Specifications of the Moment Frame

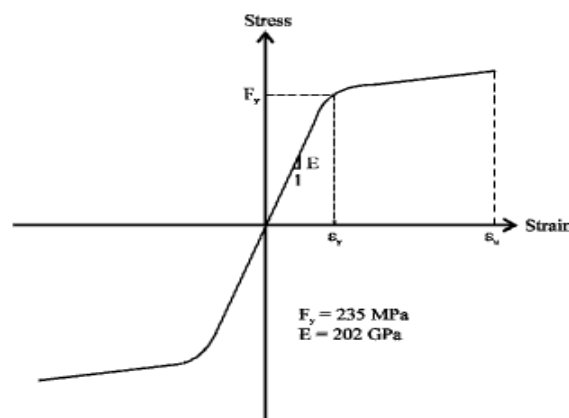


Figure 2: Stress-Strain Curve Of Steel02 Material

The 9-story steel moment frame utilized varying cross-sections optimized for each floor level. The lower three stories (1-3) employed IPB280 and IPB360 sections for interior and exterior columns respectively, with IPE360 beams. The middle stories (4-6) used IPB240 and IPB300 columns with IPE360 and IPE300 beams respectively. The upper three stories (7-9) incorporated IPB240 and IPB280 columns with IPE300 beams throughout. This section distribution follows typical design practice where heavier sections are used in lower stories to accommodate higher load demands, transitioning to lighter sections in upper levels. NonlinearBeamColumn elements with five integration points were employed for all frame members, incorporating P-Delta effects through local-to-global coordinate transformations. Nodal masses were concentrated at beam-column joints based on tributary area calculations, incorporating dead loads (2400 kg/m) and 20% of live loads (800 kg/m) as specified in seismic design provisions.

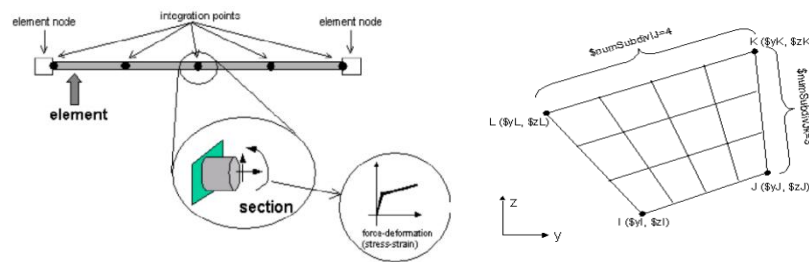


Figure 3: Method of Defining Fiber Sections in Opensees

The loading sequence commenced with static gravity analysis followed by dynamic earthquake analysis. Five ground motion records were selected from the PEER database based on magnitude range (6.0-7.0), epicentral distance (20-45 km), and site conditions (Type III soil with $V_s = 175$ -375 m/s), as summarized in Table 1. Each record was scaled according to FEMA 356 procedures, ensuring minimum spectral acceleration values over the period range of 0.2T to 1.5T exceeded code-specified design spectra. Rayleigh damping with 5% critical damping ratio was implemented using the first and third modal frequencies according to Equations 1 and 2.

Table 1: Specifications of Accelerograms Applied to the Structure

Earthquake Record	PGA (g)	Time	Duration
Landers (1992)	0.13	0.005	38
Chi-Chi Taiwan (1999)	0.137	0.004	44.52
El Mayor-Cucapah (2010)	0.227	0.005	39.44
Darfield New Zealand (2010)	0.176	0.005	31
Kobe (1995)	0.214	0.01	28

$$C = \alpha M + \beta K \quad (1)$$

$$\beta = \frac{2\xi_1\omega_1 - 2\xi_m\omega_m}{\omega_1^2 - \omega_m^2} \quad (2)$$

Rotational friction dampers were modeled using the moment-rotation relationship shown in Figure 4, with capacity determined as 30% of story shear force following established optimization guidelines. Bracing elements with cross-sectional areas specified in Table 2 were designed to ensure 30% stiffness contribution from the damping system. The dampers were

positioned in the central bay of each floor to maintain structural symmetry and minimize torsional effects, as depicted in Figure 4.

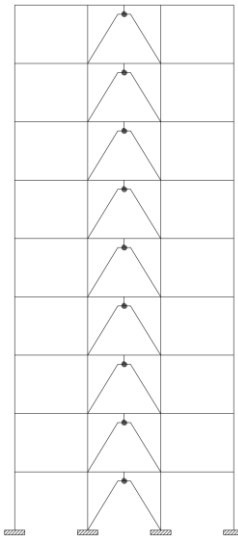


Figure 4: Damper Placement Layout in the Moment Frame

Table 2: Base Shear Force and Capacity of Dampers Used in Different Floors of the Structures

Story	Base Shear (ton)	Damper Capacity (ton)	Brace Cross- Section
9	24.08	7.22	2.02
8	28.77	8.63	2.47
7	32.89	9.87	2.7
6	36.42	10.93	2.99
5	39.38	11.81	3.31
4	41.76	12.53	3.43
3	43.54	13.06	3.4
2	44.73	13.42	3.4
1	45.33	13.6	6.28

Result and Discussion

The seismic response analysis presented in this study examines the structural behavior of a building system under five distinct earthquake ground motion records: Landers, Chi-Chi, El Mayor, Darfield (New Zealand), and Kobe. These earthquakes represent diverse seismic characteristics in terms of magnitude, frequency content, duration, and intensity, providing a comprehensive evaluation of structural performance under varying seismic excitations. The analysis focuses on two critical response parameters: maximum structural displacement and base shear forces, which are fundamental indicators of structural performance and safety under seismic loading conditions. Figure 5 compares maximum structural displacements across the five earthquake records. Chi-Chi earthquake produces the highest displacement (0.300 m), attributed to its long-duration, near-field characteristics with significant velocity pulses. Darfield shows the second-highest response (0.258 m), reflecting intense ground motion characteristics. Landers demonstrates moderate displacement (0.200 m), while El Mayor and

Kobe produce lower responses (0.151 m and 0.140 m, respectively). The variation indicates that displacement demands are highly dependent on earthquake frequency content and duration rather than magnitude alone.

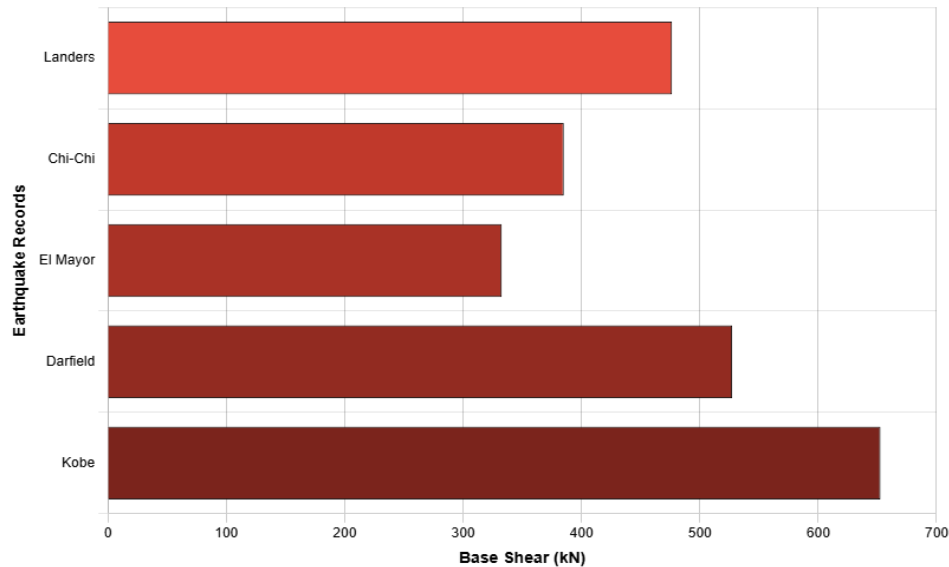


Figure 5: Maximum Structural Displacement Comparison Across Five Earthquake Records

Figure 6 illustrates base shear force demands using horizontal bars. Kobe earthquake generates the highest base shear (652.6 kN), significantly exceeding other records due to its high-frequency content and intense accelerations. This explains Kobe's devastating impact despite lower displacement values. Darfield produces the second-highest base shear (527.4 kN), followed by Landers (476.5 kN). Chi-Chi and El Mayor show lower force demands (385.1 kN and 332.7 kN), indicating different dynamic response mechanisms dominated by displacement rather than acceleration.

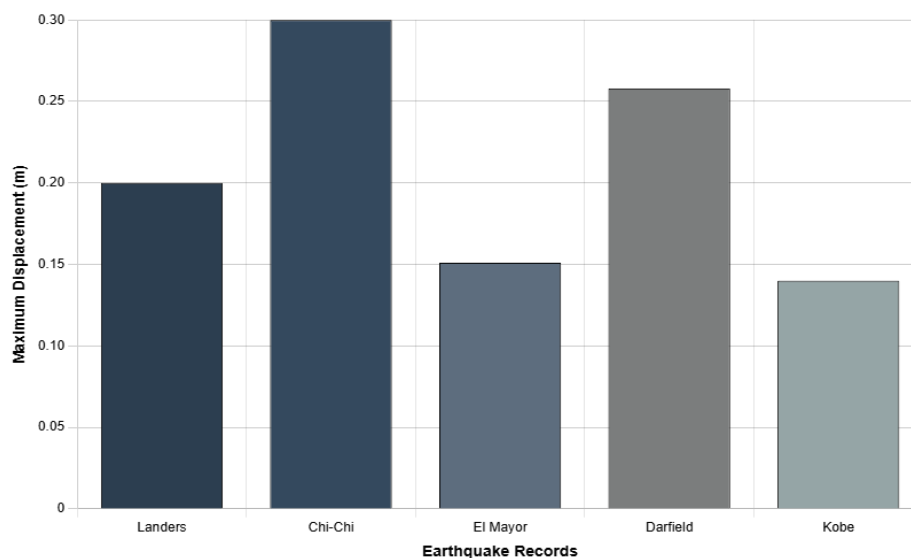


Figure 6: Base Shear Force Comparison Showing Structural Force Demands Under Different Earthquake Ground Motions

Figure 7 presents a dual-axis representation combining displacement and base shear responses to reveal the complex relationship between these two fundamental seismic response parameters. The chart employs bars for displacement values (left axis) and a connected line with markers for base shear forces (right axis), enabling direct comparison and correlation analysis.

The most significant observation from this combined representation is the apparent inverse relationship between displacement and base shear responses. While Chi-Chi earthquake produces the maximum displacement (0.300 m), it generates a moderate base shear force (385.1 kN). Conversely, Kobe earthquake exhibits the minimum displacement (0.140 m) while producing the maximum base shear force (652.6 kN). This inverse correlation suggests fundamentally different dynamic response mechanisms governing these two parameters.

The displacement-to-base shear relationship can be explained through the lens of structural dynamics and frequency content analysis. Large displacement responses typically indicate significant fundamental mode participation, characterized by lower frequencies and longer periods. In contrast, high base shear forces often result from higher-mode contributions, involving shorter periods and higher frequencies. Ground motions with rich low-frequency content (like Chi-Chi) tend to excite fundamental modes effectively, producing large displacements with moderate forces. Conversely, ground motions with significant high-frequency content (like Kobe) activate higher-order modes, resulting in substantial force amplification with limited displacement response.

The Darfield earthquake presents an interesting case, showing both high displacement (0.258 m) and high base shear (527.4 kN) responses. This suggests that Darfield ground motion contains broad-band frequency content capable of exciting multiple vibration modes simultaneously, resulting in significant response amplification across both displacement and force parameters. The Landers earthquake demonstrates moderate values for both parameters (0.200 m displacement, 476.5 kN base shear), indicating balanced frequency content affecting various structural modes. El Mayor earthquake shows consistently low responses for both parameters, suggesting limited energy content across all relevant frequency ranges. This relationship analysis has profound implications for seismic design philosophy. Structures designed primarily for displacement limits (such as drift-controlled systems) may experience unexpected force demands under certain ground motions. Similarly, force-based design approaches may inadequately address displacement-controlled failure modes under specific seismic scenarios.

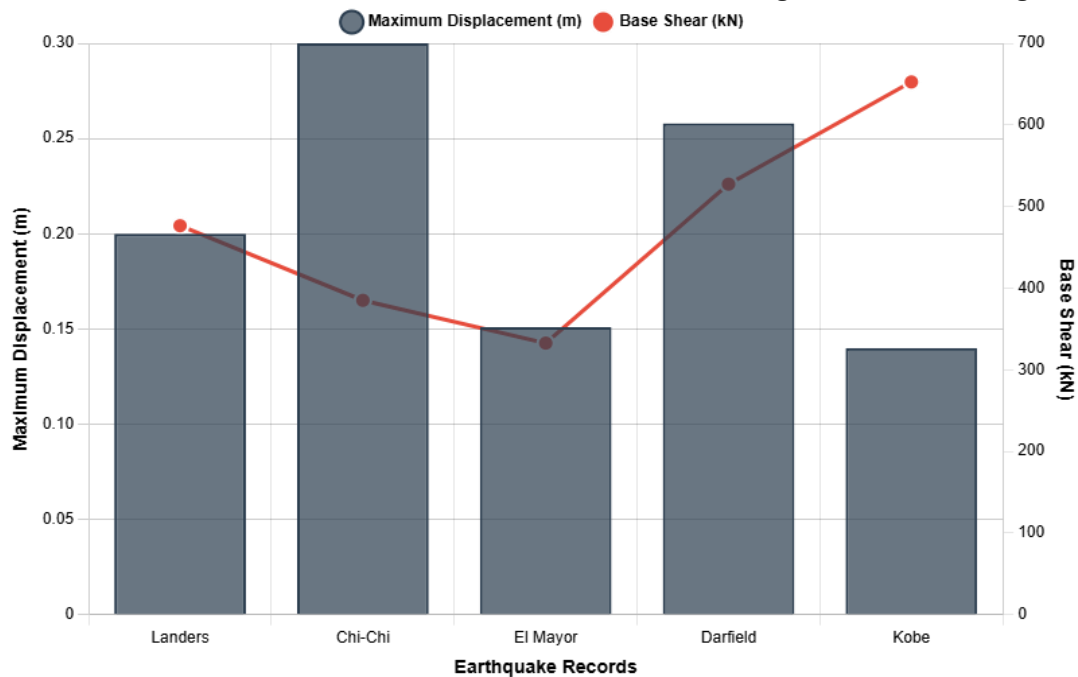


Figure 7: Dual-Axis Comparison Showing the Relationship Between Maximum Displacement (Bars) and Base Shear Forces (Line with Markers) for Each Earthquake Record

Table 3 provides a comprehensive quantitative summary of the seismic response analysis, including maximum displacement, base shear forces, and their calculated ratios. The displacement-to-base shear ratio serves as a normalized parameter for comparing relative structural behavior across different earthquake scenarios. The displacement/base shear ratios reveal significant variation, ranging from 0.214×10^{-3} (Kobe) to 0.779×10^{-3} (Chi-Chi), representing a 264% difference between extreme values. Chi-Chi earthquake exhibits the highest ratio, confirming its displacement-dominated response characteristics. This elevated ratio indicates efficient fundamental mode excitation with limited higher-mode participation.

The Kobe earthquake demonstrates the lowest ratio, consistent with its force-dominated response pattern. The low ratio suggests predominant higher-mode contributions resulting in substantial force amplification relative to displacement response. This characteristic is particularly important for understanding potential brittle failure modes under Kobe-type ground motions.

The intermediate ratios observed for Darfield (0.489×10^{-3}), El Mayor (0.454×10^{-3}), and Landers (0.420×10^{-3}) indicate more balanced response characteristics. These earthquakes produce moderate-to-low ratios, suggesting mixed-mode participation with varying degrees of displacement and force contributions. The statistical analysis of the displacement/base shear ratios provides insight into the expected range of structural behavior under different seismic scenarios. The mean ratio of 0.471×10^{-3} with a standard deviation of 0.189×10^{-3} indicates substantial variability requiring careful consideration in design applications. These quantitative relationships are essential for developing performance-based seismic design criteria, establishing appropriate acceptance limits for both displacement and force-based assessment procedures, and understanding the complex interplay between ground motion characteristics and structural response mechanisms. The data presented in Table 3 supports the development

of empirical relationships for preliminary design estimation and provides benchmark values for validating numerical modeling approaches in seismic analysis applications.

Table 3: Quantitative Summary of Seismic Response Parameters Showing Maximum Displacement, Base Shear Forces, and Their Ratios for Structural Performance Evaluation

Earthquake Record	Maximum Displacement (m)	Base Shear (kN)	Displacement/Base Shear Ratio ($\times 10^{-3}$)
Landers	0.2	476.5	0.42
Chi-Chi	0.3	385.1	0.779
El Mayor	0.151	332.7	0.454
Darfield	0.258	527.4	0.489
Kobe	0.14	652.6	0.214

Conclusion

This study demonstrates the effectiveness of rotational friction dampers in enhancing the seismic performance of steel moment frames under combined horizontal and vertical earthquake excitations. The research reveals significant improvements in structural response control, with the dampers achieving an average 31% reduction in maximum roof displacement across five earthquake records, though performance variations were observed based on specific earthquake characteristics. This displacement control capability demonstrates the dampers' effectiveness in limiting structural deformation during seismic events.

The force reduction capabilities of the rotational friction dampers proved equally impressive, delivering a consistent 32% average reduction in maximum base shear across all test scenarios. This substantial force reduction indicates effective load limitation on primary structural elements, which translates to reduced stress demands on the main structural system. The dampers exhibited reliable performance characteristics, maintaining stable energy dissipation behavior across different earthquake intensities and frequency contents, demonstrating their robustness under varying seismic conditions.

The design methodology validation confirmed that the 30% capacity design rule proves effective for achieving significant response reductions while maintaining overall system stability. This finding provides valuable guidance for practical implementation of these dampers in real-world applications. From a practical standpoint, the rotational friction dampers can be readily integrated into existing moment frame systems, making them particularly suitable for seismic retrofitting applications where structural enhancement is needed without major modifications to the primary structural system.

The research confirms that rotational friction dampers represent a viable and effective passive energy dissipation system for seismic protection of steel structures. Future research should investigate the performance under near-field earthquakes and explore optimization strategies for different structural configurations to further advance the application of this promising seismic protection technology.

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GUARDED BY THE MOON: EXPLORING THE SACRED TOMB AND DIGITAL HERITAGE DISCOURSE OF PUTERI LINDUNGAN BULAN

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Abstract: *Myths and legends play an important role in sustaining intangible cultural heritage, shaping collective memory, and reinforcing cultural identity. In Kedah, the legend of Puteri Lindungan Bulan, remembered as a princess guarded by the moon, is deeply embedded in royal history, spiritual belief, and local identity. This paper analyses how her legacy is preserved both at the physical heritage site of her tomb in Kota Siputeh and within contemporary digital heritage discourse. A qualitative approach was employed, consisting of content analysis of online newspapers and official cultural and tourism websites, a site visit to observe the tomb and its surroundings, and an interview with the tomb's guardian. The findings reveal that the legend is closely connected to historical political tensions between Kedah and Aceh, and that the princess's protected status and white-blooded lineage contribute to her symbolic significance. The tomb, enhanced with yellow royal cloth and interpretive signage, serves as a sacred and contemplative site that reinforces cultural memory within the physical landscape. Local perspectives, including the guardian's preference for referring to her as Puteri Zaleha and the cultural importance of the pokok lokcan tree, demonstrate how memory, respect, and spiritual association continue to shape community engagement. However, digital representation of the legend remains limited and fragmented, reducing the visibility of its cultural depth in wider heritage narratives. This paper highlights the need for more strategic digital heritage representation to support cultural appreciation and heritage tourism in Kedah.*

Keywords: *Puteri Lindungan Bulan, Legend, Intangible Cultural Heritage, Sacred Heritage Site, Digital Heritage*

Introduction

Background of the Study

Myths and legends have been a central part of human culture, functioning as narratives that convey moral values, express spiritual beliefs, and reflect historical and social experiences (Eliade, 1959; Shynkaruk et al., 2018). Across societies, these stories provide symbolic frameworks through which people interpret natural phenomena, organise social structures, and engage with fundamental questions of existence (Lévi-Strauss, 1955). In European traditions, the Arthurian legends recount the adventures of King Arthur and the Knights of the Round Table in their pursuit of the Holy Grail, emphasising virtues such as courage, fairness, and loyalty (Lacy, 1991). Other familiar European hero narratives, such as the tales of Hercules, Robin Hood, and William Wallace, highlight boldness, cleverness, and justice while reflecting cultural ideals (Holt, 1982).

In Asia, myths similarly shape cultural identity and ethical discourse. In India, the epics *Ramayana* and *Mahabharata* portray duty, moral conduct, and heroism (Goldman, 1984). Chinese legend presents the figure of Sun Wukong, the Monkey King, whose intelligence,

perseverance, and transformative journey offer lessons in courage and spiritual growth (Lou, 2016). Across all these regions, myths and legends do more than entertain; they act as repositories of cultural memory, reinforce social norms, and sustain shared values across generations (Campbell, 1949; Jung, 1964; Shynkaruk et al., 2018).

Malaysia has long been known for its rich and varied traditions of myths and legends that express cultural values, explain natural events, and mirror social as well as spiritual beliefs. In the northern state of Kedah, storytelling plays an especially important role, with Langkawi often celebrated as the Isle of Legends. Among the most well-known tales from Langkawi are the curse of Mahsuri, the Seven Fairy Princesses of Telaga Tujuh, the fight between Mat Raya and Mat Chinchang which is said to have shaped the island's landscape, and the story of the Lake of the Pregnant Maiden, believed to have the power to help barren women conceive. On the Kedah mainland, other well-preserved legends include Raja Bersiong, also known as the Fanged King, and Puteri Lindungan Bulan, which literally means Princess Guarded by the Moon. These traditional stories remain deeply rooted in the local imagination, offering glimpses into the region's history, royal heritage, and spiritual worldview. The tale of Puteri Lindungan Bulan is especially meaningful because it blends elements of history and belief, serving as a window into how intangible heritage, memory, and regional identity are intertwined. Despite their cultural importance, some of these legends, including Puteri Lindungan Bulan, are still not widely represented in tourism materials, whether online or in print, suggesting the need for more research and attention to their preservation and promotion.

While Malaysian folklore has attracted scholarly attention, few studies have examined how legends such as Puteri Lindungan Bulan are represented in tangible heritage sites and digital media. The tomb at Kota Siputeh, which has been developed as a cultural heritage site, offers an opportunity to study how physical spaces and interpretive narratives can work together to sustain historical knowledge, moral values, and cultural identity. This paper seeks to fill this gap by combining observations at the site, interviews with the tomb's guardian, and an analysis of digital representations of the legend. By exploring these elements, the study contributes to a deeper understanding of Kedah's intangible heritage and illustrates how local myths can support cultural tourism and heritage awareness. Investigating the ways in which both physical and digital narratives are interpreted provides a framework for safeguarding Malaysia's folklore, while fostering broader appreciation of the historical and cultural significance embedded within these stories.

Literature Review

Legends and Myths as Intangible Heritage

Intangible cultural heritage encompasses a wide array of living expressions, including oral traditions, performing arts, social practices, rituals, and knowledge systems, and it plays a critical role in preserving culture while fostering a sense of community continuity. UNESCO (2003) defines intangible cultural heritage as the living expressions that are transmitted from one generation to another. These expressions offer communities a tangible connection to their past, reinforcing identity, continuity, and social cohesion. In the Malaysian context, intangible heritage encompasses traditional knowledge, practices, myths, and legends that are central to community identity and intergenerational memory (Mustafa & Saleh, 2017). Oral traditions, particularly myths and legends, are especially significant because they encode historical events,

societal norms, and moral frameworks, reflecting the collective worldview of the societies that maintain them (Mustafa & Saleh, 2017).

Conceptual Understanding of Legends

Legends are narratives that weave together historical events and imaginative storytelling, enabling communities to pass down cultural values, moral lessons, and local knowledge over generations. According to Yusuf et al. (2022), these stories often merge factual occurrences with creative elements, reflecting social norms, shared experiences, and community identity. Dégh (2001) highlights that legends frequently incorporate supernatural or ethical dimensions, allowing societies to explore universal human concerns such as mortality, fate, and the unknown. This blend of reality and imagination gives legends enduring relevance, allowing them to remain meaningful even as societies change. They continue to thrive not only through traditional oral storytelling but also via newspapers, radio, television, and digital media, ensuring that lessons and cultural memories are preserved for future generations.

Fontenrose (1971) notes that legends typically recount the actions of notable figures, ranging from heroes to more notorious characters such as thieves or pirates. While these protagonists are usually human, some are remembered as extraordinary or even supernatural, highlighting how legends mix historical events with miraculous or imaginative aspects. Tangherlini (1990) emphasizes that legends are not static; they evolve over time, adapting to the shifting cultural and social needs of the communities that uphold them. Encyclopaedia Britannica (2025) further explains that legends are traditionally tied to specific people or places, often including mythological or supernatural features, yet they are generally narrated as historical accounts, which reinforces collective memory and identity.

Collectively, these perspectives show that legends are far more than entertaining tales. They are vital tools for transmitting societal values, maintaining communal identity, and preserving historical consciousness. By intertwining moral lessons, historical events, and supernatural elements, legends serve as living expressions of intangible cultural heritage, allowing communities to reflect on shared human experiences, connect with their past, and sustain a sense of continuity across generations (Yusuf et al., 2022; Dégh, 2001; Fontenrose, 1971; Tangherlini, 1990; Encyclopaedia Britannica, 2025).

Previous Studies on Legends

Legends have long played a significant role in preserving cultural heritage and shaping community identity. Around the world, these stories act as a bridge between the past and present, linking historical events, moral lessons, and local knowledge in ways that engage both contemporary and future generations. For instance, Turak (2025) highlights the myths and legends of Troy in Turkey, showing how storytelling and historical sites work together to safeguard cultural memory. These narratives allow communities to maintain a sense of shared history, social cohesion, and connection to their heritage. In the Malaysian context, the legend of the Chini Lake Dragon in Pahang illustrates the close relationship between folklore and the natural environment. According to Yusuf et al. (2022), the legend reflects local beliefs and moral values while connecting its story to real geographical locations. The dragons symbolize power and transformation, and the legend encourages respect for nature. Beyond its narrative

elements, the story functions as a vessel for passing traditional knowledge and community identity from one generation to the next.

Similarly, Harun (2020) examines the legend of Nakhoda Ragam and its links to the early history of Penang. This seafaring legend recounts the travels of Nakhoda Ragam across the Malay world and explains the origins of several place names in Penang, including Bayan Lepas and Pulau Kendi. While the legend should not be read as strict historical fact, it demonstrates how folklore can anchor cultural memory in local geography, reflect societal values, and preserve regional identity. Overall, these studies show that legends are more than stories. They serve as tools for transmitting cultural values, reinforcing community identity, and maintaining a living connection to the past. Legends anchor narratives in real places, teach moral and social lessons, and evolve over time to meet the changing needs of the communities that keep them alive.

The Legend of Puteri Lindungan Bulan in Kedah's Cultural Heritage

Within Malaysia, the legend of Puteri Lindungan Bulan occupies a prominent place in regional cultural heritage, particularly within Kedah's historical narrative. Magazine sources report that the princess's mausoleum functions not merely as a historical site, but as a cultural symbol embodying Kedah's royal legacy and collective memory (Haniffa, 2025). The legend demonstrates how folklore can bridge historical consciousness with contemporary cultural pride, positioning Puteri Lindungan Bulan both as a mythic figure and as a representation of cultural continuity. This narrative highlights the enduring significance of folklore in reinforcing regional identity, transmitting societal values across generations, and preserving intangible cultural heritage. Through such narratives, communities maintain strong connections to their cultural past while nurturing pride in their heritage (Haniffa, 2025).

Summary of Literature Review

Overall, these studies provide a robust foundation for understanding the preservation of intangible cultural heritage. Intangible heritage serves as the overarching domain encompassing oral traditions, rituals, and social practices that are passed through generations. Within this domain, myths and legends function as essential vehicles for preserving collective memory, communicating moral norms, and sustaining societal values. Global cases such as Troy demonstrate how storytelling reinforces historical awareness and cultural identity (Turak, 2025), while Malaysian examples, including Tasik Chini, Nakhoda Ragam, and Puteri Lindungan Bulan, highlight how local narratives sustain cultural identity and community cohesion (Yusuf et al.; Harun, 2020; Haniffa, 2025). In short, this body of research establishes a foundation for understanding the role of myths and legends in safeguarding cultural heritage, fostering identity, and transmitting societal values across generations.

Methodology

Research Approach

This study employs a qualitative approach to examine how the legend of Puteri Lindungan Bulan is represented in both digital media and physical heritage sites. Qualitative methods are particularly suited to exploring cultural narratives because they allow for a deep understanding of meaning, interpretation, and social context (Creswell & Poth, 2018). By combining analysis

of online content with field observations and interviews, this research investigates how intangible cultural heritage is communicated and preserved in contemporary society.

Digital Content Analysis

Digital content analysis was used to explore how the legend is portrayed through online newspapers, tourism and cultural official websites. Content analysis is a recognized method in qualitative research for systematically examining textual and visual materials to identify patterns and themes (Krippendorff, 2018). Relevant online materials were selected using search terms such as Puteri Lindungan Bulan, Kota Siputeh tomb, and Kedah legends. Only publicly accessible content in Malay or English was included. Each material was carefully reviewed and coded according to thematic categories, including historical references, moral and cultural values, spiritual aspects, and representations for tourism purposes. The coding and thematic analysis enabled the researcher to uncover how the legend is framed, which elements are emphasized or omitted, and how traditional narratives are adapted for contemporary audiences (Khan, Hamid, & Ali, 2021; Smith, 2020).

Field Observation at the Tomb Site and Interview with the Tomb Guardian

In addition to online content, a field visit was conducted at the tomb of Puteri Lindungan Bulan in Kota Siputeh. This allowed the researcher to examine the physical presentation of the site, including signage, spatial arrangement, and other interpretive elements. The site visit focused on how cultural, historical, and symbolic aspects of the legend were represented and how these elements reflect local memory and intangible heritage. Furthermore, an interview was conducted with the tomb's guardian. This semi-structured interview provided insights into the significance of the legend, local rituals, and community engagement with the site, allowing for an understanding of the legend from both personal and collective perspectives (Kvale & Brinkmann, 2015).

Data Analysis and Triangulation

Data from digital sources and fieldwork were analysed using thematic analysis, which involved familiarization with the materials, generating initial codes, identifying and refining themes, and producing a coherent narrative linking the different representations of the legend (Braun & Clarke, 2006). Triangulating findings from online media, site observations, and interviews helped ensure the credibility and validity of the results (Flick, 2018). This integrated approach provides a comprehensive understanding of how Puteri Lindungan Bulan is represented, interpreted, and communicated, demonstrating the interplay between intangible cultural heritage and contemporary forms of dissemination.

Findings and Discussion

Cultural and Historical Significance of the Legend

The legend of Puteri Lindungan Bulan represents a significant aspect of Kedah's cultural heritage, intertwining historical events, folklore, and tangible heritage sites. Analysis of newspaper sources, including *Harian Metro* (2017) and *The Rakyat Post* (March 11, 2022), reveals the narrative of Tengku Zaleha, the daughter of Sultan Sulaiman Shah, who was celebrated for her exceptional white-blooded lineage. The legend recounts that the Sultan

concealed her from a foreign king who sought her hand in marriage. According to the accounts, she was hidden in such a secure location that not even moonlight could reach her, ensuring that the invading forces failed to locate her. This narrative underscore the princess's uniqueness, her symbolic role in the royal lineage, and the protective duties of the Sultan, situating the legend within both historical and mythic frameworks.

Visual and physical representations of the legend further reinforce its significance. Newspaper articles and official records illustrate the tomb covered with a yellow cloth beneath a tree at Kota Siputeh. Signboards provide historical and cultural context, guiding visitors and connecting the legend to the tangible site. The tomb's location atop a hill contributes to local perceptions of the site as eerie, or *seram*, which adds an emotional and cultural layer to the community's engagement with the legend. These perceptions reveal how folklore and physical spaces interact to sustain cultural memory. Historical context enhances the understanding of the legend. Sultan Sulaiman Shah established Kota Seputeh as the administrative center of Kedah during the sixteenth century. The Sultan's decision to conceal his daughter from foreign influence reflects both political strategy and cultural priorities of the period. Furthermore, Kedah's historical relationship with Aceh positions the legend within a wider regional context, highlighting the political, cultural, and economic networks that influenced the sultanate. The accounts of Tengku Zaleha as a protected princess demonstrate how royal narratives are intertwined with broader historical processes and cultural symbolism.

Official recognition of the tomb highlights its significance. The state-published brochure *Visit Kedah 2025* (2024) describes the mausoleum as follows: "A pretty mausoleum, Makam Puteri Lindungan Bulan or Tomb of the Moon-Protected Princess holds the story of a beautiful and special white-blooded Princess of Kedah, of whom to avoid marriage to a foreign king who wanted a white-blooded queen her father the Sultan hid her in a place so impenetrable that even the moonlight would not shine on it when the foreign army invaded and so failed to find her." The brochure reinforces the narrative elements emphasized in newspapers and legitimizes the legend as an official component of Kedah's cultural heritage. The imagery of moonlight being blocked from reaching her hiding place emphasizes the exceptional protection provided by the Sultan and conveys the mystical dimension of the legend, blending historical reality with symbolic narrative. The management and conservation of the tomb by Muzium Negeri Kedah through its Unit Konservasi dan Monumen further highlight the integration of tangible and intangible heritage. The unit monitors structural integrity, cleanliness, and visitor engagement at the mausoleum, which is one of seven monuments under its supervision. Preservation efforts ensure that the story remains accessible while safeguarding the physical site, allowing it to serve as both a cultural and educational resource. Incorporating the tomb into activities organized by Museum Kedah and Tourism Kedah could strengthen public engagement, enhance cultural awareness, and position the site within broader heritage and historical narratives.

Several themes emerge from these findings. The first theme is the interconnection of history and legend. Tengku Zaleha's narrative bridges historical events, such as Sultan Sulaiman Shah's political strategies and Kedah's regional relations with Aceh, with folklore elements that include mystical imagery and exceptional traits of the princess. The second theme is the significance of the physical site in sustaining intangible heritage. The mausoleum provides a tangible focal point where the legend is anchored, enabling communities to experience, interpret, and engage with the story. The third theme involves community perception and

emotional engagement. The local understanding of the tomb as *seram* demonstrates the enduring power of folklore in shaping attitudes, beliefs, and cultural practices surrounding heritage sites. The final theme concerns institutional stewardship and heritage management. Official recognition, interpretive signage, and conservation efforts reveal how heritage authorities actively preserve and communicate both tangible and intangible dimensions of cultural heritage.

Interpretation of these findings indicates that the legend of Puteri Lindungan Bulan serves as a multidimensional cultural artifact. It operates simultaneously as historical knowledge, mythic narrative, and community symbol. The combination of historical grounding, mystical elements, visual representation, and conservation practices illustrates how tangible and intangible heritage interact to maintain cultural memory. The legend reinforces collective identity, preserves royal history, and ensures that Kedah's cultural narratives remain relevant to contemporary society. It also provides a foundation for structured cultural engagement, including educational programs, tourism initiatives, and public interpretation, demonstrating the dynamic relationship between narrative, place, and heritage management. In summary, the legend and mausoleum of Puteri Lindungan Bulan exemplify the interdependence of intangible and tangible heritage. The narrative's historical and symbolic content, the community's emotional and cultural engagement, and institutional conservation efforts collectively create a robust foundation for understanding Kedah's cultural heritage. This foundation highlights the processes through which legends are preserved, transmitted, and validated, offering insights into the ways cultural heritage can sustain identity, memory, and historical consciousness.

Findings: Physical Site, Observations and Interview

The site visit provided a detailed understanding of both tangible and intangible aspects of the legend of Puteri Lindungan Bulan. The tomb is located in Kota Siputeh, Kodiang, Kedah, on a small hill within a residential area. It is surrounded by trees, creating a quiet and contemplative environment. Access to the tomb is facilitated by a staircase, and the layout and maintenance of the area show that the site is respected and considered important by the local community. There are two graves at the site, one belonging to Sultan Sulaiman and the other to his daughter, Puteri Zaleha, who is known locally by her real name rather than her legendary title. The tombstones are wrapped in yellow cloth, signifying royal heritage, and the area is fenced to restrict close access. A large pokok lokcan tree stands beside the tomb, offering shade and contributing to the site's sacred atmosphere. Benches around the tomb and the surrounding greenery create a serene setting. An information board at the base of the staircase provides historical background about the princess and the site. The combination of elevated location, natural features, and royal symbolism reinforces the cultural and spiritual significance of the tomb.

The tomb guardian shared insights about the ongoing care and cultural practices associated with the site. "I have been taking care of this tomb for many years. I make sure it is always clean and well looked after, and I watch how visitors behave when they come. People here still call the princess by her real name, not the title used in stories or tourism. For us, it is important to remember who she truly was." This demonstrates that oral tradition emphasizes historical identity over the symbolic title used in media and tourism. The guardian described his responsibilities, which include cleaning, maintaining the graves, and observing visitor behaviour. Moreover, the guardian elaborates that "the recent restoration of the site was

initiated by Tunku Intan Shafinaz, daughter of the late Sultan Abdul Halim. Her dedication inspired the Kedah State Museum Department to formally recognize and preserve the tomb as a heritage monument.” This collaboration between the local community and official institutions illustrates the combined role of custodianship and formal conservation in safeguarding cultural heritage. Moreover, the guardian spoke about the *lokcan* tree near the tomb, which seems to stand as a protector of both graves. He explained, “The *lokcan* tree here is old and no longer bears fruit. The tree that was taken from here and planted at my house also continues to bear fruit.” This reflects continuity and protection, embodying local beliefs that connect the natural environment with spiritual significance. Historical records indicate that the tree originally came from Aceh and is unique to Kota Siputeh, further emphasizing its cultural and historical importance.

Furthermore, the guardian spoke about the rituals performed by local visitors at the tomb, noting, “visitors regularly come to the tomb, often in the morning, bringing flowers to place on the graves as an act of respect.” These practices highlight the legend’s enduring significance to the community and illustrate how cultural memory is preserved through both individual and collective actions. The interplay of tangible features, oral histories, visitor rituals, and institutional care demonstrates how heritage is maintained and experienced as a living tradition. Overall, Makam Puteri Lindungan Bulan functions as a space where history, legend, and community memory intersect. The tomb, the *lokcan* tree, and the carefully tended surroundings anchor intangible cultural heritage while promoting local engagement and continuity. The site exemplifies how legends retain their meaning when connected to physical spaces and communal practices.

Discussion of the Findings

The findings of this paper support the literature that views legends as forms of intangible heritage that carry cultural memory and identity. As discussed in the literature review, legends are not merely stories but are tied to real places, communities, and historical memory (Dégh, 2001; Tangherlini, 1990). The mausoleum of Puteri Lindungan Bulan reflects this connection, showing how a legend can remain meaningful when linked to a physical site. The yellow cloth, the royal tombstones, the guardian’s explanations, and the local practice of visiting the graves align with UNESCO’s understanding that intangible heritage continues through lived tradition rather than documentation alone. The local use of her name, Puteri Zaleha, also echoes Omar et al. (2023), who note that folklore adapts through community use and everyday speech. This supports the idea that the legend is not only a historical narrative, but a continuing part of local identity.

At the same time, the analysis of online newspapers and tourism materials reflects how legends are reshaped when circulated digitally. Previous research (Yusuf et al., 2022) shows that public or promotional representations often highlight symbolic elements while overlooking the depth of local memory. This was evident in how digital narratives focus on the princess’s purity, beauty, and royal lineage, but rarely acknowledge the community’s ongoing relationship with the site. These digital portrayals frame the story as mysterious and romantic, but they do not capture the emotional attachment seen at the physical tomb. This contrast echoes the literature on how intangible heritage can appear simplified when removed from its place of practice. The case of *the princess guarded by the moon* therefore demonstrates that cultural heritage is strongest when the tangible site and intangible memory reinforce one another.

Conclusion

The story of Puteri Lindungan Bulan, known as the princess guarded by the moon, remains important because it is remembered not just through books or online accounts but through the practices and care surrounding her tomb. The physical site allows people to connect directly with the past, while the local community keeps the story alive through visits, rituals, and storytelling. Digital media can help share the legend more widely, but it only becomes meaningful when combined with the perspectives and experiences of those who live with it. This case shows that the strength of cultural heritage lies in the connection between place, memory, and community, emphasizing that both tangible sites and intangible traditions are essential for preserving the princess's story for future generations.

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6th Penang International Multidisciplinary Conference 2025

eISSN 3036-0331

8th - 9th November 2025

Shang-Ri La Hotel, Penang, Malaysia

Yusuf, M., Ahmad, R., & Lim, S. (2022). Promoting intangible cultural heritage through online media: Malaysian case studies. *Journal of Cultural Heritage*, 53, 12–25. <https://doi.org/10.1016/j.culher.2022.03.004>

ENGLISH INSTRUCTORS' ROLE IDENTITIES AND THEIR ABILITY TO MANAGE CLASSROOM SETBACKS: THE CASE OF KYRENIA

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Abstract: *Teacher identity, a complex and dynamic phenomenon, is shaped by various social and institutional factors. While previous research has established teacher identity as a critical factor in educational outcomes, this study specifically illuminates how different aspects of professional identity influence teachers' responses to classroom setbacks. This deeper understanding contributes to the growing body of knowledge about teacher identity formation and its impact on educational effectiveness. Employing a quantitative research approach, this study delves into the survey-derived role identity of an English teacher. This research posits that teacher identity significantly impacts the engagement of teachers in the process of implementing strategies conducive to effective classroom management. The primary objective is to explore the correlation between the professional identity of university-level English teachers and their proficiency in managing classroom setbacks. Data is gathered through surveys administered to 86 English teachers in Kyrenia, focusing on educators affiliated with FIU, GAU, GU, CSU, and ARUCAD during the 2023-2024 academic year. Two scales, namely "Teacher's Ability to Manage Classroom Setbacks" and "Teacher's Role Identity", are utilized in the study. The analysis demonstrates that English language teachers in Kyrenia maintain relatively strong professional identities across multiple dimensions, with particularly high identification in learner, pundit, and interaction supervisor roles. These findings suggest that teachers in this context view themselves primarily as continuous learners, subject matter experts, and facilitators of student interaction, which aligns with contemporary pedagogical approaches emphasizing lifelong learning and student-centered instruction. The findings underscore the substantial impact of teachers' professional identity on their adeptness in handling classroom challenges. Bridging the gap between teachers' identity beliefs and their decisions in the classroom may inform interventions that mitigate this divide, fostering positive school outcomes such as improved student behaviour and academic achievement.*

Keywords: *Teacher Identity, Classroom Setbacks, Role Identity, English Language Teaching, Classroom Management*

Introduction

The past twenty years have seen significant growth in research focused on teacher identity. This expanding interest has established teacher identity as a distinct field within teacher education research (Beijaard, 2019). Teacher identity represents a complex, multidimensional, and continuously evolving construct (Beauchamp & Thomas, 2009) that significantly influences teachers' professional practice and personal life experiences. Teachers' self-perception and understanding of their roles both within classroom environments and broader societal contexts fundamentally shapes their instructional approaches and concepts of teaching effectiveness. Johnson and Golombek (2020) noted that the paradigm shift from positivistic to

interpretive frameworks in analyzing teaching processes has highlighted identity's crucial role in teacher development and professional formation (Friesen & Besley, 2013). Varghese et al. (2005) proposed that comprehending teachers requires consideration of their multifaceted identities in professional, cultural, political, and individual aspects. This study explores the correlation between teacher identity and classroom setbacks, including behavioral problems with students, teacher absences or turnover, as well as difficulties with the curriculum and assessment challenges. Enhancing awareness of teacher identity and their function as professional role models is another goal of this study of teachers' identities, including those of Knowledge transmitter, Collaborator, Interaction supervisor, and Promoter. According to this hypothesis, teachers with a strong professional identity are more inclined to employ differentiated strategies in managing classroom setbacks compared to those with a weaker professional identity. The purpose of this study is to examine the intricate relationship between teacher identity and classroom setbacks in educational settings. Specifically, this research aims to investigate how different aspects of teacher professional identity – including their roles as knowledge transmitters, collaborators, interaction supervisors, and promoters – influence their ability to navigate and overcome various classroom challenges. From a theoretical perspective, this research significantly advances our understanding of teacher professional identity by examining its dynamic relationship with classroom management and educational challenges. While previous research has established teacher identity as a critical factor in educational outcomes, this study specifically illuminates how different aspects of professional identity influence teachers' responses to classroom setbacks. This deeper understanding contributes to the growing body of knowledge about teacher identity formation and its impact on educational effectiveness.

Literature Review

In the context of English language instruction at universities in Kyrenia, North Cyprus, where teachers often operate within multicultural and multilingual environments, understanding identity formation becomes especially significant. Teachers are not only expected to deliver content effectively but also to navigate classroom dynamics, address behavioral challenges, and support student learning with limited training or support in areas such as classroom management. These setbacks can significantly impact teachers' confidence, decision-making, and overall sense of professional self. Teacher identity is a comprehensive concept that encapsulates the complexity of teaching and reflects how educators define their roles and behaviors (Hong et al., 2024). It provides insight into what teachers decide to do, the reasons behind their choices, and the ways in which they approach their work (Noonan, 2018; Schutz et al., 2018). The development of teacher identity occurs within social, cultural, and historical contexts. As teachers progress in their careers and gain more experience, they continuously reinterpret and make sense of their experiences through various perspectives, such as personal, community, and professional lenses (Flores & Day, 2006). These professional lenses, often referred to as standards, play a key role in this process. Shifting focus from merely becoming a teacher to fully embracing what it means to be a teacher reflects the ongoing negotiation of teachers' personal and professional identities (Czerniawski, 2011). Studies have shown that teacher identity plays an important role in how educators' approach and respond to classroom challenges. "Reconsidering research on teachers' professional identity" (2004) emphasize that teacher identity is an ongoing process of interpreting and reinterpreting experiences, highlighting the dynamic nature of identity formation. This evolving process directly impacts teachers' resilience and their approaches to problem-solving when facing setbacks.

Teacher professional identity consists of multiple interconnected roles and self-conceptions that significantly impact classroom practice and professional growth. Research has identified various distinct yet interrelated categories of teacher identity, which together influence how educators perceive themselves and carry out their professional responsibilities. Beauchamp and Thomas (2009) and Sammons et al. (2014) highlight how these categories—ranging from personal and professional roles to the integration of values and beliefs—collectively shape teachers' sense of self and their approach to teaching. These dynamic components of teacher identity interact to guide not only daily practices but also the ongoing development and adaptation of educators throughout their careers. Teacher identity development is intricately tied to institutional contexts and power dynamics. Flores and Day (2006) emphasize the significant role of school culture and institutional support systems in shaping teacher identity and their capacity to manage classroom challenges. Their findings suggest that supportive professional environments contribute to the development of more resilient teacher identities, enabling educators to navigate setbacks more effectively.

Classroom management refers to the strategies and techniques teachers use to establish and maintain an environment conducive to learning. It involves not only addressing and modifying student behavior but also creating a space where students can engage in education and instruction. Scholars have increasingly acknowledged that teacher identity is not simply an individual phenomenon but is deeply shaped by social, cultural, and institutional contexts (Beauchamp & Thomas, 2009).

In summary, this study has examined the multifaceted and evolving nature of English language teacher identity, particularly in the context of higher education in Kyrenia, North Cyprus. Through a review of key theoretical perspectives and empirical findings, the discussion has emphasized the role of identity as both an individual and socially mediated construct, influenced by personal experiences, institutional environments, and broader socio-political forces.

Methodology

In this study, the research model, research population, data collection tools, and data analysis are explained. In addition, the statistical analyses used in the research are clearly explained and detailed below. The methodology chapter provides a comprehensive overview of how the research was conducted, including the research design, sample selection, instruments used for data collection, and analytical approaches employed to address the research questions. Each methodological element is presented in separate subsections to ensure clarity and systematic organization of the research process. The statistical analyses employed are explicitly described to facilitate understanding of how the raw data was transformed into meaningful findings and interpretations.

Research Design

This study employed a quantitative research methodology to examine the relationship between model teacher identity and classroom setbacks among English language teachers in higher education institutions. The research design was structured to systematically investigate how teachers' professional self-concept influences their ability to navigate and respond to various classroom challenges. A cross-sectional survey design was implemented to collect data at a

single point in time from English teachers across five universities in Kyrenia. This approach was selected for its efficiency in gathering standardized information from a relatively large sample, allowing for statistical analysis of relationships between variables.

Population and Sampling

Participants were recruited through purposive sampling from a population of 100 English teachers across five universities in Kyrenia. The sample consisted exclusively of English language teachers working in higher education settings. This sampling strategy ensured representation across different institutional contexts while maintaining focus on a specific teaching discipline, allowing for more controlled comparison and analysis. The target population consisted of all English language teachers working in higher education institutions in Kyrenia.

Instruments and Procedures of Data Collection

The research employed two carefully selected and validated measurement instruments. The first instrument, the Role Model Teacher Identity Scale (Sahragard & Sadeghi, 2017), comprised 55 items distributed across 13 dimensions: professional self-efficacy, pedagogical values and beliefs, institutional belonging, professional commitment, and subject-matter expertise. Each dimension contained 4-6 items, and responses were selected from a 5-point Likert scale ranging from 1 (Never) to 5 (Always). The scale demonstrated robust psychometric properties with strong internal consistency, as evidenced by Cronbach's alpha coefficients ranging from 0.78 to 0.92 across the various subscales. The second instrument, the Classroom Setbacks Scale (Bozavlı et al., 2024), consisted of 24 items designed to measure teachers' abilities to deal with educational challenges. These items were organized based on: behavioral management issues, student motivation and engagement, instructional challenges, resource limitations, administrative constraints, and professional development barriers. Participants responded using a 5-point Likert scale (1 = Never to 5 = Always).

Model Teacher's Role Identity Scale: This instrument measured various dimensions of teacher professional identity, including self-efficacy beliefs, pedagogical values, professional commitment, and self-perception as educators.

Teacher's Ability to Manage Classroom Setbacks Scale: This instrument assessed teachers' experiences with various educational challenges, including behavioral management issues, student engagement difficulties, instructional obstacles, and resource limitations.

Data Analysis Procedures

The questionnaire was administered to 86 participants following institutional approval and informed consent procedures. Data collection occurred during a single academic term to control for potential seasonal variations in teaching experiences. Participants completed the questionnaire individually in paper format. Statistical analysis was conducted using two different scales: The Measurement of a Teacher's Ability to Manage Classroom Setbacks (Bozavlı et al., 2024) and Teacher's Role Identity (Sahragard & Sadeghi, 2017) to examine the relationships between model teacher identity variables and managing classroom setback experiences.

Results



Figure 1: Analysis of Teacher Identity Dimensions Across Demographic Variables

In figure 1, panel A shows gender differences across all 14 dimensions, with the Promoter dimension (highlighted with gold border) showing statistically significant differences ($U = 532.00, Z = -2.230, p = 0.026$), where women (Mean Rank = 47.28) demonstrated stronger identification than men (Mean Rank = 34.28). Panel B illustrates educational level differences in the Tutelage Provider dimension, approaching significance ($\chi^2 = 5.307, p = 0.070$), with PhD holders showing the highest mean rank (53.62), followed by MA holders (41.77) and BA holders (36.5). Panel C summarizes statistical findings across all tested variables. The Promoter dimension was the only variable showing statistically significant differences ($p < 0.05$) across all demographic comparisons. Mann-Whitney U test was used for gender comparisons; Kruskal-Wallis H test was used for other variables.



Figure 2: Analysis of Classroom Management (S2OVMN) Across Demographic Variables

In figure 2, panel A shows gender differences in classroom management, where women (Mean Rank = 45.42) showed higher scores than men (Mean Rank = 38.82), though this difference was not statistically significant ($U = 645.50, Z = -1.109, p = 0.267$). Panel B illustrates significant institutional differences across universities ($\chi^2 = 11.583, df = 4, p = 0.021$), with GU teachers showing the highest mean rank (61.44, highlighted with gold border), followed by ARUCAD (56.00), FIU (40.97), GAU (37.50), and CSU (35.67). Panel C summarizes statistical findings across all tested variables, revealing that institutional context was the only significant factor. The findings suggest that university environment plays a significant role in shaping teachers' classroom management approaches. Mann-Whitney U test was used for gender comparisons; Kruskal-Wallis H test was used for other variables.

Table 1: The Spearman Correlation Analysis Between S1OVMN And S2OVMN
The Spearman Correlation Analysis between S1OVMN and S2OVMN

		S1OVMN	S2OVMN
Spearman's ρ	Correlation Coefficient	1.000	
	S1OVMN Sig. (2-tailed)		
	N	86	
	Correlation Coefficient	0.176	1.000
	S2OVMN Sig. (2-tailed)	0.105	
	N	86	86

Table 1 shows a weak positive correlation ($r_s = 0.176$, $p = 0.105$) that is not statistically significant. This non-significant relationship suggests that these two aspects of teacher identity operate relatively independently of each other. With a sample size of 86 participants, the low correlation coefficient and p-value greater than 0.05 indicate that there is no strong or meaningful relationship between these two variables.

Discussion of the Findings

The results of this study reveal several important insights into the nature of teacher identity and its relationship to classroom challenges in the higher education context. The analysis demonstrates that English language teachers in Kyrenia maintain relatively strong professional identities across multiple dimensions, with particularly high identification in learner, pundit, and interaction supervisor roles. These findings suggest that teachers in this context view themselves primarily as continuous learners, subject matter experts, and facilitators of student interaction, which aligns with contemporary pedagogical approaches emphasizing lifelong learning and student-centered instruction. The descriptive statistics reveal that teachers most strongly identify with the learner dimension (Mean = 4.640), indicating a commitment to continuous professional development and adaptation to evolving educational practices. This finding demonstrates both convergence and divergence with previous research. Notably, the study by Sahragard and Sadeghi (2017) on Iranian EFL teachers also identified the learner role as a significant component of professional identity, suggesting that the commitment to continuous learning transcends cultural and institutional boundaries in English language teaching contexts. However, while Iranian teachers conceptualized their professional identity primarily through knowledge transmitter, pundit, collaborator, and learner roles, the present study reveals a more complex pattern where Kyrenia-based teachers show stronger identification with interaction supervisor roles, possibly reflecting the multicultural student population in Northern Cyprus universities. The high identification with the pundit role (Mean = 4.544) in the current study aligns closely with findings from the Iranian context, where teachers similarly maintained strong subject matter expertise identity. This consistency across different EFL contexts suggests that content knowledge confidence represents a universal dimension of English language teacher identity, regardless of geographical or institutional setting. However, unlike the Iranian study where cultural adapter roles were primarily

conceptualized within the acculturator dimension, the present research reveals that Cypriot teachers show particularly strong identification with cultural adaptation, reflecting the unique multicultural environment of Northern Cyprus higher education.

Limitations

The cross-sectional design of this study limits understanding of how teacher identity develops and changes over time. Future research should employ longitudinal designs to track identity development and identify factors that promote or constrain identity formation. The specific cultural and institutional context of this study, while providing valuable insights into teacher identity in Northern Cyprus, may limit the generalizability of findings to other contexts. Future research should examine teacher identity formation in diverse cultural and institutional settings to identify universal and context-specific patterns. The sample size, while adequate for the analyses conducted, limits the power to detect smaller effects and examine complex interactions between variables. Larger-scale studies would provide more robust evidence about the factors influencing teacher identity formation.

Concluding Remarks

This study contributes to our understanding of teacher identity formation in higher education by demonstrating the multidimensional, context-dependent nature of professional identity development. The findings highlight the importance of institutional culture, cultural background, and individual differences in shaping how teachers construct and express their professional identities. The results suggest that effective teacher development requires a comprehensive approach that recognizes the complexity of teacher identity and the multiple factors that influence its formation. Rather than viewing teacher identity as a fixed characteristic or simple outcome of training, educators and administrators should understand it as a dynamic, multifaceted construct that requires ongoing support and development throughout teachers' careers. The study also demonstrates the value of examining teacher identity in diverse, multicultural contexts where teachers must navigate multiple cultural expectations and institutional demands. The findings from Northern Cyprus provide insights that may be particularly relevant for other international educational contexts where teachers work with diverse student populations and must balance multiple cultural and institutional expectations. Ultimately, this research contributes to the growing body of literature on teacher identity by providing empirical evidence about the factors that influence identity formation and the ways that different aspects of teacher identity relate to each other. These insights can inform efforts to support teacher development, improve educational quality, and create more effective and satisfying teaching environments for educators working in complex, multicultural contexts.

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ASSESSING THE KNOWLEDGE, ATTITUDE, AND PRACTICE ON WASTE MANAGEMENT IN LYCEUM OF THE PHILIPPINES UNIVERSITY CAVITE

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Abstract: *This study assessed the knowledge, attitude and practice (KAP) of the undergraduate students, faculty, canteen vendors and janitorial personnel at the Lyceum of the Philippines University-Cavite on waste management. The assessment was focused on four critical areas: solid waste, food waste, energy waste and water waste management. The research was developed on these four key areas to reflect a full picture of institutional waste management practices. A descriptive-correlational research design of quantitative study was used, and stratified random sampling was used to select participants (N = 663). Data were gathered using structured questionnaires which were administered in the printed and online (Google Forms) formats. The results showed that the participants had a high general knowledge and a very positive attitude towards waste management. However, their reported practices were only loosely consistent with the recommended interventions. Statistical analysis showed the presence of significant differences in KAP among groups of participants, which could be explained mainly by the different type of waste management to be considered. The study suggests the introduction of various sustainability programmes in order to improve knowledge and strengthen positive attitudes as well as ensure consistent adoption of sustainable waste management practices.*

Keywords: *Knowledge, Attitude, and Practice (KAP); Waste Management*

Introduction

Waste management has become a critical worldwide problem accelerated by the rapid increase of waste production and the environmental consequences. Higher Education Institutions (HEIs) as centers of knowledge distribution and social responsibility play a crucial role in the development of sustainable practices in their communities. In compliance with their role centre of the environment, higher education centres are increasingly adopting the waste management policy that is harmonious with the Sustainable Development Goals (SDGs) promulgated by the United Nations, especially SDG 12: Responsible consumption and production.

In the Philippines, with rapid urbanisation and demographic growth, waste management issues become more severe, which has promoted the integration of sustainability practices in the academic setting, which has drawn scholarly interest. Empirical research suggests that, while students and staff have a high level of knowledge about waste management principles, the fact that this knowledge is not translated into continuous practice has been an issue (Hassan & Rosli, 2022). Moreover, Decoro & Cajucom (2025) have also highlighted how there is a need to develop a proactive mindset towards waste reduction as it found that simple awareness is not enough to produce regular waste management behaviours.

There have been a number of studies that studied KAP (knowledge, attitude, and practices) regarding waste management among university students, specifically in cognisance of waste reduction programs and practices waste management (Yang et al., 2024). However, these studies have a quantitative bias and they do not pay much attention to the determinants underlying the disjunction between positive attitudes and actual practices. In addition, while the category of interventions has been proposed, the evidence base regarding their effectiveness in promoting sustainable behaviour change in HEI settings is still limited.

The waste management policies in the Lyceum of the Philippines University - Cavite (LPU-C), are based on the national legislation including the Ecological Solid Waste Management Act of 2000 (Republic Act No. 9003). Despite these policy endeavour, recent evaluations shows that despite having a fair amount of knowledge and a positive disposition towards waste management; the actual practices of LPU-C stakeholders are inconsistent and are often "often practiced" rather than totally executed. This discrepancy raises the question of what factors prevent the consistent implementation of sustainable waste management even in an educational institution that is committed to sustainability.

This study aims to fill the identified research gaps by investigating the root causes that contributed to the knowledge-attitude-practice gap of LPU-C students, faculty, canteen vendors, and janitors on waste management. By defining the obstacles to continual implementation, the research will provide evidence-based recommendations to improve sustainable practices in the university community. The outcomes of this research will help in the general discourse of sustainable waste management in HEIs, providing some information that could be useful for policy formulation and practical action not only in LPU-C but in similar educational institutions as well.

Objectives of the Study

The primary objective of this study is to assess the knowledge, attitudes, and practices (KAP) on waste management among students, faculty, canteen vendors, and janitors of Lyceum of the Philippines University - Cavite (LPU-C), in line with the institution's sustainability initiatives and the United Nations Sustainable Development Goal (SDG) 12 on responsible consumption and production. The study also aims to identify the factors influencing the gap between awareness and actual practice to promote effective and sustainable waste management within the university.

Specifically, this study aims to:

1. Determine the level of knowledge of participants regarding solid, food, energy, and water waste management.
2. Assess the attitudes of participants toward sustainable waste management practices across the same categories.
3. Evaluate the level of practice of participants in implementing proper waste management in their respective roles.
4. Examine the significant differences in participants' knowledge, attitudes, and practices when grouped according to socio-demographic profiles such as age, sex, educational attainment, longevity, occupation, and department.
5. Identify the relationships among knowledge, attitude, and practice in the context of waste management.
6. Determine the factors contributing to the gap between knowledge, attitude, and actual waste management practices among the university community.
7. Propose evidence-based recommendations or interventions to enhance sustainable waste management programs and strengthen the implementation of LPU-C's environmental policies.

Literature Review

Knowledge, Attitude, and Practice on Waste Management

Effective waste management is not only dependent on the availability of infrastructure at the system level, but also the KAP of individuals that it is meant to serve. Empirical evidence has shown that knowledge forms the main basis for sustainable waste management with individuals who have an understanding about the right way to dispose of waste and its related environmental repercussions generally exhibit responsible behaviour (Salami et al., 2024; Kumawat et al., 2024). For instance, Molina and Catan (2021) reported that learners who have a greater awareness of 3Rs namely Reduce, Reuse, and Recycle, are more likely to engage actively in reducing waste initiatives. Likewise, Huang & Hsin (2023) showed the positive correlation of educational exposure, institutional engagement, environmental literacy and sustainability engagement in university cohorts. Nevertheless, despite some amounts of knowledge, uniform behavioural results are still elusive; Molina & Catan (2021) noted that awareness is not always translated into regular practice of waste segregation or recycling behaviours.

Regarding the attitudes, many studies have identified that a positive environmental thinking fosters improved participation in sustainability programmes. Wu et al. (2022) found that students' attitude towards waste management depends on their perceptions of institutional support and sense of environmental responsibility. Similarly, Qu et al. (2023) argued that the mere presence of favourable attitudes is not enough unless mechanisms to enforce them are implemented (e.g. incentives, policy interventions and easily accessible facilities). Wu et al (2022) unraveled a mismatch between the attitudes and the actual behaviors, and this mismatch is often traced back to things like easy access, insufficient resources or poor enforcement. Accordingly, long-term commitment to environmental commitment requires that awareness raising be followed by the development of an ecosystem, which feeds into positive attitudes through continued institutional commitment.

Waste Management in Higher Education Institutions

Roles of HEIs as major mediums for disseminating sustainable practices of waste management through education, development of policies, and community engagement. Budihardjo et al. (2021) stressed that HEIs are educators and especially practitioners of environmental stewardship and therefore they have a direct influence on the development of ecological consciousness in the next generation of professionals. Hassan and Rosli (2022) conclude that as despite students often showing high awareness towards sustainability concepts, there was a lack of translating this sustainability knowledge into sustainable waste management towards actions, hence, there is a need of transforming theoretical understanding into practical actions. Likewise, Oliveira & Proenca (2025) show that structured programmes in universities significantly increase the participation in recycling and conservation activities of students and that this is especially true if such programmes are backed up by policies aligned with the United Nations Sustainable Development Goals (SDG 12).

At the national level, Decoro & Cajucom (2025) point out that Philippine universities face similar issues, where students and staff are very aware but not all of them participate in the correct waste segregation. Manala-O and Aure (2019) support this observation, arguing that institutional communication and the will of leadership is key to bridging the gap between the disposition of attitude and the practice of action. The findings are also corroborated by other similar studies conducted across the globe by Stancu et al. (2024) and Singh et al. (2021) who have also found that demographic variables like age and sex have little impact over other variables like education level and institutional culture. Together these papers and stories from the literature demonstrate the inimitable value of HEIs in nurturing sustainable lifestyles through long-term environmental education, participatory programmes and waste-wise policies that will enable all in the academic community to realise this value.

Methodology

The study adopted a descriptive-correlational quantitative research design in order to determine knowledge, attitudes, and practices in waste management of selected participants of Lyceum of the Philippines University-Cavite (LPU-C). The data were collected using a structured survey questionnaire with sections that were based on socio-demographic data and knowledge, attitudes and practices. The internal consistency of the instrument was assessed by means of Cronbach's Alpha (0.70). The study also screened out the tendencies and connections among the variables, considering the profiles of respondents, which were students, faculty, canteen vendors and janitors from different colleges and academic departments.

All participants were interviewed on a voluntary and confidential basis, and informed consent was gained from all participants. The research was done in LPU-Cavite, an ISO certified University with a mission towards sustainable practices and promotion of Sustainable Development Goals (SDGs). Ethical features highlighted honesty, integrity, and originality in presenting the results, as well as all the data were utilized for academic purposes only.

Results and Discussion

The researchers aimed to fill the research gap by evaluating the KAP of the participant on waste management in order to advance SDG 12 and the 2030 Agenda. An in-depth debate was sparked, which combined these findings with the available sources and theories to give more insights into the KAP of students in the college of LPU, faculty members, janitors and canteen vendors.

Table 1: Socio-demographic of Participants

	Profile	Frequency N=663	Percentage (%)
Sex	Male	365	55.10
	Female	298	44.90
Age	18-27	476	71.80
	28-37	110	16.60
	38-47	47	7.10
	48-57	28	4.20
	58 and above	2	0.30
Educational Attainment	Junior High School	55	8.30
	Senior High School	56	8.40
	Undergraduate College	389	58.70
	College Graduate	81	12.20
	Masters	73	11.00
Longevity	PhD	9	1.40
	Less than a year	173	26.10
	1-2 years	156	23.50
	3-4 years	178	26.80
	5 years and above	156	23.50
Occupation	Student	389	58.70
	Faculty Members	158	23.80
	Canteen Vendor	63	9.50
	Janitor	53	8.00
Department	CBA	84	12.70
	COECSA	167	25.20
	CAMS	40	6.00
	CFAD	34	5.10
	CITHM	160	24.10
	CLAE	45	6.80
	CON	29	4.40
	Others	104	15.70

Out of 663 respondents, male respondents were 55.10% and female 44.90% which is slightly higher in the male representation, in line with Palma (2025) observation on male dominance in some of the departments. The majority of the respondents (71.80) fell within the age group of 18-27, which is in line with Yusuf & Fajri (2021), who found that younger people are those who produced more waste. Most of them (58.70) were undergraduate students, which confirms that higher education improves environmental awareness (Mahanta & Sarkar, 2025). The respondents who have been staying at LPU-C was 3-4 years might have better practices in

waste management, as Huang & Hsin (2023) postulated. The highest percentage of sample (58.70) was represented by students, followed by faculty (23.80), canteen vendors (9.50), and janitors (8.00) which means that occupation shapes knowledge and behavior on waste management (Debrah et al., 2021). The highest representation was achieved by the department of COECSA (25.20%) and CITHM (24.10), which confirms Sarma (2021) hypothesis that academic discipline influences environmental awareness and practices.

Table 2. Level of Knowledge on Waste Management

Factor	$\bar{x}$	s	Level of Agreement	Interpretation
Solid Waste	3.68	0.621	Strongly Agree	Extensive Knowledge
Food Waste	3.49	0.709	Strongly Agree	Extensive Knowledge
Energy Waste	3.63	0.643	Strongly Agree	Extensive Knowledge
Water Waste	3.50	0.741	Strongly Agree	Extensive Knowledge
Total	3.58	0.6785	Strongly Agree	Extensive Knowledge

The study showed that the participants had a fairly high level of knowledge and positive attitudes towards various forms of waste management such as solid waste, food waste, energy waste, and water waste. They performed best on their knowledge of biodegradable and recyclable materials (mean = 3.79) but had less knowledge of the university's solid waste policies (mean = 3.55) thus needing to improve dissemination of institutional policies. Food waste management knowledge was also good (mean = 3.49) although policies related to food waste were low, highlighting the need for educational and school-based interventions to promote sustainable behaviours (Leal Filho et al., 2023; Salami et al., 2024). Likewise, participants showed very positive responses related to energy conservation (mean = 3.63) and life-supporting value of water (mean = 3.75), while participants' awareness of issues related to energy and water waste (leakage) within institutions was low (Kumawat et al., 2024; Nguyen et al., 2025).

Overall, the respondents had favorable attitudes towards solid waste management (mean = 3.68) particularly in the 3Rs, that is, Reduce, Reuse, and Recycle. However, their level of engagement in recycling activities was relatively low (mean = 3.55) showing a difference between awareness and practice. This indicates that while the community is well-educated and supportive of sustainability means, more specific communication, training and engagement programs are necessary to turn knowledge and attitudes into regular and consistent environmental behavior.

Table 3: Level of Attitude on Waste Management

Factor	$\bar{x}$	s	Level of Agreement	Interpretation
Solid Waste	3.68	0.621	Strongly Agree	Very Positive Attitude
Food Waste	3.62	0.627	Strongly Agree	Very Positive Attitude
Energy Waste	3.53	0.691	Strongly Agree	Very Positive Attitude
Water Waste	3.53	0.691	Strongly Agree	Very Positive Attitude
Total	3.59	0.6575	Strongly Agree	Very Positive Attitude

The study showed that the participants had a very positive attitude towards waste management in all categories (solid, food, energy and water) with a strong support to 3Rs (Reduce, Reuse, Recycle) and institutional sustainability initiatives. However, though attitudes were very positive, there seemed to be a gap between positive perceptions and actual practices. However,

participants expressed high levels of valuing recycling behavior (mean = 3.79), and they reported fewer real recycling behaviors (mean = 3.55). Similarly, they preferred institutional interventions in the issue of food waste (mean = 3.67) to individual responsibility (mean = 3.59). The same pattern was observed in the areas of energy (mean = 3.53) and water waste management (mean = 3.53), in which participants had a willingness to conserve but were less likely to do so in a consistent way (focusing on their convenience instead of actually taking effort to do so over the long run).

These findings are similar to prior studies (Wu et al., 2022; Wu et al., 2022; Qu et al., 2023; Jerath, 2021) and highlight the importance of it being evident that while awareness and institutional frameworks are associated with a positive shift in attitudes, they may not be enough to cause behavioral change. Overall, the results point to the fact that developing long term participation in waste management will necessitate not only awareness campaigns and good institutional programs but also strategies that promote personal accountability and sustained engagement in sustainable practices.

Table 4: Level of practice on waste management

Factor	$\bar{x}$	s	Level of Agreement	Interpretation
Solid Waste	2.76	0.944	Agree	Often Practice
Food Waste	2.68	0.944	Agree	Often Practice
Energy Waste	3.03	0.860	Agree	Often Practice
Water Waste	3.12	0.916	Agree	Often Practice
Total	2.90	0.916	Agree	Often Practice

The study confirmed that the participants practiced waste management in all domains of waste (solid, food, energy, and water) with good awareness and willingness to be sustainable. The practices that were most consistently practiced were the simple and individual practices of CLAYGO (Clean As You Go) for solid waste (mean = 3.00), unplugging electrical devices (mean = 3.46) for energy conservation, and closing faucets when not in use (mean = 3.62) for water management. However, less convenient and shared behaviors, such as recycling (mean=2.44) and becoming a member of institutional programs (mean=2.67) were less regularly performed. These results are consistent with earlier research (Rodriguez-Guerreiro et al., 2024; Bittner et al., 2025; Funa & Gabay, 2025; Tehupeiory et al., 2023), which show that although awareness campaigns can lead to increased knowledge and attitudes towards sustainability, there is still a challenge in getting people to participate in institutional programs.

Overall, the results point to the existence of a divide between awareness and sustained behavior. There is good correlation that students are more likely to practice easy achievable actions and lower engagement for more structured or institution led sustainability actions. This indicates that ongoing education, increased access to recycling and conservation facilities and greater institutional encouragement to turn positive attitudes into regular, collective environmental practices is required.

Table 5: Significant Differences in Participants' Knowledge, Attitudes and Practices Regarding Waste Management

Source of Variation	F-ratio	P-value	F crit	Remarks	Reject or Accept
Knowledge					
Between Groups	18.02	0	2.61	With Significant	Reject Null
Within Groups					
Attitude					
Between Groups	16.40	0	2.61	With Significant	Reject Null
Within Groups					
Practice					
Between Groups	53.12	2.5E-33	2.61	With Significant	Reject Null
Within Groups					

The results of the one-way analysis of variance showed that there were significant differences in knowledge, attitudes and practices of participants on waste management as the values of all F-ratios were greater than the critical value of 2.61 with P-value of 0 representing high statistical significance. Specifically, knowledge differences ($F = 18.02$, $p = 0$) indicate that knowledge of methods for waste management varies between the study population, and this is similar to what Raghu & Rodrigues (2021) found, which showed that the knowledge of waste segregation among university students differed according to gender, major and background. Attitudinal differences ($F = 16.40$, $p = 0$) suggest that although students generally have positive attitudes toward waste management, attitudes and behavior are not in line, consistent with Wu et al. (2022), who found that there are gaps between attitudes and behavior among Chinese students.

In terms of practice, the F-ratio of 53.12 ($p = 2.5E-33$) showed the most significant variation, which means that the involvement of the students in the actual practice of waste management in most cases depends on the type of waste. This is concurred with Budihardjo et al. (2021) who reported inconsistencies in knowledge of the environment and practices of the disposal system. Overall, the study raises the awareness of a consistent mismatch in knowledge, attitude, and practice - students can be informed and well-intentioned, but not consistent in their implementation. Supporting studies (Oliveira & Proenca, 2025) have also highlighted that awareness and attitude do not necessarily lead to action and it is necessary to create specific education processes as well as institutional systems for having a strong environmentally responsible behavior among students.

Table 6: Knowledge on Waste Management According to Profile

Factor	Socio-demographic Profile	χ^2	df	p-value	Remarks	Accept or Reject
Solid Waste	Age	9.44	12	0.665	Not significant	Accept Null
	Sex	8.36	3	0.039	With Significant	Reject Null
	Educational Attainment	36.10	15	0.002	With Significant	Reject Null
	Longevity	34.90	9	0.000	With Significant	Reject Null
	Occupation	36.53	9	0.000	With Significant	Reject Null
	Department	39.83	21	0.008	With Significant	Reject Null

Food Waste	Age	29.52	12	0.003	With Significant	Reject Null
	Sex	6.11	3	0.107	Not Significant	Accept Null
	Educational Attainment	44.31	15	0.000	With Significant	Reject Null
	Longevity	32.93	9	0.000	With Significant	Reject Null
	Occupation	36.38	9	0.000	With Significant	Reject Null
	Department	64.05	21	0.000	With Significant	Reject Null
Energy Waste	Age	11.05	12	0.525	Not Significant	Accept Null
	Sex	3.87	3	0.275	Not Significant	Accept Null
	Educational Attainment	32.87	15	0.005	With Significant	Reject Null
	Longevity	35.43	9	0.000	With Significant	Reject Null
	Occupation	31.55	9	0.000	With Significant	Reject Null
	Department	52.85	21	0.000	With Significant	Reject Null
Water Waste	Age	25.98	12	0.066	With Significant	Reject Null
	Sex	3.23	3	0.358	Not Significant	Accept Null
	Educational Attainment	43.92	15	0.000	With Significant	Reject Null
	Longevity	19.23	9	0.023	With Significant	Reject Null
	Occupation	42.15	9	0.000	With Significant	Reject Null
	Department	47.28	21	0.001	With Significant	Reject Null

The Chi-square (χ^2) analysis showed that most of the socio-demographic factors such as age and sex did not show any significant relationship with waste management knowledge because their p-values were greater than 0.05. This indicates that these factors are not having much influence on people's understanding of the solid, food, energy or water waste management. The results support past findings that education and personal experiences play a greater role in the development of environmental knowledge than do demographic traits such as age or gender.

However, the study revealed that age played a huge role in influencing food waste knowledge whereas sex influenced the knowledge of solid waste. Education level, longevity, occupation and department also had significant relationships for all waste categories. This indicates that higher education, experience time and career or academic background have stronger influence on the knowledge and awareness of proper waste management practices by individuals.

Table 7: Attitude on Waste Management According to Profile

Factor	Socio-demographic Profile	χ^2	df	p-value	Remarks	Accept or Reject
Solid Waste	Age	9.44	12	0.665	Not significant	Accept Null
	Sex	8.36	3	0.039	With Significant	Reject Null
	Educational Attainment	36.10	15	0.002	With Significant	Reject Null
	Longevity	34.20	9	0.000	With Significant	Reject Null
	Occupation	36.53	9	0.000	With Significant	Reject Null
	Department	39.83	21	0.008	With Significant	Reject Null
Food Waste	Age	9.52	12	0.965	Not Significant	Accept Null
	Sex	4.85	3	0.183	Not Significant	Accept Null
		39.30	15	0.001	With Significant	Reject Null

	Educational Attainment	23.21	9	0.006	With Significant	Reject Null
	Longevity	29.50	9	0.001	With Significant	Reject Null
	Occupation	42.52	21	0.005	With Significant	Reject Null
	Department					
Energy Waste	Age	9.07	12	0.697	Not Significant	Accept Null
	Sex	7.44	3	0.059	Not Significant	Accept Null
	Educational Attainment	25.53	15	0.043	With Significant	Reject Null
	Longevity	14.98	9	0.910	Not Significant	Accept Null
Water Waste	Occupation	30.52	9	0.000	With Significant	Reject Null
	Department	32.17	21	0.056	Not Significant	Accept Null
	Age	9.25	12	0.682	Not Significant	Accept Null
	Sex	9.86	3	0.020	With Significant	Reject Null
	Educational Attainment	36.57	15	0.001	With Significant	Reject Null
	Longevity	29.75	9	0.000	With Significant	Reject Null
	Occupation	44.29	9	0.000	With Significant	Reject Null
	Department	53.22	21	0.000	With Significant	Reject Null

The results obtained in Table 7 revealed the rejection of the null hypothesis for most of the socio-demographic characteristics and that it implies that there is no significant relationship between age and sex and the attitude of participants towards waste management. Furthermore, the p-values in age and sex of the solid, food, and food waste were more than 0.05, indicating that these variables are not important in terms of perceptions of waste management. These results are in line with previous research indicating that age and gender are not strong indicators of environmental behavior in themselves. Instead, social factors such as educational level and profession and the department of study were found to play more important roles in determining the attitude towards waste management.

Education level was also found to have a significant positive correlation across all categories of the waste, showing that the higher the education level, the higher the environmental awareness and responsibility. Occupation had a significant association with attitudes towards energy waste, which suggested that energy conservation behavior is affected by professional exposure. Similarly, the influencing of attitudes toward water waste management was also significant by academic department, because students from environmental or science-related fields indicated more positive attitudes. All in all, the results highlight that education, professional experience and academic orientation are more powerful determinants of attitudes towards waste management than simply demographic factors such as age and sex.

Table 8. Practice on Waste Management According to Profile

Factor	Socio-demographic Profile	χ^2	df	p-value	Remarks	Accept or Reject
Solid Waste	Age	204.62	12	0.000	With significant	Reject Null
	Sex	12.47	3	0.007	With Significant	Reject Null
	Educational Attainment	463.53	15	0.000	With Significant	Reject Null
	Longevity	62.71	9	0.000	With Significant	Reject Null

Food Waste	Occupation	481.30	9	0.000	With Significant	Reject Null
	Department	98.66	21	0.000	With Significant	Reject Null
	Age	201.79	12	0.000	With Significant	Reject Null
	Sex	7.64	3	0.054	Not Significant	Accept Null
	Educational Attainment	438.01	15	0.000	With Significant	Reject Null
Energy Waste	Longevity	67.72	9	0.000	With Significant	Reject Null
	Occupation	475.30	9	0.000	With Significant	Reject Null
	Department	90.27	21	0.000	With Significant	Reject Null
	Age	110.63	12	0.000	With Significant	Reject Null
	Sex	0.871	3	0.832	Not Significant	Accept Null
Water Waste	Educational Attainment	260.18	15	0.000	With Significant	Reject Null
	Longevity	40.71	9	0.000	With Significant	Reject Null
	Occupation	255.77	9	0.020	Not Significant	Reject Null
	Department	36.28	21			
	Age	41.20	12	0.000	With Significant	Reject Null
	Sex	3.94	3	0.268	Not Significant	Accept Null
	Educational Attainment	96.90	15	0.000	With Significant	Reject Null
	Longevity	15.36	9	0.082	Not Significant	Accept Null
	Occupation	125.64	9	0.000	With Significant	Reject Null
	Department	33.46	21	0.041	With Significant	Reject Null

The Chi-square (χ^2) Analysis in table 8 showed that most of the socio-demographic factors especially age and sex had no significant effects on the waste management practices of the participants. The p-values for food waste (age = 0.054, sex = 0.832), energy waste (age = 0.832, sex = 0.871), and water waste (age and sex = 0.268) were all above threshold 0.05, so it was concluded that these variables are not significant contributors to the participant's manifestation of different types of waste. These findings indicate that waste management practices are not determined by demographic factors like age or gender and other underlying factors.

It maintains that education, cultural patterns, institutional interventions and availability of resources have more important roles than demographic factors when it comes to waste management and conservation behaviours, as described by the literature of Chuah & Singh (2020), Stancu et al. (2024), and Singh et al. (2021). This suggests that focus on promoting effective waste management should be more on educational interventions and community-based interventions rather than targeting specific age or gender groups.

Conclusion

The study concluded that the socio-demographic characteristics of the participants such as age, sex, educational attainment, longevity, occupation, and department had a significant influence on knowledge, attitude and practice (KAP) on waste management. Younger individuals were found to be less aware and involved in waste management behaviour, especially in food waste management, whereas older people were found to have greater commitment. In terms of sex, there was a significant relationship with attitudes for solid waste and water waste, males being more inclined to manage their waste of these types. Educational attainment played an important

role in influencing positive attitudes and practices with those with higher levels of education showing better levels of involvement in all areas of waste management. Longevity, or how long people had been at the university also had an effect, with people who had been at LPU-C for longer displaying more consistent behaviours on waste management issues.

The study found that although the participants had high levels of knowledge and positive attitudes in waste management, there was often a difference in the actual practice. This was especially evident in the case of recycling programs for which engagement was lower despite high attitudes towards solid waste management. Additionally, there appeared to be a significant influence of occupation, with those who handle waste as their job (e.g. janitors) exhibiting more consistent practices. Departments within the university also affected waste management practices with departments more focused on environmental issues showing better engagement. Overall, the findings indicate that behavioural specific interventions targeting particular socio-demographic characteristics may improve waste management behaviours in different groups within the University.

Recommendation

With the outcome of this study, it is apparent that education, occupation, and academic department have a significant impact on the practice of waste management which in turn can improve sustainable waste management programs as well as increase the enforcement of LPU-C environmental policy. Since age and sex were not significant predictors, a greater emphasis on educational and institutional factors should be made for interventions. Lamarine-Phoenix University-C can exemplify environmental education in every academic program, so that all students from various departments, especially non-environmental ones, can have a greater understanding of sustainability. Incorporating environmental issues into course contents and making seminars to spread awareness and bring changes in behavior towards waste reduction and conservation.

The study also found that occupation is an important factor in influencing attitudes towards energy conservation. Thus, LPU-C may develop occupational or role-specific training programs which encourage faculty and staff to utilize energy and use resources efficiently and responsibly. In addition to the above initiatives, department-based practices can be strengthened by establishing sustainability coordinators to oversee compliance and be responsible for department projects around recycling, water conservation, and energy efficiency. Furthermore, ongoing monitoring and evaluation of waste segregation practices should be done to ensure proper implementation of policies.

Fourthly, the University could develop partnerships with local government bodies, environmental organizations and industry experts to develop the technical and practical aspects of waste management. The community clean-up, recycling drives and sustainability competitions enable a culture of environmental stewardship to be strengthened. Through the development of education, participation in work and involvement in the department, LPU-C has the ability to enhance its environmental policies, as well as increase the level of sustainability practices in waste management on all campuses.

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LOGISTICAL CHALLENGES AND THEIR IMPACT ON THE OPERATIONAL PERFORMANCE OF SELECTED MEDIUM ENTERPRISES IN CAVITE

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Abstract: *This study aims to identify the logistics challenges and their level of impact on the operational performance of medium enterprises in Cavite. It specifically focuses on medium manufacturing enterprises located in the City of Dasmariñas, Cavite. A descriptive research design was employed to analyze the participants' profiles and assess the impact of various logistical challenges. Out of 23 medium manufacturing enterprises in the city, seven agreed to participate, with a total of 107 managers and supervisors responded to the survey questionnaire. The findings revealed that the primary logistics challenges include software glitches and insufficient data backups in terms of technological factors, rising fuel prices pertaining to external factors, and unsafe working conditions relating to internal factors. Among these, technological building blocks were found to have the highest impact on the operational performance of the enterprises. The study concluded that technological issues exert the most significant impact on logistics operations, underscoring the vital role of modern technology in maintaining efficiency and competitiveness. The results further suggest that many medium-sized enterprises still lack the technological resources and modernization necessary to sustain operational performance. It is therefore recommended that medium enterprises invest in upgrading outdated equipment, enhance technological systems, and implement regular data backup procedures to minimize disruptions. To obtain a more thorough understanding of logistics performance among medium enterprises, future research is also encouraged to investigate logistics challenges beyond internal, external, and technological aspects. Additionally, a wider range of participants from different industries and geographic areas should be included.*

Keywords: *Logistic Challenges, Operational Performance, Medium Enterprises*

Introduction

About 90% of all businesses worldwide are micro, small, and medium-sized enterprises (MSMEs), which account for over half of all jobs globally and are essential to economic growth, according to Kituyi (2020). Despite their ongoing growth, medium-sized businesses continue to encounter numerous obstacles, including poor operational integration and restricted finance access. These problems limit their ability to develop, innovate, make wise decisions, and perform well all around.

In the business landscape, logistics plays a crucial role in ensuring a firm's success and sustainability. It involves the efficient management of how resources are acquired, stored, and distributed to their destinations. In the Philippines, MSMEs are categorized based on employment size and total assets. Within the CALABARZON region, Cavite stands as one of the country's major economic contributors, accounting for 28% of established business enterprises. Of the 41,446 registered establishments in the province, 5% are classified as medium enterprises (DTI as cited in e-FOI, 2021).

Over time, Cavite has shown significant economic growth driven by the expansion of numerous industries and business establishments. In addition, the study conducted by Kanyepe, Musasa, and Wilbert (2025) found that elements such as financial constraints, availability of competent workforce, data protection, and supplier dependability have a positive effect on the financial and operational outcomes of small and medium enterprises. Consequently, MSMEs should develop strategies to leverage these factors to overcome operational difficulties and improve their efficiency and competitiveness.

Hence, this study aims to determine the level to which logistical challenges impact the operational performance of medium enterprises in Cavite. The findings are expected to assist entrepreneurs, managers, and supervisors in addressing logistical issues, enhancing efficiency, and improving competitiveness. Furthermore, the results will contribute to the body of knowledge on logistics management in the Philippines, serving as a valuable reference for future research, academic discussions, and policy formulation aimed at strengthening medium enterprise development.

Literature Review

Theoretical Framework

Logistics 4.0 framework serves as a guide for the researchers to objectively identify and define the relationship among variables.

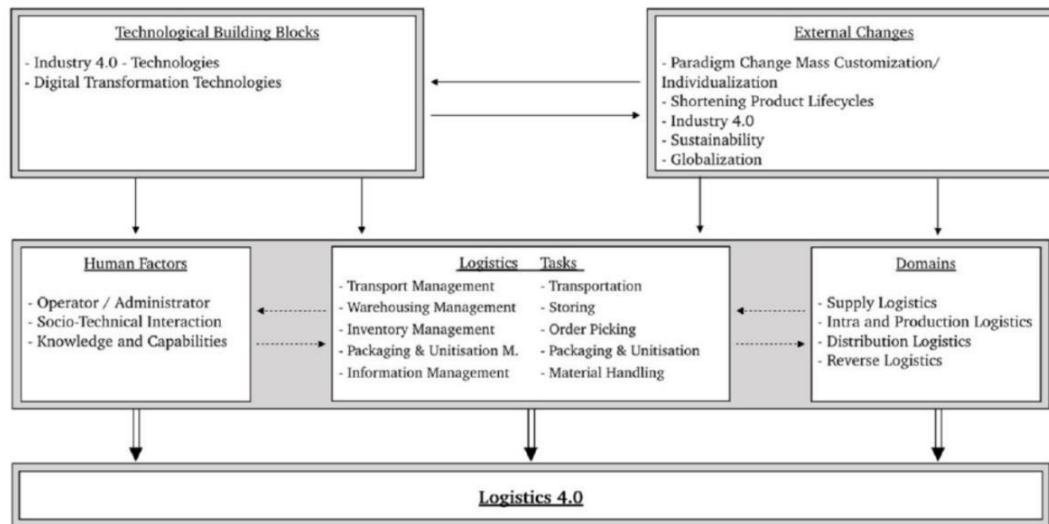


Figure 1: Logistics 4.0

Logistics 4.0 framework is adopted from the research study entitled “Logistics 4.0: a systematic review towards a new logistics system” (Winkelhaus & Grosse, 2020)

The Logistics 4.0 framework, adapted from the study “Logistics 4.0: A Systematic Review Towards a New Logistics System” by Winkelhaus and Grosse (2020), illustrates the different dimensions of logistics and their interconnections within modern systems. This framework serves as the foundation for analyzing the extent of logistical challenges faced by medium enterprises, encompassing three key dimensions: technological building blocks, external challenges, and internal factors.

Logistics Challenges

Agarwal (2025) evaluated the impact of recent disturbances, such as the COVID-19 pandemic, which revealed the conventional supply chain's weaknesses and highlighted the necessity of infrastructure development and digital transformation. There were problems unique to the FMCG industry, such as cold chain gaps. With the automobile industry's increased reliance on just-in-time logistics, suggesting the need for tailored strategic initiatives. The study ends with practical suggestions, such as the use of digital technologies, enhanced 3PL collaborations, and government-backed infrastructure, as well as educational initiatives to enhance logistics proficiency. These observations add to the scholarly discussions around supply chain efficiency while offering business executives and legislators doable tactics for enhancing resilience, cutting expenses, and obtaining a competitive edge in the manufacturing sector of India.

A study conducted by Transportify (2021) identified several challenges faced by logistics companies operating in the Philippines, including geography, poor infrastructure, unpredictable weather, demand patterns, and scattered demand. The study further emphasized that, since the Philippines is an archipelago composed of Luzon, Visayas, and Mindanao, managing logistics operations across the country is comparable to managing operations in multiple nations. This is primarily due to the heavy reliance on multimodal transportation systems, which require logistics managers to cater to smaller, region-specific markets. Additionally, language differences across regions and the higher cost of serving markets in the

Visayas and Mindanao compared to Luzon further complicate logistics management in the country.

Further, Parilla and Abadilla (2021) suggested that manufacturing firms should continuously improve their supply chain management practices by benchmarking with industry standards and ensuring that their principles remain relevant and effective. By leveraging the advantages of an efficient supply chain, organizations can reduce financing costs and gain a competitive edge over their rivals. The study also emphasized the importance of maintaining organizational principles in hiring and retaining qualified personnel. Firms should continuously train their staff and update their knowledge on emerging trends and innovations in supply chain management. Investing in employee education and training should remain a top management priority since organizations cannot operate effectively without competent people. Skilled, experienced, and knowledgeable employees, supported by efficient systems, ensure sustained professional growth, which leads to higher organizational effectiveness and profitability. They further recommended the adoption of innovative technologies to manage and optimize supply chain systems.

Borazon et al. (2020) emphasized that small businesses should be encouraged to adopt information technologies that can facilitate faster integration of their internal operations. The study further suggested that the government could invest in enterprise application integration technologies to support businesses in streamlining operations through efficient information sharing. Additionally, mechanisms that promote and incentivize the use of information technology among businesses should be strengthened to enhance productivity and competitiveness.

Small and medium-sized businesses (SMEs) in the Western Balkans encounter obstacles while attempting to access supply chains, according to a study by Semencenko and Vasilic (2020). The researchers examined a number of variables that affect SMEs' involvement in domestic and global supply chains using a binary logistic regression technique. The results showed that among the main challenges are poor logistics infrastructure, limited access to financing, a lack of managerial skills, and inadequate technology capabilities. Furthermore, legislative obstacles and institutional inefficiencies make it difficult for SMEs to successfully integrate into larger supply networks. The report underlined that in order for SMEs in the Western Balkans to become more competitive and sustainable participants in global value chains, it is imperative that logistical performance be improved, digital adoption be increased, and government support be increased.

Cichosz et al. (2020) aimed to identify barriers to digital transformation and propose strategies to overcome them. The researchers employed a review of related literature and conducted case study analyses involving nine international and global logistics service providers. The findings revealed that the primary challenges were external in nature, particularly those associated with customers, business partners, and market competition. Moreover, the complexity of implementing new technologies within organizations emerged as a major internal challenge. The study recommended enhancing operational efficiency, improving customer experience, developing new services based on customer demand, and adopting platform-based business models to strengthen organizational performance and competitiveness.

Smith, Voak, and Gunasekera (2020) revealed that the quality of logistics infrastructure significantly influences the level of foreign direct investment. Their findings indicate that in eight out of ten ASEAN member states—excluding Singapore and Malaysia—the quality of infrastructure remains below the global average, thereby hindering regional economic productivity. Moreover, poorly developed and inadequately managed transportation networks serve as barriers to trade. Transportation safety and security were identified as major concerns requiring immediate attention, while inconsistent customs policies across the region contribute to longer processing times and higher import/export costs. As part of the new open-line initiative, ASEAN members have been encouraged to harmonize customs procedures, reduce documentation requirements, and enable electronic shipment processing. The study emphasized the urgent need for enhanced intergovernmental cooperation to ensure safety and regulatory consistency within the regional shipping industry. Additionally, while opportunities for infrastructure investment are abundant, the researchers recommend revising investment policies to attract more foreign investors and establishing a regional consumer credit rating bureau to support financial transparency and integration.

The study conducted by Arsić et al. (2020) examined various implications of logistics capacity on the economic sustainability of small and medium-sized enterprises (SMEs). The research aimed to address the existing gap in understanding how logistical capabilities influence a company's long-term financial stability and performance. Previous studies by Zimon and Zimon focused on the impact of logistics on profitability, while Green explored the relationship between logistics performance and both marketing and financial outcomes. Building upon these earlier works, Arsić et al. expanded the scope by analyzing eight key business dimensions within the SME context, including supply chain position, export location and form, sales share, and supply chain volume.

Transportation cost over sales, warehousing cost over sales, inventory carrying cost over sales, physical inventory cost, and opportunity cost are the primary metrics used to assess a company's logistics performance, according to the Department of Trade and Industry (DTI, 2018). Beyond the country's geographic structure, the study noted that the unreliability of the logistics system also contributes to high logistics costs across various sectors such as electronics, automotive, furniture and décor, and even the food industry. To improve traditional logistics systems in the Philippines, the study recommended establishing a more reliable inter-island shipping network and strengthening the overall logistics infrastructure to ensure consistent connectivity and efficiency. These improvements would enable better strategic decision-making and cost reduction. Lastly, the study underlined how crucial it is to better understand logistics difficulties by encouraging the sharing of best practices and lessons gained, especially to help small and medium-sized businesses (SMEs) improve their operational performance.

Objectives of the Study

1. Determine the socio-economic profile of the participants in terms of age, sex, educational attainment, and job position.
2. Analyze the level of impact of logistics challenges on the operational performance of medium enterprises in terms of technological building blocks, external challenges, and internal factors.

Research Method

The study utilized the descriptive method, which was employed to present the socio-economic profile of the participants and to assess the extent to which logistical challenges impact the operational performance of selected medium enterprises in Cavite.

Based on data from the City Government of Dasmariñas, there are 23 medium-sized manufacturing enterprises operating within the city. However, only seven of these enterprises agreed to participate in the study. All participating enterprises had been in operation for more than six months and were engaged in logistics management within the manufacturing sector.

A total of 107 managers and supervisors from the participating enterprises took part in the study. The participants were aged 21 years and above and possessed diverse educational backgrounds. Their responses provided valuable insights into the logistics management practices of medium manufacturing enterprises in Dasmariñas City.

To collect the primary data, the researchers used a self-constructed survey questionnaire. This instrument was content-validated by experts in logistics management and pretested among 15 individuals who were not part of the actual study sample. The pretest yielded a Cronbach's alpha coefficient of 0.886, which was interpreted as "good." The responses from the pre-test participants were not included in the main data collection but were solely used to evaluate the reliability of the instrument. The results confirmed that the questionnaire contained no major lapses or inconsistencies, thereby ensuring that the instrument was comprehensive, clear, and effective for the actual data-gathering process.

The following arbitrary ranges were used as reference for interpreting the result of the statistical statement:

Option	Rating Scale	Level of impact
5	4.2-5.0	Very high level of impact (negative)
4	3.4-4.1	High level of impact (negative)
3	2.6-3.3	Low level of impact (negative)
2	1.8-2.5	Very low impact (negative)
1	1.0-1.7	No impact at all (negative)

Results and Discussion

Socio-Economic Profile of the Participants

Table 1 presents the socio-economic profile of the participants. The majority of them were aged 31–40 years old, accounting for 62 participants (57.9%), followed by those aged 41–50 years old with 27 participants (25.2%). Meanwhile, 18 participants (16.8%) were aged 51 years old and above, and no participants were within the 21–30 years old age group. In terms of sex, the majority were male, comprising 81 participants (75.7%), while female participants accounted for 26 (25.3%) of the total sample. Regarding educational attainment, most participants were bachelor's degree holders with 86 participants (80.4%), followed by postgraduate degree holders with 21 participants (19.6%). No participants were classified as high school graduates or associate degree holders. Lastly, in terms of job position, the majority were supervisors, with 65 participants (60.7%), while 42 participants (39.3%) were managers or department heads.

Table 1: Profile of the Participants

Characteristic	Category	Frequency	Percentage
Age	21-30 years old	0	0
	31-40 years old	62	57.9
	41-50 years old	27	25.2
	51 years old and above	18	16.8
Sex	Male	81	75.7
	Female	26	24.3
Educational attainment	High School Graduate	0	0
	Associate Degree	0	0
	Bachelor's Degree	86	80.4
	Postgraduate Degree	21	19.6
Job position	Manager or Department Head	42	39.3
	Supervisor	65	60.7

Impact of Logistic Challenges on the Operational Performance

Technological building blocks. Participants' perceptions of the impact of technology building blocks are shown in Table 2. With the highest mean score of 4.39, or "Very High," among the indicators, the statement "Glitches and insufficient backups" implies that participants face serious difficulties with system faults and inadequate data backup procedures. Although still regarded as a concern, problems with outdated handling equipment are thought to have a relatively smaller impact than other technological factors, according to the statement "Outdated material handling equipment (conveyors and forklifts) for loading goods," which received the lowest mean score of 3.88, or "High."

The overall mean of 4.11 for technological building blocks ranked as the highest perceived impact among the logistical challenges. This indicates that medium enterprises face a notable limitation of technological resources and support, highlighting the crucial role of technology in their operations. The finding implies that technological advancement significantly influences MSMEs, as many still struggle to invest in modern tools and systems needed to keep pace with current industry trends. A similar study emphasized that government support is essential in fostering technological development among MSMEs. For instance, Taiwan's government established a national information and communications infrastructure that serves as a platform for data exchange (Borazon, Elaine, Supangco, & Vivien, 2020). Likewise, Parilla and Abadilla (2021) found that innovative technology adoption is necessary for MSMEs in the Philippines to effectively manage logistics challenges and enhance enterprise performance.

Table 2: Perceived Level of Impact of Technological Building Blocks

Indicator	Mean	SD	Interpretation
1. Cannot keep up with technological innovations that are related to logistics management such as outdated logistics software	4.08	0.56837	High
2. Connectivity issue in logistics management specifically under the	4.00	0.59874	High

integration of systems			
3. Glitches in software and insufficient backups	4.39	0.68346	Very High
4. Lack of maintenance, updates, and monitoring for technological processes	4.22	0.53249	Very High
5. Outdated material handling equipment (conveyors and forklifts) for loading goods	3.88	0.60983	High
Overall technological building blocks	4.11		High

Interpretation: 4.2 - 5.0 = Very high level of impact (negative); 3.4 - 4.1 = High level of impact (negative); 2.6 - 3.3 = Low level of impact (negative); 1.8 - 2.5 = Very low impact (negative); 1.0 - 1.7 = No impact at all (negative)

External challenges. Table 3 shows the perceived level of impact of external challenges on the participants. The statement "Logistics costs increased due to rising oil prices" had the highest mean score of 4.21, or Very High, out of all the indicators. This suggests that changes in fuel prices have a major effect on total logistics operations and expenses. However, the statement "Limited access and available resources due to the archipelagic structure of the country" received the lowest mean score of 3.04, which is interpreted as "Low". This indicates that although there are geographical limitations, companies believe they have a smaller impact than other external challenges.

Lastly, the overall mean of 3.66 for external challenges ranked lowest on the logistic challenges. This highlighted how the cost and reliability issues of medium enterprises logistics are influenced by legislation, environmental concerns, and other logistic rates. An organization's internal problems, particularly those related to labor, research and development, and a shortage of subject-matter experts, are one of the main supply chain problems it faces, according to Narkhede and Rajhans (2019). These problems make the system as a whole less efficient and well-organized.

Table 3: Perceived Level of Impact of External Challenges

Indicator	Mean	SD	Interpretation
1. Government regulations and Local Government Unit (LGU) ordinances regarding truck bans, vehicular coding and city permits affect the firm's operations.	3.79	0.66925	High
2. Environmental issues such as carbon emissions and water contamination that a firm's operations.	3.07	0.76813	Low
3. Limited access and available resources due to the archipelagic structure of the country.	3.04	0.69940	Low
4. Increase in freight rates, taxes and tariffs across regions or countries	4.05	0.52094	High
5. Logistics costs increased due to rising oil prices	4.21	0.61026	Very High
6. Lack of options in mass customization	3.81	0.72854	High
Overall external challenges	3.66		High

Interpretation: 4.2 - 5.0 = Very high level of impact (negative); 3.4 - 4.1 = High level of impact (negative); 2.6 - 3.3 = Low level of impact (negative); 1.8 - 2.5 = Very low impact (negative); 1.0 - 1.7 = No impact at all (negative)

Internal Factors. The results show a considerable concern for workplace safety and employee welfare, with unsafe working conditions regarded to have the highest impact on logistical operations among internal factors. On the other hand, the absence of terminal amenities such as dock shelters were thought to have the least effect, indicating that inadequate infrastructure is not thought to be a significant internal problem. The participants believed that internal variables had a significant influence on logistics performance overall, with a mean score of 3.77.

The overall mean of 3.77 for internal factors ranked second among the logistics challenges, indicating that issues related to transportation, information management, and human resources have a high level of impact on the operational performance of medium enterprises, particularly in the manufacturing industry. These internal challenges significantly affect the efficiency and reliability of business operations. Findings from ASEAN (2020) emphasized the need for enhanced inter-governmental collaboration to ensure consistency in logistics processes, noting that incongruent customs policies across the region contribute to increased time and costs in import and export activities. Conversely, the Department of Trade and Industry (2018) reported that the archipelagic structure of the Philippines and poor road conditions pose the most significant external logistics challenges, while environmental regulations were also identified as highly impactful factors influencing logistics performance.

Table 4: Perceived Level of Impact of Internal Factors

Indicator	Mean	SD	Interpretation
1. Shortage of trucks and shipping containers.	2.60	0.72502	Low
2. Lack of terminal facilities such as dock shelter.	2.45	0.77986	Very Low
3. High expenses in overheads such as maintenance and repair.	2.80	0.78234	Low
4. High expenses on other modes of transportation such as sea cargo to air cargo	2.73	0.84194	Low
5. Inefficient delivery due to poor route planning or distribution pattern.	3.12	0.84351	Low
6. Weak logistics management file confidentiality.	4.18	0.57974	High
7. Poor disposal of information assets under logistics cargo department.	3.97	0.74553	High
8. Ineffective and inefficient communication between logistics departments and other departments.	4.40	0.73792	Very High
9. Lack of memorandum and other similar communication devices between logistics department and other departments.	3.99	0.70704	High
10. Unorganized documents and files in the logistics department.	4.01	0.75854	High
11. Logistical service defects due to lack of manpower such as truck drivers.	4.22	0.48191	Very High

12. Decrease the company's profits due to the increase in the value of the logistics labor force.	4.57	0.53398	Very High
13. Lack of general training and seminars for employees on logistics management.	4.38	0.56041	Very High
14. Lack of experts or trainers for employees in logistics management.	4.36	0.55376	Very High
15. Unsafe working conditions for employees in the logistics department	4.72	0.45130	Very High
OVERALL INTERNAL FACTORS	3.77		High

Interpretation: 4.2 - 5.0 = Very high level of impact (negative); 3.4 - 4.1 = High level of impact (negative); 2.6 - 3.3 = Low level of impact (negative); 1.8 - 2.5 = Very low impact (negative); 1.0 - 1.7 No impact at all (negative)

Table 5: Summary of the Perceived Level of Impact of Logistics Challenges

Indicator	Mean	SD	Interpretation	Rank
Technological Building Blocks	4.11	0.62418	High	1
External Challenges	3.66	0.80751	High	3
Internal Factors	3.77	1.02307	High	2

Interpretation: 4.2 - 5.0 = Very high level of impact (negative); 3.4 - 4.1 = High level of impact (negative); 2.6 - 3.3 = Low level of impact (negative); 1.8 - 2.5 = Very low impact (negative); 1.0 - 1.7 = No impact at all (negative)

Conclusions

1. The majority of the participants were 31–40 years old, male, supervisors, and bachelor's degree holders. This suggests that men are more likely to be employed in labor-intensive and machine-focused environments, such as manufacturing industries, compared to women. Furthermore, this indicates that the participants are experienced professionals who possess the necessary knowledge and competence to address various logistics challenges within their organizations.

2. Problems relating to technology have the highest impact of all logistical considerations, highlighting how important technology is to corporate operations. Efficiency is hampered by system errors, inadequate backups, and antiquated equipment, according to the findings, which show that many medium-sized enterprises still lack the technology resources and modernization necessary to compete in the market.

3. The rising cost of fuel, which directly raises overall logistics prices, is one of the external concerns that significantly affect logistics operations. Physical limitations resulting from the nation's archipelagic nature are acknowledged, but they are thought to have less of an impact than economic considerations, emphasizing that the most important external factor affecting logistics performance is still shifting oil prices.

4. Given that among internal issues, unsafe working conditions were thought to have the highest impact on logistical operations, the results show a considerable concern for workplace safety and employee welfare. The absence of terminal amenities like dock shelters, on the other hand, was thought to have the least impact, indicating that inadequate infrastructure is not seen as a significant internal crisis.

Recommendations

1. To improve supervisors' and employees' knowledge and proficiency in handling logistical difficulties, offer them training and skill development programs.
2. To become more efficient and competitive, medium-sized enterprises should invest to replace outdated equipment, enhance technical systems, and make sure that frequent data backups are performed.
3. Businesses should investigate fuel-efficient tactics including route optimization, routine auto maintenance, and alternate energy sources to mitigate the effects of growing oil prices.
4. Enhance safety procedures, supply protective gear, and carry out routine inspections to guarantee secure working environments and safeguard worker welfare.
5. While terminal facilities have less of an influence, enhancing storage rooms and dock shelters can nevertheless assist efficiency and improve overall logistics operations.
6. It is recommended that future research look at logistical difficulties from perspectives other than internal, external, and technology ones. A more thorough grasp of the variables affecting logistics performance among medium-sized enterprises will be possible by broadening the focus to these areas and including a larger number of participants from different sectors and geographical areas.

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THE INFLUENCE OF GOVERNMENT ACCOUNTING STANDARDS AND THE UTILIZATION OF INFORMATION TECHNOLOGY ON THE QUALITY OF FINANCIAL REPORTS AT FINANCIAL AND DEVELOPMENT SUPERVISORY AGENCY (BPKP) IN SUMATRA

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Abstract: *The purpose of the research is to examine the effect of The Implementation of Government Accounting Standards, and The Utilization of Information Technology on the Quality of Financial Reports at the Financial and Development Supervisory Agency (BPKP) in Sumatra. The research design used in this study is Descriptive Quantitative. The population and sample for this research consist of financial employees working at BPKP in Sumatra who are involved in financial management, resulting in a sample of 30 individuals. The data analysis techniques employed in this research include Descriptive Statistics, Data Quality Tests (Validity and Reliability Tests), Multiple Linear Regression Analysis, and Hypothesis Testing (R² Test, t-Test, and F-Test). The results of this study indicate that the implementation of government accounting standards and the Utilization of Information Technology simultaneously take effect on the quality of financial reports. The implementation of government accounting standards partially has a positive effect on the quality of financial reports. The utilization of information technology partially has a positive effect on the quality of financial reports. The implication of the research is that the influence of The Implementation of Government Accounting Standard and The Utilization of Information Technology results in increasing the quality of financial reports.*

Keywords: *Government Accounting Standards, Information Technology, Financial Report Quality*

Introduction

Public sector organization is often associated with government or business entities that owned by the government, and is responsible for performing public service to fulfill welfare in various spheres of life such as education, health, economy, safety, religious freedom and others (Nurillah, 2014). Financial management in government institution, including Financial and Development Supervisory Board, has vital role in supporting transparency, accountability, and efficiency towards government budget expenditures. In globalization era as well as reformation demand, it is important for government institutions to ensure that their financial practices comply with applicable accounting standards and it is implemented optimally. In accordance

with Law no. 17 of 2003 on State Finance, Law no.1 on State Treasury and Government Regulation no. 24 of 2005 on Governmental Accounting Standards that Financial and Development Supervisory Board office of Sumatera Region Representative shall compile financial statement as the accountability report on the implementation of the State/Regional Budget comprising Budget Realization Report, Statement of Financial Position, Statement of Changes in Equity, Operational Report and Notes to Financial Statement. Financial Statement is one of important tools in apprising financial health and performance of an organization, including Financial and Development Supervisory Board. The quality of financial statement becomes main indicator for a government organization to provide accurate, reliable, relevant and transparent information to all stakeholders. Good financial statement quality is a crucial aspect in supporting accountability, responsibility and effective decision-making in public fund management context. Implementation of Governmental Accounting Standards (GAS) becomes a key foundation in preparing accountable and relevant government financial statements. Meanwhile, in this modern era, the preparation of financial statements is also assisted by utilizing information technology. As times change, technology is considered as a tool used by individual and institutions to accomplish their tasks (Nurillah, 2014).. The utilization of information technology can simplify government in preparing financial statements, furthermore by utilizing information technology development, the government financial statement preparation shall be conducted more quickly, accurately, and in a timely manner. However, even though there are established standards and guidelines, in the reality there are still challenges in implementing Governmental Accounting Standards (GAS) and effective information technology utilization. Therefore, this research is aimed to analyze the impact of the implementation of Governmental Accounting Standards and the utilization of information technology in Financial and Development Supervisory Board. It is expected that a deeper understanding on the relation between implementation of Governmental Accounting Standards and utilization of information technology shall provide positive contribution towards enhancing the accountability and efficiency of financial resource utilization.

Literature Review

Governmental Accounting Standards (GAS) Pursuant to Government Regulation no. 71 of 2010, Governmental Accounting Standards (GAS) is “Generally Accepted Accounting Principle (GAAP) in compiling and presenting government financial statement”. According to Mardiasmo (2009:148) Governmental Accounting Standards is “guidelines or principles establishing accounting principles in the preparation of financial statement for the purpose of reporting for the users of the financial statement”.

According to Indra Bastian (2010:134) Governmental Accounting Standards, hereinafter referred to as GAS, is “Accounting Standards that implemented in preparing and presenting the government financial statement”. Therefore, GAS is the requirements that have binding force in enhancing the quality of government financial statement in Indonesia”. Governmental Accounting Standards normally regulate various government accounting entities aspects, including basic principles such as revenue recognition, expense recognition, assets depreciation and financial information disclosure. This standard also comprises guidelines for financial statement preparation such as balance sheet, income statement, statement of changes in equity and cash flow statement. Governmental Accounting Standards may vary among countries due to difference in government practices, statues, and regulations. In many countries, agencies or certain institutions, such as Governmental Accounting Standards Board atau GASB in the

United States, have an important role in establishing and updating Governmental Accounting Standards. Government Regulation No. 71 of 2010 comprises various aspects of governmental accounting such as measurement, recognition and disclosure of the financial transactions. This regulation also includes provisions regulating the usage of accrual basis accounting principle in Indonesia's entities, which indicate more relevant modern accounting practice compared to cash basis principle. Governmental Accounting Standards stated in Government Regulation No. 71 of 2010 become main reference for Government entities in Indonesia in compiling their financial statement. With this regulation, it is expected that government entities in Indonesia can compile the financial statement comprehensively and describe their financial position accurately. This regulation is one of Indonesian government efforts to enhance transparency, accountability and government financial administration to be more efficient and more effective. For parties interested or involved in Indonesian governmental accounting, it is crucial to refer directly to Government Regulation No. 71 of 2010 and adjust changes or additional regulation that probably released by relevant authorities.

The Objective of Governmental Accounting Standards

According to Mardiasmo (2009:149) Accounting Standards is required for ensuring consistency in financial reporting, not having proper accounting standards shall generate negative implications such as lack of reliability and objectivity to the presented information. These standards are designed to achieve some main objectives:

1. **Transparency:** Governmental Accounting Standards are designed to enhance transparency in government entities financial reporting. By having consistent standards, stakeholders such as citizens, investors, and supervisory agencies shall easily comprehend and evaluate government entities financial information.
2. **Accountability:** This standard helps enhancing level of government entities accountability towards public expenditures. By following the prescribed standards, it is expected that the government entities shall describe how well the public expenditures are used and managed.
3. **Efficiency and Effectiveness:** Governmental Accounting Standards are also aimed to enhance the efficiency and effectiveness of the government entities financial management. By having clear guidelines, government entities shall manage their financial resources better, identify potential matters and take necessary measures.
4. **Legal Compliance:** This standard helps the government entities comply with law regulations and applicable regulations in term of financial reporting. This matter is important to ensure that the government entities not only obey the statute but also perform their tasks based on stipulated regulations.
5. **Credibility and Trust:** Governmental Accounting Standards are also aimed to enhance credibility and trust in government entities financial statement. When the financial statement is prepared based on the broadly established standards, it can enhance stakeholders' trusts in the presented financial information.

The primary purpose of implementing Governmental Accounting Standards is to make financial reports easier to understand for users, to avoid misunderstandings between the preparer and the user and to ensure consistency in reporting, thus ensuring comparability. Governmental Accounting Standards contribute to higher quality financial reporting (Mahmudi, 2010:29)

By achieving these objectives, Governmental Accounting Standards are expected to enhance the government entities financial governance, subsequently shall support better and more accountable public expenditures governance.

The Utilization of Information Technology

Government Regulation No. 56 of 2005 on Financial Information System stated that both central government and regional government are obliged to develop and utilize technology development in order to increase the capability of financial governance and distribute the financial information to public services. The government is obliged to develop and utilize the information technology development to enhance the financial governance capability, as well as distribute financial information to public services. The government needs to improve the utilization of the information technology development in order to build management information system network and working process that make the government possible to work integratedly by simplifying the access among working units (Indriasari, Nahartyo, 2008). Currently there are some terms such as *E-Government (E-Gov)*, digital government, *online* government or transformation government. Through the implementation of *E-Gov*, the government can simplify the information access for the societies, business units, employees, stakeholders and other agencies related to the government. There are three models of *E-Government* delivery, which are:

1. Government-to-Citizen or Government-to-Customer (G2C)
Is one way public service and information delivery by government to the citizens, it allows information and communication exchange among the citizens and government, for example G2C : *online* tax, seeking employment, social security service, private document (birth and marriage certificate, passport application, License certificate), immigration service, health service, scholarship, disaster management.
2. Government-to-Business (G2B)
Is electronic transactions in which the government provides various information needed by business sectors. It leads to products and services marketing to the government in order to assist the government to become more efficient by enhancing business process and electronic data management. The application facilitating both G2B and B2G interaction is *e-procurement* system. For example: corporation tax, business opportunities, corporation registration, government regulation (business law), auction and sales performed by the government, patent and trademark, and so on.
3. Government-to-Government (G2G)
Is online communication and information exchange among departments or government institutions via integrated data basis, for example: online consultation, blogging for legislative, online education, integrated services for citizens.

Financial Reports

The definition of financial reports as expressed by Munawir (2010:2) Financial reports are basically the result of an accounting process that can be used as a tool to communicate between financial data or activities of a company with parties interested in the data or activities of a company. According to Irham Fahmi (2018:142), financial Reports are a structured presentation of the financial position and performance of an entity, which aims to provide information to parties who need it regarding the company's financial condition in monetary

units. According to Heri (2018:138), financial Reports are the final product of a series of processes for recording and summarizing business transaction data.

Meanwhile definition of financial reports as expressed by Kasmir (2012:45) Financial reports are reports that show the financial condition of an entity in certain period. Financial reports also determine what steps a company or agency will take now and in the future by looking at exiting problems, both weaknesses and strengths, in order to make economic decisions

Financial report is accountability or governance of economic resources that owned by an entity. Published Financial statement must be compiled based on the applicable accounting standards so that the financial statement can be compared to the prior period financial report or compared to other entities financial reports. According to Government Regulation No. 24 of 2005, Financial Statement is structured report on financial positions and transactions performed by a reporting entity. A qualified financial statement has to comply with qualitative characteristics of financial statement, namely:

1. Relevant, financial statement can be relevant if the information can affect the users' decisions by assisting them evaluate the past or current events and predicting future as well as affirming or correcting their past evaluation results. Relevant information means information presented on time and complete so that it can be used for decision making.
2. Reliable, presenting the information with honest facts, can be verified, and presenting a free from material misstatement.
3. Comparable, information stated in the financial statement shall be more useful if it can be compared to previous period financial statement or other reporting entities' financial statements. The comparison can be performed externally and internally. External comparison can be performed if the compared entities implement the same accounting policy. Internal comparison can be performed if an entity implements the same accounting policy from year to year.
4. Understandable, the presented information in the financial statement has to be understandable by the users and stated in a form and terms that adapted with the users' perception.

Research Methods

Research Population and Sampling

According to Sugiyono (2010:115) "population is generalization that consists of objects/subjects that have certain qualities and characteristics established by the researcher to be examined and concluded". Based on the above opinion, the populations in this research were some Finance employees across Sumatera Financial and Development Supervisory Board (BPKP). According to Sugiyono (2016:62) "Sampling determination technique in this research was performed by using *total sampling* technique, which was sampling determination technique based on saturated samples". According to Sugiyono (2013:124) saturated samples is sampling determination technique by taking the whole respondents as samples. Therefore the sampling of this research were all employees involved in financial governance across Sumatera Financial and Development Supervisory Board. The respondents in this research comprised of payment instruction signing officers and financial governance staff, thus there were 30 employees as samples. The reason for choosing saturated sampling as sampling determination technique was because the populations were considered low or less than 100.

Data Analysis Technique

This analysis was performed to analyze whether there was a cause and effect relation among three variables or analyze how significant the effect was (Governmental Accounting Standards X1), (information technology utilization X2) towards dependent variable (financial statement quality Y). According to Sugiyono (2010:277) : “Analysis used by the researcher, it was intended to prognosticate the fluctuations of dependent variable, two or more independent variables as predictor factors were manipulated (fluctuated its value). Multiple linear regression Model in this research was as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

Information:

Y = Financial Report Quality
X1 = Governmental Accounting Standards
X2 = Information Technology Utilization
 α = Constant
 β_1 & β_2 = Regression Coefficient
 ϵ = Error

Research Results

Multiple Linear Regression Analysis

Regression analysis used in this research was multiple linear regression. Multiple linear regression was aimed to acknowledge the effect of independent variable with dependent variable. The results of multiple linear regression can be seen in Figure 4.1 as follows:

Result of Multiple Linear Regression

		Coefficients ^a			t	Sig.	Collinearity Statistics	
Model		Unstandardized Coefficients		Standardized Coefficients			Tolerance	VIF
		B	Std. Error	Beta				
1	(Constant)	1.563	4.923		.293	.772		
	X1	.461	.086	.658	5.327	.000	.948	1.054
	X2	.694	.097	.794	5.329	.000	.948	1.054

From Figure 4.1 it can be formulated the equation of multiple linear regression as follows:

$$Y = 1,563 + 0,461 X_1 + 0,694 X_2 + \epsilon$$

From the above equation of linear regression, it may be described as follows:

1. In this research, constant of 1,563 indicated positive outcome, it could be interpreted that if the implementation of governmental accounting standards (X1), the utilization of

information technology (X2) were considered constant and 0, therefore the quality of financial report (Y) shall be 1,563.

2. The governmental accounting standards regression coefficient of 0,461 indicated positive outcome, it could be interpreted that every increase of 1 governmental accounting standard implementation unit therefore shall increase the financial report quality of 0,461 or 46,1% and other influencing factors shall be considered constant.
3. The information technology utilization regression coefficient (X2) of 0,694 indicated positive outcome, it could be interpreted that every increase of 1 finance governance implementation therefore shall increase the financial report quality of 0,694 or 69,4% and other influencing factors shall be considered constant.

Calculating the Coefficient of Determination R²

To acknowledge how significant both independent variables towards The Financial Statement Quality, it was shown by R² value from F test analysis result that could be seen in Figure 4.11 below:

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780a	.609	.670	1.7541

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

From the conducted multiple linear regression analysis testing result, it was obtained the R² *Adjusted* value of 0,670. It was indicated that 67% variation from financial statement quality was influenced by governmental accounting standards implementation and information technology utilization. Whereas the remaining 33% was influenced by other variables.

Conclusion

Based on the conducted analysis and discussion, it could be concluded as follows:

1. The governmental Accounting Standards and Information technology utilization simultaneously influenced the financial report quality across Sumatera Financial and Development Supervisory Board.
2. The Governmental Accounting Standards positively influenced the financial report quality across Sumatera Financial and Development Supervisory Board.
3. The Information Technology Utilization positively influenced the financial report financial report quality across Sumatera Financial and Development Supervisory Board.

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DIGITAL COMMUNICATION COMPETENCE AND EMOTIONAL RESILIENCE: A SYSTEMATIC REVIEW OF SOCIAL MEDIA LITERACY INTERVENTIONS FOR PREADOLESCENTS

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Abstract: *The rapid integration of social media into preadolescents' daily lives has redefined patterns of communication, learning, and emotional development. While digital platforms offer opportunities for connection and creativity, they also present risks to mental health, including cyberbullying, anxiety, and social comparison. These challenges underscore the urgent need to understand how digital communication competence and emotional resilience can serve as protective mechanisms that enhance psychological well-being. This study systematically reviews existing scholarship on social media literacy interventions targeting preadolescents, applying the PRISMA 2020 protocol to ensure transparency and replicability. Two major databases Scopus and Web of Science were systematically searched, yielding a total of 31 primary studies published between 2015 and 2025 that met inclusion criteria. Data were extracted, coded, and thematically synthesized. The analysis produced three significant thematic clusters: (1) Digital Communication Competence and Literacy Development (2) Emotional and Psychological Resilience among Adolescents, and (3) Social Media Interventions and Behavioral Outcomes. The review reveals that integrated interventions combining media literacy, emotional intelligence, and participatory communication yield the most sustainable impacts on adolescents' digital well-being. However, regional gaps persist, particularly in culturally grounded studies within Southeast Asia. The paper concludes that future research should advance a context-sensitive communication framework that unites digital competence and emotional resilience as twin pillars for promoting safe, ethical, and psychologically adaptive social media engagement among preadolescents.*

Keywords: *Digital Communication Competence, Emotional Resilience, Social Media Literacy, Preadolescents' Psychological Well-Being, Systematic Literature Review (PRISMA)*

Introduction

The exponential rise of social media use among preadolescents has transformed the landscape of communication, learning, and socialization into unprecedented ways. Children as young as ten increasingly engage in online interactions that shape their identity, worldview, and psychological development. While digital platforms provide opportunities for creativity and connectedness, they also expose young users to complex risks including cyberbullying, misinformation, social comparison, and digital dependency. These phenomena have intensified global concern about the effects of online engagement on mental health, prompting scholars to emphasize digital communication competence as a critical foundation for safe and meaningful participation in digital spaces (Livingstone et al., 2025; Carretero et al., 2017). However, existing evidence suggests that technical literacy alone is insufficient where is required a holistic model integrates communication competence with emotional resilience to promote sustainable psychological well-being among preadolescents.

Theoretically, digital communication competence encompasses the cognitive, technical, and socio-emotional skills necessary to interpret, produce, and negotiate meaning across networked environments (Editors et al., 2013; Ilomäki et al., 2016). Within this communicative framework, emotional resilience derived from (Masten, 2014) developmental resilience theory and (Lazarus & Folkman, 1984) coping model functions as the adaptive mechanism that enables young users to withstand online stressors while maintaining psychological equilibrium. Recent interventions rooted in Social Cognitive Theory by Albert Bandura 1986 (Nabavi & Bijandi, 2024) and critical media literacy pedagogy demonstrate that guided social media education can strengthen empathy, reflective judgment, and safe digital behavior. Despite growing international evidence, much of the existing research remains fragmented, discipline-bound, and concentrated in Western contexts, leaving limited understanding of how such constructs interact within Asian and multicultural settings.

In Southeast Asia especially Malaysia, empirical inquiry into digital competence and emotional resilience among preadolescents is still developing. Most national initiatives emphasize ICT proficiency rather than communicative or psychological readiness for online engagement. This gap underscores the urgent need for a systematic synthesis of global and regional evidence to inform a culturally relevant framework of social media literacy interventions. Therefore, this study systematically reviews existing scholarship to identify theoretical linkages, intervention outcomes, and research gaps that can guide the development of an integrated communication model promoting digital literacy and emotional well-being among preadolescents.

Literature Review

Conceptualizing Digital Communication Competence in the Age of Social Media

The concept of digital communication competence (DCC) has evolved as a multidimensional construct that goes beyond technological proficiency to encompass social, cognitive, and ethical dimensions of digital engagement. Early theoretical roots stem from Hymes' (1972) Communicative Competence Theory, which emphasized not only linguistic ability but also the capacity to use language appropriately within cultural and social contexts. This framework later expanded into the digital domain, where scholars such as Editors et al. (2013) and Ilomäki et al. (2016) conceptualized DCC as an integration of digital literacy, media awareness, and interpersonal communication skills mediated by technology. The European Digital Competence Framework (DigComp 2.2) further defines DCC as a combination of knowledge, skills, and attitudes that enable responsible participation in online environments (Carretero et al., 2017). Within this framework, communication competence is positioned as both a technical and ethical construct that requiring individuals to engage critically, collaborate safely, and manage digital identity effectively. This theoretical expansion underscores that in the era of social media, communication competence entails not merely "using" technology but "understanding, interpreting, and co-creating" meaning through it.

Empirical research from Western and Asian contexts has affirmed the critical role of DCC in shaping adolescents' online behavior and psychological well-being. For instance, Livingstone et al. (2018) found that adolescents with higher levels of digital literacy demonstrate better judgment when encountering misinformation and lower vulnerability to online manipulation. Hatlevik and Christophersen (2013) reported that students' self-efficacy in digital communication strongly correlates with their ability to regulate online emotions and engage in constructive discourse. Similarly, Pangrazio and Sefton-Green (2021) argue that critical digital literacy must include reflexive practices the ability to recognize one's role as both consumer and producer of digital content. In East Asian contexts, Boonwattanopas (2025) observed that structured school-based media literacy programs

enhance students' awareness of cyber ethics and empathy, highlighting the social dimension of DCC. However, despite these advancements, several studies note that global research often overemphasizes the technical aspects of digital competence, neglecting the communicative and affective skills essential for relational well-being in online settings (Campbell & Coker, 2025; Ilomäki et al., 2016).

Emotional Resilience as a Mediator of Psychological Well-Being

The concept of emotional resilience originally rooted in developmental and positive psychology, has gained renewed theoretical significance in understanding adolescents' adaptation to digital challenges. According to Masten (2014), resilience is "ordinary magic," referring to the normative human capacity to adapt successfully to adversity through protective processes. In communication and media studies, this concept aligns with Lazarus and Folkman (1984) Transactional Model of Stress and Coping, which explains that individuals interpret digital stressors such as cyberbullying, exclusion, or misinformation through cognitive appraisal and subsequently employ coping responses that are influenced by both personal capacities and social support systems. The emergence of social media amplifies this process, as adolescents' experiences of connection, comparison, and validation continuously affect their emotional regulation. The Broaden-and-Build Theory of Positive Emotions from Fredrickson (2004) also provides an interpretive foundation, suggesting that positive emotional experiences in digital environments such as supportive interactions and online empathy can broaden cognitive flexibility and build enduring psychological resources. Thus, emotional resilience in the digital era represents not merely a personality trait but a communicative capacity involving reflection, regulation, and relational negotiation within online spaces.

Empirical evidence strongly supports the role of emotional resilience in mediating the psychological effects of social media use. In Western literature, Best et al. (2014) found that adolescents who possess adaptive coping mechanisms experience less emotional distress and are more capable of transforming online adversity into social learning. Kang et al. (2025) observed that social media engagement can enhance social connectedness and empathy when mediated by emotional awareness and self-reflection. Meanwhile, Valkenburg et al. (2022) introduced Differential Susceptibility to Media Effects Model (DSMM), which explains how individual dispositions (self-esteem emotional maturity) and social contexts (parental mediation, peer norms) determine whether social media exposure yields positive or negative outcomes. Similarly, Chen et al. (2024) demonstrated that resilience moderates the relationship between problematic internet use and depressive symptoms, highlighting the buffering effect of emotional competence. Beyond the individual level, Livingstone et al. (2018) emphasized that collective resilience built through peer networks and parental guidance enhances adolescents' capacity to navigate the emotional volatility of digital spaces. However, most of these studies are cross-sectional, focusing primarily on Western cultural contexts, and therefore lack longitudinal evidence of resilience development in diverse sociocultural settings.

Social Media Literacy Interventions and Behavioral Transformation

Social media literacy interventions represent the practical application of digital communication and emotional resilience theories within structured behavioral frameworks. Drawing from Bandura's (1986) Social Cognitive Theory, these interventions emphasize observational learning and reciprocal determinism the idea that personal factors, environmental stimuli, and behavioral outcomes influence one another dynamically. In digital contexts, adolescents' model behaviors observed online, internalize social norms, and reproduce them across their social media interactions. Therefore, social media literacy interventions aim to reconstruct these learning cycles by embedding reflective, critical, and

empathic practices into adolescents' online routines. According to Uri and Hobbs (2020), literacy interventions grounded in critical pedagogy enable young users to challenge power structures, algorithmic manipulation, and persuasive communication online. Similarly, Livingstone et al. (2025) argue that effective interventions must integrate not only technical media training but also ethical and emotional learning to cultivate critical participation rather than passive consumption.

Empirical studies show strong evidence of the effectiveness of such interventions in improving adolescents' digital behavior and well-being. For instance, Lei et al. (2019) found that social media campaigns focusing on digital empathy and cyber-kindness significantly reduced instances of online aggression. Vaquero et al. (2025) demonstrated that arts-based digital programs foster creativity and emotional regulation, serving as therapeutic and educational tools simultaneously. Likewise, Ayesha et al. (2025) showed that influencer-led interventions promoting healthy body image achieved higher engagement and self-acceptance among adolescent girls, indicating that credibility and relatability enhance message impact. In Asian contexts, Lee (2010) highlighted that peer-to-peer media education improved moral reasoning and critical thinking, while Lwin et al. (2021) in Singapore emphasized the role of parental mediation in sustaining behavioral transformation. However, a recurring limitation in these studies is the short-term nature of outcomes many interventions produce temporary attitude shifts but fail to track longitudinal changes in emotional resilience, media habits, and psychosocial adaptation. This limitation underscores the need for sustained theory-driven evaluation models that integrate behavioral analytics and emotional intelligence metrics into program design.

Emerging Gaps in Regional Digital Well-Being Research

In the Malaysian and Southeast Asian context, the discourse on digital communication competence and emotional resilience among preadolescents remains fragmented and underdeveloped. Although initiatives such as Malaysia's Digital Education Policy (2021–2025) emphasize technology integration, most school-based digital literacy programs continue to focus narrowly on ICT skills rather than the communicative, ethical, and psychological dimensions of online engagement (Hamzah et al., 2023; Pauh et al., 2025). Empirical evidence on how preadolescents construct meaning, identity, and emotional safety within social media environments is still limited, reflecting a lack of contextually grounded frameworks that integrate communication competence with psychological resilience. While international models such as DigComp and the 21st Century Skills Framework (Carretero et al., 2017) have advanced global standards for digital literacy, their adaptation to collectivist cultures in Southeast Asia, where relational and moral values are central, remains minimal. Research on digital emotional resilience in Malaysia is also relatively small-scale and often conflated with general discussions of adolescent mental health. Existing studies reveal that young users face increasing digital stressors, including cyberbullying, online shaming, and social comparison (Azeqa & Abdullah, 2024; Kunhao et al., 2024), yet few interventions explicitly cultivate resilience as a communication skill. Although Malaysia's National Mental Health Strategic Plan (2020–2025) acknowledges the importance of emotional well-being, it lacks detailed guidelines for embedding resilience into digital education. Regional examples such as Singapore's Digital for Life and South Korea's Smart Media Education Policy demonstrate how emotional literacy and resilience can be systematically integrated into national curriculum. Furthermore, research on social media literacy interventions in Malaysia remains in its infancy, with most efforts limited to awareness campaigns that lack theoretical and evaluative rigor (Mohammad et al., 2025; Lim et al., 2024).

Material and Methods

Identification

In this study, key steps of the systematic review process were utilized to gather a substantial amount of relevant literature. The process began with the selection of keywords, followed by searching for related terms using dictionaries, thesauri, encyclopedias, and prior research. All relevant terms were identified, and search strings were created for the Web of Science, and Scopus databases (refer to Table 1). This initial phase of the systematic review yielded 882 publications pertinent to the study topic from the two databases.

Table 1: The Search String

Scopus	TITLE-ABS-KEY (("social media" OR "social networking sites" OR "social networks" OR "online platforms" OR "digital media" OR "virtual communities" OR "internet use" OR "interactive media" OR "online communication" OR "media technology") AND ("psychological well-being" OR "mental health" OR "psychological resilience" OR "mental wellness") AND ("preadolescents" OR "early adolescents" OR "tweens" OR "young adolescents" OR "children" OR "middle childhood" OR "school-aged children") AND ("communication" OR "information exchange" OR "message delivery" OR "social interaction" OR "digital communication" OR "discourse" OR "interpersonal communication" OR "media communication")) AND (LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2024) OR LIMIT-TO (PUBYEAR , 2025)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ARTS") OR LIMIT-TO (SUBJAREA , "PSYC")) Date of Access: Nov 2025
WOS	("social media" OR "social networking sites" OR "social networks" OR "online platforms" OR "digital media" OR "virtual communities" OR "internet use" OR "interactive media" OR "online communication" OR "media technology") AND ("psychological well-being" OR "mental health" OR "psychological resilience" OR "mental wellness") AND ("preadolescents" OR "early adolescents" OR "tweens" Date of Access: Nov 2025

Screening

During the screening phase, potentially relevant research items were assessed to ensure alignment with the predefined research questions. This step involved selecting studies based on the implementation and theoretical approach of social media literacy interventions that promote digital communication competence and emotional resilience among preadolescents. Duplicate records were removed at this stage. Initially, 772 publications were excluded, leaving 110 articles for further evaluation according to the established inclusion and exclusion criteria (see Table 2). The first inclusion criterion focused on scholarly literature, as it serves as the primary source of empirical and theoretical insights, including reviews, meta-syntheses, meta-analyses, books, book series, chapters, and conference proceedings not covered in recent studies. The review was restricted to English-language publications published between 2023 until 2025 to ensure the inclusion of contemporary and relevant evidence. Overall, 16 publications were excluded due to duplication before proceeding to the eligibility stage.

Table 2: The Selection Criterion Is Searching

Criterion	Inclusion	Exclusion
Timeline	2023- 2025	<2023
Document Type	Article	Non-Article
Source Type	Journal	Conference, Book, Review, Conference Proceeding
Language	English	Other Language
Subject area	Psychology, social sciences, art and humanities	Others

Table 3: The Quantity And Information Regarding The Database Of Primary Studies (Pss)

No.	Author	Title	Year	Scopus	WoS
1	Gallemit & Mordeno (2025)	Prevalence and risk factors of common mental health symptoms among left-behind emerging adult children amid the COVID-19 pandemic	2025	/	
2	Cohn-Schwartz et al (2025)	Sexual Orientation and Internalized Homophobia of Middle Aged and Older Gay and Lesbian Adults: The Role of Social Relationships	2025	/	
3	la Rose & Mule (2025)	Behind closed doors: Sousveillance in mandated social welfare interventions	2025	/	
4	Bourke-Taylor et al (2025)	Health, Wellbeing and Empowerment E-workshops for Mothers of Children with Disabilities: A Non-randomised Comparison Study	2025	/	
5	Chen et al (2025)	Effectiveness of digital game-based GISSC program on cyberbullying prevention among Chinese adolescents	2025	/	
6	Meiksin et al (2025)	Social norms relating to gender and dating and relationship violence in English secondary schools: Exploring student, staff and parent/carer accounts	2025	/	
7	Mader et al (2025)	The effect of social media use on adolescents' subjective well-being: Longitudinal evidence from Switzerland	2025	/	
8	Nevard et al (2025)	Socially Oriented Approaches To Working with Children of Parents with Severe and Enduring Mental Illness: Expert Perspectives	2025	/	
9	Goksal et al (2025)	District Functional Unit for Adolescents 2022: a pilot project in Italy to detect mental health strengths and difficulties among youth	2025	/	
10	Rečka et al (2025)	Challenges of Adolescents in War: a Report from Ukraine's Frontline Territories; Виклики підлітків на війні: репортаж з прифронтових територій України	2025	/	
11	Tarantino et al (2024)	"We followed their lead": Exploring relational change and support among caregivers of transgender and gender diverse youth	2024	/	
12	Wefers et al (2024)	Understanding and Deterring Online Child Grooming: A Qualitative Study	2024	/	
13	Zhang et al (2024)	Mediation and interaction of problematic internet use in the relationship between sexual minority status and depressive symptoms: Gender-based analysis	2024	/	
14	Becker et al (2024)	Digital Media-related Problems Contributing to Psychiatric Hospitalizations Among Children and Adolescents Before and After the Onset of the COVID-19 Pandemic	2024	/	



15	Gajalakshmi & Meenakshi, (2023)	Understanding the psycho-social problems of vulnerable adolescent girls and effect of intervention through life skill training	2023	/
16	Mukherjee & Beresford (2023)	Factors influencing the mental health of autistic children and teenagers: Parents' observations and experiences	2023	/
17	Stabler et al (2023)	'I probably wouldn't want to talk about anything too personal': A qualitative exploration of how issues of privacy, confidentiality and surveillance in the home impact on access and engagement with online services and spaces for care-experienced young people	2023	/
18	Satchell et al (2023)	Examining How Regular Users of Marijuana Communicate with Their Children About Marijuana Use: Lessons Learned from Facebook and Instagram Recruitment	2023	/
19	Ma & Sheng (2023)	Internet use time and mental health among rural adolescents in China: A longitudinal study	2023	/
20	Curtin et al (2023)	Assessing parent interaction with deaf infants: A quantitative survey of UK professional practice	2023	/
21	McDonald et al (2023)	'She didn't know how to go back': School attendance problems in the context of the COVID-19 pandemic—A multiple stakeholder qualitative study with parents and professionals	2023	/
22	Becker et al (2024)	Digital Media-related Problems Contributing to Psychiatric Hospitalizations Among Children and Adolescents Before and After the Onset of the COVID-19 Pandemic	2024	/
23	Rodman et al (2024)	Within-Person Fluctuations in Objective Smartphone Use and Emotional Processes During Adolescence: An Intensive Longitudinal Study	2024	/
24	Vaquero et al (2025)	Studying the effects of digital arts-based interventions on teenagers' social media usage, brain connectivity, and mental health: study protocol of the SMART project	2025	/
25	Satchell et al (2023)	Examining How Regular Users of Marijuana Communicate with Their Children About Marijuana Use: Lessons Learned from Facebook and Instagram Recruitment	2023	/



26	Paraskeva et al (2024)	An exploration of having social media influencers deliver a first-line digital intervention to improve body image among adolescent girls: A qualitative study	2024	/
27	Tamplain et al (2023)	#DCD/Dyspraxia in Real Life: Twitter Users' Unprompted Expression of Experiences With Motor Differences	2023	/
28	Tan et al (2025)	Is ostracism deadly? The relationship between different types of ostracism and adolescent suicide	2025	/
29	Christensen et al (2025)	Digital maturity of young people - unfolding dependencies between core dimensions and national context as external factor by using a machine-learning approach	2025	/
30	Gilmore et al (2024)	Building Community and Identity Online: A Content Analysis of Highly Viewed #Autism TikTok Videos	2024	/

Eligibility

In the third stage, referred to as the eligibility phase, a total of 94 articles were shortlisted for detailed assessment. At this stage, the titles, abstracts, and key content of each article were critically reviewed to ensure that they met the established inclusion criteria. Each article was examined to verify its methodological rigor, relevance to the research focus, and empirical foundation. Subsequently, 63 studies were excluded as they did not meet the eligibility standards. The reasons for exclusion included being outside the research domain, titles or abstracts lacking direct relevance to the study objectives, or the absence of full-text access supported by empirical evidence. Following this rigorous screening, 31 primary studies were retained for comprehensive analysis and thematic synthesis in the final review stage.

Data Abstraction and Analysis

An integrative analytical approach was employed in this study to examine and synthesize findings across diverse research designs, including both qualitative and quantitative studies. The primary objective of this phase was to identify key themes and subthemes related to digital communication competence, emotional resilience, and social media literacy interventions among preadolescents. Data abstraction began with a systematic extraction of relevant information from the 31 selected studies, focusing on study aims, methodologies, participant characteristics, intervention strategies, and major findings. As illustrated in Figure 1, each article was meticulously reviewed to identify statements, evidence, or discussions aligned with the study's conceptual focus. The authors collaboratively analyzed and coded the extracted data to develop initial categories, which were subsequently refined into higher-order themes through iterative discussion and comparison.

To ensure analytical rigor, a detailed audit log was maintained throughout the process, recording analytical decisions, interpretive insights, and reflections relevant to data interpretation. Any discrepancies in thematic coding or interpretation were resolved through discussion among the research team until consensus was achieved. The thematic synthesis produced three major clusters (1) Digital Communication Competence and Literacy Development, (2) Emotional and Psychological Resilience among Adolescents, and (3) Social Media Interventions and Behavioral Outcomes. The reliability and validity of the thematic framework were further strengthened through expert review involving three experts, two from media and communication and one from adolescent psychology. These experts evaluated the clarity, coherence, and domain relevance of each subtheme. Their feedback informed final adjustments to ensure conceptual consistency and analytical validity.

The final phase of synthesis addressed the two central research questions guiding this review:

1. How do existing social media literacy interventions enhance digital communication competence among preadolescents, and what specific communicative, cognitive, and ethical skills are emphasized across these programs?
2. In what ways do social media literacy interventions foster emotional resilience and positive behavioral transformation among preadolescents, and what theoretical or contextual factors influence their effectiveness?

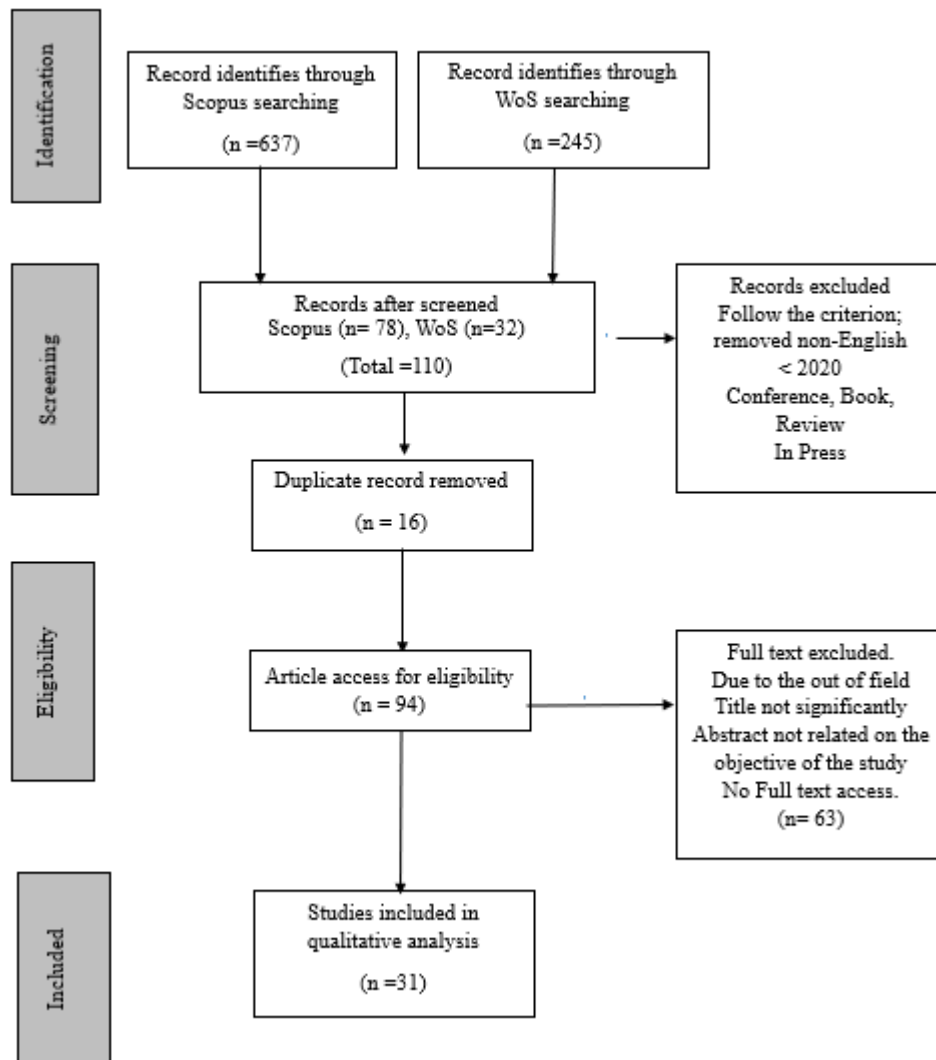


Figure 1: Flow Diagram of the Proposed Searching Study

Result and Finding

Digital Communication Competence and Literacy Development

The main output of studies under Theme 1 emphasizes how digital communication competence and social media literacy function as essential protective factors for preadolescents navigating an increasingly complex online environment. Across the analyzed abstracts, including those by Bourke-Taylor et al. (2025), Chen et al., (2025), Vaquero et al. (2025), and Paraskeva et al., (2024) a consistent outcome emerges regarding the effectiveness of structured digital interventions such as e-workshops, gamified programs, and arts-based modules. These initiatives improve young users' ability to interpret, evaluate, and respond to online information critically. Beyond technical proficiency, such interventions cultivate reflective judgment, empathy, and safe online interaction. The empirical evidence highlights that communication competence is not simply a cognitive ability but an integrated psychosocial skill that connects digital expression, social responsibility, and ethical media engagement. Moreover, the studies collectively underscore the importance of school-based and parent-supported programs as key contexts for nurturing these skills, reinforcing the notion that digital literacy should be developed within a guided and participatory ecosystem rather than through isolated exposure.

Critically, the findings suggest a significant shift from access-oriented digital education to competence-based empowerment. Several studies report that digital communication competence enhances resilience against misinformation, cyberbullying, and emotional manipulation in online settings. For instance, Chen et al. (2025) show that a digital game-based GISCC program increases engagement and retention of safety knowledge, while Paraskeva et al. (2024) highlight the role of influencers as relatable agents in promoting positive body image and self-regulation. These insights reveal that successful literacy interventions must evoke emotional engagement and contextual relevance to sustain behavioral change. However, a key limitation identified across studies is the uneven digital readiness among educators and parents, which risks widening the competency gap. This finding indicates a need for coordinated multi-stakeholder efforts to strengthen capacity building so that adults, institutions, and policy frameworks evolve concurrently with adolescent digital development.

From a broader interpretive perspective, the collective outputs of Theme 1 redefine digital literacy as a strategic form of communication defense that supports psychological safety in the digital age. The studies demonstrate that communication competence in online contexts goes beyond functional technology use and instead involves cultivating discernment, empathy, and critical dialogue. By embedding emotional intelligence into literacy frameworks, these interventions bridge the gap between technological skill and human sensitivity. Consequently, the comprehensive outcome of this thematic cluster represents the conceptual advancement of digital literacy as a holistic construct that strengthens both cognitive understanding and the psychological as well as ethical resilience of preadolescents in digital ecosystems.

Emotional and Psychological Resilience among Adolescents

The primary outcome of studies under Theme 2 focuses on how emotional resilience mediates the relationship between social media use and adolescents' psychological well-being. The abstracts of studies such as Gallemmit and Mordeno (2025), Zhang et al. (2024), Tan et al. (2025), Garaigordobil (2025), and Christensen et al. (2025) collectively indicate that online interaction produces a dual effect by facilitating social connection while at the same time increasing the risks of anxiety, depression, and loneliness. A key finding across these works is that emotional resilience, which includes self-regulation, coping mechanisms, and perceived social support, serves as a moderating factor that transforms potentially harmful digital experiences into opportunities for emotional growth. The collective output therefore identifies resilience not as a fixed personal trait but as a dynamic communicative process cultivated through peer interaction, parental mediation, and supportive online communities. These studies further reveal that adolescents who can reinterpret online stressors through reflective dialogue are better able to sustain emotional equilibrium despite constant exposure to digital pressures.

The reviewed works also show that the development of emotional resilience is deeply intertwined with the communication ecology in which adolescents articulate and negotiate their online experiences. Garaigordobil (2025) demonstrates that problematic internet use and cyberbullying heighten emotional vulnerability, while effective emotional communication reduces negative impacts. Zhang et al. (2024) highlight gender-based variations in how social media influences depressive symptoms, suggesting that digital experiences are shaped by cultural and social expectations. These findings call for a re-examination of digital well-being frameworks, emphasizing that resilience cannot be achieved through technological restrictions or regulations alone. Instead, it must be nurtured through empathy, inclusion, and opportunities

for expressive autonomy. Across the studies, resilience consistently emerges through guided self-expression that enables adolescents to share emotional challenges within safe and supportive communication spaces.

Overall, the output of Theme 2 reframes emotional resilience as a communicative and relational resource rather than a purely psychological defense. The studies show that resilient adolescents do not simply withstand online adversity but transform it into social learning through conversation, reflection, and empathetic networks. The implications for both theory and practice are substantial. Digital well-being initiatives should treat resilience communication as a pedagogical foundation by integrating emotional literacy, peer empathy, and digital coping strategies into school curricula and family programs. Through such integration, digital resilience functions simultaneously as a preventive and transformative mechanism that equips adolescents to navigate the psychological complexities of social media with confidence, balance, and adaptive emotional intelligence.

Social Media Interventions and Behavioral Outcomes

The main output of studies under Theme 3 centers on the effectiveness of social media-based interventions in shaping adolescents' behavioral, cognitive, and emotional outcomes. The abstracts of studies such as Satchell et al. (2023), Mader et al. (2025), Tamplain et al. (2023), and Ma and Sheng (2023) show that social media platforms, once regarded primarily as high-risk spaces, are increasingly being utilized as tools for behavioral transformation, mental health promotion, and social skill enhancement. These interventions, which include online awareness campaigns, digital arts programs, and structured mentoring initiatives, demonstrate that platforms often associated with risk and exposure can be reimagined as spaces of empowerment. The studies collectively reveal that adolescents respond more positively to interventions delivered through familiar digital environments, particularly when these approaches combine creativity, peer modeling, and emotional reflection. The key outcome across these studies is the recognition that contextual authenticity and cultural relevance strengthen the credibility of interventions and enhance their potential for sustained behavioral change.

From a critical perspective, the reviewed studies highlight the complex relationship between algorithmic influence and intentional engagement. Paraskeva et al. (2024) demonstrate that social media influencers, when ethically engaged, can deliver meaningful interventions that promote healthy body image, digital empathy, and positive self-expression. Similarly, Mader et al. (2025) report that prolonged exposure to prosocial digital content is associated with higher levels of subjective well-being and reduced instances of online aggression. These findings emphasize that digital behavior is not merely determined by screen time but is socially constructed through communicative modeling, peer reinforcement, and reciprocal interaction. Nevertheless, a recurring issue across studies is the sustainability of behavioral outcomes. Many interventions yield temporary attitude changes without long-term validation or follow-up. This limitation underscores the importance of integrating behavioral analytics and digital literacy indicators into the design of social media interventions to ensure continuity and measurable impact.

The overall implication of Theme 3 is that social media interventions can function as transformative communicative ecosystems where learning, empathy, and identity development

intersect. The studies reposition adolescents not as passive recipients of online influence but as active co-creators of digital norms and communities. This shift in perspective recognizes that social media, when strategically harnessed, can facilitate civic participation, emotional regulation, and digital empathy concurrently. As a result, Theme 3 reframes social media from being primarily a site of behavioral risk to a platform for behavioral development and empowerment. Ultimately, the findings suggest that sustainable digital well-being among adolescents arises not through avoidance of online spaces but through mindful, participatory, and emotionally intelligent engagement within them.

Discussion and Conclusion

The synthesis of the three thematic clusters, namely Digital Communication Competence and Literacy Development, Emotional and Psychological Resilience among Adolescents, and Social Media Interventions and Behavioral Outcomes, reveals a coherent and evolving body of knowledge on how digital communication influences psychological well-being among preadolescents. Collectively, these themes demonstrate a progressive shift in research focus from understanding the risks of digital media exposure to developing empowerment-oriented frameworks that integrate communication, cognition, and emotional intelligence. The reviewed studies affirm that adolescents' engagement with digital platforms is a central determinant of social development, identity formation, and emotional stability. This synthesis underscores that digital literacy and resilience should not be treated as isolated constructs but as interdependent competencies that jointly strengthen adolescents' well-being within an increasingly networked society.

The findings highlight the importance of adopting ecological and multi-dimensional approaches that connect digital communication competence with emotional resilience. Evidence from the reviewed studies shows that participatory interventions such as game-based learning, influencer-led initiatives, and e-workshops can effectively promote positive behavioral change and digital empathy. However, most existing studies are limited by short-term designs and context-specific approaches, resulting in insufficient evidence of long-term psychological impact. Future research should move beyond assessing immediate intervention outcomes to explore how digital competencies are internalized and sustained over time. A key challenge also lies in the uneven level of digital preparedness among educators and parents, which limits the scalability of interventions. Addressing this issue requires interdisciplinary collaboration among communication scholars, psychologists, educators, and policymakers to co-develop inclusive and culturally relevant digital well-being curricula that reflect local values and socio-cultural realities.

In conclusion, the integration of digital communication competence and emotional resilience emerges as the foundation for sustainable digital well-being among preadolescents. Advancing this field requires longitudinal and mixed-method approaches, cross-cultural comparisons, and the integration of adaptive technologies such as artificial intelligence-based literacy tools and emotion-sensitive learning systems. By redefining digital literacy as a form of strategic communication defense and emotional resilience as a relational and socio-communicative skill, scholars and practitioners can contribute to a transformative model of adolescent development. This model envisions digital engagement not as a source of vulnerability but as a medium for fostering psychological growth, ethical awareness, and social empathy. Future scholarship should therefore focus on establishing empirically validated and culturally grounded

frameworks that connect communication competence, emotional resilience, and behavioral transformation to prepare preadolescents to become emotionally intelligent, ethically responsible, and socially resilient digital citizens.

Acknowledgements

The present study was funded by the Ministry of Higher Education Malaysia under the Fundamental Research Grant Scheme-Early Career Researcher (FRGS-EC-FRGS/1/2024/SS05/UPNM/02/2).

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MORAL REASONING AND ETHICAL BEHAVIOR IN MALAYSIA'S OIL AND GAS INDUSTRY: IMPLICATIONS FOR MANAGEMENT PRACTICE

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Introduction

Malaysia's oil and gas sector represents one of the most strategic economic sectors, generating significant revenue and employment while operating in an environment characterized by safety-critical operations, large financial stakes, and intense regulatory scrutiny. Personnel in this industry occupy positions where decisions carry significant ethical consequences affecting organizational reputation, environmental stewardship, and stakeholder trust. Despite the extensive corporate compliance frameworks and ethics training programs, unethical conduct persists across the sector, manifesting in forms ranging from procurement irregularities to safety protocol violations and HSE reporting discrepancies.

This study examines the moral reasoning capabilities and ethical competencies of personnel in Malaysia's upstream oil and gas sector, investigating whether higher moral reasoning corresponds with lower observed unethical behavior. Grounded in pragmatist philosophy, which emphasizes practical problem-solving and real-world applicability, this research provides a descriptive profile of personnel's ethical competencies while exploring the complex interplay between moral cognition, motivational factors, and situational influences in shaping ethical conduct.

Research Objectives

This study aims to:

- Determine the level of moral reasoning among personnel in Malaysia's oil and gas industry using the Cognitive Moral Development (CMD) framework
- Examine their perceived moral intensity regarding ethical dilemmas in operational contexts
- Assess their perceived moral potency, which is the capacity to translate moral judgment into moral action
- Identify the level of observed unethical behavior within organizational settings
- Investigate the relationship between moral reasoning and observed unethical behavior

Theoretical Framework

This study integrates multiple theoretical perspectives to understand the judgment-action gap in organizational ethics. Rest's (1986) Four-Component Model provides the foundational

framework, recognizing that moral behavior requires not only moral reasoning (cognitive capacity) but also moral sensitivity, moral motivation, and moral character. The Weber and McGivern (2010) Moral Reasoning Inventory (MRI) utilized a Cognitive Moral Development (CMD) approach that extends Kohlberg's cognitive developmental theory by integrating personal interest, normative expectations, and post-conventional principles into moral reasoning assessment.

Hannah and Avolio's (2010) concept of moral potency addresses the motivational component, encompassing moral courage, moral efficacy, and moral ownership. These are the psychological resources enabling individuals to act on moral judgments despite organizational pressures. Jones's (1991) moral intensity framework captures situational factors, recognizing that ethical decision-making is influenced by characteristics of the moral issue itself. This study focuses on two of its key dimensions, specifically magnitude of consequences and social consensus, which are particularly salient in high-stakes operational contexts characteristics of the oil and gas industry.

Methodology

This quantitative descriptive study employed validated measurement instruments to assess ethical competencies among 142 personnel from Malaysia's upstream oil and gas sector. Data were collected using a pragmatic two-pronged approach; initially during the Malaysia Oil and Gas Services Exhibition and Conference (MOGSEC 2022) using paper-based surveys distributed to trade visitors, followed by snowball sampling to reach additional industry personnel beyond the conference venue. This combined approach ensured access to a diverse cross-section of industry professionals including engineers, managers, and technical specialists.

Four validated instruments were employed:

- Moral Reasoning Inventory (MRI) by Weber and McGivern (2010) - an adapted ethical scenario with four response options representing CMD levels and measuring personal interest, normative expectations, and post-conventional principles;
- Moral Potency Questionnaire (MPQ) by Hannah and Avolio (2010) - assessing moral courage, efficacy, and ownership;
- Ethical scenario by May and Pauli (2002) paired with Singhapakdi et al.'s (1996) Moral Intensity Scale, measuring two key dimensions of moral intensity perception (Magnitude of consequence and social consensus)
- Unethical Behavior Scale adapted from Kaptein (2008) - 19-item instrument capturing observed organizational misconduct aligned with the Malaysian Anti-Corruption Commission (MACC) Act 2009. Items were selected through expert panel review and Content Validity Index (CVI) assessment.

All instruments demonstrated strong internal consistency reliability in prior validation studies (Weber & McGivern, 2010: $\alpha = .70-.80$; Hannah & Avolio, 2010: $\alpha = .92$; Singhapakdi et al. 1996 Magnitude of Consequence $\alpha = .81$, Social Consensus $\alpha = .79$; Kaptein, 2008: $\alpha = .94$).

Face and content validation procedures were conducted with both survey respondents and subject matter experts from the oil and gas industry to ensure contextual relevance. The

unethical behavior scale was adapted through expert panel assessment and CVI analysis to align with Malaysian regulatory context, specifically the MACC Act 2009, reducing the original 37-item scale to 19 contextually relevant items. Data analysis employed SPSS for descriptive statistics and Pearson correlation analysis to examine relationships between variables.

Key Findings

Descriptive results revealed notably high ethical competencies across all measured constructs. Personnel demonstrated high levels of moral reasoning ($M = 3.38$, $SD = 0.75$) on a four-point scale, indicating that most respondents reasoned at the normative expectations or post-conventional principles levels. Moral potency was similarly elevated ($M = 3.92$, $SD = 0.75$), suggesting strong confidence in their capacity to act ethically under pressure. Moral intensity perceptions were particularly high ($M = 4.43$, $SD = 1.04$ on a six-point scale), indicating important awareness of the ethical implications of workplace dilemmas. Conversely, observed unethical behavior was low ($M = 1.95$, $SD = 1.00$ on a seven-point scale), suggesting relatively ethical organizational environments.

However, correlation analysis revealed a surprising finding, there was no significant relationship between moral reasoning and observed unethical behavior, $r(142) = -0.03$, $p = .76$. This null finding challenges the assumption that higher cognitive moral development directly translates into more ethical conduct in organizational settings. The disconnect between knowing what is right and doing what is right, described as the judgment-action gap, emerged as the central finding requiring theoretical explanation.

Discussion and Implications

The absence of a significant correlation between moral reasoning and unethical behavior illuminates a critical limitation of cognition-focused ethics interventions. While personnel possess high moral reasoning capabilities, this cognitive capacity alone does not guarantee ethical action. This finding aligns with Rest's (1986) Four-Component Model, which posits that moral behavior requires the integration of multiple psychological processes beyond reasoning, including moral motivation and moral character.

The high levels of moral potency observed in this study suggest that motivational factors may serve as crucial enablers bridging the judgment-action gap. Hannah and Avolio's (2010) framework indicate that moral courage, efficacy, and ownership provide the psychological resources needed to translate moral judgment into moral action, particularly when organizational pressures create barriers to ethical conduct. Similarly, the elevated moral intensity perceptions suggest that situational factors, particularly the magnitude of consequences and social consensus, may activate or inhibit the translation of moral cognition into behavior.

For management practice, these findings carry significant implications. Traditional ethics training programs emphasizing moral reasoning development through case studies and ethical frameworks may be insufficient to drive behavioral change. Instead, organizations require integrated approaches that develop not only cognitive moral capabilities but also the motivational resources and organizational systems that enable ethical action under operational pressure. This includes:

- Leadership development programs focused on building moral courage and moral efficacy, enabling managers to act ethically despite organizational constraints
- Organizational systems that reduce barriers to ethical action, including clear reporting mechanisms, protection against retaliation, and visible consequences for ethical violations
- Ethics training that moves beyond abstract reasoning to scenario-based simulations addressing real operational dilemmas in high-stakes, time-pressured contexts
- Performance management systems that explicitly recognize and reward ethical conduct, embedding ethics into organizational incentive structures
- Continuous reinforcement of ethical standards through consistent leadership behavior and transparent decision-making processes

Conclusion

This study contributes to organizational ethics literature by empirically demonstrating that moral cognition must be supported by motivational and contextual enablers to sustain ethical behavior in high-stakes industrial settings. The judgment-action gap observed in Malaysia's oil and gas sector underscores the complexity of ethical decision-making in organizational contexts and challenges simplistic assumptions about the relationship between moral knowledge and moral conduct.

For researchers, this work highlights the importance of integrated theoretical frameworks that account for cognitive, motivational, and situational factors in understanding ethical behavior. For practitioners and policymakers, the findings indicate that effective ethics management requires comprehensive approaches addressing not only what personnel know but also their capacity and willingness to act on that knowledge within organizational realities. As Malaysia's oil and gas sector continues to navigate complex ethical challenges related to safety, environmental stewardship, and stakeholder trust, developing these integrated approaches becomes essential to organizational sustainability and social endorsement to operate.

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BUSINESS STRATEGY AND DIGITAL MARKETING AS DRIVERS OF COMPETITIVE ADVANTAGE IN LOCAL CAFÉS IN MALAYSIA

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Abstract:

Keywords: *Local cafés, Business strategy, Competitive advantage, Digital Marketing*

Introduction

The café industry in Malaysia has expanded rapidly due to lifestyle changes, urbanisation, and the rising coffee culture (Tuan Norhafizah & Che Ku Nuraini, 2024; Yahya et al., 2022). Local cafés play a significant role in the creative economy and tourism sector by offering unique cultural, social, and experiential value (Saleh et al., 2024). However, market saturation, increasing competition from international brands, and rising operational costs have made sustainability and competitive positioning more difficult for local operators (Moorthy et al., 2017). Strategic management and digital capabilities are now critical for cafés seeking long-term competitiveness. While many cafés adopt cost leadership, differentiation, or niche strategies, their success increasingly depends on aligning these strategies with digital marketing practices (Abdul Malik et al., 2024; Chaffey & Ellis-Chadwick, 2019).

Purpose of the Study

This concept paper aims to examine the relationship between business strategy and competitive advantage among local cafés in Malaysia. It proposes digital marketing as a moderating variable and integrates Porter's Generic Strategies (Porter, 1980), the Resource-Based View (RBV) (Barney, 1991), and Dynamic Capabilities Theory (Teece, 2007) to explain how digital capabilities enhance strategic effectiveness.

Literature Background

Local cafés including kopitiam and modern artisanal cafés contribute to entrepreneurship, cultural identity, and economic development (Farid, 2021). However, challenges such as high dependency on imported raw materials, labour shortages, and price-sensitive consumers affect

their competitive strength (Abdullah et al., 2024; Ab. Malik et al., 2024). Competitive advantage stems from delivering superior value or operating more efficiently (Porter, 1985).

Porter's strategies provide a clear foundation for local cafés to strengthen their market positioning in a competitive industry. Through cost leadership, cafés focus on operational efficiency by streamlining processes, controlling costs, and offering affordable menu items to attract price-sensitive customers (David et al., 2020). Meanwhile, the differentiation strategy emphasizes creating unique value through elements such as distinctive ambience, high-quality products, innovative menus, and strong branding, enabling cafés to stand out and cultivate customer loyalty. The focus strategy then targets specific niche segments such as students, working professionals, or health-conscious consumers by tailoring offerings and experiences to meet the specialised needs of these groups, thereby building deeper customer connections within the selected niche (Talib et al., 2021).

Role of Digital Marketing

Importantly, digital marketing enhances all three of Porter's strategies by improving brand visibility, strengthening customer engagement, and increasing responsiveness to market trends, allowing cafés to amplify the impact of their chosen strategic approach and sustain competitive advantage (Homburg & Wielgos, 2022; Kumar et al., 2020). Digital marketing tools such as social media, influencer partnerships, online ordering systems, and mobile applications enable cafés to build stronger connections with customers and reinforce their brand presence in the highly competitive café landscape (Chaffey & Ellis-Chadwick, 2019; Kotler et al., 2021). As a moderating variable, digital marketing strengthens strategic outcomes by supporting cost leadership through low-cost promotional activities and operational efficiency, enhancing differentiation via compelling brand storytelling and visually appealing digital content, and reinforcing focus strategies through targeted advertising and personalised engagement tailored to niche customer segments.

Underpinning theory

The theoretical foundation of this study is anchored in Porter's Generic Strategies, the RBV, and the Dynamic Capabilities Theory, which collectively explain how firms achieve and sustain competitive advantage in a changing environment. Porter's Generic Strategies outline three key strategic positions cost leadership, differentiation, and focus that firms use to compete effectively by aligning their operations with market demands (Porter, 1980). Complementing this, the RBV posits that competitive advantage arises from valuable, rare, inimitable, and non-substitutable internal resources such as brand reputation, employee skills, and technological capabilities (Barney, 1991). However, in fast-changing markets, possessing resources alone is insufficient; firms must also develop the ability to sense opportunities, seize them quickly, and reconfigure their resources in response to change. This is captured by the Dynamic Capabilities Theory, which emphasises strategic agility and adaptability as essential drivers of long-term performance (Teece, 2007). Together, these theories provide a comprehensive lens for understanding how business strategies, internal capabilities, and digital technologies interact to shape competitive advantage among local cafés in Malaysia.

Conclusion

The café sector in Malaysia must navigate an environment of digital transformation and intense competition. Strategic alignment between business strategy and digital marketing is essential for achieving sustained competitive advantage. The conceptual framework contributes to theory by integrating traditional strategy with modern digital capabilities and offers practical insights for local café operators. Future empirical research is recommended to validate the model and support strategic decision-making within Malaysia's café industry.

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RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY IN MALAYSIA

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Abstract: *This paper explores the risk management practices within the Malaysian construction industry, which is essential for the success and sustainability of construction projects. Given the sector's complexity and exposure to various risks such as fluctuating costs, labor shortages, and regulatory changes, effective risk management is crucial. The study examines how companies and contractors identify, assess, and mitigate risks, while also highlighting the challenges in implementing comprehensive risk strategies, particularly among small and medium-sized enterprises (SMEs). The paper provides insights into current practices, identifies gaps, and offers recommendations to improve risk management through better frameworks, training, and the integration of technologies like Building Information Modeling (BIM). Ultimately, enhancing risk management will help ensure the successful completion of construction projects in Malaysia.*

Keywords: *Risk Management; Construction Industry; Malaysia*

Introduction

Risk management is a crucial aspect of any construction project, given the complexity and unpredictability inherent in the industry. In Malaysia, the construction sector plays a vital role in the country's economic development, with numerous projects being undertaken annually. The construction industry is not only a significant contributor to GDP but also a major employer, providing jobs to a large workforce. The sector's dynamism, which includes residential, commercial, and infrastructural projects, is influenced by both local and global factors. However, the sector faces several challenges, including fluctuating material costs, labor shortages, regulatory changes, and unforeseen environmental factors, all of which contribute to the overall risk profile of construction projects.

Risk management involves the identification, assessment, and mitigation of risks to ensure the successful delivery of construction projects. In the Malaysian context, risks are particularly compounded due to the diverse nature of projects, ranging from high-rise buildings in urban areas to infrastructure developments in rural regions. The diversity of these projects introduces multiple risk factors, such as geological risks, political instability, and economic volatility. Therefore, the adoption of effective risk management practices becomes crucial for sustaining the sector's growth and maintaining the quality, safety, and cost-effectiveness of construction outputs.

The purpose of this paper is to examine the risk management practices employed in Malaysia's construction industry. The aim is to explore the methods used by companies and contractors to identify, assess, and mitigate risks. Risk management is a systematic process that involves anticipating potential issues, evaluating their likelihood, and determining the appropriate response strategies to prevent or minimize adverse outcomes. Additionally, this study will identify key challenges in implementing effective risk management strategies and provide recommendations for improvement. By exploring the strategies and techniques used by local construction firms, this paper hopes to offer insights into the effectiveness of current practices and propose possible enhancements for improved outcomes.

The Importance of Risk Management in Construction

The construction industry is inherently fraught with risks. The sector involves large-scale projects, often with high financial stakes, tight deadlines, and diverse stakeholder involvement, including clients, contractors, suppliers, regulatory bodies, and local communities. Risk in construction is not only an inevitable occurrence but also an integral part of project planning and execution. Risks can manifest in various forms, including financial risks, safety risks, legal risks, operational risks, and environmental risks. The consequences of not adequately managing these risks can range from project delays and cost overruns to legal disputes and damage to a company's reputation.

In Malaysia, construction projects are often large, complex, and multifaceted, meaning the potential for encountering risks is even more pronounced. These risks are further exacerbated by the fluctuating economic landscape, which influences material costs, the availability of skilled labor, and project financing. Moreover, the regulatory environment is dynamic, with changes in policies, building codes, and environmental regulations influencing how projects are managed.

Malaysia's rapid urbanization and infrastructure development have spurred numerous mega projects, such as the development of transport systems, high-rise buildings, and large-scale industrial parks. However, as the size and complexity of projects increase, so does the exposure to risk. For example, unexpected soil conditions can result in costly delays and require specialized solutions, while the volatility of construction material prices can lead to budget overruns. Additionally, safety concerns on construction sites remain a persistent issue, with accidents leading to both human and financial costs. These factors necessitate the need for a robust risk management framework to address such uncertainties.

The Evolution of Risk Management in Malaysia's Construction Sector

Historically, risk management in Malaysia's construction industry was reactive rather than proactive. Many companies relied on traditional methods of handling risks as they arose, often without structured planning or a comprehensive risk management framework. However, over the past few decades, there has been a notable shift toward more structured, proactive approaches to risk management. This shift has been driven by several factors, including the increasing complexity of construction projects, the need to maintain competitiveness, and the desire to mitigate financial and reputational risks.

In the past, risk management in the Malaysian construction sector was limited to the identification of common risks such as cost overruns, project delays, and safety issues. Contractors often used a “trial and error” approach to risk mitigation. However, with the introduction of international best practices and the growing recognition of the importance of risk management, the industry has seen the adoption of formal risk management systems. These systems focus on identifying potential risks before they materialize and developing strategies to mitigate them. Today, many construction companies in Malaysia incorporate advanced techniques such as risk assessment matrices, Monte Carlo simulations, and software tools for risk analysis.

The Malaysian government has also recognized the importance of risk management in the construction industry, and as a result, it has implemented various regulatory frameworks to guide construction practices. For instance, Malaysia's Construction Industry Development Board (CIDB) plays a pivotal role in developing standards, guidelines, and certification programs to ensure that construction projects meet required quality and safety standards. Additionally, initiatives such as the Malaysian Construction Sector Master Plan (2006-2015) and the more recent Malaysia Vision 2020 have emphasized the need for the construction industry to adopt best practices in risk management.

Despite these advancements, challenges remain. The industry still faces significant gaps in the application of risk management principles across small and medium-sized enterprises (SMEs). Many of these smaller players still lack the resources, knowledge, or infrastructure to implement comprehensive risk management processes. Moreover, while larger firms may have access to advanced risk management tools, they still face difficulties in managing the increasing complexity of mega projects and the associated risks.

Risk Types in the Malaysian Construction Industry

The risks faced by construction projects in Malaysia can be broadly categorized into several types:

1. **Financial Risks:** These involve fluctuations in costs, such as material prices, labor costs, and financing rates. Due to global supply chain disruptions and political factors, material costs can be volatile. Moreover, the availability of financing for large projects can be uncertain, especially with changes in economic conditions or government policy.
2. **Safety and Health Risks:** Safety is a critical issue on construction sites, where workers are exposed to numerous hazards. Construction sites are inherently dangerous environments, and the failure to implement adequate safety measures can lead to accidents, injuries, and fatalities. This not only jeopardizes workers' safety but also causes delays and legal consequences.
3. **Environmental Risks:** Environmental considerations are becoming increasingly significant in construction projects, especially with Malaysia's growing focus on sustainability. Risks related to climate change, environmental regulations, and resource conservation can influence project design and execution. Unexpected weather events, such as floods or prolonged droughts, can also disrupt construction schedules and raise costs.
4. **Regulatory and Legal Risks:** Changes in laws and regulations, particularly those related to zoning, environmental standards, labor laws, and building codes, can create

uncertainty in the construction process. The non-compliance with legal requirements can lead to delays, fines, or even the halting of projects.

5. **Political and Social Risks:** Malaysia's political landscape can also influence the construction industry. For example, political instability, changes in government policies, or public protests can delay or halt projects. Similarly, social factors such as community opposition to certain developments or labor strikes can affect the smooth execution of construction projects.

Objectives of the Study

The significance of risk management cannot be overstated. Without proper risk mitigation strategies, construction projects may face delays, cost overruns, and, in extreme cases, project failures. This paper, therefore, aims to highlight the importance of proactive risk management in ensuring the successful completion of construction projects in Malaysia.

The objectives of this paper are as follows:

1. To identify and categorize the types of risks most prevalent in the Malaysian construction sector.
2. To examine the current risk management practices employed by construction companies and contractors in Malaysia.
3. To assess the effectiveness of these risk management strategies and identify areas for improvement.
4. To provide recommendations for enhancing risk management practices, particularly for small and medium-sized enterprises (SMEs) in the industry.
5. To explore the role of government regulations and industry standards in shaping risk management practices in the sector.

By achieving these objectives, this study seeks to contribute valuable insights into the current state of risk management in Malaysia's construction industry and provide actionable recommendations to enhance its practices for better project outcomes.

Previous Studies

Several studies have addressed the various aspects of risk management in the construction industry, both globally and in Malaysia. According to Ahmad and Sulaiman (2016), effective risk management is critical to the success of construction projects, particularly in countries like Malaysia, where the industry is prone to significant external and internal risks. The authors note that common risks in Malaysian construction projects include financial instability, safety concerns, and legal complications arising from contract disputes.

The study by Aziz and Hafez (2019) found that the risk management process in Malaysian construction companies is often informal and inconsistent, which can lead to ineffective risk mitigation. The authors recommend the adoption of standardized risk management frameworks to improve the effectiveness of risk control measures. In their research, they highlight the use of risk registers, risk assessment matrices, and qualitative and quantitative analysis methods as essential tools for managing risk.

Another significant issue raised in previous studies is the lack of awareness and expertise in risk management among construction professionals in Malaysia. According to Sweis, Sweis, and Hammad (2020), many construction workers and contractors fail to recognize the importance of early risk identification, which often leads to poor decision-making and mismanagement during the execution phase. The researchers suggest that comprehensive training and education programs should be developed to improve risk management knowledge across the industry.

Additionally, the role of technology in risk management has been explored by several scholars. For example, Building Information Modeling (BIM) is increasingly seen as a tool that can enhance risk management by providing accurate data and simulation capabilities to identify potential risks during the design phase (Sweis et al., 2020).

Risk Management Practices in Malaysia's Construction Industry

In Malaysia, risk management practices vary significantly across the construction sector. Larger construction firms tend to adopt more formal risk management practices, often supported by structured methodologies and risk management departments. Smaller companies, however, tend to rely on more informal processes, which may lead to inconsistent risk identification and mitigation.

Risk Identification: The first step in risk management is the identification of potential risks. In Malaysia, risks are typically identified through stakeholder meetings, expert judgment, and project assessments. The construction industry in Malaysia faces several unique risks, such as political instability, regulatory changes, and environmental factors like flooding and soil erosion.

Risk Assessment: After identifying the risks, construction firms assess the likelihood and potential impact of each risk. This is usually done using qualitative methods, such as expert opinions and risk matrices, as well as quantitative approaches like probability analysis. However, research by Aziz and Hafez (2019) indicates that many firms still rely on subjective assessments, which can lead to an inaccurate understanding of the risks involved.

Risk Control and Mitigation: To mitigate risks, construction companies in Malaysia employ various strategies. These include purchasing insurance, incorporating safety measures on-site, adopting contingency planning, and developing contractual provisions to share risks with subcontractors. Some firms have also adopted technological solutions such as BIM to detect risks during the early stages of construction.

Challenges in Implementing Effective Risk Management

Although risk management has made significant progress in Malaysia's construction industry, several challenges remain in implementing effective strategies. One of the main challenges is the lack of risk management expertise, particularly among SMEs. Many smaller construction firms are unfamiliar with formal risk assessment processes, and there is a general reliance on informal or ad-hoc approaches to managing risks. Furthermore, the absence of a standardized risk management framework across the industry can lead to inconsistencies in how risks are handled.

Another challenge is the resistance to change. Construction firms, particularly established ones, may be reluctant to adopt new risk management practices due to the perceived costs of implementation and the perceived complexity of new systems. Additionally, the fragmented nature of the construction supply chain, with multiple subcontractors and suppliers involved, can complicate the coordination of risk management practices across different stakeholders.

Lastly, the fast-paced nature of construction projects often leads to a reactive rather than proactive approach to risk management. Project timelines and cost pressures may cause companies to overlook or underestimate risks, leading to problems that arise late in the project cycle.

Conclusion

Risk management is a vital component of Malaysia's construction industry, ensuring the successful delivery of projects despite the numerous uncertainties inherent in the sector. Given the complexity of construction activities, risks such as financial instability, safety hazards, environmental challenges, and regulatory changes must be effectively identified, assessed, and mitigated. While larger firms have made significant strides in implementing structured risk management practices, smaller companies still face challenges in adopting comprehensive frameworks due to resource constraints and a lack of expertise.

Despite progress in risk management, inconsistencies remain in the application of formalized approaches across the industry. The reliance on traditional, reactive methods must be replaced with proactive risk assessment tools, including risk matrices, simulations, and digital solutions like Building Information Modeling (BIM). Furthermore, regulatory bodies and industry stakeholders should collaborate to develop standardized risk management guidelines, ensuring that best practices are accessible to all construction firms, regardless of size.

Moving forward, a combination of education, technological advancements, and government policies will be essential in strengthening risk management practices. By enhancing awareness and encouraging systematic risk mitigation strategies, Malaysia's construction industry can improve project outcomes, minimize delays and cost overruns, and contribute to the sustainable growth of the sector.

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BEYOND REWARDS: UNDERSTANDING THE DRIVERS OF EMPLOYEE ENGAGEMENT IN KOLEJ POLY-TECH MARA

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Abstract: *Employee engagement is a concept that refers to the level of mental and emotional attachment an employee has to their job, team, and organization. It reflects how much employees feel owned and driven to contribute to the success of the organization. A high level of employee engagement is associated with increased productivity, performance, sales, and profitability of the organization. Therefore, this study was conducted to examine the factors that influence employee engagement among polytechnic college staff in Malaysia. The main focus of this study was to identify the relationship between **job recognition, job motivation, co-worker support, and employee engagement**. This study involved **142 respondents** from two Kolej Poly-Tech MARA (KPTM), namely in Alor Setar and Ipoh, who were selected through a **convenience sampling**. The questionnaire was used to collect data, consisting independent and dependent variables such as job recognition, job motivation, co-worker support, and employee engagement. The data were analyzed using **pearson correlation and multiple regression** to identify the strength and direction of the relationship between variables. The findings of the study show that there is a significant relationship between all independent variables and employee engagement. Overall, the results of this study provide useful insights for the management of educational institutions to devise effective strategies in increasing the level of involvement and commitment of staff to the organization.*

Keywords: *Job recognition, job motivation, co-worker support, employee engagement*

Introduction

In the era of rapid digital transformation, employee engagement is a top priority for organizations to remain competitive. The emergence of new technologies such as artificial intelligence (AI), IoT, and Big Data has transformed traditional working methods towards more automated and intelligent systems (Menon et al., 2023). These changes require employees to improve their digital skills and continuous adaptation, which can be stressful and reduce engagement levels if not well supported (Kahn, 1992). Therefore, engagement is not just physical presence, but involves the mental and emotional dedication of employees in performing tasks productively and of high quality.

Employee engagement is influenced by a variety of organizational factors including rewards, workload, autonomy, social support, and alignment with personal values (Manivannan & Sanchita, 2020). Studies show that employees who feel their efforts are valued, given career development opportunities, and enjoy a good work-life balance are more likely to show high levels of engagement (Sadilla & Wahyuningtyas, 2023; Rana & Chopra, 2019). High

engagement has been shown to reduce the intention to quit a job, improve job performance and promote positive behaviour in the workplace. In the educational environment especially, engaged employees are more proactive in improving the quality of academic services as well as contributing to the excellence of the institution.

Furthermore, peer support becomes an important element in fostering engagement, especially when adaptation to new technologies is intensive. Effective collaboration encourages skill improvement, provides a sense of belonging and strengthens positive working relationships (Griep et al., 2021). Therefore, employee engagement is a strategic aspect that needs to be given serious attention in the education sector in Malaysia. In line with this view, this study assesses three main organizational factors, namely **job recognition, job motivation and co-worker support**, which have the potential to strengthen engagement among polytechnic staff, thus ensuring better service quality and increased competitiveness of educational institutions.

Literature Review and Hypothesis

Employee Engagement

Employee engagement refers to the level of emotional attachment and active involvement of an employee to the task, colleagues, and organization as a whole (Guo & Hou, 2022). It describes a situation in which individuals are fully present in their work from physical, cognitive and emotional aspects, as well as demonstrate self-worth and authentic expression when performing tasks (Walsh & Gordon, 2008). According to Storey et al. (2008), truly engaged employees not only work with excitement, but also connect deeply with the organization so that they are able to contribute to innovative ideas and the company's progress.

Aside from mere job satisfaction, employee engagement involves a higher level of commitment where employees are driven to perform responsibilities beyond the organization's basic expectations (Mansor et al., 2023). This engagement is influenced by positive thinking, a sense of dedication and a desire to give your best in each assignment (Schaufeli et al., 2001; Gupta & Shaheen, 2017). Studies have also shown that employees who are actively involved have higher levels of loyalty, are less likely to quit their jobs voluntarily, and show extra effort for organizational success (Macey & Schneider, 2008).

Employee engagement has been proven to have a direct impact on the excellence of organizational performance, including increasing financial results, productivity as well as achieving the company's strategic objectives (Budriene & Diskiene, 2020; Chanana & Sangeeta, 2020). Factors such as psychological safety, organizational support, innovation opportunities, and work recognition were identified as important catalysts for strengthening employee engagement levels (Kahn, 1990; Al-Ruqaishi, 2017). In the context of higher education in particular, engagement is key to improving the motivation, quality of work and productivity of instructors (Hermsen & Rosser, 2008), thus ensuring the sustainability of educational service delivery at the best level.

Job Recognition

Job recognition refers to the appreciation given by an employer for the contribution and commitment of employees in an organization (Hussain et al., 2019). It not only reflects work performance, but also the loyalty and involvement of employees in performing tasks (Smith, 2014). A study conducted by Harvard Business School also shows that a positive relationship and a sense of comfort between employers and employees can be formed through a consistent appreciation of employees' efforts (Marcellus, 2021). Therefore, work recognition is an important factor in building a work culture that supports employees' internal well-being and motivation.

Employees who receive proper recognition tend to show higher levels of performance because they feel their efforts are valued and recognized (Hussain et al., 2019). Additionally, work recognition associated with positive feedback has been found to increase motivation to overcome performance expectations (Short, 2016). In the same context, Baqir et al. (2020) emphasize that recognition is more effective than material rewards in increasing employee productivity and engagement, as recognition can foster stronger emotional connections between employees and organizations.

Accordingly, when employees feel valued through consistent recognition, they are more likely to be actively engaged, have a high sense of belonging and remain loyal to the organization (Shonubi et al., 2016). In the education sector in particular, recognition to instructors has been shown to increase their commitment and efforts in delivering their duties with excellence (Bialopotocki, 2006). Based on the theory and findings of past studies, this study forms the following hypothesis:

H1: *There is a significant positive relationship between job recognition and employee engagement.*

Job Motivation

Motivation refers to the internal or external impulses that make a person act and work with a specific purpose. From a management perspective, motivation is a catalyst for employees to behave in a way that provides value to the organization (Tohidi & Jabbari, 2012). Dawson (1986) also points out that motivation is the main driver that determines the willingness of employees to put in more effort to achieve a set goal. This motivation in turn influences a person's energy, direction and focus on the task performed, thus determining the efficiency and effectiveness of work performance (Baron, 1991 in Brooks, 2007).

Conceptually, motivation can be divided into two main forms, namely intrinsic motivation and extrinsic motivation. Intrinsic motivation arises from a person's deep interest in a job that provides inner satisfaction such as a sense of pleasure and self-achievement (Engidaw, 2021). On the other hand, extrinsic motivation relies on external rewards such as pay, incentives, and recognition received as a result of performing tasks (Legault, 2016). Therefore, organizations need to understand the balance between these two forms of motivation so that employees continue to be motivated to perform optimally.

High motivation has been shown to play an important role in shaping employee engagement, especially in terms of their willingness to put in extra effort and stay focused on organizational goals (Jain et al., 2019; Mariza, 2016). Motivated employees are not only more productive, but also show a stronger commitment to organizational success (Baah, 2010). Based on the theoretical arguments and findings of the past study, this study proposes the following hypothesis:

H2: There is a significant positive relationship between job motivation and employee engagement.

Co-worker Support

Co-worker support refers to the social assistance that employees provide to their colleagues in performing tasks, either through the sharing of skills, knowledge, or coaching in the workplace (Wright, 2009; Zhou & George, 2001). Positive interactions such as empathy, trust, appreciation, and respect also form the dimensions of effective co-worker support (Lowe, 2019). Previous research has shown that co-worker support can reduce employee stress and potential dropouts while increasing their engagement with the organization (Ludwig-Hardman & Dunlap, 2003; Sinclair, 2017).

In addition, co-worker support plays an important function as a medium of social development in the workplace that can accelerate the process of employee adaptation as well as increase the effectiveness of collaborative work delivery (Ng & Sorensen, 2008). This kind of support is more meaningful for new hires because they will have an easier time understanding the organization's work culture through immediate feedback and mentorship from colleagues. This situation not only fosters employee confidence, but also increases the likelihood that they will be actively involved in the assigned task.

Positive working relationships between colleagues have the potential to foster emotional engagement and employee commitment in the organization at a higher level, sometimes providing a stronger influence than supervisory support (Williams, 2021; Chen, 2018). Therefore, a work environment that emphasizes collaboration and social support can shape employees who are more engaged, motivated and positive about their roles. Based on this discussion, the following hypothesis is proposed:

H3: There is a significant positive relationship between co-worker support and employee engagement.

Maslow's Hierarchy of Needs

Maslow's Hierarchy of Needs Theory states that employees will only show high motivation and commitment when their needs at each stage are progressively met (Maslow in Kaur, 2013). In the context of **job motivation**, factors such as salary, job stability, and job security meet physiological and safety requirements, the two most basic levels in Maslow's pyramid. When these needs are met, employees are better prepared to put extra energy, focus, and effort into a given task. This supports the theoretical findings that strong motivation will increase employee engagement in the organization.

Next, **job recognition** is closely related to the need for self-esteem in Maslow's theory. When employees are valued and given positive feedback for their efforts, they gain a sense of competence, social respect, and self-achievement. This situation not only boosts confidence but also encourages employees to stay engaged in performing tasks proactively. Therefore, recognition becomes an important non-financial strategy to maintain a high level of employee engagement.

At the same time, **the co-worker support of colleagues** is at the level of belonging needs, as employees need positive social connections to feel accepted in the organization. Harmonious interaction between colleagues forms a sense of belonging, emotional support and psychological security that is indispensable in a modern technology-based work environment. When employees feel themselves part of a mutually helpful work community, their engagement increases significantly. Thus, Maslow's theory can support the understanding that a combination of these three factors, job recognition, job motivation, and co-worker support, can strengthen employee engagement across the board.

Methodology

This study used a **quantitative approach** to assess the relationship between three independent variables, namely job recognition, job motivation and co-worker support, and the dependent variable, employee engagement. The selection of a quantitative approach is in line with the objective of the study which requires empirical testing to confirm the strength of the relationship between variables in the context of social science and management. The unit of analysis for this study is **individual**, i.e. each respondent represents one unit of data.

The study population included **215 staff** of Kolej Poly-Tech MARA (KPTM) in Alor Setar and Ipoh. Based on simple sampling techniques, a total of **142 valid responses** were obtained for analysis. This sample size is sufficient and meets the sample determination guidelines by Krejcie and Morgan (1970). The questionnaire instrument used consists of five sections covering demographic information as well as four main constructs. All items were adapted from a valid scale and widely used in previous studies, as well as measured using a five-point Likert scale (1 = Strongly Agree to 5 = Strongly Agree).

For the study construct measurement, employee engagement was measured using **21 items** adapted from Rutledge (2015). Job recognition was measured using **4 items** by De Beer (1987), while job motivation was measured through **12 items** by Gagné et al. (2010). Additionally, co-worker support was measured using **14 items** by Tews et al. (2013). The questionnaire was distributed online to facilitate respondents' access and speed up the data collection process.

Data were analyzed using **Statistical Package for Social Sciences (SPSS) software version 24**. Descriptive analysis was used to describe the demographic profile of respondents. Next, the relationship between variables was studied through **Pearson Correlation** and **Multiple Linear Regression** to determine the strength and significance of the relationship between work recognition, work motivation, peer support and employee engagement.

Findings

Table 1 indicates that two of the independent variables, **job motivation** and **job recognition**, demonstrated **strong positive correlations** with employee engagement, with correlation values of $r = 0.761$ and $r = 0.721$ respectively. Meanwhile, **co-worker support** recorded a **moderate positive correlation** with employee engagement ($r = 0.686$). Although one variable showed only a moderate relationship, all independent variables were found to have favourable and statistically meaningful associations with employee engagement, suggesting their importance as contributing factors in enhancing employees' involvement at work.

Table 1: Results of Pearson Correlation Analysis

Variables	EE	JR	JM	WE	CS
Employee Engagement (EE)	1				
Job Recognition (JR)	0.721**	1			
Job Motivation (JM)	0.761**	0.575**	1		
Co-worker support (CS)	0.686*	0.633**	0.683**	0.701**	1

The aforementioned Table 2 indicates that there is a positive significant relationship between job recognition and employee engagement ($\beta = 0.289$, $p < 0.05$), and between job motivation and employee engagement ($\beta = 0.340$, $p < 0.05$). Hence, H1 and H2 are accepted. Support from co-workers does not appear to be related with employee engagement, thus H3 is rejected.

Table 2: Findings of Multiple Regression Analysis

Variables	Standardized Coefficient Beta	t	Sig.
(Constant)		2.590	0.011
Job Recognition	0.289	4.705	0.000
Job Motivation	0.340	5.077	0.000
Work Environment	0.299	4.147	0.000

Dependent variable: Employee Engagement

Discussions

This study proves that job recognition and job motivation have a strong positive relationship with employee engagement, based on a significant correlation value at the $p < 0.01$ level. For work recognition, the Pearson value $r = 0.721$ indicates a substantial relationship with employee engagement, supported by regression results ($p = 0.000$) which confirm that work recognition significantly influences engagement. These findings show that when employees receive appreciation for their efforts, they will be more motivated to perform highly and exhibit

innovative and proactive work behaviors (Mufeed & Showkat, 2018). In fact, employers who consistently adopt recognition systems have the potential to improve a positive work environment and strengthen employee retention rates (Mngomezulu et al., 2015; Brown & Dugas, 2008).

In addition, job motivation emerged as the most dominant factor in influencing worker engagement, with the highest correlation coefficient ($r = 0.761$, $p < 0.01$) as well as strong beta values in multiple regression analysis ($\beta = 0.367$, $p < 0.05$). These results are in line with previous research that found that motivation can increase employees' extra effort, commitment, and focus in achieving organizational goals (Engidaw, 2021; Mariza, 2016). When employees' needs are met through incentives, career support, or an encouraging work environment, they tend to be more engaged and contribute optimally to the success of the organization (Varma, 2017; Sulaiman et al., 2022).

In contrast, co-worker support showed a moderate association with employee engagement via Pearson correlation ($r = 0.686$, $p < 0.01$), however regression analysis showed no significant influence ($\beta = 0.068$, $p = 0.348$). These findings suggest that social support from colleagues is not necessarily the main driver of engagement for employees in the study sample, the majority of whom are older and have served longer, perhaps because they are now more focused on rewards and career progression than social support. Despite this, other literature still asserts that co-worker support is still important as a facilitator of engagement in the context of young worker groups or specific industries (Ahmed et al., 2018). Therefore, this factor cannot be completely ruled out as a supporting element in increasing employee involvement.

Implications of Study

This study makes a significant theoretical contribution to the literature on employee engagement in the context of private higher education in Malaysia. The findings of the study confirm that job recognition and job motivation are factors that have a positive and significant relationship with employee engagement. These findings support Kahn's (1990) model of engagement psychology as well as Maslow's Hierarchy of Needs, in which the need for self-esteem, security, and self-actualization are the main drivers of engagement at work. Indirectly, this study expands the understanding that the formation of engagement does not rely on a single factor but is the result of a combination of emotional elements, appreciation and organizational support.

Practically, private higher education institutions need to pay serious attention to strategies to increase employee engagement to ensure that the teaching staff remains motivated, loyal and productive. To increase job motivation which is identified as the most dominant factor, management needs to provide holistic rewards including financial incentives, academic performance rewards, career development opportunities as well as technology-based learning support. In addition, a conducive and efficient work environment also plays an important role in supporting the effectiveness of teaching, especially in the era of digital education which requires complete facilities, technical support and comfortable workspaces to reduce stress and fatigue.

At the same time, consistent recognition of work not only increases the sense of appreciation but also strengthens the psychological relationship of employees with the organization, thus improving the retention of quality staff and the overall performance of the institution. Although peer support shows moderate and insignificant influence on regression models, it is still needed to promote academic collaboration and professional learning community practices in the workplace. Therefore, it is important for organizations to adopt a balanced approach to human resource management such as prioritizing welfare, growth, and appreciation, to ensure a high level of employee engagement in the long run.

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THE MOTIVATION BEHIND THE BADGE: UNCOVERING THE KEYS TO JOB SATISFACTION AMONG MALAYSIAN POLICE OFFICERS

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Abstract: *Job satisfaction is an important factor in ensuring the survival and effectiveness of an organization. It has a direct impact on an employee's performance, productivity, and level of commitment to the organization. This study was conducted to assess the level of job satisfaction among Malaysia police officers and to identify the relationship between factors that affect job satisfaction. Specifically, this study examined the relationship between several factors such as salary, benefits, and promotion opportunity with the job satisfaction. This study used a quantitative approach through a questionnaire distributed to 350 respondents from among police officers in Melaka. The data obtained were analysed to identify the level of job satisfaction as well as the strength of the relationship between the variables studied. The findings of the study showed that the three independent factors had a significant and positive relationship on job satisfaction. This proves that financial and non-financial reward aspects, as well as career prospects play an important role in shaping a high level of job satisfaction. The results of this study are expected to be used as a guide for the top management of the Royal Malaysia Police (RMP) and policymakers in devising more effective improvement strategies to increase the level of job satisfaction of members. Increased job satisfaction can not only increase individual commitment and performance, but also contribute to the overall efficiency of the organization in carrying out the responsibility of maintaining public safety and order.*

Keywords: *Job Satisfaction, Salary, Benefits, Promotion Opportunity*

Introduction

In the era of globalization and increasingly intense organizational competition, employee job satisfaction is a very important aspect in ensuring the success of an organization. Nowadays, an organization that wants to ensure customer satisfaction must first ensure that its employees are satisfied with their work. This is because job satisfaction is the foundation for the formation of quality employees, a positive work environment, and a healthy work culture. According to Chan (2015), job satisfaction refers to a person's level of self-motivation, internal satisfaction, and positive feelings towards his or her career. Employees who feel job stable, have career advancement opportunities, and are able to balance work and personal life typically achieve higher levels of job satisfaction. According to Rothenberg et al. (2017), job satisfaction has a positive influence on employee behavior, leading to increased performance, commitment, loyalty, and engagement. On the other hand, a low job satisfaction rate can lead to an increase in absenteeism rates, work stress, as well as a decrease in morale and discipline.

The issue of job satisfaction among members of the Royal Malaysian Police (RMP) has become increasingly evident as reports show an increase in disciplinary actions and complaints against the agency. For example, a total of **1,404 officers** have been subject to disciplinary action by 2024, including **164 fired**, but the perception of corruption is still a concern (Malay Mail, 2025). In addition, According to the latest data from the Malaysian Anti-Corruption Commission (MACC) (2025) in the 2023 Annual Report, a total of 1,026 corruption investigation papers were opened in 2023, an increase of 25.1% compared to 820 cases in 2022. Furthermore, the Public Complaints Management System (SISPAA) recorded 10,020 complaints in 2023 and increased to 12,958 complaints in the January–June 2024 period (The Sun, 2025). This situation shows that the issue of complaints against the public service, including enforcement organisations such as the RMP, remains critical. A study on the integrity of the RMP stated that the enforcement sector recorded a relatively high rate of complaints and investigations among government agencies (Yahya et al, 2024).

The decline in the level of public trust in the RMP is also coloured by the perception that the performance and integrity of the members do not meet the expectations of the public. There is a tendency that job dissatisfaction among RMP members can contribute to decreased performance, increased public complaints and officer misconduct. Therefore, human resource management in the RMP needs to address organizational factors such as rewards, career opportunities and work environment in an effort to increase job satisfaction and at the same time strengthen the image and effectiveness of the agency in carrying out its duties.

This situation erodes public trust in the RMP as a law enforcement agency and reinforces the perception that job dissatisfaction among members can have a negative impact on performance and integrity. To address these challenges, the RMP has introduced several welfare initiatives such as childcare centres, salary increases and additional benefits as well as promotion opportunities. Despite this, there is a perception among members that the remuneration received is not commensurate with the current workload and stress. This situation is associated with an increase in cases of misconduct, integrity and poor performance which ultimately affects the image of the organization. In the context of employee engagement, previous studies have shown that low job satisfaction is associated with poor job performance, low organizational commitment as well as high absenteeism rates (Yahya et al, 2024). Looking at the current evidence and disciplinary reports, it is clear that organisational factors such as work culture, rewards, career opportunities and supervision need to be addressed systematically so that the level of job satisfaction of PDRM members can be strengthened. Therefore, PDRM management needs to pay serious attention to these factors in an effort to increase the level of job satisfaction of members. Improving job satisfaction can not only strengthen the performance and integrity of members, but also reduce the rate of misconduct, absenteeism, and public complaints against this agency. Overall, understanding the causes of job dissatisfaction among PDRM members is very important to ensure that this organisation can maintain public trust and perform its role more effectively in maintaining public safety and order. Therefore, this study is conducted to examine the impact of organizational factors such as salary, fringe benefits, and promotion opportunities on job satisfaction among members of the Royal Malaysia Police (RMP).

Literature Review and Hypothesis

Job Satisfaction

According to Bayona, Caballer and Peiró (2020) the concept of job satisfaction is people's affective reaction to their jobs and is essentially the degree to which they like their jobs. In today's organization, employees demand work experience that is not only financially remunerative, but also fulfills psychological needs such as purpose, meaning and self-development (Srikrishna, 2017; Loo, 2024). Therefore, job satisfaction is a multidimensional construct that is influenced by the interaction between individual expectations and the reality formed by the organization (Dhamija et al., 2019; Kasperczuk et al., 2025).

The changing career landscape that is digital and dynamic in nature demands organizations to re-understand the real causes of job dissatisfaction (Ajayi, 2018). Recent studies have shown that job satisfaction has a direct impact on performance, commitment, and work behavior (Hu, 2020; Devi et al., 2023). In the context of public security services, such as the RMP, decreased job satisfaction can contribute to a decrease in operational effectiveness as well as affect public perception and trust (Izdihar et al., 2023). Furthermore, mismatches between expectations and rewards received lead to counterproductive behaviors such as absenteeism, burnout, and intention to quit (Okechukwu, 2017; Dalkrani & Dimitriadis, 2018). This is also supported by a study among enforcement officers who found that a disproportionate workload with remuneration is a trigger for a decline in morale and integrity (Ahmed, 2024).

At the same time, modern research confirms that job satisfaction serves as a catalyst for the sustainability of human capital and the long-term effectiveness of organizations (Dhamija et al., 2019; Chaudhary & Bhaskar, 2016). Therefore, organizations that prioritize employee satisfaction and psychological well-being are not only more productive, but even more competitive and sustainable in the long run (Bailey et al., 2016; Kasperczuk et al., 2025). Critically, job satisfaction should be considered as a key management strategy that has a direct impact on productivity, integrity and the image of the organisation, not just a cosmetic welfare effort. Studies that link job satisfaction and performance in law enforcement agencies such as the RMP need to be strengthened to ensure that HR policy decisions are based on the latest empirical evidence.

Salary

Salary is a basic form of financial reward promised in an employment contract and is paid regularly in exchange for labor contributions. In contrast to an hourly or unit-based wage system, pay reflects a long-term commitment between employees and the organization. Since ancient times, pay has been seen as a major catalyst for work behavior, where a commensurate pay can improve employees' efforts and performance (Taylor & Vest, 1992). However, a contemporary perspective shows that the value of wages is not just an economic factor, but is also closely related to the social appreciation and dignity of employees in organizations (Loo, 2024).

Financial rewards such as salaries and incentives are categorized as extrinsic rewards, which are rewards given by employers to encourage certain achievements (Daft, 2010). Modern human resource management recognizes that competitive salaries can reduce financial stress,

increase work motivation, and retain high-performing employees (Devi et al., 2023). Thus, salary satisfaction is an important component of overall job satisfaction and is a basic requirement to ensure a balance between employee expectations and organizational rewards (Oshagbemi, 2000; Kasperczuk et al., 2025).

In the context of the public sector and law enforcement such as the RMP, the issue of pay has become more critical as workers are faced with high workloads, safety risks and psychological pressures that exceed other sectors. Recent studies show that when rewards do not align with the risks and demands of work, employees are more likely to experience stress, burnout, and decreased morale (Izdihar et al., 2023). Therefore, the payment improvement strategy must not only be based on the government's financial capabilities, but also consideration of fairness and appreciation for the professionalism of security personnel. Organizations that fail to manage salary satisfaction have the potential to face bigger issues such as increased employee turnover rates, work misconduct, and deteriorating performance, thus directly impacting the effectiveness of services (Ahmed, 2024) and job satisfaction towards job. Based on these insights, the following hypothesis is proposed:

Hypothesis 1: There is a positive significant relationship between salary and job satisfaction.

Benefits

Fringe benefits refer to additional rewards provided by employers in addition to basic salary, covering forms of financial and non-financial benefits such as health insurance coverage, retirement benefits, transportation facilities, accommodation and paid leave (Aswathappa, 2005). In the current context, fringe benefits are no longer purely complementary, but become a strategic element in attracting, motivating, and retaining employees especially in high-risk organizations such as law enforcement agencies.

Recent studies show that employees place a high value on benefits that can improve their physical and mental well-being (Devi et al., 2023). Benefits such as health programs, social security protection, and family support can reduce stress and improve the quality of work life, thus contributing to increased job satisfaction (Kasperczuk et al., 2025). In critical sectors such as the RMP, where workers face safety challenges, moral conflicts, and emotional distress, appropriate side benefits can play a mitigating role against burnout and job dissatisfaction (Izdihar et al., 2023).

Furthermore, organizations that provide competitive benefits are able to reduce employee entry and exit rates, increase loyalty and strengthen the perception of fairness among members (Loo, 2024). If the benefits are not commensurate with the demands and risks of the job, employees may feel themselves undervalued, affecting morale and productivity (Ahmed, 2024), and job satisfaction as well. Therefore, the effectiveness of fringe benefits needs to be evaluated not only in terms of costs to the organization, but also their impact on the motivation and success of public safety services. Based on this discussion, the following hypothesis is proposed:

Hypothesis 2: There is a positive significant relationship between benefits and job satisfaction

Promotion Opportunity

Promotion refers to the movement of employees to higher positions in the organizational hierarchy which is usually accompanied by an increase in job grade, remuneration and level of responsibility (Stephen, 2009). However, in the context of human resources, the concept of promotion is not just a salary improvement, but also serves as a formal recognition of employees' competencies, performance, and potential to contribute more significantly to the organization. This change in position gives symbolic meaning to one's self-worth as well as one's professional status in the work structure.

From an occupational psychology perspective, employees typically expect a clear career path so that they can develop and hone their skills through more challenging and high-value assignments (Jane et al., 2012). The lack of career mobility opportunities causes employees to feel unappreciated, thus weakening their satisfaction, intrinsic motivation, work ethic and commitment to the organization (Loo, 2024). In the security industry such as the RPM, promotion opportunities become more critical as they also affect the confidence and credibility of members in carrying out law enforcement roles.

Recent studies assert that promotion paths that are not transparent, unfair, or too slow can trigger dissatisfaction, interpersonal conflicts, as well as increased employee turnover rates (Devi et al., 2023). On the other hand, a promotion system based on performance and merit is seen to be able to increase productivity, innovation and employee participation in organizational transformation initiatives (Izdihar et al., 2023). This shows that promotion is not just an administrative aspect, but rather a talent retention mechanism that is important for the long-term sustainability of the organization. Thus, it is proposed that:

Hypothesis 3: There is a positive significant relationship between promotion opportunity and job satisfaction.

Herzberg's Two-Factor Theory

A fundamental theory that is often used to understand job satisfaction is Herzberg's Two-Factor Theory (Herzberg, 1966). This theory distinguishes two categories of factors that affect work experience, namely motivating factors and hygiene factors. Motivating factors include intrinsic aspects such as achievement, recognition, work content, autonomy and career growth, which can increase motivation as well as produce job satisfaction when strengthened. On the other hand, hygiene factors involve extrinsic elements such as salary, organizational policy systems, peer relationships, and working conditions. Their absence can trigger job dissatisfaction but their presence does not necessarily guarantee satisfaction (Herzberg et al., 2017).

Herzberg's approach emphasizes that job satisfaction and dissatisfaction are not two ends to the same dimension, but two different constructs. Thus, even if the organization increases salaries or provides the best facilities, it only prevents employees from feeling dissatisfied but does not guarantee that internal motivation will increase (Alshmemri et al., 2017). In the context of high-risk jobs such as security forces, motivating factors play a greater role in

strengthening commitment and integrity, as employees need a sense of meaning and value in carrying out tasks (Loo, 2024; Izdihar et al., 2023).

Methodology

This study used a quantitative approach to assess the relationship between independent variables (salary, benefits and promotion opportunity) and dependent variable (job satisfaction). The quantitative approach was chosen as it is suitable in social science and business research to validate the empirical relationship between variables. The unit of analysis in this study is individual.

The study population consists of 2,512 RMP personnel in Melaka. A total of 350 valid responses were obtained, and this sample size was in line with the determination of Krejcie and Morgan (1970). The selection of respondents was made through a convenience sampling.

The questionnaire instrument was divided into five sections covering respondent demographics and four constructs. All items are adapted from existing instruments that have been verified and measured using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Job satisfaction was measured using five items adapted from Hopkins (1983). Meanwhile, salary, benefits, and promotion opportunity were measured using four items adapted from Spector (1985). The questionnaires were distributed online, as this method was able to speed up the data collection process and increase the response rate during the study period.

Data were analyzed using the Statistical Package for Social Sciences (SPSS) software version 24. Descriptive analysis was conducted to reflect the demographic characteristics of the respondents. Next, the relationship between factors was tested using Pearson Correlation and Multiple Linear Regression to determine the strength and significance of the relationship.

Results

Pearson Correlation

Table 1 shows that all three independent variables, namely salary, benefits, and promotion opportunity, have a significant positive relationship with job satisfaction. The analysis showed that there was a strong relationship between salary and job satisfaction ($r = 0.706$, $p < 0.001$), benefits and job satisfaction ($r = 0.684$, $p < 0.001$), as well as promotion opportunity and job satisfaction ($r = 0.655$, $p < 0.001$). Based on the interpretation of the correlation coefficient by Pallant (2013), correlation values that are in the range of ± 0.60 to ± 0.70 indicate a strong and significant relationship, thus confirming that an increase in these organizational factors has the potential to increase the level of job satisfaction among the RMP members.

Table 1: Correlation Analysis

Variable	Job Satisfaction	Salary	Benefits	Promotion Opportunity
Job Satisfaction	1			
Salary	.706**	1		
Benefits	.684**	.811**	1	
Promotion Opportunity	.655**	.695**	.744**	1

**Correlation is significant at the 0.01 level (2-tailed)

Multiple Regression

Further, the results of the multiple regression in Table 2 found that the three independent variables acted as significant predictors of job satisfaction, $F(3, 346) = 120.519$, $p < 0.001$ with a value of $R^2 = 0.583$. This shows that the 58.3% variance of changes in job satisfaction can be explained by a combination of salary, benefits, and promotion opportunity. In more detail, the three independent variables made a significant contribution to the prediction of job satisfaction, namely salary ($\beta = 0.343$, $p < 0.001$), benefits ($\beta = 0.145$, $p = 0.030$), and promotion opportunity ($\beta = 0.179$, $p = 0.002$). These results thus support the H1, H2 and H3.

Among the three factors, salary emerged as the strongest predictor based on the highest beta value ($\beta = 0.343$), indicating that the financial reward aspect had the most significant influence on influencing respondents' job satisfaction compared to other factors tested. Overall, these findings underscore that well-remunerated career positions as well as clear career development prospects are important components in improving the job satisfaction level of members of security organisations such as the RMP.

Table 2: Multiple Regression Analysis

	B	Std. Error	Beta	t	Sig
(Constant)	0.502	.162		3.095	.002
Salary	.372	.067	.343	5.569	.000
Benefits	.157	.0702	.145	2.179	.030
Promotion Opportunity	.210	.066	.179	3.173	.002

Dependent Variable: Job satisfaction

Discussions

The findings of this study show that salary is the most dominant factor in influencing the job satisfaction of RMP members in Melaka. The regression results prove that salary has a positive and significant relationship with job satisfaction ($\beta = 0.343$, $p < 0.001$). These results are in line with Bayona's (2020) view that increased financial rewards increase the likelihood of an employee feeling satisfied with their job. In the security sector such as the RMP, the issue of salary is often in the spotlight as it is closely related to the cost of living and the perception of career security. A study by Hays (2025) also asserts that employees will evaluate whether the remuneration received commensurates with the workload carried. So, if employees feel that

their salary is fair and commensurate, it will increase self-esteem and form higher job satisfaction (Devi et al., 2023).

Meanwhile, the findings of the study also showed that benefits have a significant relationship with job satisfaction. This is in line with the results of the analysis which shows that employees will be more motivated and show a positive attitude towards the organisation if benefit schemes such as health protection, supplementary allowances, and welfare support are assessed as adequate and beneficial. As argued by Millan et al. (2011), an effective reward system can increase productivity as well as employee commitment to the organization. However, the findings of this study also give the impression that benefits are not the main factor, but rather complementary to salary as the most important basis of reward in increasing members' job satisfaction.

In addition, the opportunity for promotion was also found to have a significant positive effect on job satisfaction ($\beta = 0.179$, $p < 0.002$). The opportunity to grow in a career provides high intrinsic motivation as it is not only related to increased income, but also status, social appreciation as well as professional confidence (Alshmemri et al., 2017). In fact, promotion is a form of non-financial reward that can increase motivation without directly burdening the organization (Khan et al., 2022). These findings underscore that employees are willing to maintain a commitment to the organization if they see a clear and fair future prospect in their careers.

Implications of Study

From a theoretical point of view, the findings of this study contribute to the literature related to job satisfaction, especially in the context of security organizations such as the RMP. Empirical results showing that salary, benefits, and promotion opportunities have a positive and significant relationship with job satisfaction support the foundations of Herzberg's Two-Factor Theory as well as contemporary motivational theories in the field of organizational behavior. Therefore, this study can be used as a reference in future research that examines the factors of reward and career development in improving the psychological well-being and work performance of law enforcement personnel in Malaysia.

In terms of practical implications, this study emphasises that the RMP needs to pay continuous attention to the level of job satisfaction of its members through systematic monitoring such as periodic assessments or internal satisfaction surveys. Top management needs to ensure that the reward structure reflects the true value of the work of security team members who face high risk, particularly involving salary improvements, benefits and clearer and more transparent promotion pathways. In addition, the implementation of the survey can help the RMP identify the reasons for leaving the service and subsequently devise a more effective retention strategy.

The findings of this study also prove that job satisfaction cannot be viewed from just one perspective such as rewards alone. Career development factors, professional improvement and supervisor support also play an important role in increasing the motivation and commitment of members. Therefore, the approach to human resource management in the RMP must be holistic, taking into account the balance between financial and non-financial rewards. Advanced training programs, supervisory guidance and opportunities for participation in task

specialization are strategies that can increase the sense of appreciation and strengthen job satisfaction.

Overall, these findings show that effective management of rewards, welfare and career development can not only increase job satisfaction, but also contribute to improving organisational performance, reducing misconduct and restoring public trust in the PDRM as the country's main law enforcement institution.

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EKSPLORASI WARNA ALAM DALAM PENGHASILAN BATIK: KAJIAN PEWARNAAN MENGGUNAKAN *INDIGOFERA*, KULIT BUAH JALawe DAN KULIT KAYU TINGI

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Abstrak: Kajian ini bertujuan untuk meneroka penghasilan kain batik menggunakan ekstrak warna alam daripada tumbuhan *Indigofera*, Kulit Kayu Tingi dan Kulit Buah Jalawe bagi menghasilkan warna Coklat Kemerahan dan Hijau Kekuningan. Latar belakang kajian memfokuskan kepada permasalahan penggunaan warna sintetik yang memberi kesan negatif terhadap alam sekitar dan kesihatan manusia. Kajian eksplorasi yang dijalankan melibatkan teknik fermentasi (fermentation) dan pengekstrakan warna daripada sumber semula jadi, serta penggunaan bahan pengunci warna (fiksasi) seperti tawas, kapur dan Iron II Sulfate. Kajian ini turut memberi tumpuan terhadap teknik tumpangan warna (overdyeing) untuk menghasilkan warna sekunder yang lebih rata pada kain batik. Kaedah membatik melibatkan teknik mencanting, mengecap, berus dan celupan warna. Hasil akhir kajian ini menghasilkan produk kain batik warna alam, sekali gus yang membuktikan bahawa sumber alam mampu menjadi alternatif lestari dalam industri fesyen dan tekstil.

Kata Kunci: Ekstrak Warna Alam, Teknik Fermentasi, Bahan Pengunci Warna, *Indigofera*

Pengenalan

Ekstrak warna alam merujuk kepada warna yang diperolehi daripada sumber semula jadi seperti tumbuhan, tanah dan batuan. Bahagian tumbuhan seperti daun, bunga, batang, akar dan buah mengandungi pigmen (pigment) yang menghasilkan warna tertentu bergantung kepada kandungan "colouring matter" (senyawa organik). Terdapat dua jenis ekstrak warna alam iaitu melalui proses fermentasi (fermentation) dan ekstraksi (extraction), di mana warna ekstrak seperti dari kulit kayu tingi dan buah jalawe sering digunakan sebagai warna tumpangan untuk menghasilkan warna sekunder atau meratakan warna pada kain. Dalam penghasilan batik, teknik batik blok dan batik tulis digunakan. Kajian ini memfokuskan kepada penghasilan batik menggunakan warna alam bagi mendapatkan warna Coklat Kemerahan dan Hijau Kekuningan, namun cabaran seperti kesukaran menghasilkan warna sekunder dan ketidaksempurnaan warna akibat proses yang tidak tepat turut diambil kira

Latar Belakang Kajian

Seni batik merupakan warisan budaya yang telah lama bertapak dalam masyarakat Melayu, khususnya sejak zaman pemerintahan Parameswara pada abad ke-15 di Melaka. Di Malaysia, batik mula diperkenalkan secara aktif sekitar tahun 1910 di negeri Kelantan dan berkembang pesat sebagai satu bidang kraftangan yang unggul. Kaedah penghasilan batik tradisional terbahagi kepada dua bentuk utama iaitu batik blok dan batik tulis. Walaupun teknik pembuatan

batik telah mengalami evolusi dari penggunaan ubi kentang sebagai pengecap kepada alat-alat moden, semangat dan keunikan seni ini masih dikekalkan.

Warna memainkan peranan penting dalam penghasilan batik, dan pada masa kini, industri tekstil banyak bergantung kepada pewarna sintetik kerana ia mudah diperoleh, cepat dihasilkan dan mempunyai pelbagai variasi warna. Namun begitu, penggunaan warna sintetik telah menimbulkan kesan negatif terhadap alam sekitar dan kesihatan manusia, termasuk pencemaran air dan sensitiviti kulit. Oleh itu, terdapat keperluan mendesak untuk kembali menggunakan ekstrak warna alam yang lebih mesra alam dan selamat digunakan.

Warna alam diperoleh daripada tumbuhan seperti daun, batang, akar, bunga, dan buah. Dalam kajian ini, tiga sumber alam utama telah digunakan: Kulit Kayu Tingi untuk menghasilkan Warna Coklat Kemerahan, Kulit Buah Jalawe untuk menghasilkan Warna Kuning, dan tumbuhan Indigofera yang melalui proses fermentasi untuk menghasilkan Warna Biru. Warna Hijau Kekuningan pula diperoleh melalui teknik tumpangan warna, iaitu gabungan antara Warna Kuning dan Biru.

Kajian ini memberi tumpuan kepada penghasilan warna alam yang berkualiti, sekata, dan tahan lama. Ia juga berhasrat untuk menyelesaikan permasalahan dalam penghasilan warna sekunder yang rata dan mengelakkan kerosakan warna akibat proses cucian atau penggunaan bahan pengunci warna yang tidak sesuai. Tambahan pula, kajian ini turut menekankan kepentingan pematuan kepada Standard Operating Procedure (SOP) dalam proses pencelupan, pemilihan bahan, serta penggunaan bahan pengunci seperti tawas, kapur dan iron II sulfate (tunjung).

Persoalan Kajian

1. Apakah tumbuhan yang digunakan untuk menghasilkan ekstrak warna alam iaitu Warna Coklat Kemerahan dan Hijau Kekuningan?
2. Apakah langkah-langkah yang patut dipatuhi (SOP) untuk menghasilkan warna yang sekata pada permukaan kain?
3. Apakah langkah-langkah terkawal yang perlu diikuti bagi menjamin hasil pewarnaan yang rata dan konsisten pada permukaan kain?

Objektif Kajian

1. Mengenal pasti jenis tumbuhan yang digunakan sebagai sumber pewarna semula jadi bagi menghasilkan warna Coklat Kemerahan dan Hijau Kekuningan untuk aplikasi pada permukaan fabrik.
2. Menentukan prosedur standard (SOP) dalam proses pewarnaan bagi memastikan warna yang dihasilkan adalah sekata pada keseluruhan permukaan kain.

Kepentingan Kajian

Kajian ini penting untuk memperkukuh kefahaman terhadap kaedah pewarnaan semula jadi serta membetulkan tanggapan negatif terhadap penggunaannya dalam industri tekstil. Ia juga membantu menyelesaikan isu pencemaran daripada pewarna sintetik dengan menawarkan alternatif yang lebih mesra alam, selain menyumbang kepada pemuliharaan warisan kraf tempatan seperti batik warna alam.

Memartabatkan penggunaan warna alam yang selesa dan selamat dipakai serta dapat melestarikan alam.

1. Untuk dokumentasikan Warna Kuning Kehijauan dengan menggunakan ekstrak warna daripada tumbuhan Indigofera iaitu Warna Indigo/ Biru dan Kulit Buah Jalawe iaitu Warna Kuning dan Warna Coklat Kemerahan dengan menggunakan ekstrak warna daripada Kulit Kayu Tingi.
2. Menjadi rujukan dan panduan kepada pengkaji akan datang untuk menghasilkan Warna Hijau Kekuningan dan Coklat Kemerahan dengan menggunakan bahan semula jadi

Kajian Literatur

Bab ini menerangkan tentang kajian-kajian lepas yang telah dibuat oleh para penyelidik terdahulu berkaitan dengan kajian pengkaji iaitu kajian berkaitan ekstrak warna alam terutamanya tentang ekstrak Warna Indigofera, Warna Kulit Kayu Tingi dan Warna Kulit Buah Jalawe. Kajian ini penting sebagai maklumat awal bagi membantu dalam mengetahui dan menyelesaikan sesuatu permasalahan yang timbul semasa kajian dilaksanakan kelak.

Bahan Warna Alam

Menurut Isminingsih (1978), ekstrak warna untuk bahan tekstil terbahagi kepada dua iaitu ekstrak warna alam dan ekstrak warna sintetik. Ekstrak warna alam ialah ekstrak warna yang terhasil daripada ekstrak bahagian tumbuhan iaitu akar, batang, daun, buah, kulit dan bunga. Kelebihan ekstrak warna alam ialah ia digunakan pada batik sejak zaman dahulu kala, dan ia mempunyai nilai ekonomi dan juga nilai pasaran yang tinggi kerana mempunyai seni reka yang unik dan warna yang khusus. Malah, warna alam juga mempunyai kekurangannya yang tersendiri iaitu variasi warna yang sangat terbatas dan memerlukan proses yang agak panjang untuk menghasilkan warnanya.

Ekstrak warna alam merupakan alternatif pewarna yang tidak mempunyai toksik seperti pewarna kimia. Ia dapat diperbaharui (*renewable*), mudah larut dan mesra alam (Yernisa, et.al, 2013). Namun yang demikian, ekstrak pewarna alam memiliki kekurangannya jika tidak dijaga dengan baik antaranya ialah warna yang tidak stabil, kerataan warna kurang baik, kepekatan pigmen rendah, spektrum warna juga terbatas (Paryanto, 2012). Selain daripada spektrum yang terbatas, ia juga mudah kusam dan ketahanan luntur rendah apabila dicuci serta jika terkena sinaran matahari (Kant, 2012).

Proses Fermentasi Dan Ekstrak

Proses penghasilan ekstrak warna alam terbahagi kepada dua iaitu proses fermentasi dan proses mengekstrak. Proses mengekstrak iaitu proses untuk mengeluarkan pigmen zat warna alam, dengan cara merebus bahan bersama larutan air. Proses fermentasi pula biasanya dilakukan untuk zat warna indigo, kulit buah naga (Rodia Syamwil, Urip Wayuhningsih, 2015).

Manakala, menurut Fitria Kurniastuti dan E.lia Dwi Susanti (2009), proses mengekstrak merupakan proses pengasingan suatu komponen dari suatu bahan yang terdiri dari dua atau lebih komponen dengan cara melarutkan salah satu komponen ke dalam pelarut yang sesuai. Menurutny lagi, bahan tersebut dapat menggunakan pelbagai jenis pelarut organik, kerana jika pelarut organik digunakan maka ekstrak yang terhasil bukan sahaja pewarna tetapi semua

bahan yang terkandung di dalamnya yang mengandung lebih banyak minyak. Sebatian tidak organik yang sering digunakan adalah air.

T Pujilestari (2014), menyatakan proses ekstrak secara umumnya adalah sama iaitu dengan mengambil pigmen atau pigmen warna yang terkandung dalam serat tumbuhan. Ekstrak dilakukan dengan cara merebus bahan yang menghasilkan zat warna alam menggunakan air adalah cara yang paling umum dilakukan. Air yang digunakan untuk merebus bahan akan ditentukan jumlahnya seperti yang ditetapkan supaya dapat menghasilkan warna yang gelap. Perebusan akan dilakukan sehingga jumlah air berkurang sebanyak separuh daripada jumlah yang asal. Jika memerlukan ekstrak warna yang lebih gelap, perebusan bahan akan dilanjutkan sehingga jumlah air menjadi satu per tiga dari jumlah asal.

Ekstrak Warna Alam

Rajah 1: Sumber Warna Alam Yang Di Gunakan

Tumbuhan/ sumber warna alam	Gambar
Indigofera Tanaman Indigofera adalah salah satu tumbuhan yang menghasilkan ekstrak warna alam. Tanaman Indigofera adalah sejenis tanaman yang mempunyai bunga berwarna ungu, dan termasuk dalam kategori tumbuhan renek (Chanayat, 2002). Sejak dahulu lagi daun Indigofera dimanfaatkan sebagai pewarna alam untuk batik. Namun, seiring dengan perkembangan zaman dan teknologi serba moden para pembatik tidak tertarik untuk menghasilkan warna alam oleh kerana ia mengambil masa yang agak lama berbanding warna sintetik. Hal yang demikian menyebabkan tumbuhan Indigofera menjadi tumbuhan liar yang tidak dimanfaatkan.	

Kulit Kayu Tingi

Kulit Kayu Tingi berwarna kelabu dan coklat. Ia juga halus dan pangkalnya menggelembung (Noor, et.al, 1999 dalam Ramayani, 2012). Memiliki nama ilmiah *Ceriops tagal*, tumbuhan ini juga dikenal dengan beberapa nama lain seperti tengar, tengal, tenga, tingi, palun, parun, bido-bido dan lain-lain. (Ramayani, 2012) Tanin dari Kulit Soga Tingi dapat divariasi dari 13% sehingga lebih dari 40% yang merupakan filtrum umum dan penting dari Kulit Kayu Bakau. Tanin ini termasuk ke dalam kelompok tanin yang terkondensasi jenis procyanidin, sehingga pewarnaan dari Kulit kayu Tingi menghasilkan Warna Coklat Kemerahan. (Jansen et.al, 2005)



Kulit Buah Jalawe

Warna yang paling banyak dijumpai dalam jenis-jenis tumbuhan ialah Warna Kuning (Sutara, 2009), begitu juga dengan tanaman Jalawe atau latinnya *Terminalia Bellirica*. Bahagian kulit buahnya digunakan untuk menghasilkan ekstrak warna alam. Jalawe merupakan pohon dengan tingginya mencapai 30-50 meter. Pokok ini mengeluarkan bunga pada bulan September sehingga November (A.P. Utomo, et.al, 2018). Selain itu, Kulit Buah Jalawe merupakan salah satu bahan jamu tradisional bagi masyarakat Indonesia.



Sumber: Album Pengkaji, 2022

Bahan Pengunci Warna

Untuk pencelupan bahan tekstil dengan menggunakan ekstrak warna alam, ia memerlukan proses pengunci, pemat, pemegang atau dikenali sebagai pengikat warna (fiksasi) selepas kain batik dicelup menggunakan larutan warna alam. Hal ini supaya warna pada kain batik memiliki ketahanan warna yang baik dan tidak luntur. Terdapat tiga jenis larutan pengunci yang biasa digunakan iaitu tunjung, tawas, dan kapur. (Fitria Kurniastuti dan E.lia Dwi Susanti ,2009).

Seterusnya, menurut Rodia Syamwil,Urip Wayuhningsih (2015), bahan pengunci warna digunakan untuk proses fiksasi (fixation) iaitu proses pembangkitan dan penguncian warna setelah bahan dicelup ke dalam larutan ekstrak warna alam, sehingga kain batik yang dihasilkan memiliki ketahanan luntur yang baik. Menurut (Agus, et.al, 2018), Daripada kesemua tumbuhan yang menghasilkan ekstrak warna alam, belum tentu kesemuanya sudah diuji ketahanan warnanya. Untuk memperoleh ketahanan warna yang tinggi, perlu dilakukan proses

pembangkitan warna iaitu pengunci warna yang bertujuan untuk mempertajam warna dan supaya tidak mudah luntur.

Rajah 2: Bahan-Bahan Pengunci Warna

Bahan pengunci warna	Gambar
Alum/ Tawas Nama lainnya ialah tawas. Alum adalah kumpulan garam berkumpul dalam bentuk kristal dan isomorfik. Kristal alum sangat mudah dilarutkan di dalam air, dan larutannya berbeza mengikut suhu dan jenis logam	
Kapur Kapur adalah objek putih dan halus yang terhasil daripada batu yang terdiri daripada mineral kalsium. Biasanya batu kapur terbentuk di laut dalam dengan keadaan batu yang mengandungi plat kalsium (coccolithhs) dan dibentuk oleh mikroorganisma.	
Iron II Sulfate Dikenali sebagai tunjung / karat yang akan membuatkan warna ke arah gelap / tua. Berbentuk kristal seperti garam dan berwarna hijau	

Sumber: Album Pengkaji, 2022

Metodologi Kajian

Bahagian ini menerangkan pendekatan dan kaedah yang digunakan dalam kajian eksplorasi terhadap penghasilan kain batik menggunakan pewarna semula jadi daripada tumbuhan tempatan. Kajian ini dilaksanakan secara kualitatif berbentuk eksperimen, di mana proses

penghasilan, pemerhatian dan dokumentasi dijalankan secara sistematik dalam persekitaran bengkel seni tekstil.

Reka Bentuk Kajian

Kajian ini menggunakan pendekatan kajian berbentuk eksplorasi dan amali yang bertujuan meneroka potensi warna alam daripada tiga jenis bahan utama, iaitu tumbuhan *Indigofera tinctoria*, Kulit Kayu Tingi, dan Kulit Buah Jalawe. Kajian ini tidak hanya memberi tumpuan terhadap warna primer yang dihasilkan, tetapi juga terhadap proses campuran dan tumpangan warna bagi menghasilkan warna sekunder yang stabil dan sesuai digunakan pada fabrik batik.

Prosedur Eksperimen

Prosedur eksperimen dijalankan secara berperingkat melibatkan beberapa langkah utama seperti berikut:

1. Proses Pengekstrakan Pewarna

Setiap bahan alam dikumpulkan dan diproses menggunakan kaedah fermentasi dan rebusan ekstrakatif bergantung kepada sifat bahan tersebut. Proses ini dijalankan bagi menghasilkan larutan warna yang pekat dan sesuai digunakan pada fabrik kapas

2. Proses Pewarnaan Fabrik

Kain kapas yang digunakan akan melalui beberapa siri pewarnaan yang berbeza mengikut jenis ekstrak. Pewarnaan dilakukan dengan pelbagai teknik seperti:

Celupan Tunggal, celupan berlapis (*overdyeing*) dan Teknik campuran (*layering*)

3. Penggunaan Mordant (Bahan Pengunci Warna)

Tiga jenis mordant digunakan iaitu tawas (alum), kapur, dan Iron (II) sulfate. Setiap jenis mordant diaplikasikan pada fabrik sebelum dan selepas proses pewarnaan bagi mengkaji keberkesanan penguncian warna dan perubahan tona yang dihasilkan.

4. Teknik Membatik

Beberapa teknik membatik diaplikasikan dalam kajian ini termasuk:

Mencanting menggunakan lilin panas, Mengecap (*block printing*) dan Teknik berus (*brushwork*)

Pemerhatian dan Dokumentasi

Sepanjang eksperimen, proses pewarnaan dan hasil kain yang dihasilkan didokumentasikan melalui:

1. Rakaman visual (gambar)
2. Catatan teknikal dan pemerhatian harian
3. Penilaian visual terhadap ketahanan warna, dan keserataan warna pada permukaan fabrik

Dapatan Kajian

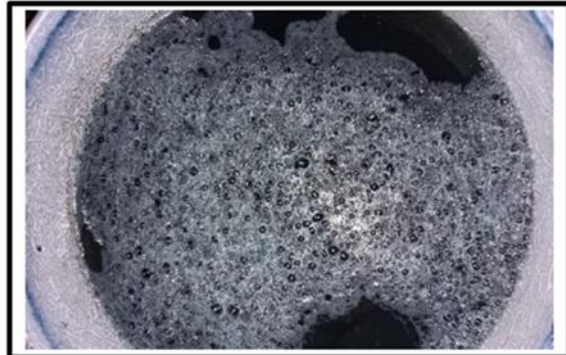
Proses Fermentasi (Tumbuhan Indigofera)

Proses pertama yang harus dilakukan ialah cara membuat pes indigo. Cara untuk menghasilkan pes adalah seperti berikut (untuk pembuatan 1KG pes pewarna Indigo):

Rajah 3: Proses Fermentasi Daun Indigofera

No	Proses fermentasi (indigofera)	Gambar
1	Memilih tumbuhan/daun Indigofera yang segar. Jumlah daun Indigofera yang di perlukan sekitar 7Kg – 9Kg.	
2	Proses kedua ialah daun Indigofera akan di rendam di dalam air yang bersih dan kesemua daun perlu di tenggelamkan. Rendaman perlu di buat selama 2 hari atau sehingga rendaman berbau busuk.	
3	Proses seterusnya, air rendaman perlu di tapis dan di asingkan daunnya.	
4	Proses yang ke-4 adalah Masukkan kapur ke dalam larutan, kemudian lakukan proses pengudaraan dengan mencedok larutan menggunakan gayung dan menuangkannya semula ke dalam bekas asal sehingga terbentuk buih-buih. Ulang proses ini sehingga buih semakin berkurang dan warna larutan berubah daripada hijau kepada biru.	

- 5 Seterusnya, larutan biru tersebut akan di biarkan selama satu hari hingga terhasilnya mendapan yang berwarna biru pekat



- 6 Bahagian larutan yang jernih di permukaan perlu dibuang, manakala mendapan berwarna biru di dasar hendaklah diambil dan ditapis dengan teliti.



- 7 Hasil Pes Warna Indigo setelah selesai proses menapis.

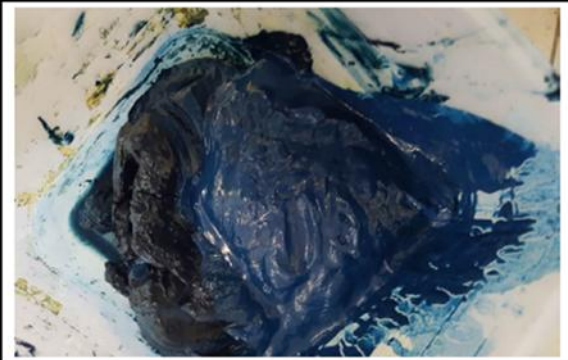


Sumber: Album Pengkaji, 2022

Proses Membuat Larutan Warna Indigo

Berikut merupakan proses untuk membuat larutan warna Indigo.

Rajah 4: Proses Pembuatan Larutan Warna Indigo

No	Proses membuat larutan warna indigo	Gambar
1	Bahan yang di perlukan adalah 1Kg gula merah/ gula melaka dan 7Liter air bersih.	
2	Keseluruhan 1Kg gula merah di masukkan ke dalam 7Liter air dan di rebus sehingga gula merah larut.	
3	Proses seterusnya, Larutan air gula merah dituangkan ke dalam besen, diikuti dengan penambahan 1Kg pes indigo. Gaulkan sehingga pes larut sepenuhnya dan larutan bertukar kepada warna biru kehijauan. Serbuk kapur di tambah bergantung pada kadar kepekatan larutan yang di hasilkan.	 

- 4 Setelah bancuan mencapai warna yang dikehendaki, ia dibiarkan rehat selama setengah hari aatau lebih kurang 12 jam. Selepas itu, larutan indigo sudah boleh digunakan untuk proses pewarnaan.



Sumber: Album Pengkaji, 2022

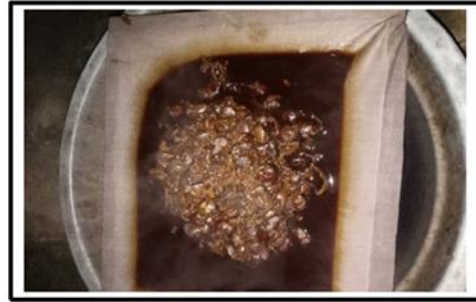
Proses Ekstrak (batang kayu, kulit kayu, kulit buah)

Untuk menghasilkan larutan warna daripada proses ekstrak pula, Bahan yang di gunakan ialah Kulit Buah Jalawe dan Kulit Kayu Tingi yang menghasilkan Warna Kuning dan Warna Coklat Kemerahan. Proses untuk menghasilkan warna ekstrak daripada Kulit Buah Jalawe adalah seperti berikut (untuk satu kilogram bahan):

Rajah 5: Proses Mengekstrak Warna Dari Kulit Buah Jalawe

No	Proses ekstrak (kulit buah jalawe)	Gambar
1	Proses pertama, Kulit buah jalawe akan di timbang. Kuantiti yang di perlukan ialah 1Kg.	
2	Proses seterusnya ialah kulit buah jalawe akan di rendam di dalam air bersih yang berukuran 7Liter. Proses rendaman akan di lakukan selama 8 hingga 12 jam.	
3	Seterusnya, Kulit Buah Jalawe akan direbus bersama air rendamannya sehingga mendidih dan nisbah air menyusut/ berkurang.	

- 4 Akhir sekali, Air rebusan akan di tapis untuk mengasingkan warna yang terhasil dengan kulit buah jalawe.



Proses dan formula yang sama akan di gunakan bagi mendapatkan ekstrak warna dari Kulit Batang Kayu Tingi. Walaubagaimanapun, Ekstrak dari bahan Kulit Kayu Tingi menghasilkan warna coklat kemerahan.

Hasil Warna Pada Permukaan Fabrik

Rajah 6: Hasil Pewarnaan Pada Permukaan Fabrik

No	Hasil warna atas permukaan fabrik	Gambar
1	1.Celupan Fabrik dalam rendaman warna Indigo. Rendaman di lakukan sebanyak 3 kali – 3 kali – 3 kali, setiap celupan di rehatkan 20 – 25 minit.	
2	Celupan warna tumpangan antara Indigo dan kulit kayu Tingi.	

- 3 Celupan campuran antara warna Indigo dan Kulit buah jalawe (overdyeing)



- 4 Celupan campuran antara warna Indigo dan Kulit buah jalawe (overdyeing)



- 5 Fiksasi Ion II sulfat



Sumber: Album Pengkaji, 2022

Perbincangan Kajian

Kajian ini secara keseluruhannya telah membuka satu dimensi baharu dalam penghasilan batik dengan menekankan penggunaan sumber alam sebagai pewarna semula jadi. Pendekatan ini bukan sahaja selari dengan prinsip kelestarian alam sekitar, malah turut menyumbang kepada pemeliharaan warisan tradisional dalam konteks moden. Eksplorasi terhadap tiga sumber utama iaitu Daun Indigofera, Kulit Kayu Tingi, dan Kulit Buah Jalawe membuktikan bahawa tumbuhan tersebut mempunyai potensi besar sebagai alternatif kepada pewarna sintetik, yang diketahui memberi impak negatif terhadap kesihatan manusia dan alam sekitar.

Dari segi teknik pewarnaan, penggunaan kaedah fermentasi dan pengekstrakan yang dijalankan telah berjaya menghasilkan warna-warna semula jadi yang stabil dan terang, iaitu Coklat Kemerahan dan Hijau Kekuningan. Proses ini memperlihatkan bahawa kombinasi bahan semula jadi dengan bahan pengunci warna (fiksasi) seperti tawas, kapur, dan Iron (II) Sulfate mampu membantu dalam pengekalan warna pada fabrik, di samping memberikan kesan warna yang lebih rata. Eksperimen tumpangan warna (overdyeing) turut berjaya mencipta warna sekunder yang lebih unik dan berkarakter, serta memberi lebih banyak pilihan dan kebebasan dalam rekaan.

Penggunaan motif Paku Tanduk Rusa dalam batik ini juga membawa elemen flora tempatan yang simbolik dan bernilai estetika tinggi. Motif ini bukan sahaja melambangkan keindahan alam, malah mencerminkan hubungan erat antara manusia dan persekitaran. Dari segi teknikal, gabungan pelbagai teknik seperti mencanting, mengecap, berus dan celupan telah menunjukkan bahawa warna alam mampu disesuaikan dengan pelbagai gaya membatik sama ada tradisional mahupun moden tanpa menjejaskan kualiti visual dan kemasan akhir.

Selain daripada nilai estetik, hasil kajian ini berjaya menghasilkan produk sebenar dalam bentuk pakaian dan hiasan dalaman, sekali gus membuktikan aplikasi praktikal pewarna alam ini dalam industri. Ia membuka peluang kepada usahawan tekstil, penggiat kraftangan, dan pereka fesyen untuk mengeksplorasi pendekatan lebih mesra alam yang bukan sahaja unik tetapi juga komersial. Dalam konteks pendidikan dan penyelidikan, kajian ini turut memberikan sumbangan signifikan terhadap dokumentasi dan pemuliharaan teknik pewarnaan tradisional, khususnya dalam dunia tekstil dan fesyen.

Secara keseluruhannya, kajian ini telah menunjukkan bahawa bahan-bahan semula jadi bukan sahaja berupaya menghasilkan warna yang menarik malah juga mampu mencabar dominasi pewarna sintetik dalam pasaran tekstil. Kejayaan ini membuka ruang untuk kajian lanjutan, khususnya dalam menambah baik kestabilan warna alam, penghasilan variasi warna lebih luas, serta memperluas aplikasi pada fabrik selain kapas (cotton). Inisiatif seperti ini perlu disokong secara berterusan agar warisan pewarnaan alam tidak tenggelam dalam arus pemodenan industri tekstil.

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MENELUSURI PENYELIDIKAN REKABENTUK PEMBANGUNAN MODEL

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Abstrak: Fasa reka bentuk dan pembangunan model merupakan komponen penting dalam proses penyelidikan yang melibatkan pendekatan sistematik untuk menjelaskan latar belakang teori dan kajian-kajian dalam reka bentuk penyelidikan. Fasa ini bukan sahaja merangkumi aspek reka bentuk, tetapi juga pembangunan yang diperlukan dalam penghasilan sesuatu produk. Dengan kata lain, fasa ini merupakan titik kritikal di mana pembinaan produk sebenar berlaku. Dalam konteks reka bentuk dan pembangunan model, kajian ini meneliti beberapa kajian lepas yang berkaitan, termasuk yang menggunakan dapatan fasa analisis dan pendekatan penyelidikan reka bentuk dan pembangunan. Khususnya, kepada kajian-kajian yang menggunakan teknik Fuzzy Delphi Method, satu pendekatan yang semakin popular dalam bidang ini kerana keupayaannya untuk menggabungkan pendapat pakar secara sistematik dan mengurangkan kekaburan dalam proses membuat keputusan. Selain itu, kajian ini juga menyoroti pendekatan-pendekatan selain daripada teknik Fuzzy Delphi Method. Perbandingan ini bertujuan untuk memberikan perspektif yang lebih luas dan menyeluruh tentang pelbagai metodologi yang digunakan dalam reka bentuk dan pembangunan model.

Kata Kunci: Rekabentuk dan Pembangunan, Fasa Analisis Keperluan, Kebolegunaan Model, Fuzzy Delphi, Model

Pengenalan

Fasa reka bentuk dan pembangunan model merupakan komponen penting dalam proses penyelidikan yang melibatkan pendekatan sistematik untuk menjelaskan latar belakang teori dan kajian-kajian dalam reka bentuk penyelidikan (Richey & Klien 2014). Fasa ini bukan sahaja merangkumi aspek reka bentuk, tetapi juga pembangunan yang diperlukan dalam penghasilan sesuatu produk (Mohd Ridhuan Mohd Jamil et al. 2018). Dengan kata lain, fasa ini merupakan titik kritikal di mana pembinaan produk sebenar berlaku.

Dalam konteks reka bentuk dan pembangunan model, kajian ini meneliti beberapa kajian lepas yang berkaitan, termasuk yang menggunakan dapatan fasa analisis dan pendekatan penyelidikan reka bentuk dan pembangunan. Khususnya, kepada kajian-kajian yang menggunakan 530 teknik *Fuzzy Delphi Method*, satu pendekatan yang semakin popular dalam bidang ini kerana keupayaannya untuk menggabungkan pendapat pakar secara sistematik dan mengurangkan kekaburan dalam proses membuat keputusan. Selain itu, kajian ini juga menyoroti pendekatan-pendekatan 530 teknik 530 tive selain daripada 530 teknik *Fuzzy Delphi Method*. Perbandingan ini bertujuan untuk memberikan perspektif yang lebih luas dan menyeluruh tentang pelbagai metodologi yang digunakan dalam reka bentuk dan Pembangunan model.

Penyelidikan Rekabentuk dan Pembangunan Model

Fasa Pertama

Fasa pertama dalam penyelidikan reka bentuk dan pembangunan ialah fasa analisis keperluan. Mengikut Mc Ardle (1998), fasa analisis keperluan merupakan satu proses yang melibatkan beberapa siri aktiviti untuk mengenal pasti masalah atau isu yang timbul dalam persekitaran kerja. Ia juga dapat menentukan sama ada tindakan penambahbaikan adalah langkah yang sesuai atau sebaliknya. Melalui fasa ini, para pengkaji dapat mengumpul maklumat daripada kumpulan sasaran mengenai keperluan produk yang sedang direka bentuk dan dibangunkan.

Fasa Kedua

Fasa kedua dalam penyelidikan reka bentuk dan pembangunan (DDR) adalah fasa perancangan dan pembangunan sesuatu produk yang dihasratkan, seperti yang dinyatakan oleh Mohd Ridhuan Jamil & Nurulrabihah Mat Noh pada tahun 2020. Proses ini melibatkan langkah-langkah sistematik yang bertujuan untuk menjelaskan latar belakang teori dan kajian-kajian yang berkaitan dengan DDR, sebagaimana yang dikemukakan oleh Richey & Klein pada tahun 2014. Fasa ini terdiri daripada dua bahagian utama, iaitu fasa reka bentuk dan fasa pembangunan. Saedah Siraj et al. (2020) menyatakan bahawa fasa kedua melibatkan proses menentukan reka bentuk model dengan mengaplikasikan beberapa metode, serta membangunkan model menggunakan pelbagai kaedah yang sesuai.

Beberapa kajian lepas telah menerangkan proses reka bentuk produk, seperti model dan modul, menggunakan dapatan yang diperoleh daripada kajian analisis keperluan tinjauan literatur, teori, dan model sebagai asas untuk membentuk elemen dalam fasa reka bentuk. Antaranya ialah kajian yang dijalankan oleh Rosli Yacob et al. (2023) adalah tentang pembangunan model guru futuristik Malaysia (GFM). Kajian ini menggunakan kaedah *fuzzy delphi* bagi pembinaan elemen model. Teknik *Fuzzy Delphi* boleh memberikan fleksibiliti dalam menangani ketidakpastian dan kerumitan maklumat, dan membolehkan integrasi pandangan pakar yang lebih baik melalui konsep *fuzzy*. Sampel kajian ini adalah seramai 12 orang pakar yang terdiri daripada ahli akademi yang berpengalaman lebih daripada 10 tahun. Pengkaji menggunakan borang soal selidik skala Likert 7 bagi menyatakan aras persetujuan terhadap setiap elemen model GFM. Hasil dapatan kajian menunjukkan 17 elemen telah diterima dan empat elemen telah ditolak daripada keseluruhan elemen. 17 elemen ini boleh dijadikan panduan dalam melahirkan Guru Futuristik Malaysia yang mampu mengadaptasi perubahan persekitaran yang dinamik dan terus relevan dengan arus pendidikan global.

Seterusnya, dalam kajian bertajuk "Pembangunan Model Latihan Kaunseling Berasaskan Personaliti Dan Cerdas Spiritual Guru Pelatih Di IPGM" oleh Zuraini Idris (2022) menggunakan pendekatan kaedah *Fuzzy Delphi* untuk fasa kedua dengan menggunakan soal selidik 7 skala Likert kepada 12 orang pakar dalam bidang kaunseling. Proses analisis melibatkan Model *Fuzzy Delphi* di mana nilai *threshold 'd'*, nilai kesepakatan pakar, dan nilai *defuzzification* dihitung untuk mengesahkan persetujuan pakar terhadap semua komponen utama dan elemen model. Hasil fasa kedua menunjukkan kesepakatan di kalangan pakar terhadap empat komponen utama, iaitu objektif kandungan, aktiviti, dan penilaian, yang melibatkan 27 elemen. Secara keseluruhan, para pakar mencapai kesepakatan dengan komponen utama melebihi 75%, dan nilai *threshold (d) ≤ 0.2*. Nilai skor *Fuzzy (A)* untuk komponen-komponen utama adalah seperti berikut: (1) Objektif model (0.897), (2) Kandungan

dalam model (0.889), (3) Aktiviti model (0.928), dan (4) Penilaian dalam model (0.911). Dapatan kajian menunjukkan nilai *threshold* (d) dan persetujuan pakar yang melebihi 75%, dengan peratus persetujuan panel pakar mencapai 91.7% untuk kesemua item, menandakan kesepakatan pakar terhadap elemen-elemen yang dikaji.

Manakala kajian Zurina Mustaffa, Zaharah Hussin, dan Abdul Muhsien Sulaiman (2022) pula adalah untuk mendapatkan konsensus pakar terhadap keperluan elemen utama dan turutan kedudukan (ranking) keutamaan bagi setiap item dalam reka bentuk pembangunan Model Pedagogi Terbeza\ berdasarkan elemen proses pengajaran bagi mata pelajaran tilawah al-Quran. Dalam kajian ini, kaedah *Fuzzy\ Delphi* digunakan dengan menggunakan skala likert tujuh peringkat. Pengkaji berhasil mendapatkan konsensus pakar daripada 16 orang pakar yang terlibat daripada pelbagai bidang, terutamanya dalam bidang pedagogi dan tilawah al-Quran. Hasil kajian menunjukkan konsensus pakar terhadap semua item dalam elemen utama. Semua item diterima dan memenuhi tiga syarat *Fuzzy* iaitu nilai *threshold* (d) tidak melebihi atau sama dengan 0.2, peratus kesepakatan pakarmelebih atau sama dengan 75%, dan nilai *Defuzzification* (α cut) melebihi atau sama dengan 0.5. Model Pedagogi Terbezayang berfokus pada elemen proses pengajaran diharapkan dapat memberikan konsep baru kepada sektor pendidikan, khususnya guru Pendidikan Islam dalam memperkaya metodologi pengajaran bagi menangani kepelbagaian pelajar.

Sementara itu, kajian Kharhan Haji Jait (2021) pula adalah bertujuan untuk melihat elemen yang diperlukan untuk mengintegrasikan teori asas akhlak Imam al-Ghazali dan model QAIT Slavin bagi membangunkan model yang berdasarkan amalan pengajaran berkesan guru agama di sekolah-sekolah agama Brunei Darussalam. Kajian ini juga menggunakan kaedah *Fuzzy Delphi* (FDM) bagi fasa reka bentuk dan pembangunan yang merupakan satu kaedah yang menggunakan pakar sebagai responden kajian bagi menghuraikan kesesuaian komponen dan elemen yang terkandung di dalam model serta bagi menentukan keutamaannya dalam fasa ini (Richey & Klein, 2007). Bilangan pakar reka bentuk komponen dan elemen ialah seramai 15 orang yang melibatkan pakar dari bidang Pendidikan Islam dan pendidikan keguruan. Pendekatan yang dijalankan adalah dengan mengadakan pertemuan secara bersemuka dan perhubungan lanjut melalui email. Dapatan kajian mendapati kesemua komponen utama model K.H.A.I.R berada pada status sesuai digunakan berdasarkan pandangan dan penilaian pakar pelaksana pendidikan Islam di sekolah agama Brunei Darussalam.

Manakala kajian, Suzana Harun, Zaharah Hussin, Abdul Muhsien Sulaiman (2021) adalah bertujuan untuk mengenal pasti konstruk dan elemen yang bersesuaian bagi pembinaan model pengajaran inklusif guru Pendidikan Islam di sekolah rendah. Fasa ini menggunakan kaedah *Fuzzy Delphi Method*. Seramai 12 orang pakar bidang Pendidikan Islam dipilih bagi mendapat pengesahan elemen model pengajaran inklusif. Kesemua item diterima dengan mematuhi tiga syarat *Fuzzy* iaitu nilai *threshold* (d) tidak melebihi atau sama dengan 0.2, peratus kesepakatan pakar\ melebihi atau sama dengan 75%, dan nilai *Defuzzification* (α cut) melebihi atau sama dengan 0.5.

Kajian Nurul Khairani Ismail (2021) juga menggunakan kaedah *Fuzzy Delphi* di fasa kedua kajian beliau untuk mereka bentuk dan membangunkan model pembentukan akhlak kanak-kanak prasekolah. Seramai 11 orang pakar dipilih untuk mendapatkan persetujuan, kesepakatan dan kesahan terhadap konstruk model yang dibangunkan. Pakar terdiri daripada pensyarah dari universiti awam, IPG dan IKIM yang mempunyai latar belakang Pendidikan Islam dan

Pendidikan Awal Kanak. Kesepakatan dan kesahan tersebut berdasarkan respons pakar terhadap soal selidik yang terdiri daripada 7 skala Likert. Nilai *threshold* 'd', nilai kesepakatan pakar dan nilai *defuzzification* dihitung untuk menentu sahkan konsensus pakar terhadap semua item yang terdapat dalam soal selidik. Dapatan kajian *Fuzzy Delphi* menunjukkan pakar telah bersetuju dan mencapai kesepakatan terhadap tiga konstruk iaitu konstruk kepercayaan beragama, penglibatan ibu bapa dan keterikatan dengan sekolah, tujuh sub konstruk, 18 aspek dan 93 item.

Kajian yang dijalankan oleh Sukor, Marinah & Ramlee (2020) bertujuan untuk mengenal pasti elemen-elemen yang sesuai dalam pembangunan Model Kompetensi Pemimpin Pertengahan. Dalam fasa kedua, teknik *Fuzzy Delphi Method* (FDM) digunakan, melibatkan 30 orang pakar dalam FDM1 dan 30 orang pakar dalam FDM2, serta temu bual dengan tiga orang pakar untuk mencapai kesepakatan mengenai konstruk dan elemen model. Panel pakar FDM1 dalam fasa Pembangunan telah mengesahkan empat konstruk utama dalam model yang dibina, dengan penambahan satu konstruk baharu. Dalam dapatan temu bual tiga orang pakar, item konstruk kompetensi tersebut telah di susun semula, dan kesepakatan pakar FDM2 menyenaraikan 60 elemen yang perlu dimasukkan dalam Model Kompetensi POPPS. Dalam melaksanakan fasa ini, instrumen soal selidik menggunakan skala *linguistik Fuzzy* telah dibangunkan dan telah melalui proses kesahan oleh pakar kandungan serta pakar bahasa sebelum ia diberikan kepada responden. Selanjutnya, instrumen FDM2 juga telah dibangunkan untuk memperoleh kesepakatan pakar mengenai elemen-elemen yang perlu dimasukkan ke dalam konstruk model yang sesuai dengan konteks pemimpin pertengahan. Hasil kajian menunjukkan bahawa terdapat kesepakatan pakar terhadap kesemua konstruk dan elemen yang diuji tanpa sebarang pengguguran atau pindaan. Akhirnya, berdasarkan hasil tersebut, sebuah prototaip model kompetensi POPPS telah dibangunkan.

Bagi kajian Muhammad Nidzam et al. (2020) adalah bertujuan membangunkan model kurikulum pembelajaran yang berfokuskan kursus teknologi dalam PdP di IPG. Pendekatan DDR digunakan dalam membangunkan model tersebut. Fasa kedua adalah fasa reka bentuk dan Pembangunan pengkaji memilih pendekatan secara kaedah *fuzzy delphi method* bagi mengenal pasti konstruk dan elemen bagi model kurikulum M-pembelajaran kursus teknologi di IPG. Objektif kajian fasa dua pula ialah untuk mereka bentuk model kurikulum m-Pembelajaran Kursus Teknologi Dalam Pengajaran Dan Pembelajaran menggunakan Teknik *Fuzzy Delphi*. Fasa kedua pengkaji menggunakan pendekatan kaedah *Fuzzy Delphi* bagi mendapatkan kesepakatan pakar yang dipilih terhadap elemen dan konstruk bagi model yang ingin dibangunkan. pengkaji memilih responden panel pakar yang terdiri daripada 20 panel pakar iaitu tujuh pakar kurikulum dan reka bentuk pengajaran, tujuh pakar Kursus Teknologi Dalam Pengajaran Dan Pembelajaran dan enam pakar teknologi pendidikan. Data di analisis menggunakan Teknik *Fuzzy Delphi* iaitu *Triangular Fuzzy Numbers* dan *Defuzzification Process* iaitu proses untuk menentukan ranking bagi setiap pembolehubah dan membina model. Nilai *threshold* 'd' dihitung untuk menentu sahkan konsensus pakar terhadap semua elemen. Nilai *threshold* mesti kurang 0.2 dan peratus kesepakatan pakar melebihi 75%. Jumlah panel pakar yang terlibat dalam kajian ialah 20 orang. Panel pakar mencapai konsensus dari segi kesesuaian elemen dalam model m-Pembelajaran merujuk kepada elemen Isi Kandungan Model, Objektif Model, Elemen Perisian, Elemen Perkakasan, Aktiviti, Strategi P&P, Bentuk Penilaian dan Peluang Pelaksanaan. Dapatan fasa dua kajian menunjukkan panel pakar mencapai konsensus bagi elemen dalam model dengan nilai *threshold* kurang 0.2 dan peratus konsensus pakar melebihi 75%.

Manakala kajian oleh Muhammad Nidzam et al. (2020) bertujuan membangunkan model kurikulum pembelajaran yang menitikberatkan kursus teknologi dalam Pengajaran dan Pembelajaran (PdP) di Institut Pendidikan Guru (IPG). Dalam proses pembangunan model tersebut, mereka menggunakan pendekatan DDR. Fasa kedua melibatkan reka bentuk dan pembangunan, di mana pengkaji memilih pendekatan kaedah *Fuzzy Delphi Method* untuk mengenal pasti konstruk dan elemen bagi model kurikulum M-pembelajaran kursus teknologi di IPG dan mereka bentuk model kurikulum m-Pembelajaran Kursus Teknologi Dalam Pengajaran Dan Pembelajaran menggunakan Teknik *Fuzzy Delphi*. Dalam fasa kedua, pengkaji menggunakan kaedah *Fuzzy Delphi* untuk mendapatkan kesepakatan pakar terpilih mengenai elemen dan konstruk bagi model yang akan dibangun. Responden panel pakar terdiri daripada 20 orang, termasuk tujuh pakar kurikulum dan reka bentuk pengajaran, 7 pakar Kursus Teknologi Dalam Pengajaran Dan Pembelajaran, dan enam pakar teknologi pendidikan. Analisis data dilakukan menggunakan Teknik *Fuzzy Delphi* iaitu *Triangular Fuzzy Numbers*, dan proses *Defuzzification* untuk menentukan ranking bagi setiap pembolehubah dan membina model. Nilai *threshold 'd'* dihitung untuk memastikan konsensus pakar terhadap semua elemen, dengan syarat nilai *threshold* kurang daripada atau sama dengan 0.2 dan peratus kesepakatan pakar melebihi atau sama dengan 75%. Dapatan fasa dua menunjukkan bahawa panel pakar mencapai konsensus terhadap elemen dalam model m-Pembelajaran dengan nilai *threshold* kurang daripada 0.2 dan peratus konsensus pakar melebihi 75%.

Sementara itu, kajian oleh Radha, Mohd. Ridzwan dan Suriani (2020) adalah bagi pembangunan model pemikiran Invensif. Kajian pembangunan model ini juga telah menggunakan pendekatan kaedah penyelidikan reka bentuk dan pembangunan (DDR) yang melibatkan tiga fasa kajian iaitu fasa analisis keperluan, fasa reka bentuk dan pembangunan serta fasa penilaian dan kebolegunaan model. Seramai 17 orang pakar bidang teknologi dan reka cipta dalam menentukan konstruk dan elemen sebagai asas pembinaan model ini. Dalam fasa reka bentuk model ini beliau telah mereka bentuk elemen model ini berdasarkan kepada kaedah *fuzzy delphi* bagi mengenal pasti dan menentukan konstruk dan item. Konstruk dan item bagi pembangunan model ini berasaskan kesepakatan dan persetujuan pakar (*Threshold (d)* 0.2, dan peratus kesepakatan pakar adalah $\geq 75\%$ dan $\alpha\text{-cut} \geq 0.5$). Implikasi daripada kajian ini adalah guru dapat meningkatkan kecekapan mereka dalam menerapkan kemahiran pemikiran inventif yang berkesan dan sistematik kepada pelajar.

Fasa reka bentuk dan pembangunan yang dilakukan oleh Fazidah Naziri (2020) melibatkan kesepakatan 15 pakar untuk mengesahkan item dalam elemen utama setiap domain. Dalam fasa reka bentuk, kaedah *Fuzzy Delphi* digunakan, dengan 114 item disahkan melalui pendekatan *Modified Nominal Group Technique* (NGT Ubahsuai). Sebanyak 73 item dipilih melalui *Interpretive Structural Modelling* (ISM) dengan bantuan perisian *Concept Star*, diundi oleh pakar. Proses ini melibatkan tiga kaedah utama, iaitu *Fuzzy Delphi Modified* (FDM), *Nominal Group Technique* (NGT), dan ISM. Pengkaji memisahkan proses pengutipan data kepada dua sub fasa, iaitu reka bentuk dan pembangunan model penyeliaan klinikal guru RBT. Dalam sub fasa reka bentuk, pendekatan kaedah *Fuzzy Delphi* dan *Modified Nominal Group Technique* digunakan untuk menilai, menolak, atau menambah dan mengesahkan item dan elemen dalam domain setiap komponen utama melalui proses kesepakatan pakar. Seterusnya, fasa pembangunan melibatkan pendekatan ISM dengan tujuan utama membentuk model yang menilai keutamaan setiap item dalam domain bagi setiap komponen utama. Pembangunan Kaedah *Interpretive Structural Modelling* (ISM) melibatkan penentuan elemen dan item untuk setiap domain berdasarkan keutamaan dan kedudukan dalam Model Penyeliaan Klinikal Guru

RBT. Implikasi dari pembangunan model ini adalah sebagai panduan kepada Guru Kanan Mata Pelajaran Teknik dan Vokasional dalam membimbing guru RBT di sekolah.

Fasa Ketiga

Model Penilaian Kebolehgunaan

Fasa penilaian merupakan fasa terakhir dalam penyelidikan reka bentuk dan pembangunan (PRP), yang bertujuan menilai produk hasil dari fasa reka bentuk dan pembangunan. Dalam PRP, boleh dilakukan menggunakan penilaian keberkesanan, penilaian kebolehgunaan, atau gabungan keduanya (Mohd Ridhuan Mohd Jamil & Nurul Rabihah Mat Noh, 2020; Saedah Siraj et al., 2020). Hasil penilaian pada fasa ini dianggap sebagai langkah pengesahan untuk produk yang dihasilkan dalam kajian PRP (Saedah et al., 2020). Menurut Saedah et al. (2020), penilaian kebolehgunaan dilakukan untuk menilai kelebihan dan kekurangan produk, termasuk aspek kemudahan penggunaan, mengaplikasikan produk dan keupayaan mencapai tujuan pembangunan.

Bagi fasa ketiga penilaian kebolehgunaan model pengkaji telah memilih Model kebolehgunaan USE (2011) sebagai model sandaran dan panduan dalam melaksanakan fasa ketiga kajian ini. Model ini diasaskan oleh Lund (2011) dengan memperkenalkan Borang Soal Selidik USE. Penilaian ini mengukur aspek kebergunaan, kemudahpelajaran, kemudahgunaan, dan kepuasan sesuatu produk yang dibangunkan. Kaedah tinjauan melalui borang soal selidik akan diagihkan kepada guru-guru untuk mendapatkan kesahan produk.

Penilaian dan Kebolehgunaan Model

Fasa penilaian merupakan tahap akhir dalam Proses Reka Bentuk dan Pembangunan (PRP) yang bertujuan untuk menilai produk yang dihasilkan semasa proses reka bentuk dan pembangunan. Penilaian dalam fasa penilaian PRP dapat dilakukan dengan menggunakan kriteria keberkesanan, penilaian kebolehgunaan atau gabungan keduanya (Mohd Ridhuan Mohd Jamil & Nurulrabihah Mat Noh, 2020). Hasil daripada penilaian ini dianggap sebagai proses pengesahan bagi produk yang dihasilkan menggunakan kajian PRP (Saedah Siraj et al., 2020).

Antara kajian yang menggunakan pendekatan penyelidikan reka bentuk dan pembangunan (PRP) adalah seperti kajian yang dilakukan oleh Nurul Khairani Ismail (2021) yang bertajuk “Pembangunan Dan Penilaian Model Pembentukan Akhlak Kanak-Kanak Prasekolah”. Di fasa ketiga kajian ini adalah bertujuan menilai kebolehgunaan model kajian, melalui kaedah borang soal selidik penilaian Model. Seramai 21 orang guru Pendidikan Islam mengajar prasekolah dipilih untuk menilai kebolehgunaan model yang dibangunkan. Hasil kajian kebolehgunaan menunjukkan kesemua tiga konstruk, tujuh sub konstruk, 18 aspek dan 93 item sesuai untuk digunakan kepada kanak-kanak di peringkat prasekolah. Dapatan ini kemudiannya digunakan untuk membina borang kaji selidik penilaian kebolehgunaan bagi menilai kebolehgunaan model melalui *Modified Nominal Group Technique* (MNGT). Penggunaan lima skala likert dalam borang kaji *Modified Nominal Group Technique* (MNGT) bagi menunjukkan aras persetujuan pakar terhadap item-item adalah bersesuaian kerana semakin tinggi bilangan skala semakin jitu dan tepat data yang diperoleh (Mohd Ridhuan et al. 2014). Kandungan soal selidik ini dibentuk hasil daripada analisis dapatan Fasa II.

Seterusnya, kajian yang dijalankan oleh Suzana, Zaharah, Abdul Muhsien (2021) dalam membangunkan model inklusif pengajaran guru Pendidikan Islam. Di Fasa penilaian kebolegunaan ini pengkaji melibatkan 360 orang Guru Pendidikan Islam yang mengajar dalam kelas inklusif di sekolah rendah. Data dikutip menggunakan soal selidik. Data dianalisis berdasarkan Indeks kesepadanan (*fitness indexes*) menggunakan *Structural Equation Modelling* (SEM). Tujuan fasa ini dijalankan adalah untuk membuat penilaian terhadap model yang dibangunkan. Implikasi daripada kajian ini model yang dibangunkan menepati keperluan semasa guru Pendidikan Islam arus perdana yang mengajar murid berkeperluan khas (MBK) khususnya dalam aspek pedagogi inklusif dan juga memberi penambahbaikan dari aspek kurikulum kepada Bahagian Pendidikan Khas juga kepada Bahagian Pendidikan Islam, Kementerian Pendidikan Malaysia.

Dalam fasa penilaian model bagi kajian yang dijalankan oleh Syarina Ramli (2021), guru pelatih TVET di IPG dipilih sebagai sampel kajian untuk menilai kebolegunaan model. Kajian ini menggunakan IBM SPSS Statistik versi 25 dan analisis permodalan persamaan struktur (SEM-PLS). Soal selidik disebarikan kepada guru pelatih IPG untuk memperoleh pandangan mereka terhadap indikator dan item dalam model yang telah dibangunkan. Hasil kajian menunjukkan bahawa terdapat empat indikator kritikal, iaitu strategi pengajaran, rangkaian, refleksi, dan pembelajaran pembangunan lestari (PPL) yang diperlukan dalam membangunkan model kompetensi kemahiran hijau industri 4.0 bagi guru pelatih.

Manakala kajian yang dilakukan oleh Noor Azman Hanif, Mazlina Che Mustafa dan Hamidah Yusof (2020) dalam menentukan kebolegunaan model pengurusan bilik darjah prasekolah berasaskan empat dimensi pengurusan bilik darjah terhadap guru-guru prasekolah. Pada fasa ketiga iaitu penilaian kebolegunaan model pengurusan bilik darjah prasekolah ini beliau menggunakan kaedah Teknik Kumpulan *Norminal* yang diubahsuai (*modified Nominal Group technique-NGT*) dengan menggunakan set soal selidik yang diedarkan kepada 30 orang guru prasekolah KPM di negeri Perak yang berpengalaman selama 10 tahun. Hasil dapatan kajian ini menunjukkan, peratus elemen yang dinilai dalam model ini kesemuanya sesuai dan boleh digunakan kerana melebihi 70 peratus. Maka model ini adalah sesuai untuk dijadikan panduan kepada guru yang mengajar di prasekolah bagi melaksanakan pengajaran dan pembelajaran dalam bilik darjah dengan lebih berkesan.

Kepelbagaian Kajian Fasa Pertama ***Penyelidikan Rekabentuk dan Pembangunan Model***

Beberapa kajian lepas menunjukkan terdapat pengkaji terdahulu menggunakan pendekatan selain daripada dapatan fasa analisiskeperluanteori, model dan kajian literatur dalam mereka bentuk model. Antaranya ialah kajian kajian yang dijalankan oleh Suzana Harun, Zaharah Hussin, Abdul Muhsien Sulaiman (2021) bertujuan untuk pembinaan model pengajaran inklusif guru Pendidikan Islam di sekolah rendah. Bagi fasa analisis keperluan menggunakan borang soal selidik yang melibatkan 348 orang Guru Pendidikan Islam yang mengajar di sekolah rendah. Transkrip dianalisis secara verbatim Menggunakan SPSS. Hasil kajian mendapati ada keperluan terhadap pembangunan model pengajaran inklusif kepada guru pendidikan Islam di sekolah rendah.

Manakala, Fasa pertama kajian Nurul Khairani Ismail (2021) menggunakan kaedah temu bual untuk mengenal pasti keperluan pembangunan model pembentukan akhlak kanak-kanak

prasekolah melibatkan analisis keperluan yang telah dijalankan kepada 3 orang guru pendidikan Islam Data yang diperoleh dianalisis melalui kaedah perbandingan berterusan dengan menggunakan perisian NVIVO versi 12. Dapatan fasa pertama menunjukkan wujud permasalahan akhlak dalam kalangan kanak-kanak prasekolah dan perlunya kepada model pembentukan akhlak kanak-kanak prasekolah dibina. Dapatan kajian fasa pertama juga menunjukkan terdapat tiga kod dan tujuh tema bagi membangunkan model tersebut. kajian ini hanya memberi fokus kepada guru Pendidikan Islam berpengalaman lebih dari tujuh tahun mengajar di prasekolah KPM di negeri Selangor.

Seterusnya, kajian yang dijalankan oleh Sukor, Marinah Awang & Ramlee Ismail (2020) adalah bertujuan untuk fokus kepada persoalan berkaitan keperluan membangunkan satu model kompetensi pemimpin pertengahan bagi kolej matrikulasi. Pengkaji menggunakan kaedah secara pemetaan terhadap satu teori kepemimpinan dan empat model kompetensi sedia ada. Fasa satu ini diteruskan dengan temu bual terhadap enam orang pemimpin kolej matrikulasi merangkumi pemimpin tertinggi dan pemimpin pertengahan menggunakan satu instrumen protokol temu bual yang dibangunkan. Hasil kajian ini menepati keperluan semasa pemimpin pertengahan sebagai kumpulan kepimpinan sokongan yang berkualiti di institusi pendidikan seperti kolej matrikulasi. Dapatan analisis keperluan dalam fasa satu mengesahkan bahawa ada keperluan untuk membangunkan satu model khusus bagi kegunaan pemimpin pertengahan kolej matrikulasi.

Di samping itu, kajian yang dilakukan oleh Muhamad Nasir, Zaharah, dan Mohd Faisal (2020) adalah bertujuan untuk meneroka keperluan pembangunan Model Pengajaran Tarannum al-Quran (MPTQ) di sebuah Institusi Pengajian Tinggi yang dikenali sebagai 'IPT-A'. Pengumpulan data dilakukan melalui temu bual separa berstruktur dengan dua orang pensyarah yang terlibat dalam kursus sarjana muda di IPT-A. Selain itu, borang soal selidik telah diedarkan kepada 59 orang guru pelatih Pendidikan Islam pengkhususan al-Quran tahun tiga yang telah menamatkan kursus tarannum. Analisis data temu bual menggunakan perisian NVivo, sementara analisis data soal selidik menggunakan *Statistical Package for Social Sciences* (SPSS). Dapatan dari analisis keperluan menunjukkan tentang keperluan pembangunan MPTQ di IPT-A yang melibatkan enam komponen pengajaran, iaitu matlamat, objektif, kaedah, teknik, BBM, dan penilaian. Hasil kajian ini memberi penekanan pada pentingnya menyusun dan membangunkan model pengajaran yang komprehensif untuk meningkatkan kualiti pengajaran al-Quran di kalangan pensyarah dan guru pelatih.

Kepelbagaian Kajian Fasa Kedua

Penyelidikan Rekabentuk dan Pembangunan Model

Antara kajian-kajian lepas yang menggunakan pendekatan selain teknik *Fuzzy Delphi Method* (FDM) dalam membangunkan model ialah kajian oleh Ahmad Bazli, Muhammad Hafiz, dan Adibah (2023) mengenai reka bentuk model pengintegrasian ayat hafazan Al-Quran dengan ilmu aqli di Kolej PERMATA Insan, pendekatan perbincangan Kumpulan Fokus (FGD) digunakan dengan melibatkan sekumpulan tujuh pakar yang relevan dalam bidang kajian. Pakar-pakar ini dipilih berdasarkan panduan Krueger dan Casey (2009) untuk memberikan komentar, menambah atau menolak setiap komponen utama, fasa-fasa, sub-fasa, dan elemen di dalam model yang direka bentuk. Hasil kajian menghasilkan sebuah reka bentuk model yang terdiri dari lima komponen, lima fasa, lapan sub-fasa, dan tujuh puluh empat elemen. Model

ini dapat menjadi panduan yang jelas bagi guru dan murid dalam mengintegrasikan ayat hafazan dengan ilmu aqli di institusi tersebut.

Kajian oleh Najib et al. (2021) bertujuan membangunkan model penilaian MOOC untuk pengajaran Bahasa Arab. Mereka menggunakan pendekatan *Interpretive Structural Modeling* (ISM) untuk mendapatkan pandangan konsensus dari tujuh orang pakar yang terlibat dalam pendidikan bahasa Arab, teknologi maklumat, dan bidang penilaian. Dalam penentuan keutamaan elemen di setiap komponen utama model penilaian MOOC, tujuh elemen telah dikenal pasti oleh pakar. Keutamaan ditetapkan pada elemen menentukan jenis pentaksiran (penilaian sendiri, rakan sebaya, penilaian sumatif, formatif) untuk mengukur prestasi pelajar, diikuti dengan elemen menentukan syarat pensijilan bagi pelajar yang menamatkan kursus. Hasil kajian ini memberikan bimbingan berharga, terutamanya kepada pensyarah baru dalam penghasilan bahan pengajaran yang berkualiti, khususnya dalam pengajaran Bahasa Arab melalui platform MOOC.

Fasa reka bentuk dan pembangunan model dalam kajian Mohamad Ikram Zakaria (2021) telah dilaksanakan dengan menggunakan teknik *Interpretive Structural Modelling* (ISM), melibatkan partisipasi 11 orang pakar. Proses penggunaan teknik ISM melibatkan sembilan langkah, dan interpretasi data dilakukan berdasarkan pandangan serta keputusan yang diberikan oleh para pakar dalam teknik ISM. Hasil dari fasa kedua kajian ini menunjukkan bahawa sebanyak 30 aktiviti pengajaran M-PBM dianggap sesuai untuk dimasukkan dalam pembangunan model. Aktiviti-aktiviti pengajaran ini telah dihubungkan untuk membentuk satu model pengajaran M-PBM yang holistik. Para pakar juga sepakat untuk mengelaskan aktiviti pengajaran M-PBM mengikut kluster bebas, kebergantungan, dan autonomi. Kesemua ini menunjukkan usaha yang berterusan dalam menghasilkan model pengajaran yang mencerminkan keperluan serta pandangan pakar dalam meningkatkan pengajaran matematik dengan menggunakan teknologi.

Seterusnya, dalam fasa kedua kajian oleh Nurulrabihah Mat Noh (2020), model pengajaran pemikiran reka bentuk sekolah rendah dibangunkan menggunakan pendekatan kaedah *Nominal Group Technique* (NGT) dan *Interpretive Structural Modelling* (ISM). Kesembilan pakar yang terlibat, terdiri dari pakar profesional dalam pemikiran reka bentuk dan pensyarah institusi pengajian tinggi, serta pakar lapangan seperti guru pakar sekolah rendah. Perbengkelan diadakan untuk memperoleh pandangan dan keputusan pakar, dan elemen-elemen model dikenal pasti menggunakan teknik NGT. Seterusnya, ISM digunakan untuk membina prototaip model dengan hanya memasukkan elemen-elemen yang mencapai kesepakatan bersama. Soal selidik NGT terdiri daripada 26 elemen yang dikembangkan pada fasa sebelumnya, dan perisian concept star digunakan dalam teknik ISM. Kombinasi kaedah NGT dan ISM memberikan landasan bagi pembangunan model pengajaran pemikiran reka bentuk yang sesuai bagi murid sekolah rendah.

Sementara itu, kajian Mohd Norulhisham Abdul Rashid (2020) menggunakan kaedah *Nominal Group Technique* dan sesi *Interpretive Structural Modelling* dengan menggunakan perisian *Concept Star* untuk membangunkan model pembelajaran autentik. Seramai tujuh orang panel pakar yang mewakili Politeknik Malaysia, Jabatan Pendidikan Politeknik dan wakil industri. Dalam fasa reka bentuk dan pembangunan model, panel pakar telah mengenal pasti 13 konstruk utama pembelajaran autentik. Konstruk-konstruk utama ini merangkumi nota persefahaman, sesi pengajaran dan pembelajaran, penempatan pelajar ke industri, taklimat industri kepada

pelajar, pemantauan pensyarah, pengetahuan dalam konteks sebenar, aktiviti dalam persekitaran sebenar, interaksi sosial, kebebasan kepada pelajar, kemahiran generik, refleksi, perkongsian pengetahuan, dan penilaian. Hasil daripada kajian ini, model autentik ini akan menjadi garis panduan yang jelas untuk melaksanakan pendekatan pembelajaran di kalangan pensyarah Politeknik.

Kepelbagaian Kajian Fasa Ketiga

Penyelidikan Rekabentuk dan Pembangunan Model

Antara kajian-kajian lepas yang menggunakan pendekatan selain kaedah soal selidik kebolehgunaan model ialah kajian Mohamad Ikram Zakaria (2021), fasa penilaian melibatkan dua aspek utama, iaitu kebolehgunaan dan kepenggunaan model pengajaran M-PBM. Kebolehgunaan dilakukan melalui kaedah *Fuzzy Delphi* dengan melibatkan 18 orang pakar, Data dikumpulkan melalui soal selidik dan dianalisis berdasarkan nilai *threshold* (*d*), peratusan, dan skor *Fuzzy* (*A*). Hasilnya menunjukkan kesepakatan "sangat setuju" terhadap aktiviti, hubungan antara aktiviti, klasifikasi aktiviti mengikut domain, dan kebolehgunaan keseluruhan model. Penilaian kepenggunaan pula dilakukan melalui temu bual dengan 3 orang guru, menunjukkan pandangan positif terhadap aspek teknologi, kepenggunaan, dan pedagogi dalam model pengajaran M-PBM. Implikasinya, model ini berpotensi menjadi panduan bagi guru dalam melaksanakan pengajaran penyelesaian masalah secara kreatif dengan menggunakan teknologi mudah alih.

Manakala kajian oleh Nurul Khairani Ismail (2021) adalah bertujuan menilai kebolehgunaan model pembentukan akhlak kanak-kanak prasekolah. Seramai 21 orang guru Pendidikan Islam yang mengajar prasekolah dipilih bagi menilai kebolehgunaan model melalui *Modified Nominal Group Technique* (MNGT). Penggunaan lima skala likert dalam borang kaji *Modified Nominal Group Technique* (MNGT) bagi menunjukkan aras persetujuan pakar terhadap item-item adalah bersesuaian kerana semakin tinggi bilangan skala semakin jitu dan tepat data yang diperoleh (Mohd Ridhuan et al. 2014). Hasil dapatan kajian telah menunjukkan kesemua tiga konstruk, tujuh subkonstruk, 18 aspek dan 93 item sesuai untuk digunakan untuk kanak-kanak di peringkat prasekolah.

Seterusnya, Pembangunan Model Pengajaran Pemikiran Bentuk Sekolah Rendah oleh Nurulrabihah Mat Noh (2020). Fasa ketiga pengkaji menggunakan kaedah *fuzzy delphi* melibatkan penilaian kebolehgunaan model bertujuan untuk melihat kesesuaian serta kebolehgunaan model pengajaran pemikiran reka bentuk untuk dijadikan panduan oleh guru-guru dalam melaksanakannya dalam proses pengajaran dan pembelajaran (PdP) menggunakan kaedah *Fuzzy Delphi*. Hasil analisis menunjukkan ke semua pakar dalam kajian ini bersetuju elemen, dimensi dan keseluruhan model dalam model pengajaran pemikiran reka bentuk bersesuaian dan boleh digunakan dalam proses pengajaran dan pembelajaran. Pembangunan model ini dapat memberi garis panduan kepada guru-guru dalam pembelajaran abad ke-21.

Sementara itu, kajian Mohd Norulhisham Abdul Rashid (2020) untuk fasa penilaian kebolehgunaan model pembelajaran autentik untuk Program Kejuruteraan di Politeknik Malaysia, pengkaji menggunakan kaedah *Fuzzy Delphi* untuk mendapatkan kesepakatan kebolehgunaan terhadap model yang telah dibangunkan. Seramai 30 orang pensyarah utama Politeknik Malaysia terlibat bagi penilaian kebolehgunaan model yang dibangunkan dengan cara borang soal selidik. Instrumen yang digunakan diuji kesahan dan kebolehpercayaan

dengan analisis model pengukuran Rasch. Dapatan menunjukkan bahawa model pembelajaran autentik dapat digunakan dengan berkesan apabila kesesuaian konstruk, klasifikasi fasa, klasifikasi kluster, dan hubungan setiap konstruk dalam model memenuhi syarat kesepakatan yang telah ditetapkan melalui kaedah *Fuzzy Delphi*. Syarat kesepakatan ini dicapai dengan nilai $threshold\ d \leq 0.2$, dan peratusan kesepakatan melebihi 75%. Kajian ini memberikan sumbangan baru dalam penghasilan model pembelajaran autentik, di mana pembinaannya melibatkan kesepakatan panel pakar, berbeza dengan pendekatan sebelumnya yang lebih bersifat teoritikal.

Kesimpulan

Proses reka bentuk dan pembangunan model dalam penyelidikan pendidikan merupakan satu fasa yang kritikal dan kompleks. Ia memerlukan ketelitian, kreativiti, dan pemahaman mendalam tentang konteks pendidikan serta metodologi penyelidikan. Melalui perbincangan dalam bab ini, jelas bahawa terdapat pelbagai pendekatan yang boleh digunakan oleh penyelidik dalam mereka bentuk dan membangunkan model, dengan setiap pendekatan mempunyai kekuatan dan kesesuaian tersendiri bergantung kepada objektif dan konteks kajian.

Kajian lepas menunjukkan kepelbagaian aplikasi proses reka bentuk dan pembangunan model dalam pendidikan, membuktikan fleksibiliti dan kepentingannya dalam menangani pelbagai isu. Penyelidik perlu memilih metodologi yang sesuai dengan konteks dan objektif kajian. Penglibatan pakar dan proses pengumpulan serta analisis data yang teliti adalah penting untuk kesahihan model. Proses ini bukan sahaja menghasilkan penyelesaian praktikal, namun ia juga menyumbang kepada perkembangan teori dan amalan pendidikan secara keseluruhan.

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KONSEP AKOMODASI SEBAGAI PENDEKATAN SIGNIFIKAN KE ARAH PENYATUPADUAN ANTARA KAUM DI MALAYSIA

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Abstrak: *Malaysia merupakan sebuah negara yang terdiri daripada masyarakat multi etnik yang berbeza dari sudut agama dan kepercayaan, adat resam, budaya serta pandangan hidup. Perbezaan itu wujud sejak negara mencapai kemerdekaan pada tahun 1957 lagi dan sehingga kini. Keadaan ini menyebabkan wujud krisis hubungan antara kaum yang berterusan seperti prasangka, diskriminasi, serta defisit sosial sehingga menjejaskan usaha penyatupaduan masyarakat di Malaysia. Walaupun pada dasarnya negara berada dalam keadaan aman, namun krisis hubungan antara kaum berlaku secara perlahan-lahan akibat rasa ketidakpuasan serta rasa ketidakadilan dalam kalangan mereka. Justeru, kertas kerja ini diketengahkan dalam usaha mengetengahkan konsep akomodasi sebagai salah satu pendekatan terbaik dan signifikan dalam menangani cabaran membabitkan hubungan kaum di Malaysia. Dua objektif utama dikemukakan iaitu: meneliti konsep akomodasi dalam kerangka pemikiran sosial, dan menganalisis kerangka akomodasi sebagai strategi terbaik dalam proses penyatupaduan kaum di Malaysia. Kertas kerja ini menggunakan metode kualitatif dalam usaha merungkai data dan fakta berkaitan akomodasi dan hubungan antara kaum. Kaedah pengumpulan data berasaskan kajian kepustakaan iaitu berasaskan dokumen dan teks pensejarahan tentang akomodasi, hubungan kaum, dan sejarah pembentukan negara Malaysia. Analisis dokumen berasaskan pendekatan interpretatif diguna pakai untuk memahami amalan akomodasi dalam konteks masyarakat Malaysia. Dapatan awal menunjukkan bahawa akomodasi merupakan satu mekanisme toleransi dalam sebarang usaha penyatupaduan antara kaum, serta suatu proses integratif yang membolehkan kepelbagaian budaya diterima dengan baik oleh semua kaum. Implikasi kertas kerja ini diperhalusi melalui kerangka akomodasi sebagai satu konseptual yang dapat diketengahkan sebagai suatu dasar perpaduan di peringkat nasional. Asasnya akomodasi dapat mengurus perbezaan antara kaum, serta membina identiti nasional yang inklusif dan berdaya tahan dalam kalangan masyarakat di Malaysia.*

Kata Kunci: *Akomodasi, Pemikiran Sosial, Hubungan Antara Kaum, Penyatupaduan, Perpaduan di Malaysia*

Pengenalan

Malaysia ialah sebuah negara majmuk kerana terdiri daripada pelbagai kumpulan etnik, agama dan budaya. Kemajmukan masyarakat berasaskan sejarah pembentukan negara pada tahun 1920-an iaitu peristiwa migrasi besar-besaran membabitkan pekerja daripada negara China dan India ke Tanah Melayu. Proses migrasi tersebut membawa perubahan besar terhadap kedinamikan masyarakat dan kesannya dapat diperhatikan sehingga ke hari ini.

Keadaan ini menyebabkan pelbagai pendekatan digunakan oleh pihak kerajaan dalam usaha memelihara seterusnya menjaga keharmonian antara kaum. Inisiatif kerajaan diperhalusi

melalui pelbagai kaedah seperti dasar serta polisi yang diketengahkan, aktiviti serta program yang dirangka bersesuaian dengan kepelbagaian kaum dan masyarakat di Malaysia.

Dalam konteks ini, konsep akomodasi (*accommodation*) muncul sebagai suatu pendekatan terbaik dan penting ke arah penyatuan seterusnya perpaduan antara kaum. Asasnya, akomodasi menekankan penyesuaian, toleransi serta peruntukan ruang yang lebih terbuka bagi setiap kaum dan budaya yang pelbagai untuk berinteraksi dan berasimilasi dalam ruang lingkup masyarakat Malaysia.

Walaupun akomodasi dikemukakan sebagai strategi penyatupaduan, keberkesanannya bergantung kepada reka bentuk dasar, pelaksanaan di peringkat akar umbi, serta penerimaan dalam kalangan masyarakat di Malaysia (sebagai kumpulan sasaran). Ini kerana cabaran seperti jurang ekonomi antara kaum, politik berteraskan identiti tunggal dan wacana media (sama ada media massa mahupun media sosial) boleh menjejaskan fungsi akomodasi sebagai pemudah cara kepada proses perpaduan.

Apabila diperhalusi dengan sedalamnya didapati Malaysia pada ketika ini masih terus berhadapan dengan isu segregasi sosial dalam beberapa keadaan. Misalnya dalam ruang lingkup persekolahan di Malaysia yang menyaksikan berlakunya pemisahan antara kaum sejak di peringkat sekolah rendah lagi kerana kewujudan pelbagai jenis sekolah (seperti Sekolah Kebangsaan, Sekolah Jenis Kebangsaan Cina, Sekolah Jenis Kebangsaan Tamil, dan Sekolah Antarabangsa). Kepelbagaian sekolah ini pada dasarnya menyebabkan para pelajar di Malaysia tidak bergaul ataupun kurang berinteraksi dengan kaum lain secara lebih meluas.

Selain sekolah, wujud ruang seperti kawasan perumahan, tempat kejiranan terutamanya di kawasan bandar, serta tempat kerja yang berasaskan etnik tunggal sehingga menyebabkan tiadanya interaksi dengan kaum lain yang ada di Malaysia. Keadaan ini sebenarnya menimbulkan suatu persoalan iaitu adakah strategi akomodasi sedia ada benar-benar dapat menghasilkan integrasi yang substantif ataupun hanya sekadar mengekalkan koeksistensi yang rapuh.

Permasalahan selanjutnya ialah ketidaksamaan hasil daripada pelaksanaan akomodasi yang diketengahkan oleh pihak kerajaan. Misalnya ialah akomodasi yang dilaksanakan bersifat *top-down* (kerajaan kepada masyarakat) tanpa penglibatan pihak komuniti dalam pelaksanaan tersebut. Kesannya sudah pasti wujud ketidakpuasan hati atau kurangnya rasa pemilikan terhadap sebarang program perpaduan yang dilaksanakan oleh pihak kerajaan.

Bertitik tolak daripada permasalahan di atas, kertas kerja ini dirangka dalam usaha mengetengahkan konsep akomodasi dan perkaitannya dalam proses penyatupaduan antara kaum di Malaysia. Terdapat dua persoalan utama kajian, iaitu apakah yang dimaksudkan sebagai konsep akomodasi dalam kerangka pemikiran sosial, dan bagaimanakah akomodasi dapat diketengahkan sebagai salah satu strategi terbaik dalam proses penyatupaduan kaum di Malaysia?

Dua persoalan tersebut akan dirungkai dan menjadi fokus utama penulisan. justeru, terdapat dua objektif dalam kertas kerja ini iaitu: pertama, meneliti konsep akomodasi dalam kerangka pemikiran sosial, dan kedua, menganalisis akomodasi sebagai strategi terbaik dalam proses penyatupaduan kaum di Malaysia.

Metode Kajian

Kertas kerja ini mengimplemenkan metode kualitatif berbentuk konseptual dalam meneliti akomodasi sebagai suatu kerangka penting dalam proses penyatupaduan antara kaum di Malaysia. Untuk itu, kaedah pengumpulan data menggunakan kajian kepustakaan berbentuk dokumen seperti dasar kerajaan, teks Rukun Negara, laporan Kementerian Perpaduan, dan laporan rasmi lain berkaitan dengan perpaduan kaum.

Kaedah analisis data kajian menggunakan pendekatan analisis tematik iaitu mengenal pasti tema utama yang ditekankan dalam setiap data dan fakta yang diperolehi. Selain itu, analisis kandungan turut digunakan iaitu menganalisis setiap dokumen berkaitan dengan memfokuskan kepada perkataan, simbol serta mesej dasar yang menggambarkan nilai akomodasi.

Ulasan Karya

Karya dan kajian terdahulu yang memfokuskan kepada akomodasi dan penyatupaduan kaum di Malaysia diperhalusi diusahakan oleh beberapa pengkaji. Sebelum meneliti kajian lepas berkaitan, berikut dikemukakan makna kepada dua tema utama penulisan iaitu akomodasi dan penyatupaduan kaum.

Definisi Akomodasi

Akomodasi merujuk kepada suatu mekanisme politik dan sosial yang digunakan untuk mencari titik persetujuan ataupun persamaan antara setiap kumpulan atau etnik yang berlainan seperti mana wujud di Malaysia. Persetujuan mahupun persamaan tersebut akan dicari melalui sama ada secara rundingan, pembahagian sumber (ekonomi, alam semula jadi dan harta negara), pelaksanaan peruntukan khas atau pemeliharaan identiti. Tujuannya ialah interaksi sosial yang berlaku dapat berfungsi dengan sebaiknya tanpa berlakunya konflik atau ketegangan antara kaum yang berkepanjangan.

Definisi Penyatupaduan antara kaum

Ia difahami sebagai suatu proses menyatukan pelbagai etnik atau kaum dalam sesebuah negara supaya hidup bersama secara aman dan harmoni, saling hormat menghormati, dan saling bertoleransi serta bekerjasama demi kebaikan bersama dalam kehidupan seharian. Proses tersebut penting untuk manfaat semua kaum dan kemajuan negara dalam jangka masa panjang dan berterusan. Dalam konteks Malaysia, proses penyatupaduan antara kaum bermaksud sebarang usaha menyatukan masyarakat Melayu, Cina, India dan etnik bumiputera di Sabah dan Sarawak supaya hidup secara harmoni sebagai satu bangsa Malaysia.

Berdasarkan kerangka konseptual di atas, terdapat beberapa kajian lepas yang meneliti tentang akomodasi dalam proses penyatupaduan antara kaum di Malaysia. Justeru itu, berikut dikemukakan huraian ringkas berkenaan kajian lepas bertemakan (1) konsep akomodasi, dan (2) penyatupaduan antara kaum.

Kajian Lepas Tentang Konsep Akomodasi

Akomodasi sebagai satu pendekatan berbentuk teoritikal dan praktikal dalam ruang lingkup masyarakat diusahakan oleh beberapa pengkaji terutamanya dari sudut komunikasi dan bahasa. Misalnya, Dilah & Chong (2024) merungkai akomodasi sebagai teori komunikasi dalam kalangan masyarakat di Telok Melano, Sarawak dengan Temajuk, Kalimantan Barat, Indonesia. Selain itu, Malloy et al. (2022), Rami et al. (2022), Montgomery et al. (2021), Woods & Ruscher (2021), dan Chevalier et al. (2020) meneliti akomodasi sebagai satu teori yang diterapkan dalam komunikasi melibatkan komuniti masyarakat yang berbeza antara satu sama lain.

Dalam konteks Malaysia, pendekatan akomodasi sebagai satu teori komunikasi antara kaum diketengahkan oleh pengkaji seperti Puteri Roslina (2009) yang meneliti akomodasi berbentuk bahasa dalam interaksi di antara kaum Melayu dan Cina. Kajian tersebut mendapati bahawa akomodasi bahasa membantu individu memahami individu lain yang bertutur dengan caranya tersendiri, memahami tingkah laku yang diinterpretasi mengikut keperluan situasi dan orang yang dilawan bercakap, dan juga mencari jalan agar komunikasi berjalan lancar, serta mengelakkan konflik.

Kajian Lepas Tentang Penyatupaduan Antara Kaum

Apabila meneliti kajian lepas terdapat beberapa yang berkaitan dengan penyatupaduan antara kaum. Misalnya penelitian Khairi & Ramli (2023) berkenaan sejarah pembentukan perpaduan negara dalam kerangka ekonomi, Maifuza & Nor Shela (2023) membincangkan proses penyatupaduan berasaskan kerangka kesepaduan dalam kalangan masyarakat majmuk di Malaysia, dan Mohd Khaidir (2019) meneliti potensi falsafah bahasa sebagai suatu pendekatan penyatupaduan nasional. Terdapat juga kajian yang memfokuskan kepada evolusi perpaduan yang bermula daripada peristiwa 13 Mei 1969 dan sehingga kini (Shamsul, 2021) yang menjadi asas perhubungan antara kaum.

Berdasarkan rangkuman kajian lepas di atas didapati bahawa penelitian terhadap konsep akomodasi dalam konteks penyatupaduan antara kaum di Malaysia masih belum banyak dilakukan. Kajian terdahulu lebih memfokuskan akomodasi sebagai teori komunikasi dan elemen perpaduan antara kaum berbanding dengan akomodasi sebagai proses penyatupaduan. Justeru itu, kertas kerja ini diusahakan dalam meneliti dua asas tersebut dalam usaha menambah baik perhubungan antara kaum di Malaysia dari masa ke masa.

Dapatan Kajian

Berdasarkan penelitian mendalam yang dilakukan mendapati bahawa konsep akomodasi memainkan peranan penting sebagai asas kepada pembentukan kerangka pemikiran sosial dalam konteks masyarakat majmuk di Malaysia. Akomodasi terbukti bukan sekadar satu bentuk penyesuaian sosial, namun menjadi satu mekanisme dinamik yang membolehkan pelbagai kelompok etnik hidup bersama secara harmoni tanpa perlu mengorbankan identiti budaya masing-masing. Justeru itu, dikemukakan dua dapatan utama kertas kerja ini seperti mana penghuraian di bawah.

Konsep Akomodasi

Akomodasi difahami sebagai suatu pendekatan berbentuk pragmatik yang membenarkan penyesuaian struktur sosial untuk menampung kepelbagaian identiti masyarakat tanpa melalui proses paksaan ataupun pemaksaan. Ciri utama dalam akomodasi diperhalusi sebagai satu proses rundingan melibatkan setiap pihak yang berkepentingan ataupun terlibat. Dalam kerangka Malaysia, rundingan melibatkan kaum utama dan kaum sah yang ada iaitu Melayu, Cina, India, bumiputera di Sabah dan Sarawak, dan orang Asli.

Selain itu, akomodasi turut melibatkan peruntukan khas seperti kuota atau ruang budaya dalam konteks pendidikan serta cara hidup masyarakat Malaysia. Akomodasi juga merupakan suatu inisiatif yang mempromosikan toleransi dan hormat menghormati di antara kaum yang ada. Setiap ciri akomodasi ini boleh berlaku di peringkat makro iaitu dasar negara mahupun di peringkat mikro iaitu interaksi antara komuniti yang wujud.

Akomodasi secara praktikalnya dapat dipraktikkan dalam ruang lingkup masyarakat (Hamizah et al., 2023). Ia diperhalusi melalui dimensi praktikal seperti mana berikut:

- i. Pendidikan iaitu kurikulum berkenaan kaum dan etnik di Malaysia seperti kursus Sejarah di peringkat sekolah rendah dan menengah, serta kursus Penghayatan Etika dan Peradaban dan Kenegaraan Malaysia di peringkat universiti.
- ii. Ekonomi iaitu melibatkan program pemberdayaan ekonomi untuk kumpulan terpinggir – jurang antara kaum berasaskan ekonomi dapat dikecilkan.
- iii. Ruang awam iaitu reka bentuk perumahan dan fasiliti yang dibina untuk menggalakkan interaksi dan komunikasi dengan pelbagai kaum.
- iv. Mekanisme berbentuk representasi politik iaitu satu bentuk penyesuaian institusional yang menjamin setiap kaum mempunyai ruang dan suara dalam proses politik serta pentadbiran negara.

Akomodasi Dalam Kerangka Pemikiran Sosial

Dalam kerangka pemikiran sosial, akomodasi merujuk kepada proses penyesuaian sosial yang berlaku apabila individu atau kumpulan dengan latar belakang budaya, etnik, agama, atau ideologi yang berbeza mencapai satu bentuk keseimbangan hubungan bagi mengurangkan sebarang konflik dan mengekalkan keharmonian sosial dari masa ke masa.

Ini bermakna, akomodasi merupakan satu mekanisme sosial untuk mengekalkan kestabilan dalam kepelbagaian. Ia bukan untuk menghapuskan perbezaan, tetapi mengurus dan menyesuaikan melalui proses toleransi, bertolak ansur, serta penghormatan bersama melibatkan semua kumpulan etnik atau kaum yang ada.

Akomodasi turut berperanan sebagai alat pengimbang sosial yang dapat mencegah masyarakat daripada terjerumus ke dalam konflik yang berpanjangan. Maknanya di sini ialah fungsi akomodasi diketengahkan sebagai (i) suatu toleransi berbentuk sosial iaitu kesediaan menerima perbezaan pandangan dan budaya antara kaum di Malaysia, (ii) kompromi dan rundingan iaitu mencari jalan tengah antara setiap tuntutan dalam kumpulan berbeza, (iii) konvensi sosial dan undang-undang iaitu peraturan bersama yang melindungi kepentingan semua pihak, dan (iv) institusi sosial iaitu tempat menengahkan akomodasi yang kemudiannya diserapkan melalui pendidikan, agama, dan politik agar interaksi harmoni antara masyarakat terus berlaku.

Analisis Kajian

Berdasarkan analisis yang dilakukan didapati bahawa akomodasi merupakan salah satu pendekatan terbaik setakat ini dalam melancarkan proses penyatupaduan antara kaum di Malaysia. Asasnya ialah akomodasi merupakan pendekatan bersifat inklusif dan realistik yang sesuai untuk keadaan negara ketika ini. Untuk itu, berikut dikemukakan analisis rinci berkaitan fungsi sebenar akomodasi sebagai pendekatan penyatupaduan,

Pertama, Mengiktiraf Kepelbagaian Kaum Sebagai Suatu Bentuk Kekuatan

Malaysia merupakan negara berbilang kaum yang terdiri daripada pelbagai etnik seperti Melayu, Cina, India, serta pelbagai kumpulan Bumiputera di Sabah dan Sarawak. Dalam konteks ini, akomodasi berfungsi dengan mengiktiraf bahawa kepelbagaian bukanlah ancaman kepada perpaduan, sebaliknya suatu bentuk kekuatan nasional. Pendekatan akomodasi membenarkan setiap kaum mengekalkan identiti, budaya, dan bahasa masing-masing sambil hidup bersama dalam suasana harmoni. Ia membentuk asas kepada prinsip *unity in diversity*, di mana perbezaan dilihat sebagai sumber kekayaan budaya dan sosial, bukannya pemisah.

Fungsi ini amat penting kerana masyarakat Malaysia tidak diasaskan atas satu budaya tunggal, tetapi atas persetujuan hidup bersama. Berbeza dengan pendekatan asimilasi yang menekankan penyatuan melalui penyerapan budaya dominan, akomodasi mengekalkan keunikan budaya setiap kaum. Dengan cara ini, setiap kelompok merasa dihormati dan diiktiraf dalam kerangka kenegaraan. Perasaan dihargai ini menimbulkan kesetiaan terhadap negara, sekali gus memperkukuh integrasi sosial. Tanpa pengiktirafan terhadap kepelbagaian, perasaan terpinggir boleh wujud dan menggugat keharmonian.

Contoh jelas dapat dilihat dalam Dasar Kebudayaan Kebangsaan (1971) yang menerima unsur-unsur kebudayaan pelbagai kaum sebagai sebahagian daripada kebudayaan kebangsaan. Begitu juga dengan amalan sambutan perayaan pelbagai kaum seperti Tahun Baharu Cina, Deepavali, Gawai Dayak, dan Aidilfitri yang diraikan secara terbuka oleh masyarakat Malaysia. Kesediaan kerajaan dan rakyat menghormati tradisi pelbagai kaum membuktikan bahawa akomodasi mengiktiraf kepelbagaian sebagai sumber kekuatan sosial dan perpaduan nasional.

Kedua, Menggalakkan Toleransi Dan Kompromi Sosial Dalam Kalangan Masyarakat Malaysia

Akomodasi turut berfungsi sebagai asas kepada pembentukan **toleransi sosial**, iaitu kesediaan setiap kaum untuk memahami, menghormati dan menerima perbezaan antara satu sama lain. Dalam masyarakat majmuk, perbezaan agama, adat dan budaya mudah menimbulkan salah faham. Oleh itu, akomodasi memastikan hubungan antara kaum dapat dikekalkan melalui komunikasi terbuka, kesopanan dan saling menghormati. Nilai ini seiring dengan semangat Rukun Negara, terutamanya prinsip kesopanan dan kesusilaan, yang menjadi panduan hidup rakyat pelbagai etnik.

Toleransi yang lahir daripada amalan akomodasi bukanlah pasif, tetapi berbentuk kompromi sosial aktif. Ini bermaksud, setiap kaum bersedia menyesuaikan diri demi kepentingan bersama. Misalnya ialah dalam bidang pendidikan dan pekerjaan, wujudnya peraturan atau norma yang menghormati keperluan budaya tertentu seperti pakaian, makanan halal, dan waktu

ibadah. Keanjalan sosial ini menunjukkan bahawa masyarakat Malaysia mampu menerima perbezaan tanpa perlu mengorbankan identiti masing-masing. Akomodasi, dalam hal ini, bertindak sebagai mekanisme sosial yang meredakan potensi konflik dan mengekalkan kestabilan nasional.

Bukti konkrit dapat dinilai berdasarkan penggunaan bahasa kebangsaan bersama-sama bahasa ibunda, serta kerjasama masyarakat majmuk dalam aktiviti komuniti seperti gotong-royong, Hari Kebangsaan, dan program sukarelawan. Tindakan ini memperlihatkan semangat kompromi dan saling bantu membantu antara kaum yang berbeza. Ini bermakna fungsi akomodasi di sini ialah membina persefahaman dan keharmonian melalui penerimaan, bukan pemaksaan, sesuatu yang amat penting dalam memastikan kelangsungan perpaduan sosial di Malaysia.

Ketiga, Menyokong Dasar Pembangunan Inklusif

Fungsi ketiga akomodasi ialah menyokong dasar pembangunan yang bersifat inklusif dan seimbang, agar semua kaum mendapat manfaat daripada kemajuan negara. Dalam konteks Malaysia, pembangunan ekonomi dan sosial tidak boleh bersifat eksklusif kepada sesuatu kumpulan, kerana ketidakseimbangan ekonomi mudah menimbulkan ketegangan kaum. Akomodasi menjadi pendekatan yang memastikan dasar-dasar pembangunan mengambil kira keperluan semua lapisan masyarakat tanpa meminggirkan mana-mana kaum.

Pendekatan ini dapat dilihat dalam pelaksanaan Dasar Ekonomi Baru (DEB) pada tahun 1971, yang bertujuan membasmi kemiskinan tanpa mengira kaum dan menyusun semula masyarakat bagi mengurangkan jurang ekonomi antara etnik. Walaupun sering dilihat dari sudut membantu Bumiputera, prinsip asas DEB berteraskan akomodasi kerana ia menyeimbangkan keperluan keadilan sosial dengan kestabilan hubungan kaum. Begitu juga dengan dasar Ekonomi Madani yang diperkenalkan kini, yang menekankan kesejahteraan bersama, keterangkuman sosial, dan pembentukan masyarakat seimbang dari segi ekonomi dan nilai.

Kesimpulan

Secara keseluruhannya, kertas kerja ini merumuskan bahawa konsep akomodasi merupakan pendekatan signifikan dalam memperkukuh proses penyatupaduan antara kaum di Malaysia. Akomodasi bukan hanya melibatkan penyesuaian luaran, tetapi juga penghayatan nilai saling menghormati, toleransi dan kompromi sosial yang menjadi asas kepada kestabilan hubungan antara etnik. Melalui proses ini, masyarakat pelbagai kaum dapat hidup bersama dalam suasana aman, menghargai perbezaan budaya, serta bekerjasama membina keharmonian sosial yang berteraskan semangat kebersamaan nasional. Oleh itu, akomodasi terbukti berfungsi sebagai kerangka pemikiran sosial yang mengekalkan keseimbangan antara kepelbagaian dan perpaduan dalam konteks masyarakat majmuk.

Dari segi cadangan penambahbaikan, kertas kerja ini mencadangkan agar nilai-nilai akomodasi diperkukuh melalui pendidikan, dasar awam dan amalan sosial. Institusi pendidikan perlu berperanan lebih aktif dalam memupuk kefahaman lintas budaya, manakala media massa boleh menjadi medium penting dalam memperluas wacana keharmonian dan penerimaan sosial. Selain itu, dasar pembangunan nasional seperti *Pelan Perpaduan Negara* perlu disemak dari semasa ke semasa bagi memastikan ia benar-benar mencerminkan prinsip akomodasi dalam

pelaksanaan dasar yang inklusif. Kerjasama pelbagai pihak termasuk kerajaan, NGO, institusi akademik dan masyarakat amat penting bagi memastikan amalan akomodasi terus hidup dan berkembang dalam realiti sosial Malaysia yang sentiasa berubah.

Akhirnya, kertas kerja ini menekankan keperluan menjadikan akomodasi sebagai mekanisme utama dalam pengurusan perpaduan nasional yang berteraskan nilai empati, saling menghormati dan keadilan sosial dari masa ke masa. Generasi muda wajar dididik untuk melihat kepelbagaian sebagai kekuatan dan bukan ancaman, manakala masyarakat keseluruhan perlu terus mengekalkan semangat keterbukaan dalam mendepani cabaran perbezaan etnik dan ideologi. Dengan penerapan berterusan nilai akomodasi, Malaysia berpotensi membina masyarakat yang bukan sahaja bersatu secara struktural, tetapi juga bersatu hati dan matlamat dalam menjayakan visi negara yang harmoni, sejahtera dan inklusif.

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6th Penang International Multidisciplinary Conference 2025

eISSN 3036-0331

8th - 9th November 2025

Shang-Ri La Hotel, Penang, Malaysia

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KAEDAH PENGAJARAN AL-QURAN DENGAN PENDEKATAN MULTIMEDIA INTERAKTIF

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Abstrak: *Pengajaran Al-Quran merupakan elemen asas dalam pendidikan Islam yang berfungsi membentuk keperibadian, spiritual, dan sosial umat Islam. Evolusi kaedah pengajaran Al-Quran daripada talaqqi dan mushafahah kepada penggunaan teknologi moden memperlihatkan usaha berterusan dalam memastikan keberkesanan proses pembelajaran. Artikel ini membincangkan integrasi multimedia interaktif dalam pengajaran Al-Quran sebagai pendekatan inovatif yang mampu meningkatkan kefahaman, motivasi, serta keterlibatan pelajar. Melalui gabungan elemen audio, video, animasi, dan aplikasi digital, pengajaran tajwid, tilawah, serta tafsir dapat disampaikan secara lebih menarik, dinamik, dan berkesan. Walaupun terdapat cabaran seperti kekangan teknologi, kos pembangunan bahan digital, dan tahap kemahiran guru, penyelesaian seperti latihan berterusan, sokongan teknikal, dan penyediaan aplikasi kos rendah dapat membantu mengatasi halangan tersebut. Kajian ini juga menekankan prospek masa hadapan pengajaran Al-Quran dengan penerapan teknologi baharu seperti Kecerdasan Buatan (AI), Realiti Maya (VR), dan Realiti Terimbuh (AR) yang berpotensi merevolusikan pendekatan pembelajaran Al-Quran. Secara keseluruhannya, penggunaan multimedia interaktif bukan sahaja meningkatkan kualiti pengajaran, malah turut membuka ruang bagi inovasi pendidikan Islam yang lebih inklusif, interaktif, dan relevan dengan era digital.*

Kata kunci: *Pengajaran Al-Quran, Multimedia Interaktif, Tajwid, Tilawah, Tafsir, Teknologi Pendidikan, AI, VR, AR*

Pengenalan

Pengajaran Al-Quran merupakan aspek yang sangat penting dalam pendidikan Islam, kerana ia melibatkan proses pembelajaran, pemahaman, dan penghafalan ayat-ayat suci Al-Quran. Pengajaran ini bukan sahaja berkisar tentang membaca ayat-ayat tersebut, tetapi juga bertujuan untuk memahami, menghayati, dan mengamalkan ajaran yang terkandung di dalamnya. Usaha ini adalah suatu langkah yang amat mulia dan memerlukan komitmen tinggi daripada semua pihak yang terlibat. Dalam karangan ini, kita akan membincangkan kepentingan pengajaran Al-Quran serta kaedah-kaedah pelaksanaannya, disertai dengan pandangan daripada para pengkaji dalam bidang ini.

Menurut Siti Mursyidah (2018), pengajaran Al-Quran adalah sangat penting kerana ia merupakan panduan hidup bagi umat Islam. Al-Quran mengandungi ajaran yang mencakupi semua aspek kehidupan, termasuk akidah, ibadah, akhlak, dan muamalat. Dengan memahami dan mengamalkan ajaran Al-Quran, seseorang Muslim dapat menjalani kehidupan yang diredhai Allah dan mencapai kebahagiaan di dunia serta akhirat. Selain itu, membaca Al-Quran

juga merupakan satu ibadah yang mendatangkan pahala besar. Oleh itu, pengajaran Al-Quran adalah satu usaha yang amat penting dalam memastikan umat Islam dapat menjalani kehidupan yang berlandaskan syariat.

Berdasarkan kajian oleh Abdul Rahman (2020), pengajaran Al-Quran bukan sahaja memberi manfaat kepada individu, tetapi juga kepada masyarakat secara keseluruhan. Pendidikan Al-Quran dapat membentuk masyarakat yang lebih bertanggungjawab dan berakhlak mulia, serta mengelakkan mereka daripada terjebak dalam perbuatan yang dilarang dalam agama. Kajian tersebut juga menekankan bahawa pengajaran Al-Quran harus dilaksanakan secara holistik, merangkumi aspek pembelajaran teori dan praktikal agar para pelajar dapat mengamalkan ilmu yang diperoleh dalam kehidupan seharian.

Dalam konteks pengajaran Al-Quran, terdapat beberapa komponen utama yang perlu diberi perhatian. Salah satu daripadanya adalah tajwid. Tajwid adalah ilmu yang berkaitan dengan kaedah dan peraturan bacaan Al-Quran untuk memastikan bacaan yang betul dan fasih. Ia merangkumi sebutan huruf, panjang pendek bacaan (mad), dan aturan lain yang memastikan bacaan Al-Quran mengikut tatacara yang betul. Pengajaran tajwid adalah penting bagi memastikan setiap ayat Al-Quran dibaca dengan tepat dan mengelakkan kesalahan yang boleh mengubah makna ayat tersebut.

Selain itu, tilawah juga merupakan satu komponen penting dalam pengajaran Al-Quran. Tilawah adalah bacaan Al-Quran dengan suara yang merdu dan tartil, iaitu bacaan yang jelas dan tertib. Tilawah membantu pelajar untuk membaca Al-Quran dengan betul dan indah, serta meningkatkan kecintaan terhadap kitab suci tersebut. Dalam kajian yang dijalankan oleh Ahmad Zaki (2019), didapati bahawa tilawah yang betul dan indah mampu meningkatkan minat pelajar untuk terus mendalami Al-Quran dan menjadikan mereka lebih konsisten dalam penghafalan ayat-ayat suci.

Hafazan atau menghafal Al-Quran juga merupakan satu aspek penting dalam pengajaran Al-Quran. Program hafazan melibatkan jadual yang ketat dan teknik memori yang khusus untuk membantu pelajar mengingati ayat-ayat dengan tepat. Menghafal Al-Quran bukan sahaja memberikan pahala besar, tetapi juga menjadikan seseorang itu lebih dekat dengan Al-Quran dan ajarannya. Dalam kajian oleh Fariha Ahmad (2021), penghafalan Al-Quran dikaitkan dengan peningkatan kemampuan otak dalam mengekalkan ingatan jangka panjang dan meningkatkan daya fokus.

Tafsir pula adalah penjelasan dan penafsiran ayat-ayat Al-Quran untuk memahami maknanya dengan lebih mendalam. Tafsir membantu pelajar memahami konteks, sebab penurunan ayat (asbabun nuzul), dan pengajaran yang terkandung dalam ayat tersebut. Dengan memahami tafsir, pelajar dapat menghayati ajaran Al-Quran dan mengamalkannya dalam kehidupan seharian. Kajian yang dilakukan oleh M. Khairuddin (2022) menunjukkan bahawa pemahaman tafsir memberi impak besar dalam membantu pelajar menghubungkan antara teks Al-Quran dengan situasi kehidupan moden, menjadikan ajaran Al-Quran lebih relevan dan mudah diterima.

Selain itu, pengajaran Al-Quran juga sering kali merangkumi pendidikan agama asas (fardhu ain), termasuk akidah, ibadah, dan akhlak yang diambil daripada ajaran Al-Quran dan sunnah. Menurut kajian oleh Kamaludin (2020), integrasi antara pengajaran Al-Quran dengan

pendidikan akhlak dapat membantu membentuk peribadi pelajar yang lebih bertanggungjawab dan beretika, serta lebih peka terhadap nilai-nilai murni dalam kehidupan seharian.

Dalam usaha meningkatkan keberkesanan pengajaran Al-Quran, pelbagai kaedah pengajaran telah diperkenalkan. Antaranya adalah penggunaan teknik fonetik, modul-modul interaktif, serta penggunaan teknologi seperti aplikasi dan perisian komputer. Kaedah-kaedah ini bukan sahaja memudahkan proses pembelajaran, tetapi juga menjadikannya lebih menarik dan efektif. Dalam kajian oleh Mahmud (2019), penggunaan teknologi dalam pengajaran Al-Quran menunjukkan peningkatan yang signifikan dalam minat pelajar untuk belajar, serta membantu mereka menguasai bacaan dan penghafalan dengan lebih cepat.

Pengajaran Al-Quran juga boleh dilaksanakan di pelbagai tempat seperti sekolah-sekolah agama, masjid-masjid, pusat tahfiz, dan institusi pendidikan Islam. Menurut kajian oleh Zainal Abidin (2020), suasana pembelajaran yang kondusif dan sokongan dari pihak sekolah serta masyarakat sangat penting dalam memastikan pengajaran Al-Quran dapat dilaksanakan dengan berkesan.

Kesimpulannya, pengajaran Al-Quran adalah satu aspek penting dalam pendidikan Islam yang bertujuan melahirkan individu yang celik Al-Quran, memahami isi kandungannya, dan mengamalkan ajarannya dalam kehidupan seharian. Dengan komitmen yang tinggi daripada semua pihak, serta penggunaan kaedah-kaedah pengajaran yang efektif, kita dapat memastikan bahawa pengajaran Al-Quran dapat dilaksanakan dengan baik dan mencapai matlamat yang diinginkan. Keberkesanan pengajaran ini memerlukan kerjasama antara pendidik, pelajar, serta masyarakat untuk mewujudkan generasi yang bukan sahaja celik Al-Quran, tetapi juga berakhlak mulia dan bertanggungjawab.

Objektif Kajian

1. Mengkaji bagaimana penggunaan multimedia interaktif seperti animasi, audio, dan video dapat membantu pelajar memahami dan belajar Tajwid, Tilawah, dan Tafsir Al-Quran dengan lebih baik.
2. Meneroka bagaimana teknologi baru seperti AI, VR, dan AR boleh membantu menjadikan pembelajaran Al-Quran lebih menarik dan menyeronokkan.
3. Mengenal pasti masalah dalam penggunaan multimedia dalam pengajaran Al-Quran dan mencadangkan cara untuk mengatasinya, seperti latihan guru dan peningkatan kemudahan teknologi.

Peranan Al-Quran dalam Kehidupan Seorang Muslim

Al-Quran memainkan peranan yang sangat penting dalam kehidupan seorang Muslim. Pertama sekali, ia menyediakan panduan hidup yang lengkap dan sempurna. Al-Quran mengandungi peraturan dan undang-undang yang perlu diikuti untuk mencapai kebahagiaan di dunia dan akhirat. Sebagai sumber utama ajaran Islam, Al-Quran juga membentuk akhlak mulia dengan menekankan nilai-nilai seperti kejujuran, kesabaran, dan kesederhanaan. Melalui ajaran Al-Quran, seorang Muslim dapat membentuk akhlak yang terpuji dan menjadi contoh yang baik kepada masyarakat. Ini selaras dengan firman Allah SWT dalam Surah Al-Ahzab, ayat 21: "Sesungguhnya telah ada pada diri Rasulullah itu contoh teladan yang baik bagi kamu."

Selain itu, Al-Quran adalah sumber ilmu pengetahuan yang tidak ternilai. Ia mengandungi maklumat yang merangkumi pelbagai aspek kehidupan, termasuk sejarah, sains, etika, dan hukum. Banyak penemuan moden yang membuktikan kebenaran ilmiah yang terkandung dalam Al-Quran, yang menunjukkan bahawa kitab ini relevan sepanjang zaman. Sebagai contoh, kajian tentang perkembangan janin yang terdapat dalam Al-Quran (Surah Al-Mu'minun, ayat 13-14) telah disahkan oleh penemuan saintifik moden. Hal ini menunjukkan bahawa Al-Quran bukan sahaja relevan dalam konteks keagamaan, tetapi juga dalam konteks ilmiah. Menurut kajian oleh Mohammed (2017), kebijaksanaan ilmiah yang terkandung dalam Al-Quran menjadi bukti bahawa ilmu pengetahuan dalam Al-Quran adalah abadi dan sesuai dengan pelbagai penemuan masa kini.

Membaca dan memahami Al-Quran juga memberikan ketenangan dan ketenteraman jiwa. Firman Allah dalam Surah Ar-Ra'd, ayat 28, yang bermaksud: "Ketahuilah, dengan mengingat Allah itu, tenang tenteramlah hati manusia." Ayat ini menekankan bahawa mengingat Allah melalui pembacaan Al-Quran adalah satu cara untuk mencapai ketenangan jiwa, terutamanya dalam menghadapi ujian hidup. Kajian oleh Jamil (2019) mendapati bahawa pembacaan Al-Quran secara konsisten dapat mengurangkan stres dan meningkatkan kesejahteraan mental seseorang.

Al-Quran juga memberikan panduan yang jelas dalam melaksanakan ibadah-ibadah utama seperti solat, puasa, zakat, dan haji. Ia menjadi asas kepada sistem perundangan Islam dan mengatur hubungan manusia dengan Allah serta sesama manusia. Dalam konteks ini, Al-Quran mengajarkan seorang Muslim cara untuk menjalani kehidupan yang penuh berkat dan harmoni. Dengan mengamalkan ajaran Al-Quran, seorang Muslim dapat mendekatkan diri kepada Allah SWT, meningkatkan ketakwaan dan keimanan, serta menjaga akidah yang benar. Hal ini dibuktikan oleh kajian oleh Saad (2020), yang menunjukkan bahawa pengamalan ajaran Al-Quran dalam kehidupan seharian berfungsi untuk memperkukuhkan spiritualiti individu dan memperbaiki hubungan sosial dalam masyarakat.

Kesimpulannya, Al-Quran bukan sahaja merupakan panduan hidup yang mengandungi hukum dan peraturan yang sempurna, tetapi juga sumber ilmu pengetahuan yang dapat memperkaya pemahaman manusia tentang dunia dan akhirat. Melalui pemahaman dan pengamalan ajaran Al-Quran, seorang Muslim dapat mencapai ketenangan jiwa, memperbaiki akhlak, dan mendekatkan diri kepada Allah SWT.

Evolusi Kaedah Pengajaran Al-Quran

Kaedah pengajaran Al-Quran telah melalui perubahan yang signifikan sejak zaman Rasulullah SAW. Pada awalnya, pengajaran Al-Quran dilakukan melalui talaqqi dan mushafahah, di mana guru dan murid bersemuka, dengan Rasulullah SAW sendiri mengajarkan Al-Quran kepada para sahabat melalui sesi mendengar dan mengulang bacaan. Kaedah ini diteruskan oleh para sahabat dan diterapkan oleh generasi seterusnya.

Namun, seiring dengan perkembangan zaman, kaedah pengajaran Al-Quran telah berkembang pesat dengan penerapan teknologi dan multimedia interaktif. Walaupun kaedah tradisional seperti talaqqi dan mushafahah masih diamalkan, ia kini dilengkapi dengan aplikasi digital, video pengajaran, dan program interaktif yang mempercepatkan dan mempermudah proses pembelajaran. Aplikasi e-pembelajaran Al-Quran, contohnya, membolehkan pelajar

mempelajari dan memahami Al-Quran dengan cara yang lebih menarik, interaktif, dan berkesan.

Selain itu, pelbagai kaedah pengajaran baru telah diperkenalkan, seperti Iqra', Qiraati, dan al-Baghdadi, yang disusun secara sistematik untuk membantu pelajar menguasai bacaan Al-Quran dengan cepat dan tepat. Program-program seperti j-QAF di Malaysia juga memainkan peranan penting dalam memperkukuh pengajaran Al-Quran di sekolah-sekolah.

Secara keseluruhannya, pengajaran Al-Quran adalah aspek asas dalam kehidupan seorang Muslim. Ia bukan sahaja menjadi panduan hidup, tetapi juga membentuk akhlak, memberikan ilmu pengetahuan, dan mendatangkan ketenangan jiwa. Evolusi kaedah pengajaran Al-Quran ini menekankan kepentingan adaptasi dan inovasi agar ajaran Al-Quran terus relevan dan dapat dihayati oleh setiap generasi Muslim. Dengan berpegang teguh pada Al-Quran, umat Islam dapat mencapai kebahagiaan dan kejayaan yang hakiki di dunia dan akhirat.

Multimedia Interaktif

Multimedia interaktif merujuk kepada penggunaan pelbagai elemen media seperti teks, gambar, audio, video, dan animasi yang digabungkan dalam satu platform untuk menyampaikan maklumat secara dinamik dan membolehkan interaksi langsung daripada pengguna. Pendekatan ini bukan sahaja menjadikan proses pembelajaran lebih menarik, tetapi juga meningkatkan pemahaman pelajar melalui rangsangan visual dan auditori yang sesuai dengan pelbagai gaya pembelajaran. Dengan ini, pembelajaran menjadi lebih inklusif dan mudah diakses oleh pelbagai golongan pelajar.

Salah satu prinsip utama multimedia interaktif adalah integrasi pelbagai elemen media dalam satu platform. Contohnya, aplikasi pembelajaran interaktif boleh menggabungkan teks pelajaran dengan video demonstrasi, suara narasi, serta animasi yang menerangkan konsep-konsep sukar dengan cara yang mudah difahami. Integrasi ini membolehkan penyampaian maklumat yang lebih berkesan berbanding dengan penggunaan media tunggal.

Selain itu, multimedia interaktif menekankan aspek interaktiviti pengguna. Pengguna tidak hanya sebagai penonton pasif, tetapi juga boleh berinteraksi dengan kandungan yang disajikan. Interaksi ini boleh berupa klik pada butang, memasukkan data, memilih pilihan, atau melalui kawalan gestur pada peranti tertentu. Sebagai contoh, dalam permainan video pendidikan, pengguna boleh mengawal watak, membuat keputusan dalam cerita, dan mempengaruhi hasil akhir permainan berdasarkan pilihan mereka.

Navigasi juga merupakan elemen penting dalam multimedia interaktif. Pengguna diberikan kawalan penuh tentang bagaimana mereka ingin mengakses dan berinteraksi dengan kandungan. Ini bermakna mereka boleh memilih laluan pembelajaran mereka sendiri, mengulangi bahagian yang tidak difahami, atau melangkaui bahagian yang sudah dikuasai. Sistem navigasi yang baik memberikan fleksibiliti dan kawalan kepada pengguna, membolehkan mereka memperibadikan pengalaman mereka mengikut keperluan dan keutamaan mereka.

Respons dinamik juga menjadi sebahagian penting daripada multimedia interaktif. Sistem ini mampu memberikan maklum balas atau respons langsung berdasarkan tindakan pengguna.

Sebagai contoh, dalam kuiz interaktif, sistem boleh segera memberikan jawapan yang betul atau salah selepas pengguna menjawab soalan, lengkap dengan penjelasan dan cadangan untuk belajar lebih lanjut. Respons yang cepat ini membantu pengguna memahami bahan dengan lebih baik dan menjadikan pengalaman pembelajaran lebih berkesan.

Contoh-contoh aplikasi multimedia interaktif sangat pelbagai dan merangkumi pelbagai bidang. Dalam pendidikan, aplikasi e-pembelajaran yang interaktif membantu pelajar belajar dengan cara yang lebih menyeronokkan dan berkesan. Dalam bidang hiburan, permainan video menawarkan pengalaman bermain yang mendalam dan mencabar. Laman web interaktif membolehkan pengguna untuk terlibat dengan kandungan melalui tinjauan dalam talian, kuiz, atau simulasi. Malahan dalam perniagaan, pembentangan interaktif boleh membantu menyampaikan maklumat secara lebih menarik dan meyakinkan.

Secara keseluruhannya, multimedia interaktif membawa banyak manfaat dalam pelbagai bidang kehidupan. Dengan keupayaan untuk menggabungkan pelbagai bentuk media, memberikan kawalan dan interaktiviti kepada pengguna, serta memberikan respons dinamik, multimedia interaktif menjadi alat yang sangat berkesan untuk meningkatkan keterlibatan dan pemahaman pengguna. Sama ada dalam pendidikan, hiburan, atau perniagaan, multimedia interaktif terus berkembang dan memainkan peranan penting dalam cara kita mengakses dan berinteraksi dengan maklumat.

Kaedah-Kaedah Pengajaran Al-Quran dengan Multimedia Interaktif ***Pengajaran Tajwid melalui Animasi dan Audio Interaktif***

Tajwid adalah ilmu yang berkaitan dengan kaedah dan peraturan bacaan Al-Quran untuk memastikan bacaan yang betul dan fasih. Pengajaran Tajwid melalui animasi dan audio interaktif boleh menjadi kaedah yang sangat berkesan untuk melibatkan pelajar dan meningkatkan pemahaman mereka terhadap subjek tersebut. Dengan menggabungkan elemen multimedia interaktif seperti animasi dan audio, pelajar dapat mendapat manfaat daripada bantuan visual dan auditori yang menjadikan proses pembelajaran lebih menarik dan menyeronokkan.

Menurut Nur Fatin Syamimi et.al. (2021), gabungan teks, grafik, animasi, audio, dan video boleh mencipta pengalaman pembelajaran yang dinamik yang menarik minat pelajar dan menjadikan pembelajaran lebih menyeronokkan. Multimedia interaktif, apabila digunakan secara efektif, boleh merangsang minat, mempengaruhi, dan menarik perhatian audiens, membawa kepada peningkatan penglibatan dan motivasi dalam aktiviti pembelajaran.

Selain itu, penggunaan alat multimedia seperti CD interaktif telah terbukti membantu kanak-kanak memahami topik dengan lebih cepat, menjawab soalan, dan menjalankan tugas dengan lebih berkesan dalam aktiviti pengajaran dan pembelajaran. Pendekatan ini tidak hanya meningkatkan pemahaman tetapi juga memperbaiki tingkah laku dan meningkatkan minat dalam subjek, akhirnya membantu dalam pembinaan pengetahuan berdasarkan maklumat yang disampaikan.

Dengan menggunakan animasi, pelbagai peraturan tajwid seperti makhraj (tempat keluarnya huruf), sifatul huruf (sifat huruf), dan hukum-hukum tajwid lain dapat dijelaskan dengan visual yang menarik. Contohnya, animasi yang menunjukkan bagaimana udara keluar dari mulut dan

hidung ketika menyebut huruf tertentu membantu pelajar memahami makhraj huruf dengan lebih baik. Animasi ini memberikan gambaran yang jelas dan mudah difahami, menjadikan proses pembelajaran lebih menyeronokkan

Selain itu, penggunaan audio interaktif membolehkan pelajar mendengar bacaan yang betul dan mempraktikkannya sendiri. Aplikasi yang menyediakan audio interaktif, di mana pelajar boleh mendengar dan mengulangi bacaan, sangat berguna dalam menguatkan ingatan dan kefahaman mereka terhadap tajwid. Pelajar boleh merakam bacaan mereka dan membandingkannya dengan bacaan yang betul, seterusnya memperbaiki kesilapan mereka dengan mudah.

Pengajaran Tilawah Al-Quran menggunakan Video dan Aplikasi Interaktif

Tilawah Al-Quran adalah bacaan Al-Quran dengan suara yang merdu dan tartil, iaitu bacaan yang jelas dan tertib. Pengajaran tilawah Al-Quran menggunakan video dan aplikasi interaktif adalah satu pendekatan yang berkesan dalam membantu pelajar memperbaiki bacaan mereka. Dengan memanfaatkan teknologi multimedia, pelajar dapat merasai pengalaman pembelajaran yang lebih dinamik dan menarik.

Menurut Nur Fatin Syamimi et.al. (2021), penggunaan multimedia interaktif seperti video dapat membantu pelajar untuk memberi tumpuan dalam proses pembelajaran. Selain itu, aplikasi interaktif yang menggabungkan elemen teks, grafik, audio, dan animasi juga dapat menjadikan pembelajaran lebih menarik dan menyeronokkan.

Dalam konteks pengajaran Tilawah Al-Quran, penggunaan video dan aplikasi interaktif dapat membantu pelajar memahami dengan lebih baik bacaan Al-Quran melalui visualisasi yang disediakan. Selain itu, elemen interaktif dalam aplikasi juga dapat meningkatkan daya tarikan dan minat pelajar terhadap pembelajaran Tilawah Al-Quran. Dengan memanfaatkan teknologi multimedia dalam pengajaran Tilawah Al-Quran, diharapkan pengalaman pembelajaran akan menjadi lebih efektif, menyeronokkan, dan memberi impak yang positif terhadap kemahiran bacaan Al-Quran pelajar.

Video pembelajaran yang menunjukkan qari-qari terkenal membaca Al-Quran dengan tartil dapat dijadikan rujukan oleh pelajar. Video ini boleh didapati di platform seperti YouTube, di mana pelajar boleh melihat dan mendengar teknik bacaan yang betul. Video yang mengandungi penjelasan tentang cara menyebut huruf dan ayat dengan betul juga sangat berguna. Dengan menonton dan mendengar bacaan qari yang mahir, pelajar dapat meniru dan memperbaiki bacaan mereka sendiri.

Selain itu, aplikasi mudah alih seperti 'Ayat - Al Quran' dan 'Quran Majeed' menawarkan ciri-ciri interaktif yang membantu pelajar memperbaiki bacaan mereka. Aplikasi ini biasanya dilengkapi dengan fungsi rakaman, di mana pelajar boleh merakam bacaan mereka dan membandingkannya dengan bacaan yang betul. Selain itu, aplikasi ini juga menyediakan panduan visual dan audio untuk membantu pelajar memperbaiki bacaan mereka. Dengan penggunaan aplikasi ini, pelajar boleh belajar pada bila-bila masa dan di mana sahaja, mengikut keselesaan mereka sendiri.

Pengajaran Tafsir Al-Quran melalui Multimedia Interaktif

Tafsir Al-Quran adalah penjelasan dan penafsiran ayat-ayat Al-Quran untuk memahami maknanya dengan lebih mendalam. Pengajaran tafsir Al-Quran melalui multimedia interaktif adalah satu kaedah yang sangat berkesan dalam membantu pelajar memahami kandungan dan konteks ayat-ayat Al-Quran.

Perisian seperti 'Al-Quran Explorer' menyediakan alat pembelajaran yang komprehensif, termasuk tafsir ayat. Perisian ini membolehkan pelajar membaca tafsir dan memahami konteks serta sebab penurunan ayat (asbabun nuzul) dengan lebih mendalam. Dengan adanya tafsir yang mudah diakses melalui perisian ini, pelajar dapat memahami makna ayat-ayat Al-Quran dengan lebih jelas dan mendalam.

Selain itu, penggunaan animasi dan video dalam pengajaran tafsir juga sangat berkesan. Video yang mengandungi penjelasan visual tentang konteks sejarah dan sosial ayat-ayat Al-Quran membantu pelajar memahami tafsir dengan lebih jelas. Contohnya, animasi yang menggambarkan peristiwa-peristiwa penting dalam sejarah Islam boleh membantu pelajar memahami latar belakang ayat-ayat tertentu. Dengan adanya penjelasan visual ini, pelajar dapat mengaitkan ayat-ayat Al-Quran dengan konteks sejarah dan sosialnya, seterusnya meningkatkan pemahaman mereka.

Dengan komitmen yang tinggi daripada semua pihak, serta penggunaan kaedah-kaedah pengajaran yang efektif, kita dapat memastikan bahawa pengajaran Al-Quran dapat dilaksanakan dengan baik dan mencapai matlamat yang diinginkan. Namun, cabaran-cabaran yang ada perlu diatasi dengan bijaksana untuk memastikan teknologi ini dapat digunakan dengan berkesan. Pendekatan multimedia interaktif dalam pengajaran Al-Quran bukan sahaja membantu pelajar memahami dan menghayati isi kandungan Al-Quran dengan lebih mendalam, tetapi juga menjadikan proses pembelajaran lebih menarik dan menyeronokkan. Ini seterusnya dapat meningkatkan minat pelajar terhadap pembelajaran Al-Quran dan mengukuhkan hubungan mereka dengan kitab suci ini. Oleh itu, usaha untuk memperkenalkan dan memperluaskan penggunaan multimedia interaktif dalam pengajaran Al-Quran perlu diteruskan dan diperkasakan bagi manfaat generasi masa depan.

Kesimpulannya, pendekatan multimedia interaktif dalam pengajaran Al-Quran menawarkan banyak kelebihan yang boleh meningkatkan kualiti pembelajaran. Pengajaran tajwid melalui animasi dan audio interaktif membantu pelajar memahami dan menguasai tajwid dengan lebih mudah. Pengajaran tilawah Al-Quran menggunakan video dan aplikasi interaktif membantu pelajar memperbaiki bacaan mereka. Pengajaran tafsir Al-Quran melalui multimedia interaktif membantu pelajar memahami kandungan dan konteks ayat-ayat Al-Quran dengan lebih mendalam.

Kelebihan Penggunaan Multimedia Interaktif dalam Pengajaran Al-Quran

Penggunaan multimedia interaktif dalam pengajaran Al-Quran telah membawa banyak kelebihan yang dapat meningkatkan pengalaman pembelajaran dan keberkesanan pengajaran. Dalam era teknologi yang semakin canggih ini, kaedah tradisional pengajaran Al-Quran kini boleh diperkaya dengan penggunaan teknologi multimedia yang interaktif dan menarik.

Pertama sekali, penggunaan multimedia interaktif dapat meningkatkan motivasi pelajar. Dengan adanya elemen visual, audio, dan animasi, pembelajaran menjadi lebih menarik dan menyenangkan. Pelajar akan lebih bersemangat untuk belajar apabila mereka terlibat secara aktif dalam proses pembelajaran. Ini berbeza dengan kaedah tradisional yang mungkin membosankan bagi sesetengah pelajar. Apabila pembelajaran menjadi lebih menarik, pelajar akan lebih bermotivasi untuk terus belajar dan mendalami Al-Quran.

Selain itu, multimedia interaktif membolehkan pembelajaran berasaskan sendiri. Pelajar dapat belajar mengikut kadar mereka sendiri tanpa tekanan. Mereka boleh mengulang tayang bahan pengajaran, mengkaji semula pelajaran, dan memperbaiki sebutan atau tajwid Al-Quran secara sendiri. Ini memberi ruang kepada pelajar untuk belajar dengan lebih tenang dan fokus, tanpa perlu tergesa-gesa mengikut rentak orang lain.

Menurut Muhammad Zulazizi (2020), dari sudut motivasi, para pelajar akan terus bersemangat untuk melakukan aktiviti perbincangan dalam talian kerana jadual pembelajarannya yang fleksibel. Bagi perkara melibatkan penguasaan silibus PdP pula, para pelajar dan guru perlu bersedia dengan topik santai dalam sesuatu perbincangan tanpa terlalu kaku, terkurung dan jumud dengan penetapan pelan pengajaran. Justeru, apabila melibatkan perbincangan dalam lingkungan komuniti maya, maka sudah pasti secara tidak langsung dapat mencuri tumpuan masing-masing mengenai konteks PdP yang dilakukan. Para pelajar juga secara tidak langsung dapat meningkatkan tahap Kemahiran Berfikir Aras Tinggi (KBAT), menambah keyakinan, berkongsi pengalaman dan menimba ilmu baharu serta membina rangkaian berkolaboratif dalam kalangan komuniti maya tanpa rasa tertekan mengikut domain perbincangan yang dibuat.

Visualisasi konsep-konsep abstrak dalam Al-Quran juga menjadi lebih mudah dengan penggunaan multimedia interaktif. Konsep-konsep yang sukar difahami melalui pembacaan sahaja boleh dijelaskan dengan lebih jelas melalui grafik, animasi, dan simulasi. Ini membantu pelajar memahami kandungan Al-Quran dengan lebih mendalam dan jelas.

Penggunaan pelbagai deria dalam pembelajaran juga meningkatkan keupayaan ingatan pelajar. Kajian menunjukkan bahawa pelajar lebih mudah mengingat maklumat yang disampaikan melalui multimedia interaktif kerana mereka melibatkan pelbagai deria seperti penglihatan dan pendengaran. Dengan gabungan visual dan audio, pelajar dapat mengingat dan memahami kandungan dengan lebih baik.

Tambahan pula, pembelajaran menjadi lebih interaktif dengan penggunaan multimedia. Pelajar boleh berinteraksi dengan kandungan pembelajaran melalui kuiz, permainan pendidikan, dan latihan interaktif. Ini bukan sahaja membuatkan pembelajaran lebih menyenangkan, tetapi juga meningkatkan pemahaman dan pengekalan maklumat. Interaktiviti dalam pembelajaran membantu pelajar menguasai tajwid dan makhraj dengan lebih baik melalui latihan yang memberikan maklum balas segera.

Multimedia interaktif juga memberikan akses kepada sumber pembelajaran yang pelbagai. Pelajar boleh mengakses video ceramah, tafsiran digital, dan forum perbincangan dalam talian. Ini memperkayakan pengalaman pembelajaran mereka dan memberi pendedahan kepada pelbagai perspektif. Dengan akses kepada pelbagai sumber, pelajar dapat memperluas pengetahuan mereka dan mendalami Al-Quran dengan lebih menyeluruh.

Dari segi penilaian, penggunaan multimedia interaktif memudahkan guru menilai prestasi pelajar. Tugas dan latihan interaktif yang disertakan dalam bahan multimedia membolehkan guru memberikan maklum balas yang cepat dan tepat kepada pelajar. Ini membantu pelajar memperbaiki kelemahan mereka dengan segera dan meningkatkan prestasi mereka.

Pengajaran yang lebih efisien juga dapat dicapai dengan penggunaan multimedia interaktif. Guru dapat menyampaikan kandungan pengajaran dengan lebih berkesan dan menarik. Ini menjimatkan masa dan tenaga guru serta memastikan pengajaran disampaikan dengan cara yang paling berkesan. Pengajaran yang efisien dan berkesan akan memberikan impak positif yang besar dalam meningkatkan kualiti pembelajaran pelajar.

Kesimpulannya, penggunaan multimedia interaktif dalam pengajaran Al-Quran membawa banyak kelebihan yang dapat meningkatkan motivasi, kefahaman, dan prestasi pelajar. Dengan memanfaatkan teknologi ini, pembelajaran Al-Quran dapat menjadi lebih menarik, interaktif, dan efektif. Oleh itu, guru dan institusi pendidikan perlu mempertimbangkan penggunaan multimedia interaktif sebagai sebahagian daripada strategi pengajaran mereka untuk meningkatkan kualiti pendidikan Al-Quran.

Cabaran dan Penyelesaian dalam Pelaksanaan Pendekatan Multimedia Interaktif dalam Pengajaran Al-Quran

Dalam era digital yang semakin canggih, penggunaan pendekatan multimedia interaktif menjadi salah satu kaedah yang berpotensi besar untuk meningkatkan keberkesanan pengajaran Al-Quran. Pendekatan ini tidak hanya membuat pembelajaran menjadi lebih menarik, tetapi juga membolehkan pelajar untuk lebih mudah memahami dan menghafaz Al-Quran. Namun, pelaksanaan pendekatan ini tidak terlepas dari pelbagai cabaran. Oleh itu, adalah penting untuk mengenal pasti cabaran-cabaran ini serta strategi untuk mengatasinya, di samping memberikan sokongan teknikal dan latihan kepada guru.

Salah satu cabaran utama dalam pelaksanaan pendekatan multimedia interaktif adalah kekangan teknologi. Tidak semua institusi pendidikan atau individu mempunyai akses kepada peralatan teknologi yang mencukupi seperti komputer, tablet, atau sambungan internet yang stabil. Kekurangan infrastruktur ini boleh menghalang pelaksanaan multimedia interaktif secara efektif. Selain itu, kos yang tinggi untuk pembangunan dan penyelenggaraan bahan multimedia interaktif juga menjadi satu lagi cabaran besar. Perisian, aplikasi, dan kandungan digital yang berkualiti biasanya memerlukan pelaburan yang besar, dan ini boleh menjadi beban kewangan terutama bagi institusi pendidikan yang mempunyai bajet terhad.

Di samping itu, kekurangan kemahiran teknologi di kalangan guru turut menjadi cabaran. Ramai guru mungkin tidak mempunyai kemahiran yang diperlukan untuk mengintegrasikan multimedia interaktif dalam pengajaran mereka. Kekurangan pengetahuan dan pengalaman dalam menggunakan alat-alat digital boleh menyebabkan keberkesanan pengajaran menurun. Tidak ketinggalan, rintangan budaya dan sikap konservatif terhadap penggunaan teknologi dalam pengajaran Al-Quran juga boleh menghalang penerimaan pendekatan ini. Sesetengah pihak mungkin meragui keberkesanan pendekatan ini atau menganggapnya tidak sesuai dengan tradisi pengajaran Al-Quran yang lebih konvensional.

Untuk mengatasi kekangan teknologi, pihak berwajib perlu meningkatkan akses kepada peralatan digital dan sambungan internet yang stabil. Kerjasama dengan pihak swasta dan NGO boleh membantu menyediakan peralatan dan infrastruktur yang diperlukan di institusi pendidikan. Selain itu, memanfaatkan perisian sumber terbuka dan aplikasi kos rendah boleh mengurangkan beban kewangan. Terdapat banyak alat multimedia interaktif yang tersedia secara percuma atau dengan kos yang minimal yang boleh digunakan untuk pengajaran Al-Quran.

Menurut Nur Atiqah (2018), latihan dan pembangunan profesional untuk guru juga sangat penting. Memberikan latihan yang mencukupi kepada guru dalam penggunaan teknologi adalah kunci untuk mengatasi kekurangan kemahiran teknologi. Program pembangunan profesional yang berterusan perlu diadakan untuk memastikan guru-guru sentiasa mahir dan terkini dengan teknologi pendidikan terkini. Selain itu, menjalankan program pendidikan dan kesedaran untuk mengubah sikap negatif terhadap penggunaan teknologi dalam pengajaran Al-Quran juga penting. Menunjukkan bukti keberkesanan pendekatan multimedia interaktif melalui kajian dan contoh kejayaan boleh membantu meyakinkan pihak yang ragu-ragu.

Sokongan teknikal dan latihan yang berterusan adalah elemen penting untuk memastikan keberkesanan pelaksanaan multimedia interaktif dalam pengajaran Al-Quran. Menyediakan bimbingan teknikal secara berterusan kepada guru dapat membantu mereka mengatasi sebarang masalah teknikal yang dihadapi semasa menggunakan alat multimedia interaktif. Mengadakan workshop dan seminar secara berkala untuk melatih guru-guru dalam menggunakan peralatan dan perisian multimedia juga boleh menjadi platform untuk berkongsi amalan terbaik dan pengalaman antara guru-guru. Di samping itu, menyediakan bahan latihan yang komprehensif dan mudah difahami, termasuk panduan penggunaan perisian, video tutorial, dan manual pengguna, serta menubuhkan sistem sokongan dalam talian seperti forum atau platform e-pembelajaran di mana guru boleh bertanya soalan, mendapatkan bantuan, dan berkongsi idea serta pengalaman dengan rakan sejawat mereka.

Kesimpulannya, pelaksanaan pendekatan multimedia interaktif dalam pengajaran Al-Quran menghadapi pelbagai cabaran, tetapi dengan strategi yang tepat dan sokongan teknikal serta latihan yang mencukupi, cabaran-cabaran ini dapat diatasi. Penggunaan teknologi dalam pengajaran Al-Quran bukan sahaja boleh meningkatkan keberkesanan pembelajaran, tetapi juga menarik minat pelajar dan menjadikan proses pembelajaran lebih interaktif dan menyeronokkan. Oleh itu, semua pihak perlu bekerjasama untuk memastikan pendekatan ini dapat dilaksanakan dengan jayanya, seterusnya memartabatkan lagi pengajaran dan pembelajaran Al-Quran dalam era digital ini.

Masa Depan Pengajaran Al-Quran dengan Multimedia Interaktif

Pengajaran Al-Quran telah mengalami perkembangan yang pesat sejak zaman Rasulullah SAW hingga ke zaman moden ini. Seiring dengan kemajuan teknologi digital, masa depan pengajaran Al-Quran semakin cerah, dengan pendekatan multimedia interaktif yang memberi peluang untuk mencipta pengalaman pembelajaran yang lebih inovatif dan berkesan. Pendekatan ini bukan hanya menjadikan pembelajaran lebih menarik, tetapi juga meningkatkan pemahaman pelajar melalui elemen visual dan auditori yang sesuai dengan pelbagai gaya pembelajaran. Dengan menggunakan teknologi ini, proses pembelajaran menjadi lebih inklusif

dan mudah diakses oleh semua lapisan pelajar, sambil membantu mereka memahami konsep-konsep yang lebih kompleks dengan cara yang lebih mudah dan menarik.

Menurut kajian Mohd Maziz et al. (2018), penggunaan multimedia interaktif dalam pengajaran Al-Quran menjanjikan banyak faedah bagi pendidik dan pelajar. Dengan menggabungkan elemen seperti video, animasi, kuiz interaktif, dan realiti maya, pengajaran Al-Quran bukan sahaja lebih menarik tetapi juga lebih berkesan. Pendekatan ini juga membantu mencipta persekitaran pembelajaran yang dinamik, di mana pelajar dapat terlibat secara aktif, meneroka berbagai aspek Al-Quran, dan menerima maklum balas segera tentang kemajuan mereka. Ini memastikan mereka tetap termotivasi dan fokus pada tujuan pembelajaran.

Secara keseluruhan, integrasi multimedia interaktif dalam pengajaran Al-Quran memiliki potensi besar untuk meningkatkan pengalaman pembelajaran pelajar. Dengan memanfaatkan teknologi ini, pendidik dapat mencipta persekitaran yang lebih menarik dan berkesan, membantu pelajar memahami dan menghayati isi kandungan Al-Quran dengan lebih mendalam.

Selain itu, teknologi terkini seperti Kecerdasan Buatan (AI), Realiti Maya (VR), dan Realiti Terimbuh (AR) memiliki potensi besar untuk merevolusikan pengajaran Al-Quran. AI, sebagai contoh, boleh digunakan untuk membangunkan tutor pintar yang memberi bimbingan dan maklum balas secara langsung kepada pelajar, membantu mereka memperbaiki sebutan, tajwid, dan hafalan melalui analisis suara dan teks yang lebih tepat.

Realiti Maya (VR) pula menawarkan pengalaman pembelajaran yang lebih mendalam dan imersif. Dengan VR, pelajar dapat "masuk" ke dalam dunia Al-Quran dan mengalaminya secara visual, membantu mereka memahami dan menghayati kisah-kisah serta pengajaran dalam Al-Quran dengan lebih jelas. Begitu juga, Realiti Terimbuh (AR) boleh digunakan untuk memaparkan makhraj huruf dan cara bacaan yang betul secara visual ketika pelajar membaca Al-Quran, memberi maklum balas visual segera yang membantu mereka membetulkan bacaan dengan lebih cepat.

Masa depan pengajaran Al-Quran dengan multimedia interaktif sangat menjanjikan. Dengan perkembangan teknologi yang pesat, lebih banyak alat dan sumber inovatif akan tersedia untuk menyokong pengajaran dan pembelajaran Al-Quran. Teknologi ini bukan sahaja menjadikan pembelajaran lebih menarik, tetapi juga lebih berkesan dan efisien.

Harapan kita adalah agar lebih ramai guru dan pelajar dapat memanfaatkan teknologi ini untuk meningkatkan pengajaran dan pembelajaran Al-Quran. Dengan itu, diharapkan Al-Quran dapat diakses dengan lebih mudah oleh semua lapisan masyarakat, termasuk mereka yang berada di kawasan terpencil atau kurang mempunyai akses kepada guru-guru yang berkelayakan.

Selain itu, penggunaan teknologi ini juga dapat membantu mengatasi cabaran-cabaran dalam pengajaran Al-Quran, seperti kekurangan guru yang mahir, kesukaran dalam menguasai tajwid, dan kurangnya motivasi pelajar. Dengan sokongan teknologi baru, pengajaran Al-Quran dapat menjadi lebih inklusif, menarik, dan berkesan.

Secara keseluruhannya, masa depan pengajaran Al-Quran dengan multimedia interaktif sangat cerah. Trend dan inovasi dalam teknologi digital, termasuk AI, VR, dan AR, membuka peluang

yang besar untuk memperbaharui cara Al-Quran diajar dan dipelajari. Dengan harapan yang cerah ini, kita dapat melihat pengajaran Al-Quran yang lebih dinamik, interaktif, dan mudah diakses oleh semua. Teknologi bukan sekadar alat, tetapi juga jambatan yang membawa kita lebih dekat kepada pemahaman yang lebih mendalam dan penghargaan yang lebih tinggi terhadap Al-Quran, kitab suci umat Islam.

Kepentingan, Implikasi, dan Masa Depan Pengajaran Al-Quran dengan Pendekatan Multimedia Interaktif

Pengajaran Al-Quran telah melalui pelbagai perubahan dan inovasi dari zaman Rasulullah SAW hingga ke era moden ini. Penggunaan pendekatan multimedia interaktif dalam pengajaran Al-Quran telah membuka dimensi baru dalam pembelajaran kitab suci ini. Melalui gabungan elemen seperti audio, video, animasi, dan gamifikasi, pendekatan ini bukan sahaja menjadikan pembelajaran lebih menarik tetapi juga meningkatkan keberkesanan pengajaran dan pemahaman pelajar terhadap Al-Quran.

Pendekatan multimedia interaktif membawa pelbagai manfaat dalam pengajaran Al-Quran. Pertama sekali, ia meningkatkan motivasi dan minat pelajar. Penggunaan teknologi dalam pembelajaran menjadikan prosesnya lebih menyeronokkan dan menarik. Pelajar dapat berinteraksi dengan kandungan, yang mana ini dapat meningkatkan keterlibatan mereka dan membantu mereka memahami konsep-konsep yang diajarkan dengan lebih mendalam. Sebagai contoh, animasi yang menunjukkan makhras huruf atau video interaktif yang menerangkan hukum tajwid dapat membantu pelajar memperbaiki sebutan dan bacaan mereka dengan lebih efektif.

Selain itu, pendekatan multimedia interaktif menyediakan platform yang fleksibel dan mudah diakses. Pelajar boleh belajar pada bila-bila masa dan di mana sahaja, asalkan mereka mempunyai akses kepada peralatan digital dan sambungan internet. Ini amat bermanfaat bagi pelajar yang berada di kawasan terpencil atau mempunyai jadual yang sibuk. Guru juga mendapat manfaat dengan adanya alat bantu pengajaran yang canggih, yang memudahkan mereka menyampaikan pelajaran dengan cara yang lebih efektif dan efisien. Penilaian yang lebih tepat dan berterusan juga dapat dilakukan melalui platform digital, di mana prestasi pelajar dapat dipantau secara real-time dan maklum balas dapat diberikan segera.

Namun, untuk terus memperkukuh pendekatan ini, beberapa cadangan untuk kajian lanjut dan pengembangan kurikulum perlu dipertimbangkan. Pertama, kajian empirikal yang mendalam perlu dijalankan untuk menilai keberkesanan multimedia interaktif dalam pengajaran Al-Quran. Ini termasuk menilai impak terhadap motivasi pelajar, pencapaian akademik, dan pemahaman konsep. Data daripada kajian ini boleh digunakan untuk memperbaiki dan mengoptimumkan pendekatan ini.

Kedua, pengembangan lebih banyak sumber digital yang berkualiti tinggi adalah penting. Ini termasuk aplikasi mudah alih, platform e-pembelajaran, dan bahan multimedia interaktif yang sesuai dengan pelbagai peringkat umur dan tahap kemahiran pelajar. Sumber-sumber ini perlu mudah diakses dan digunakan, serta disokong dengan panduan dan latihan yang mencukupi.

Ketiga, latihan berterusan untuk guru dalam penggunaan teknologi dan alat multimedia interaktif perlu diberikan. Program pembangunan profesional perlu dirancang untuk

memastikan guru sentiasa up-to-date dengan teknologi terkini dan amalan terbaik dalam pengajaran Al-Quran. Guru yang mahir dalam teknologi akan lebih yakin dan mampu mengintegrasikan multimedia interaktif dalam pengajaran mereka dengan lebih berkesan.

Keempat, teknologi baru seperti Kecerdasan Buatan (AI), Realiti Maya (VR), dan Realiti Terimbuh (AR) perlu diintegrasikan dalam kurikulum pengajaran Al-Quran. Teknologi ini boleh menyediakan pengalaman pembelajaran yang lebih imersif dan interaktif, membantu pelajar memahami dan menghafaz Al-Quran dengan cara yang lebih menarik dan efektif.

Akhir sekali, kurikulum pengajaran Al-Quran perlu dikembangkan berasaskan penyelidikan yang mengambil kira keperluan pelajar dan perkembangan teknologi. Kurikulum ini perlu fleksibel dan dapat disesuaikan dengan perubahan teknologi dan keperluan pendidikan semasa. Dengan kurikulum yang dinamik dan relevan, pengajaran Al-Quran dapat terus berkembang dan memberikan impak yang lebih besar dalam kehidupan pelajar. Pendekatan multimedia interaktif menawarkan pelbagai manfaat dalam pengajaran dan pembelajaran Al-Quran. Ia bukan sahaja menjadikan pembelajaran lebih menarik dan berkesan, tetapi juga membuka peluang untuk inovasi dalam pendidikan Islam. Dengan sokongan kajian lanjut dan pengembangan kurikulum yang berterusan, penggunaan multimedia interaktif dalam pengajaran Al-Quran dapat diperkukuhkan lagi, membawa kita lebih dekat kepada matlamat melahirkan generasi Muslim yang celik Al-Quran dan berpegang teguh kepada ajaran Islam. Teknologi bukan hanya alat, tetapi juga jambatan untuk membawa kita lebih dekat kepada kefahaman yang mendalam dan penghayatan yang lebih tinggi terhadap Al-Quran, kitab suci yang menjadi panduan hidup umat Islam.

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KESAN KAEDAH FLIPPED CLASSROOM TERHADAP PEMBELAJARAN KESUSASTERAAN KANAK-KANAK KONTEMPORARI MURID TAHUN 4

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Abstrak: Kajian ini bertujuan untuk mengkaji impak pendekatan *flipped classroom* berbanding dengan kaedah pengajaran Konvensional terhadap pembelajaran Kesusasteraan Kanak-kanak Kontemporari (KKK) oleh murid Tahun 4. Kajian ini menggunakan kaedah kuantitatif reka bentuk kuasi-eksperimen. Kajian melibatkan satu kumpulan eksperimen yang diajar menggunakan pendekatan *Flipped Classroom* dan satu kumpulan kawalan yang diajar secara Konvensional. Seramai 38 murid Tahun 4 dari Sekolah Kebangsaan Kuala Ketil telah dipilih melalui pensampelan bertujuan. Pencapaian pembelajaran murid dinilai melalui ujian pasca pengajaran yang mengandungi 15 soalan objektif dan satu soalan struktur. Analisis statistik menggunakan ujian-t bebas dijalankan untuk menentukan perbezaan signifikan antara kedua-dua kumpulan. Keputusan kajian menunjukkan bahawa murid yang diajar menggunakan pendekatan *Flipped Classroom* memperoleh skor yang lebih tinggi secara signifikan berbanding kumpulan Konvensional. Dapatan kajian menunjukkan pendekatan ini memberi kesan positif terhadap pemahaman dan penglibatan murid Tahun 4 dalam KKK. Kajian ini menegaskan keberkesanan pendekatan *Flipped Classroom* sebagai strategi pedagogi dalam pendidikan rendah serta memberikan implikasi penting kepada pendidik, murid dan ibu bapa.

Kata Kunci: *Flipped Classroom*, Pendekatan Konvensional, Kesusasteraan Kanak-kanak Kontemporari (KKK), Kanak-kanak, Sekolah Rendah

Pengenalan

Penguasaan bahasa Inggeris sentiasa menjadi keutamaan dalam sistem pendidikan Malaysia kerana dianggap sebagai bakat nasional dan individu. Pelbagai usaha telah dijalankan oleh Kementerian Pendidikan termasuk memperkenalkan Kurikulum Standard Sekolah Rendah (KSSR) pada tahun 2011 hasil proses penanda aras dengan negara maju. KSSR menekankan lima kemahiran asas bahasa iaitu mendengar, bertutur, membaca, menulis dan seni bahasa yang membolehkan murid menguasai bahasa secara menyeluruh (Sulaiman et al., 2017; Ahmad & Yamat, 2020). Seni bahasa memberi peluang kepada murid meneroka kepelbagaian kecerdasan pelbagai (multiple intelligences) seperti linguistik, visual-ruang, kinestetik dan interpersonal (Khairunnisa, 2019), justeru guru perlu menggunakan pendekatan pengajaran berbeza serta aktiviti pembelajaran yang pelbagai.

Seiring dengan keperluan pendidikan abad ke-21, integrasi ICT menjadi elemen penting dalam PdP. Antara pendekatan yang semakin mendapat perhatian ialah kaedah *Flipped Classroom*

yang membolehkan murid mengakses bahan pengajaran melalui video, slaid atau kuiz di luar kelas, manakala masa di dalam kelas dimanfaatkan untuk perbincangan, latihan, penyelesaian masalah dan interaksi (Lo & Khe, 2017; Brame, 2020). Kajian menunjukkan penggunaan elemen visual (Guney, 2019) dan drama (Amjad et al., 2020) dalam pengajaran bahasa memberi impak positif terhadap penguasaan kosa kata, pemahaman serta komunikasi murid. Oleh itu, penyelidikan ini mencadangkan penggunaan pendekatan bilik darjah terbalik dalam pengajaran sastera kanak-kanak kontemporari kepada murid Tahun 4.

Penyataan Masalah Kajian

Walaupun kesusasteraan diperkenalkan dalam KSSR, kemahiran ini masih baharu dan kurang diberi perhatian berbanding empat kemahiran asas lain. Kajian menunjukkan pengajaran kesusasteraan berpotensi meningkatkan perkembangan kognitif, afektif dan pemikiran kreatif murid (Rahman & Manaf, 2017). Namun, kaedah Konvensional yang berpusatkan guru menyebabkan murid pasif serta kurang masa untuk aktiviti bermakna (Sii & Chen, 2017; Hwang & Embi, 2017).

Pendekatan *Flipped Classroom* dilihat sesuai untuk mengatasi kelemahan tersebut. Kaedah ini membolehkan murid mengakses kandungan lebih awal melalui video, nota atau kuiz, manakala masa kelas digunakan untuk aktiviti hands-on dan perbincangan (Lo & Khe, 2017; Brame, 2020). Kajian lepas juga membuktikan pendekatan ini meningkatkan kepuasan, keyakinan, kreativiti dan kemahiran menyelesaikan masalah murid (Akçayır & Akçayır, 2018).

Kaedah ini selari dengan keperluan abad ke-21 yang menekankan pemikiran kritis, komunikasi, kolaborasi dan literasi maklumat (Zainudin et al., 2018; Rahman et al., 2019). Walaupun banyak kajian telah menilai *Flipped Classroom* dalam aspek membaca, menulis dan tatabahasa, masih kurang penyelidikan dalam pengajaran kesusasteraan bahasa Inggeris di sekolah rendah. Oleh itu, kajian ini bertujuan meneliti keberkesanannya dalam pengajaran Kesusasteraan Kanak-kanak Kontemporari kepada murid Tahun 4.

Objektif Kajian

- 1) Membandingkan pencapaian KKK kumpulan eksperimen (*Flipped Classroom*) dan kumpulan kawalan (Konvensional) menggunakan ujian pasca.

Tinjauan Literatur

Ulasan sistematik dan meta-analisis terkini merumuskan bahawa *Flipped Classroom* lazimnya memberikan kesan positif kecil hingga sederhana terhadap pencapaian, dengan keberhasilan bergantung pada reka bentuk aktiviti kelas, kualiti bahan pra-pengajaran dan maklum balas guru (Akçayır & Akçayır, 2019; Lo & Hew, 2020; Strelan et al., 2020; van Alten et al., 2020). Dalam konteks pendidikan rendah dan pengajaran literasi/sastera, kajian melaporkan peningkatan pemahaman bacaan, penglibatan aktif dan penyertaan kolaboratif apabila murid hadir ke kelas selepas prapemedahan kandungan (Hussin et al., 2021; Norazlan & Jamaludin, 2022; Lai & Hwang, 2023).

Sorotan ini menyokong rasional kajian: sekiranya murid mengakses kandungan asas sebelum kelas, maka masa tatap muka dapat difokuskan kepada pembinaan makna yang lebih mendalam

tentang teks, perbincangan nilai, serta aktiviti pengayaan yang mengukuhkan keterlibatan. Fokus kajian kekal kepada pencapaian KKK, pemahaman dan penglibatan.

Metodologi Kajian

Reka bentuk kajian ini menggunakan kaedah kuantitatif dengan reka bentuk kajian kuasi-eksperimen dua kumpulan tidak setara, melibatkan 38 murid Tahun 4 dari Sekolah Kebangsaan Kuala Ketil yang dipilih melalui pensampelan bertujuan; 19 murid ditempatkan dalam kumpulan eksperimen dan 19 murid dalam kumpulan kawalan. Kumpulan eksperimen menerima intervensi *Flipped Classroom* di mana murid menonton video pendek atau membaca helaian berpandu sebelum kelas, manakala masa dalam kelas digunakan untuk aktiviti kolaboratif seperti perbincangan berpasangan/kumpulan kecil, peta minda dan lakonan watak dengan bimbingan serta maklum balas formatif guru. Sebaliknya, kumpulan kawalan mengikuti pengajaran Konvensional yang berpusatkan guru melalui penerangan, soal jawab asas dan latihan individu. Instrumen penilaian terdiri daripada ujian pasca dengan 15 item objektif (pilihan berganda) dan 1 item struktur yang menilai kefahaman literal (fakta/plot), inferens (tema/niat penulis) dan aplikasi/nilai (mengaitkan tema dengan situasi murid), dengan skor ditukarkan kepada skala 0–100. Data dianalisis menggunakan ujian-t sampel bebas bagi membandingkan skor pasca antara kumpulan, disertakan statistik deskriptif (min dan sisihan piawai), serta ukuran kesan Cohen's d untuk menganggar magnitud perbezaan.

Table 1: Demografi Responden Mengikut Jantina

Kumpulan	Jantina	n
Eksperimen	Lelaki	10
	Perempuan	9
Kawalan	Lelaki	9
	Perempuan	10

Dapatan Kajian dan Perbincangan

Skor Min dan Sisihan Piawai Ujian Pasca

Table 2: Skor Min dan Sisihan Piawai Ujian Pasca

Kumpulan	N	Min	SP
Kawalan	19	70.2	7.1
Eksperimen	19	78.5	6.4

Jadual 2 melaporkan skor min dan sisihan piawai ujian pasca bagi kedua-dua kumpulan. Kumpulan eksperimen yang menerima intervensi *Flipped Classroom* memperoleh skor min yang lebih tinggi ($M = 78.5$, $SP = 6.4$) berbanding kumpulan kawalan yang mengikuti kaedah Konvensional ($M = 70.2$, $SP = 7.1$). Perbezaan ini menunjukkan bahawa pendekatan *Flipped Classroom* memberi kesan positif terhadap pencapaian murid dalam pembelajaran kesusasteraan kanak-kanak kontemporari. Dapatan ini selaras dengan kajian Akçayır dan Akçayır (2018) yang mendapati *Flipped Classroom* meningkatkan kefahaman pelajar melalui penglibatan aktif serta akses awal kepada bahan pembelajaran.

Ujian-t Bebas dan Ukuran Kesan (Cohen's d) bagi Skor Ujian Pasca

Table 3: Ujian-t Bebas dan Ukuran Kesan (Cohen's d) bagi Skor Ujian Pasca

Kumpulan	Min	SP	t	df	p	Cohen's d
Kawalan	70.2	7.1				
Eksperimen	78.5	6.4	2.45	36	.02	1.23

Jadual 3 memperincikan keputusan ujian-t bebas dan ukuran kesan (Cohen's d). Perbezaan min antara kumpulan eksperimen dan kawalan adalah signifikan, $t(36) = 2.45$, $p = .02$. Nilai Cohen's $d = 1.23$ menunjukkan kesan yang besar, menandakan bahawa *Flipped Classroom* memberikan impak ketara terhadap pencapaian murid berbanding kaedah Konvensional. Hasil ini seiring dengan dapatan kajian terkini di Malaysia yang menunjukkan keberkesanan *Flipped Classroom* dalam meningkatkan prestasi bahasa Inggeris di sekolah rendah, termasuk aspek kefahaman bacaan dan penguasaan kosa kata (Zainudin et al., 2020). Selain itu, dapatan ini juga disokong oleh naratif kajian antarabangsa yang menekankan kelebihan *Flipped Classroom* dalam meningkatkan motivasi, kolaborasi dan kemahiran abad ke-21 dalam kalangan murid (Akçayır & Akçayır, 2018; Lo & Hew, 2020).

Secara keseluruhannya, hasil kajian ini membuktikan bahawa pendekatan *Flipped Classroom* bukan sahaja meningkatkan pencapaian akademik murid tetapi juga mampu mengatasi kelemahan kaedah Konvensional yang cenderung menjadikan murid pasif. Dengan menyediakan peluang pembelajaran aktif melalui aktiviti kolaboratif dan bimbingan formatif, *Flipped Classroom* dilihat sebagai strategi pedagogi yang berkesan dalam konteks pengajaran kesusasteraan kanak-kanak kontemporari di sekolah rendah.

Implikasi Kajian

- Guru: Sediakan bahan pra-pengajaran ringkas (≤ 8 minit) yang menonjolkan kosa kata utama dan idea pokok teks; gunakan masa kelas untuk aktiviti kolaboratif bertumpu pemahaman tema dan nilai.
- Murid: Amalkan akses pra-pengajaran mengikut jadual dan catat soalan untuk dibincang dalam kelas; terlibat aktif dalam diskusi dan aktiviti kreatif berkaitan teks.
- Ibu bapa: Pantau akses anak kepada bahan pra-pengajaran dan sokong pembinaan rutin belajar prakelasi yang ringkas.
- Sekolah/Dasar: Galakkan penyediaan sumber digital ringkas dan latihan mikro untuk guru dalam mereka bentuk bahan pra-pengajaran dan aktiviti kelas yang berstruktur.

Kesimpulan

Kajian ini membuktikan bahawa pendekatan *Flipped Classroom* memberi kesan positif yang signifikan terhadap pencapaian Kesusasteraan Kanak-kanak Kontemporari (KKK) dalam kalangan murid Tahun 4, apabila kumpulan eksperimen mencatat skor yang lebih tinggi berbanding kumpulan kawalan. Dapatan ini menunjukkan bahawa *Flipped Classroom* bukan sahaja meningkatkan pemahaman literal, inferens dan aplikasi nilai, malah turut menggalakkan penglibatan aktif murid dalam aktiviti kolaboratif, perbincangan serta pembelajaran bermakna. Keberkesanan ini seiring dengan tuntutan pendidikan abad ke-21 yang menekankan kemahiran berfikir kritis, kolaborasi, komunikasi dan literasi digital, sekali gus membuktikan potensinya sebagai strategi pedagogi yang mampu mengatasi kelemahan kaedah Konvensional berpusatkan guru. Oleh itu, *Flipped Classroom* wajar dipertimbangkan untuk diaplikasikan secara lebih meluas dalam pengajaran bahasa Inggeris di sekolah rendah, khususnya dalam

pengajaran KKK dan berpotensi dikembangkan kepada mata pelajaran lain bagi meningkatkan kualiti pembelajaran murid secara menyeluruh.

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KEBERKESANAN PEMBELAJARAN BERASASKAN PERMAINAN SEMASA LATIHAN UNTUK GURU

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Abstrak: Kajian ini bertujuan untuk menilai keberkesanan pembelajaran berasaskan permainan dalam sesi latihan kepada guru serta mengenal pasti tahap penglibatan guru semasa latihan dijalankan. Kajian ini menggunakan kaedah kuantitatif. Reka bentuk kajian yang digunakan ialah kuasi-eksperimen, melibatkan dua kumpulan iaitu kumpulan eksperimen yang mengikuti latihan menggunakan pendekatan GBL dan kumpulan kawalan yang mengikuti kaedah konvensional. Seramai 23 orang guru terlibat sebagai peserta kajian, terdiri daripada 12 orang dalam kumpulan eksperimen dan 11 orang dalam kumpulan kawalan. Ujian pra dan ujian pasca dijalankan bagi mengenal pasti tahap pencapaian peserta, dengan instrumen yang mengandungi soalan berkaitan Standard Kualiti Pendidikan Malaysia Gelombang 2 (SKPMg2) Standard 1.1.2. Data kuantitatif dianalisis menggunakan perisian SPSS versi 25 melalui ujian-t bagi menentukan perbezaan skor antara kumpulan. Hasil kajian menunjukkan terdapat perbezaan yang signifikan dalam skor ujian pasca antara kumpulan eksperimen dan kumpulan kawalan, memihak kepada kumpulan eksperimen. Kajian ini memberikan maklumat penting kepada pegawai Jabatan Pendidikan Negeri (JPN) dan Pejabat Pendidikan Daerah (PPD) dalam merancang serta melaksanakan latihan guru menggunakan pendekatan pembelajaran berasaskan permainan.

Kata Kunci: Pembelajaran berasaskan Permainan, Latihan, Kahoot, Pencapaian, Penglibatan

Pengenalan

Perancangan induk pendidikan negara melalui Blueprint Pendidikan Malaysia 2013-2025 menggariskan transformasi sistem pendidikan Malaysia dengan tumpuan kepada kemahiran abad ke-21, termasuk pemanfaatan ICT serta pembangunan profesional berterusan untuk guru. Kerangka ini menggambarkan strategi untuk mempertingkatkan proses pembelajaran, melatih dan melantik guru, serta mentransformasikan operasi sektor pendidikan secara menyeluruh (Kementerian Pendidikan Malaysia, 2013). Dalam konteks globalisasi dengan perubahan ekonomi, sosial dan teknologi yang pesat, kerjaya perguruan kini mengharapkan guru bukan sahaja menyampaikan ilmu tetapi juga membentuk insan yang lebih baik (Ruzana et al., 2017; Korthagen, 2017).

Selaras dengan perubahan tersebut, kaedah pembelajaran berasaskan permainan (*Game-Based Learning*) muncul sebagai pendekatan penting dalam pendidikan abad ke-21. Kaedah ini mampu meningkatkan motivasi, penglibatan dan interaksi pelajar serta menurunkan kebimbangan penilaian kerana pembelajaran dikaitkan dengan elemen permainan yang

bermakna. Kajian terkini di Malaysia menunjukkan bahawa implementasi dan pemahaman guru terhadap pendekatan GBL masih rendah dan memerlukan pembangunan profesional yang khusus (Low et al., 2023). Di samping itu, kajian juga mencadangkan bahawa latihan guru yang berfokus kepada reka bentuk dan pengintegrasian permainan dalam pengajaran merupakan satu keperluan utama (Zulkefli & Jamil, 2024).

Penyataan Masalah Kajian

Guru yang berkualiti merupakan faktor utama yang menentukan tahap pencapaian pelajar di sekolah. Menurut Suarman (2015; seperti yang dipetik dalam Dali et al., 2017), guru yang menerima bimbingan berkualiti daripada pihak berwibawa mempunyai semangat yang tinggi dalam menyampaikan ilmu kepada pelajar. Sehubungan itu, Kementerian Pendidikan Malaysia (KPM) menekankan kepentingan pembangunan profesional berterusan (Continuous Professional Development, CPD) melalui pelbagai latihan, seminar, kursus dan bengkel yang dapat membantu guru meningkatkan keupayaan serta kompetensi profesional mereka (Kementerian Pendidikan Malaysia, 2013). Walau bagaimanapun, kajian oleh Akademi Kepimpinan Pendidikan Tinggi (AKEPT) menunjukkan bahawa hanya 50% sesi pembelajaran dijalankan secara berkesan, menandakan wujudnya cabaran dalam menjadikan penyampaian latihan lebih menarik dan berpusatkan pelajar. Justeru, KPM menetapkan bahawa setiap guru perlu mengikuti sekurang-kurangnya lima hari latihan setiap tahun bagi memastikan kualiti pengajaran terus dipertingkatkan (Human Resources Development Panel Meeting, 2022).

Keberkesanan latihan guru dapat dinilai melalui tiga peringkat utama, iaitu input, proses dan output. Pada peringkat input, penyampaian kandungan oleh penceramah memainkan peranan penting dalam memastikan objektif latihan tercapai, namun pendekatan konvensional berasaskan kuliah sering menyebabkan guru menjadi pasif dan hilang tumpuan (Eby et al., 2017; Menz et al., 2019). Pada peringkat proses, kekurangan interaksi, aktiviti kolaboratif dan maklum balas yang berkesan menjadikan peserta kurang terlibat secara aktif (Schachter et al., 2019; Vincent, 2020). Manakala pada peringkat output, kaedah penilaian konvensional di akhir latihan sering dianggap membosankan dan menimbulkan tekanan, sekali gus mengurangkan keberkesanan CPD (Nur et al., 2018). Dalam menghadapi cabaran ini, pendekatan latihan yang lebih interaktif dan menyeronokkan diperlukan agar guru dapat mengekalkan tumpuan serta meningkatkan kefahaman sepanjang sesi latihan.

Seiring dengan era Pendidikan 4.0, pembelajaran berasaskan permainan (*Game-Based Learning*, GBL) telah dikenal pasti sebagai satu pendekatan inovatif yang dapat meningkatkan motivasi, penglibatan dan pencapaian peserta latihan. Penggunaan alat Web 2.0 seperti Kahoot! bukan sahaja menjadikan latihan lebih menyeronokkan tetapi juga dapat berfungsi sebagai alat penilaian formatif yang efektif (Esra & Mustafa, 2019; Dillie & Rokenes, 2021). Walaupun banyak kajian telah meneliti keberkesanan GBL dalam bilik darjah, penyelidikan mengenai penggunaannya dalam latihan profesional guru masih terhad (Sánchez-Mena & Martí-Parreño, 2017; An, 2018; Low et al., 2023). Oleh itu, kajian ini dijalankan untuk menilai keberkesanan penggunaan pendekatan pembelajaran berasaskan permainan dalam latihan guru serta meneliti kesannya terhadap tahap penglibatan, motivasi dan pencapaian guru semasa latihan profesional, sekali gus menyumbang kepada usaha memperkukuh pelaksanaan CPD yang lebih interaktif dan berimpak tinggi.

Objektif Kajian

Kajian ini dilaksanakan dengan objektif berikut:

1. Mengenal pasti perbezaan pencapaian peserta latihan guru antara GBL dan latihan konvensional.

Tinjauan Literatur

Pembangunan Profesional Berterusan (CPD) berperanan penting dalam meningkatkan kemahiran dan kompetensi guru agar selaras dengan keperluan pendidikan abad ke-21. Walau bagaimanapun, pelaksanaan CPD secara konvensional masih menunjukkan tahap penglibatan dan pencapaian guru yang sederhana kerana aktiviti latihan kurang interaktif dan tidak berpusatkan peserta (Ryan et al., 2020; Ajani et al., 2018). Sehubungan itu, integrasi pendekatan pembelajaran berasaskan permainan (*Game-Based Learning*, GBL) dalam CPD dilihat mampu memperkukuh keberkesanan latihan guru. GBL berlandaskan Teori Konstruktivisme yang menekankan pembelajaran aktif melalui pengalaman dan interaksi sosial (Vygotsky, 1978), serta Teori Motivasi Kendiri oleh Deci dan Ryan (2000) yang menegaskan kepentingan autonomi, kompetensi dan keterhubungan dalam memupuk motivasi intrinsik. Selain itu, Teori Flow oleh Csikszentmihalyi (1990) menerangkan bagaimana elemen permainan seperti cabaran, matlamat jelas dan maklum balas segera mewujudkan pengalaman pembelajaran yang optimum dan menyeronokkan.

Pendekatan GBL terbukti memberi kesan positif terhadap pencapaian, motivasi dan keterlibatan peserta latihan melalui persekitaran pembelajaran yang interaktif, kompetitif serta berorientasikan maklum balas segera. Kajian terkini menunjukkan bahawa GBL meningkatkan prestasi dan motivasi pelajar di pelbagai peringkat pendidikan (Fotaris et al., 2017; Hamari et al., 2019; Sung et al., 2023). Dalam konteks latihan guru, Yusoff dan Ibrahim (2022) mendapati penggunaan Quizizz dan Kahoot! meningkatkan keterlibatan serta kefahaman guru pelatih dalam modul pedagogi. Meta-analisis oleh Clark et al. (2021) pula menegaskan bahawa GBL bukan sahaja meningkatkan pencapaian kognitif, tetapi turut memperkukuh kemahiran sosial dan kolaboratif. Dapatan ini disokong oleh kajian tempatan oleh Jagathisvaran (2022) yang membuktikan bahawa latihan guru menggunakan Kahoot! meningkatkan pencapaian dan penglibatan berbanding kaedah konvensional, sekali gus menunjukkan potensi besar GBL sebagai strategi berkesan dalam memperkaya pelaksanaan CPD guru di Malaysia.

Metodologi Kajian

Kajian ini menggunakan kaedah kuantitatif bagi menilai keberkesanan pendekatan pembelajaran berasaskan permainan (GBL) terhadap pencapaian dan motivasi guru semasa latihan. Reka bentuk kajian yang digunakan ialah kuasi-eksperimen, melibatkan dua kumpulan iaitu kumpulan eksperimen yang mengikuti latihan menggunakan pendekatan GBL dan kumpulan kawalan yang mengikuti kaedah konvensional. Seramai 23 orang guru terlibat sebagai peserta kajian, terdiri daripada 12 orang dalam kumpulan eksperimen dan 11 orang dalam kumpulan kawalan. Instrumen kajian berbentuk kuantitatif yang merangkumi ujian pra dan ujian pasca bagi mengukur tahap pencapaian peserta, serta soal selidik motivasi bagi menilai tahap motivasi mereka semasa latihan dijalankan. Data yang diperoleh dianalisis menggunakan perisian SPSS dengan kaedah statistik deskriptif dan inferensi melalui ujian-t bebas bagi menentukan perbezaan yang signifikan antara kedua-dua kumpulan.

Jadual 1: Demografi Peserta Kajian

Kumpulan	Jantina	n
Eksperimen	Lelaki	6
	Perempuan	6
Kawalan	Lelaki	5
	Perempuan	6

Dapatan Kajian dan Perbincangan

Skor Min Ujian Pra dan Pasca Mengikut Kumpulan

Jadual 2: Skor Min Ujian Pra dan Pasca Mengikut Kumpulan

Kumpulan	N	Pra (Min)	Pasca (Min)
Eksperimen	12	62.3	82.5
Kawalan	11	63.1	71.4

Jadual 2 menunjukkan skor min ujian pra dan ujian pasca bagi kumpulan eksperimen dan kumpulan kawalan. Secara keseluruhannya, kedua-dua kumpulan mencatatkan peningkatan skor daripada ujian pra ke ujian pasca. Namun demikian, peningkatan skor min bagi kumpulan eksperimen adalah jauh lebih tinggi berbanding kumpulan kawalan. Kumpulan eksperimen yang mengikuti latihan menggunakan pendekatan pembelajaran berasaskan permainan (GBL) menunjukkan peningkatan skor min daripada 62.3 kepada 82.5, manakala kumpulan kawalan yang mengikuti kaedah latihan konvensional hanya meningkat daripada 63.1 kepada 71.4. Perbezaan ini menunjukkan bahawa pendekatan GBL memberi impak yang lebih besar terhadap peningkatan pencapaian peserta berbanding kaedah konvensional. Dapatan ini selari dengan kajian oleh Fotaris et al. (2017) dan Hamari et al. (2019) yang membuktikan bahawa elemen permainan seperti maklum balas segera, elemen kompetitif dan ganjaran intrinsik dapat meningkatkan kefahaman serta pengekalannya ilmu dalam kalangan pelajar dan peserta latihan.

Keputusan Ujian-t Bebas Skor Pasca

Jadual 3: Keputusan Ujian-t Bebas Skor Pasca

Perbandingan	Min	SD	t	df	p
Kawalan	71.4	1.38	2.37	21	0.028
Eksperimen	82.5	1.44			

Jadual 3 pula menunjukkan keputusan ujian-t bebas bagi skor pasca antara kumpulan eksperimen dan kumpulan kawalan. Dapatan menunjukkan terdapat perbezaan min yang signifikan antara kedua-dua kumpulan ($t(21) = 2.37, p < .05$) dengan kumpulan eksperimen mencatatkan skor pasca yang lebih tinggi (Min = 82.5) berbanding kumpulan kawalan (Min = 71.4). Ini menunjukkan bahawa penggunaan pendekatan GBL secara signifikan meningkatkan pencapaian guru semasa latihan berbanding latihan konvensional. Keputusan ini selari dengan dapatan Jagathisvaran (2022) yang mendapati penggunaan Kahoot! dalam latihan guru meningkatkan kefahaman dan prestasi mereka dalam penilaian pasca latihan. Hasil kajian ini turut menyokong pandangan Deci dan Ryan (2000) melalui Self-Determination Theory, yang menjelaskan bahawa elemen autonomi, kompetensi dan keterhubungan yang terdapat dalam permainan mampu meningkatkan motivasi intrinsik peserta, seterusnya memperkukuh pencapaian pembelajaran. Selain itu, teori Flow oleh Csikszentmihalyi (1990) turut menjelaskan bahawa pengalaman pembelajaran yang seimbang antara cabaran dan kemahiran

seperti dalam persekitaran GBL membantu peserta kekal fokus, terlibat aktif dan menikmati proses pembelajaran.

Secara keseluruhannya, hasil dapatan ini menunjukkan bahawa pendekatan pembelajaran berasaskan permainan bukan sahaja berkesan dalam meningkatkan pencapaian guru semasa latihan, malah turut menyokong pembelajaran aktif dan bermakna. Implikasi daripada dapatan ini menunjukkan bahawa elemen GBL wajar dipertimbangkan oleh pihak Kementerian Pendidikan Malaysia dan institusi latihan guru sebagai strategi latihan yang dapat memperkukuh pelaksanaan pembangunan profesional berterusan (CPD) secara lebih interaktif dan berimpak tinggi.

Implikasi Kajian

Implikasi kajian ini merangkumi aspek teori, amalan dan dasar pendidikan. Dari sudut teori, hasil kajian menyokong Teori Konstruktivisme dan Teori Motivasi Kendiri (Deci & Ryan, 2000) dengan menunjukkan bahawa pembelajaran berasaskan permainan (GBL) mampu mewujudkan persekitaran pembelajaran aktif yang memenuhi keperluan psikologi asas seperti autonomi, kompetensi dan keterhubungan. Dari segi amalan, dapatan kajian mencadangkan agar modul latihan guru diubah suai untuk mengintegrasikan elemen GBL menggunakan platform digital seperti Kahoot! atau Quizizz, bagi menjadikan proses latihan lebih interaktif, menyeronokkan dan berkesan dalam meningkatkan penglibatan serta pencapaian guru. Seterusnya, dari perspektif dasar, Kementerian Pendidikan Malaysia disaran mempertimbangkan GBL sebagai pendekatan strategik dalam pelaksanaan pembangunan profesional berterusan (CPD), selaras dengan aspirasi Pendigitalan Pendidikan di bawah Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013–2025 yang menekankan penggunaan teknologi dalam memperkukuh kualiti latihan dan pengajaran guru.

Kesimpulan

Kajian ini menegaskan bahawa pembelajaran berasaskan permainan (GBL) merupakan pendekatan yang berkesan dalam meningkatkan keberkesanan latihan guru, khususnya dalam konteks pembangunan profesional berterusan (CPD). Dapatan menunjukkan terdapat perbezaan signifikan dalam pencapaian antara kumpulan eksperimen dan kumpulan kawalan, di mana guru yang mengikuti latihan berasaskan GBL mencapai skor pasca yang lebih tinggi serta menunjukkan tahap motivasi dan penglibatan yang lebih aktif semasa latihan dijalankan. Elemen permainan seperti maklum balas segera, persaingan sihat dan suasana pembelajaran yang menyeronokkan membantu peserta mengekalkan fokus, meningkatkan pemahaman dan memupuk motivasi intrinsik. Selain itu, kajian ini turut membuktikan bahawa GBL bukan sahaja memperkukuh pembelajaran kognitif, tetapi juga menyokong dimensi afektif dan sosial dalam proses latihan guru. Bagi kajian lanjutan, disarankan agar aplikasi GBL diterokai dalam modul latihan guru yang berbeza seperti pengurusan bilik darjah, pentaksiran atau pedagogi digital, serta dijalankan menggunakan sampel yang lebih besar dan reka bentuk jangka panjang (longitudinal) bagi menilai kesan berterusan GBL terhadap prestasi dan pembangunan profesional guru.

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KEPIMPINAN INSTRUKSIONAL PENGETUA DENGAN EFIKASI KENDIRI GURU SEKOLAH MENENGAH KEBANGSAAN DI DAERAH KOTA SETAR

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Abstrak: Kajian ini bertujuan untuk mengkaji hubungan antara Kepimpinan Instruksional Pengetua dengan Efikasi Kendiri dalam kalangan guru di sekolah menengah kebangsaan di daerah Kota Setar, Kedah. Kajian ini menggunakan pendekatan kuantitatif melalui kaedah tinjauan. Populasi kajian terdiri daripada guru di 35 buah sekolah menengah kebangsaan di daerah Kota Setar. Seramai 378 orang guru telah dipilih sebagai sampel kajian melalui teknik persampelan rawak berstrata. Instrumen kajian berbentuk soal selidik yang diadaptasi daripada kajian terdahulu dan telah diuji dari segi kesahan serta kebolehpercayaan. Data yang diperoleh dianalisis menggunakan statistik deskriptif, ujian-t sampel bebas dan korelasi Pearson. Dapatan kajian menunjukkan bahawa tahap Kepimpinan Instruksional Pengetua dan tahap Efikasi Kendiri Guru berada pada tahap yang tinggi. Tidak terdapat perbezaan yang signifikan Efikasi Kendiri Guru berdasarkan Jantina. Analisis turut menunjukkan terdapat hubungan positif yang signifikan tetapi lemah antara Kepimpinan Instruksional Pengetua dengan Efikasi Kendiri Guru. Implikasi kajian ini mencadangkan bahawa amalan kepimpinan instruksional oleh pengetua berpotensi menyumbang kepada peningkatan Efikasi Kendiri Guru. Justeru, aspek kepimpinan instruksional perlu diberikan perhatian oleh pihak pengurusan sekolah sebagai salah satu usaha ke arah memperkukuh profesionalisme dan keyakinan sendiri guru.

Kata Kunci: Kepimpinan Instruksional, Efikasi Kendiri Guru, Pengetua, Guru

Pengenalan

Pendidikan berperanan penting dalam pembangunan ekonomi dan kemajuan negara melalui proses pengajaran dan pembelajaran yang berkesan (Pelan Pembangunan Pendidikan Malaysia, 2013–2025). Sekolah sebagai organisasi sosial membentuk generasi muda melalui pendidikan formal yang menyeluruh, manakala keberkesanan sekolah bergantung kepada kepimpinan pengetua dalam merancang dan melaksanakan program sekolah dengan baik (Mohd Yusoff & Sufean, 2013; Sufean, 2014).

Kepimpinan Instruksional Pengetua memberi kesan langsung terhadap kualiti pengajaran, persekitaran pembelajaran dan efikasi guru (Quah, 2017; Dayangku Rodzianah & Awangku Amin, 2021). Kajian menunjukkan bahawa kepimpinan yang berkesan mampu meningkatkan efikasi sendiri serta komitmen guru terhadap kejayaan pelajar dan sekolah (Yulk, 2006; Jamilah Ahmad & Yusof Boon, 2011; Abdul Ghani, Ekerim & Ying-Leh Ling, 2019; Abdul Said Ambotang & Haniza Jadin, 2020).

Penyataan Masalah Kajian

Warga sekolah di daerah Kota Setar memainkan peranan penting dalam memastikan pengurusan sekolah berjalan lancar dan mencapai objektif Kementerian Pendidikan Malaysia. Kejayaan ini bergantung kepada kepimpinan pengetua yang berkesan dalam mengurus, memimpin kurikulum serta memotivasikan warga sekolah (Jemaah Nazir Sekolah, 2017; Kalaichelvi & Aida Hanim, 2020). Kajian menunjukkan bahawa Kepimpinan Instruksional Pengetua mempunyai hubungan signifikan dengan sikap guru terhadap perubahan pendidikan abad ke-21 (Mejran Duman, Muhammad Suhaimi Taat & Mohd Khairuddin Abdullah, 2021).

Walau bagaimanapun, perubahan sistem pendidikan dan pelaksanaan PPPM 2013–2025 meningkatkan beban tugas guru dan menjejaskan motivasi serta komitmen mereka. Kepimpinan pengetua berperanan penting dalam memupuk Efikasi Kendiri Guru agar mereka kekal yakin dan cekap dalam melaksanakan tanggungjawab. Namun, kajian tempatan lebih menumpukan kepada gaya kepimpinan umum dan efikasi guru (Saleh, Ibrahim & Ariffin, 2009; Masitah Mohammad Yusof et al., 2013; Baharin et al., 2018) berbanding kepimpinan instruksional yang banyak dikaji di peringkat antarabangsa (Gallante, 2015; Dopson et al., 2016; Ehdinezhad & Mansouri, 2016).

Kekurangan kajian tentang hubungan antara Kepimpinan Instruksional Pengetua dan Efikasi Kendiri Guru di Malaysia menunjukkan wujud jurang pengetahuan dalam bidang ini (Rosnarizah Abdul Halim & Husein Ahmad, 2015). Oleh itu, kajian ini dijalankan bagi mengkaji hubungan gaya Kepimpinan Instruksional Pengetua dengan Efikasi Kendiri Guru di sekolah menengah daerah Kota Setar.

Objektif Kajian

1. Mengetahui tahap Kepimpinan Instruksional Pengetua.
2. Mengetahui tahap Efikasi Kendiri Guru.
3. Mengetahui perbezaan Efikasi Kendiri Guru berdasarkan jantina.
4. Mengetahui hubungan antara Kepimpinan Instruksional Pengetua dengan Efikasi Kendiri Guru.

Tinjauan Literatur

Kepimpinan Instruksional Pengetua

Kepimpinan instruksional lazimnya merangkumi penetapan hala tuju pengajaran, penyelarasan kurikulum dan pengajaran, serta pembentukan iklim pembelajaran yang positif (Hallinger & Murphy, 1985). Sorotan mutakhir terus menegaskan kaitannya dengan pengajaran guru dan hasil pembelajaran (Hallinger, 2012). Walaupun konteks berbeza, konsistensi penemuan rentas kajian menunjukkan bahawa tingkah laku kepimpinan yang menyokong instruksional—pemantauan pengajaran, bimbingan profesional dan perlindungan masa mengajar—berkait dengan pengukuhan amalan guru.

Efikasi Kendiri Guru

Efikasi sendiri berasaskan Teori Kognitif Sosial (Bandura, 1986) dan dalam konteks bilik darjah sering dioperasikan melalui tiga domain: penglibatan pelajar, strategi instruksional dan

pengurusan bilik darjah (Tschannen-Moran, Hoy & Hoy, 1998; Tschannen-Moran & Hoy, 2001). Bukti empirikal terkini juga mengaitkan efikasi sendiri dengan kesejahteraan psikologi guru dan prestasi pengajaran (Ong et al., 2022).

Hubungan Antara Kepimpinan Instruksional dan Efikasi Kendiri

Kajian antarabangsa dan serantau menunjukkan hubungan positif antara Kepimpinan Instruksional Pengetua dan Efikasi Kendiri Guru, meskipun magnitudnya boleh berbeza mengikut konteks sekolah dan faktor perantara seperti kollegialiti dan PLC (Elfira et al., 2024; Romero, 2024; Zhang et al., 2025; Ulasan sistematik 2025). Sorotan ini menyokong rasional kajian di Kota Setar untuk menguji kekuatan dan arah hubungan tersebut.

Metodologi Kajian

Kajian ini menggunakan pendekatan kuantitatif melalui kaedah tinjauan bagi menerangkan tahap konstruk serta menguji perbezaan dan hubungan antara pemboleh ubah yang dikaji. Populasi terdiri daripada guru di 35 buah sekolah menengah kebangsaan di daerah Kota Setar, Kedah, dengan 378 orang guru dipilih sebagai sampel melalui persampelan rawak berstrata bagi memastikan kebolehwakilan. Instrumen kajian ialah soal selidik yang diadaptasi daripada kajian terdahulu dan telah diuji kesahan serta kebolehpercayaannya. Skala yang digunakan menilai Kepimpinan Instruksional Pengetua dan Efikasi Kendiri Guru, seperti *Teacher Sense of Efficacy Scale (TSES)* yang terbukti sesuai digunakan dalam konteks Malaysia (Khairani, 2012). Data dianalisis menggunakan statistik deskriptif untuk menentukan tahap pemboleh ubah kajian, ujian-t sampel bebas bagi menilai perbezaan efikasi sendiri berdasarkan jantina dan korelasi Pearson bagi menguji hubungan antara Kepimpinan Instruksional Pengetua dengan Efikasi Kendiri Guru.

Dapatan Kajian

Tahap Kepimpinan Instruksional Pengetua

Jadual 1: Tahap Kepimpinan Instruksional Pengetua

Dimensi Kepimpinan Instruksional	Min	Tahap
Mentakrif Misi Sekolah	3.85	Tinggi
Mengurus Program Instruksional	3.90	Tinggi
Membentuk Iklim Sekolah yang Positif	3.88	Tinggi
Keseluruhan	3.88	Tinggi

Jadual 1 menunjukkan tahap Kepimpinan Instruksional Pengetua berada pada tahap tinggi (min keseluruhan = 3.88). Antara tiga dimensi utama, mengurus program instruksional mencatatkan min tertinggi (3.90), diikuti membentuk iklim sekolah yang positif (3.88) dan mentakrif misi sekolah (3.85). Ini menunjukkan pengetua di daerah Kota Setar berupaya melaksanakan peranan instruksional dengan baik, khususnya dalam mengurus pengajaran dan membina suasana sekolah yang kondusif.

Tahap Efikasi Kendiri Guru

Jadual 2: Tahap Efikasi Kendiri Guru

Dimensi Efikasi Kendiri Guru	Min	Tahap
Penglibatan Pelajar	3.80	Tinggi
Strategi Instruksional	3.92	Tinggi
Pengurusan Bilik Darjah	3.87	Tinggi
Keseluruhan	3.86	Tinggi

Jadual 2 menunjukkan tahap Efikasi Kendiri Guru juga berada pada tahap tinggi (min keseluruhan = 3.86). Dimensi strategi instruksional mencatatkan min tertinggi (3.92), diikuti pengurusan bilik darjah (3.87) dan penglibatan pelajar (3.80). Ini menggambarkan bahawa guru di daerah Kota Setar yakin dengan kebolehan mereka untuk merancang dan melaksanakan pengajaran secara berkesan serta mengurus bilik darjah dengan baik.

Perbezaan Efikasi Kendiri Guru Berdasarkan Jantina

Jadual 3: Perbezaan Efikasi Kendiri Guru Berdasarkan Jantina

Jantina	Min	SD	t	Sig. (p)
Lelaki	3.85	0.42	1.21	0.23
Perempuan	3.87	0.39		

Ujian-t sampel bebas (Jadual 3) menunjukkan tiada perbezaan signifikan antara guru lelaki (min = 3.85) dan guru perempuan (min = 3.87) dengan nilai $p = 0.23$ (> 0.05). Ini bermaksud tahap Efikasi Kendiri Guru tidak dipengaruhi oleh faktor jantina dan kedua-dua kumpulan menunjukkan keyakinan serta kecekapan profesional yang seimbang.

Hubungan Kepimpinan Instruksional Pengetua dengan Efikasi Kendiri Guru

Jadual 4: Hubungan Kepimpinan Instruksional Pengetua dengan Efikasi Kendiri Guru

Pemboleh Ubah	Nilai r Efikasi Kendiri Guru	p-value
Kepimpinan Instruksional	0.30	0.00

Analisis korelasi Pearson (Jadual 4) menunjukkan terdapat hubungan positif yang signifikan tetapi lemah antara Kepimpinan Instruksional Pengetua dan Efikasi Kendiri Guru ($r = 0.30$, $p < 0.05$). Ini menunjukkan semakin tinggi amalan Kepimpinan Instruksional Pengetua, semakin tinggi juga Efikasi Kendiri Guru, walaupun kekuatan hubungan tersebut adalah sederhana rendah.

Perbincangan Kajian

Dapatan kajian menunjukkan bahawa tahap Kepimpinan Instruksional Pengetua di sekolah menengah daerah Kota Setar berada pada tahap tinggi. Pengetua didapati mengamalkan kepimpinan yang berkesan dalam mentakrif misi sekolah, mengurus program instruksional dan membentuk iklim sekolah yang positif. Ini sejajar dengan dapatan kajian Sufean (2014) dan Jemaah Nazir Sekolah (2017) yang menegaskan bahawa pengetua berperanan utama dalam memastikan keberkesanan pengajaran serta pencapaian matlamat sekolah. Amalan kepimpinan yang berasaskan pemantauan pengajaran, penyeliaan guru dan pembinaan budaya sekolah

positif juga selaras dengan pandangan Hallinger (2003) bahawa kepimpinan instruksional memberi kesan langsung terhadap peningkatan kualiti PdPc.

Tahap Efikasi Kendiri Guru pula turut berada pada tahap tinggi, menunjukkan guru mempunyai keyakinan diri yang tinggi dalam melaksanakan tugas profesional mereka. Dimensi strategi instruksional mencatatkan min tertinggi, menandakan guru yakin dalam memilih dan melaksanakan kaedah pengajaran yang berkesan. Dapatan ini menyokong pandangan Bandura (1997) bahawa efikasi sendiri mempengaruhi cara individu bertindak dan berusaha mencapai kejayaan. Ia juga selari dengan kajian Dayangku Rodzianah dan Awangku Amin (2021) yang menyatakan bahawa persekitaran pembelajaran yang kondusif di bawah kepimpinan instruksional mampu meningkatkan efikasi guru dalam melaksanakan PdPc.

Selain itu, dapatan menunjukkan tiada perbezaan signifikan Efikasi Kendiri Guru berdasarkan jantina, membuktikan bahawa guru lelaki dan perempuan memiliki tahap keyakinan serta kompetensi profesional yang hampir sama. Hasil ini menyokong dapatan kajian Shafinaz A. Maulod et al. (2017) yang turut mendapati faktor jantina tidak mempengaruhi Efikasi Kendiri Guru secara signifikan, kerana tugas dan peranan profesional mereka bergantung lebih kepada pengalaman dan sokongan kepimpinan sekolah daripada faktor demografi.

Akhir sekali, analisis korelasi menunjukkan hubungan positif yang signifikan tetapi lemah antara Kepimpinan Instruksional Pengetua dan Efikasi Kendiri Guru ($r = 0.30$, $p < 0.05$). Ini menunjukkan bahawa amalan kepimpinan instruksional yang baik masih memainkan peranan dalam meningkatkan keyakinan guru. Dapatan ini menyokong kajian Abdul Said Ambotang dan Haniza Jadin (2020) serta Abdul Ghani, Ekerim dan Ying-Leh Ling (2019) yang mendapati kepimpinan instruksional berkesan dapat memperkukuh Efikasi Kendiri Guru. Hubungan yang lemah mungkin disebabkan faktor lain seperti pengalaman mengajar, beban kerja dan sokongan organisasi yang turut mempengaruhi tahap efikasi guru.

Secara keseluruhannya, dapatan kajian ini menegaskan bahawa Kepimpinan Instruksional Pengetua memainkan peranan penting dalam membina keyakinan profesional guru, namun usaha memperkukuh efikasi sendiri perlu dilaksanakan secara menyeluruh melalui latihan profesional, sokongan emosi dan budaya kolaboratif di sekolah.

Implikasi Kajian

- Amalan Pengetua: Pengetua perlu memantapkan peranan instruksional dengan membimbing dan memantau pengajaran guru secara berkesan.
- Pembangunan Guru: Latihan berterusan dan perkongsian amalan terbaik dapat meningkatkan keyakinan dan kemahiran guru.
- Dasar Pendidikan: KPM boleh memperluas latihan kepimpinan instruksional berdasarkan bukti kajian untuk memperkukuh pengurusan sekolah.
- Sokongan Kesejahteraan: Program kesejahteraan guru membantu mengekalkan motivasi dan efikasi sendiri tinggi, seterusnya meningkatkan prestasi PdP.

Kesimpulan

Kajian ini menunjukkan bahawa Kepimpinan Instruksional Pengetua di sekolah menengah daerah Kota Setar berada pada tahap tinggi, di mana pengetua secara konsisten mengamalkan

amalan seperti penetapan visi sekolah, pemantauan pengajaran dan pembentukan iklim sekolah yang positif. Begitu juga, Efikasi Kendiri Guru turut berada pada tahap tinggi, termasuk dalam penglibatan pelajar, strategi instruksional dan pengurusan bilik darjah. Analisis korelasi mendedahkan terdapat hubungan positif yang signifikan tetapi lemah antara Kepimpinan Instruksional Pengetua dan Efikasi Kendiri Guru, menunjukkan bahawa amalan kepimpinan instruksional boleh menyokong peningkatan keyakinan dan keberkesanan guru dalam pengajaran. Walau bagaimanapun, tahap efikasi guru juga dipengaruhi oleh faktor lain seperti pengalaman, latihan, sokongan organisasi dan kesejahteraan guru, yang perlu diambil kira dalam usaha memperkukuh prestasi sekolah dan kejayaan PdP.

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HUBUNGAN ANTARA KEBOLEHSUAIAN KERJAYA DAN PRESTASI KERJA DALAM INDUSTRI PEMBUATAN DI CHINA

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Abstrak: Kajian ini bertujuan untuk mengenal pasti hubungan antara Kebolehsuaian Kerjaya dan Prestasi Kerja dalam kalangan pekerja industri pembuatan di China. Empat dimensi Kebolehsuaian Kerjaya yang dikaji ialah Keprihatinan, Rasa Ingin Tahu, Kawalan dan Keyakinan. Kajian ini menggunakan pendekatan kuantitatif berasaskan kaedah korelasi bagi mengukur tahap hubungan antara pemboleh ubah tersebut. Data dikumpul melalui soal selidik yang melibatkan 384 orang pekerja industri pembuatan di China. Analisis kebolehpercayaan menunjukkan nilai Cronbach's Alpha yang tinggi bagi semua konstruk, iaitu Keprihatinan ($\alpha = .74$), Rasa Ingin Tahu ($\alpha = .85$), Kawalan ($\alpha = .74$), Keyakinan ($\alpha = .78$) dan Prestasi Kerja ($\alpha = .80$). Data dianalisis menggunakan teknik statistik inferensi iaitu korelasi Pearson. Hasil kajian menunjukkan bahawa semua dimensi Kebolehsuaian Kerjaya mempunyai hubungan positif yang signifikan terhadap Prestasi Kerja. Dapatan ini mengesahkan bahawa peningkatan tahap Kebolehsuaian Kerjaya pekerja berkait secara positif dengan peningkatan Prestasi Kerja. Oleh itu, pihak pengurusan industri pembuatan disarankan untuk memberi tumpuan kepada pembangunan Kebolehsuaian Kerjaya pekerja berdasarkan empat dimensi tersebut bagi meningkatkan prestasi dan kecekapan tenaga kerja.

Kata Kunci: Kebolehsuaian Kerjaya, Keprihatinan, Rasa Ingin Tahu, Kawalan, Keyakinan, Prestasi Kerja

Pengenalan

Globalisasi dan ketidakstabilan pasaran kerja menuntut individu memiliki kebolehan menyesuaikan diri dalam kerjaya (*Career Adaptability*) untuk menguruskan cabaran dan tekanan pekerjaan (Johnston, 2018; Arthur & Rousseau, 1996). *Career Adaptability* merangkumi empat dimensi: *Concern* (perancangan masa depan), *Control* (mengawal pertumbuhan kerjaya), *Curiosity* (menjelajah kemungkinan masa depan) dan *Confidence* (keyakinan menghadapi cabaran), yang mempengaruhi kepuasan kerja, pengurusan stres dan pencapaian kerjaya (Hartmann et al., 2020; Davidescu & Ali, 2020). Menurut Teori Pembinaan Kerjaya (CCT), pembangunan kerjaya memerlukan integrasi konsep diri dengan peranan pekerjaan bagi mencapai keharmonian antara keperluan dalaman dan peluang luaran (Obrenovic et al., 2020). Individu yang tinggi *adaptability* lebih mampu menghadapi perubahan, mengurus tekanan, meningkatkan keyakinan diri dan memanfaatkan peluang kerjaya, menjadikannya konstruksi psikologi penting untuk kejayaan dalam dunia kerja moden (Spurk & Straub, 2020; Cooper et al., 2019; Davidescu et al., 2020).

Penyataan Masalah Kajian

Sejak kemunculan ekonomi global, konsep tingkah laku kerjaya mengalami perubahan drastik daripada anggapan kerjaya bersifat tetap kepada pemahaman bahawa kerjaya dibentuk melalui pengalaman, memori dan aspirasi individu sepanjang hayat (Johnston, 2018). Dalam ekonomi yang berubah-ubah, keupayaan menyesuaikan diri (*Career Adaptability*) menjadi penting untuk menguruskan cabaran pekerjaan, pembangunan sendiri dan pembelajaran sepanjang hayat (Cooke et al., 2019; Akagunduz, Alkan & Gok, 2018). *Career Adaptability* merangkumi empat dimensi utama: *Concern* (perancangan masa depan), *Curiosity* (keingintahuan dan eksplorasi kerjaya), *Confidence* (keyakinan menghadapi cabaran) dan *Control* (mengawal hala tuju kerjaya), yang kesemuanya mempengaruhi kepuasan kerja, kesejahteraan dan kejayaan profesional (Cavaliere et al., 2021; Wanggyue, 2021).

Individu yang tinggi tahap *adaptability* mampu menyesuaikan diri dengan perubahan, mengurus tekanan, meningkatkan keyakinan diri dan memanfaatkan peluang kerjaya dengan lebih baik (De Vos, Van der Heijden & Akkermans, 2020; Chen, 2019; Guan et al., 2019). Faktor personaliti seperti keterbukaan, ketahanan dan ekstroverti, serta sokongan sosial dan bimbingan daripada pengurus atau mentor, turut mempengaruhi keupayaan adaptasi kerjaya (Spurk & Straub, 2020; Davidescu et al., 2020; Darvishmotevali & Ali, 2020). Individu yang fleksibel lebih berkemampuan untuk menghadapi transisi kerjaya, mengekalkan penglibatan dalam kerja dan mengurangkan risiko tekanan atau ketidakpuasan kerja (Diamantidis & Chatzoglou, 2018; Cooke et al., 2019).

Walaupun kepentingan *Career Adaptability* diakui, terdapat perbezaan pandangan mengenai cara membangunkan keupayaan ini sama ada melalui sifat personaliti yang wujud sejak awal atau melalui latihan, sokongan sosial dan pengalaman kerjaya (Hartmann et al., 2020; Cooke et al., 2019). Kekurangan *adaptability* boleh menyebabkan stres, burnout, pengangguran atau pekerjaan tidak tetap, yang seterusnya menjejaskan kesejahteraan individu dan produktiviti organisasi. Justeru, kajian lanjut diperlukan untuk memahami mekanisme perkembangan *adaptability* dan strategi terbaik untuk membina kemahiran ini dalam menghadapi cabaran dunia kerja moden.

Objektif Kajian

1. Mengetahui tahap kebolehsuaian kerjaya pekerja dalam industri pembuatan di China.
2. Mengetahui tahap prestasi kerja pekerja.
3. Mengetahui hubungan antara keprihatinan, rasa ingin tahu, kawalan dan keyakinan dengan prestasi kerja.

Tinjauan Literatur

Prestasi kerja telah lama dianggap sebagai faktor kritikal dalam kejayaan organisasi kerana ia secara langsung berkaitan dengan produktiviti, inovasi dan daya saing. Menurut Safari dan Karatepe (2018), prestasi kerja merujuk kepada tahap pencapaian matlamat melalui tindakan individu dalam organisasi. Kajian terdahulu dalam psikologi industri/organisasi menegaskan bahawa prestasi kerja bukan sahaja diukur melalui hasil kerja, tetapi juga melalui tingkah laku pekerja yang menyumbang kepada matlamat organisasi (Federici, Boon & Den Hartog, 2021).

Oleh itu, memahami faktor yang mempengaruhi prestasi kerja adalah penting dalam memastikan keberkesanan organisasi dan pembangunan kerjaya individu.

Salah satu kerangka teori yang banyak digunakan dalam mengkaji penyesuaian kerjaya ialah *Career Construction Theory* (Savickas, 2005), yang menekankan bahawa pembangunan kerjaya adalah proses psikososial berterusan untuk menyesuaikan diri dengan perubahan peranan kerja sepanjang hayat. Teori ini melihat penyesuaian kerjaya sebagai keupayaan individu untuk mengurus cabaran, perubahan, serta ketidakpastian dalam dunia pekerjaan (Obrenovic et al., 2020). Kajian oleh Spurk dan Straub (2020) serta Darvishmotevali dan Ali (2020) menunjukkan bahawa kebolehsuaian kerjaya meningkatkan keupayaan individu menghadapi cabaran pekerjaan, mengurangkan tekanan kerja dan seterusnya meningkatkan prestasi kerja.

Empat dimensi utama kebolehsuaian kerjaya iaitu keprihatinan (*Concern*), rasa ingin tahu (*Curiosity*), kawalan (*Control*) dan keyakinan (*Confidence*) didapati memberi kesan positif terhadap prestasi kerja. Keprihatinan berkaitan dengan kesedaran masa depan dan perancangan kerjaya, manakala rasa ingin tahu mendorong individu meneroka peluang baharu yang dapat memperkaya pengalaman kerja (Hartmann et al., 2020). Kajian Yu et al. (2018) serta Rasheed et al. (2020) mendapati pekerja yang mempunyai tahap keprihatinan dan rasa ingin tahu tinggi lebih berinovasi dan proaktif dalam melaksanakan tugas. Sementara itu, kawalan memberi pekerja rasa tanggungjawab terhadap kerjaya mereka dan keyakinan pula meningkatkan keberanian mengambil keputusan serta menyelesaikan masalah yang kompleks (Cooke et al., 2019).

Literatur terdahulu juga menekankan bahawa kebolehsuaian kerjaya bukan sahaja meningkatkan prestasi kerja, malah memberi kesan kepada kesejahteraan psikologi dan kepuasan kerjaya. Johnston (2018) menegaskan bahawa individu yang mampu menyesuaikan diri dengan perubahan lebih cenderung mengalami tahap kepuasan kerja yang tinggi serta kurang terdedah kepada tekanan dan kebimbangan. Tambahan pula, Davidescu et al. (2020) menyatakan bahawa pekerja dengan tahap kebolehsuaian kerjaya yang baik mempunyai kecenderungan lebih tinggi untuk mengekalkan penglibatan kerja dan komitmen terhadap organisasi. Dapatan ini menunjukkan bahawa kebolehsuaian kerjaya berfungsi sebagai faktor pelindung yang bukan sahaja menyokong prestasi kerja tetapi juga meningkatkan kesejahteraan keseluruhan pekerja.

Metodologi Kajian

Kajian ini menggunakan pendekatan kuantitatif dengan reka bentuk korelasi bagi menilai hubungan antara kebolehsuaian kerjaya dan prestasi kerja dalam kalangan pekerja industri pembuatan di China. Sampel terdiri daripada 384 orang pekerja yang dipilih melalui kaedah *convenience sampling*. Instrumen kajian berupa soal selidik berskala Likert lima mata yang mengukur empat dimensi kebolehsuaian kerjaya iaitu keprihatinan, rasa ingin tahu, kawalan dan keyakinan, serta satu pemboleh ubah bersandar iaitu prestasi kerja. Analisis kebolehpercayaan menunjukkan nilai *Cronbach's Alpha* yang tinggi bagi semua konstruk, iaitu Keprihatinan ($\alpha = .74$), Rasa Ingin Tahu ($\alpha = .85$), Kawalan ($\alpha = .74$), Keyakinan ($\alpha = .78$) dan Prestasi Kerja ($\alpha = .80$). Nilai melebihi .70 menunjukkan konsistensi dalaman yang memuaskan (Nunnally, 1978). Data dianalisis menggunakan statistik deskriptif untuk menerangkan profil

responden dan taburan skor, manakala analisis korelasi Pearson digunakan bagi menentukan kekuatan serta arah hubungan antara kebolehsuaian kerjaya dan prestasi kerja.

Dapatan Kajian

Tahap Kebolehsuaian Kerjaya dan Tahap Prestasi Kerja

Jadual 1: Tahap Kebolehsuaian Kerjaya dan Tahap Prestasi Kerja

Variabel Kajian	Min	SD
Kebolehsuaian Kerjaya	3.78	1.06
Prestasi Kerja	3.45	.91

Jadual 1 menunjukkan tahap kebolehsuaian kerjaya dan tahap prestasi kerja dalam kalangan responden. Secara keseluruhan, min kebolehsuaian kerjaya adalah 3.78 (SD = 1.06), manakala min prestasi kerja ialah 3.45 (SD = 0.91). Dapatan ini menunjukkan bahawa tahap kebolehsuaian kerjaya responden berada pada tahap yang agak tinggi berbanding tahap prestasi kerja yang berada pada tahap sederhana. Hal ini membayangkan bahawa pekerja dalam industri pembuatan di China mempunyai keupayaan yang baik untuk menyesuaikan diri dengan cabaran dan perubahan kerjaya, namun pencapaian prestasi kerja mereka masih boleh dipertingkatkan.

Hubungan antara Dimensi Kebolehsuaian Kerjaya dan Prestasi Kerja

Jadual 2: Hubungan antara Dimensi Kebolehsuaian Kerjaya dan Prestasi Kerja

Dimensi	Korelasi (r) Prestasi Kerja
Keprihatinan	0.65**
Rasa Ingin Tahu	0.81**
Kawalan	0.74**
Keyakinan	0.66**

Jadual 2 pula memperincikan hubungan antara dimensi kebolehsuaian kerjaya dengan prestasi kerja. Keputusan analisis korelasi Pearson menunjukkan bahawa keempat-empat dimensi kebolehsuaian kerjaya mempunyai hubungan yang positif dan signifikan dengan prestasi kerja pada aras $p < .01$. Dimensi rasa ingin tahu mencatatkan korelasi tertinggi ($r = 0.81$), diikuti kawalan ($r = 0.74$), keyakinan ($r = 0.66$) dan keprihatinan ($r = 0.65$). Dapatan ini menjelaskan bahawa semakin tinggi tahap rasa ingin tahu, kawalan, keyakinan dan keprihatinan pekerja, semakin tinggi juga prestasi kerja mereka.

Perbincangan Kajian

Dapatan kajian menunjukkan bahawa tahap kebolehsuaian kerjaya berada pada tahap agak tinggi manakala prestasi kerja pada tahap sederhana. Hal ini selari dengan pandangan Johnston (2018) bahawa pekerja yang mempunyai kebolehsuaian kerjaya lebih bersedia menghadapi perubahan, namun faktor organisasi juga diperlukan untuk memastikan kebolehsuaian tersebut dapat diterjemahkan kepada prestasi kerja yang lebih tinggi. Analisis korelasi turut membuktikan bahawa keempat-empat dimensi kebolehsuaian kerjaya mempunyai hubungan positif dengan prestasi kerja, dengan rasa ingin tahu menunjukkan korelasi paling tinggi ($r = 0.81$). Ini menyokong dapatan Rasheed et al. (2020) yang menegaskan bahawa rasa ingin tahu

pekerja dapat meningkatkan kreativiti, inovasi dan komitmen, sekali gus memperkuat pencapaian kerja dalam industri berintensifkan pengetahuan seperti pembuatan.

Selain itu, dimensi kawalan ($r = 0.74$), keyakinan ($r = 0.66$) dan keprihatinan ($r = 0.65$) turut memberi kesan positif terhadap prestasi kerja. Pekerja yang mempunyai kawalan terhadap kerjaya mereka biasanya lebih bertanggungjawab dalam membuat keputusan, selaras dengan model kawalan pekerjaan Karasek yang menekankan kepentingan autonomi dalam kerja (Safari & Karatepe, 2018). Keyakinan pula membolehkan pekerja menghadapi cabaran dengan lebih berkesan, sebagaimana ditegaskan oleh Avram et al. (2019) bahawa keyakinan diri berkait rapat dengan keupayaan menyelesaikan masalah. Sementara itu, keprihatinan terhadap masa depan kerjaya membantu pekerja membuat perancangan yang sistematik, yang akhirnya meningkatkan prestasi kerja (Yu et al., 2018). Secara keseluruhannya, dapatan ini menyokong teori *Career Construction* (Savickas, 2005) yang menekankan kebolehsuaian kerjaya sebagai asas penting dalam pembangunan dan kejayaan kerjaya seseorang pekerja.

Implikasi Kajian

Kajian ini memberi implikasi dari segi teori dan praktikal. Dari segi teori, dapatan kajian mengukuhkan lagi *Career Construction Theory* (Savickas, 2005) dengan membuktikan bahawa empat dimensi kebolehsuaian kerjaya (keprihatinan, rasa ingin tahu, kawalan dan keyakinan) berperanan penting dalam meningkatkan prestasi kerja, sekali gus menambah bukti empirikal dalam konteks industri pembuatan di China. Dari segi praktikal, hasil kajian menekankan keperluan pengurus sumber manusia untuk merangka strategi pembangunan pekerja yang lebih holistik melalui latihan berterusan, peluang pembangunan kerjaya, pemberian autonomi, bimbingan mentor-mentee dan sistem sokongan organisasi. Langkah ini bukan sahaja meningkatkan kebolehsuaian kerjaya dan prestasi kerja, tetapi juga menyumbang kepada penglibatan kerja, kepuasan kerjaya dan daya saing organisasi dalam jangka panjang (De Vos, Van der Heijden & Akkermans, 2020).

Kesimpulan

Kajian ini membuktikan bahawa kebolehsuaian kerjaya mempunyai hubungan positif yang signifikan terhadap prestasi kerja dalam kalangan pekerja industri pembuatan di China. Keempat-empat dimensi kebolehsuaian kerjaya iaitu keprihatinan, rasa ingin tahu, kawalan dan keyakinan didapati menyumbang secara langsung kepada peningkatan prestasi kerja. Pekerja yang prihatin terhadap masa depan kerjaya akan lebih berdisiplin dan berstrategi, manakala mereka yang mempunyai rasa ingin tahu cenderung untuk meneroka peluang baharu serta meningkatkan kreativiti dan inovasi. Seterusnya, pekerja yang mempunyai kawalan berasa lebih bertanggungjawab terhadap kerjaya mereka dan mampu membuat keputusan yang tepat, manakala keyakinan memberi mereka keberanian menghadapi cabaran kerja dengan lebih berkesan. Justeru, pihak pengurusan industri perlu memberi perhatian serius terhadap pembangunan kebolehsuaian kerjaya pekerja melalui latihan, bimbingan dan sokongan organisasi, kerana usaha ini bukan sahaja meningkatkan prestasi individu tetapi juga menjadi strategi penting dalam memperkuat daya saing organisasi di pasaran global.

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PENJAWAT AWAM DAN PENIPUAN PINDAH MILIK TANAH DI MALAYSIA: ISU DAN SOLUSI

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Abstrak: *Isu penipuan pindah milik tanah di Malaysia adalah isu yang dibincangkan sekian lama. Masalah ini telah menyebabkan kerugian beratus ribu ringgit kepada pemilik tanah asal. Terdapat banyak pihak yang terlibat di dalam isu ini seperti broker, pemunya surat wakil kuasa, peguam dan beberapa pihak lagi. Terdapat di dalam sesetengah kes berlakunya penglibatan pihak luar dibantu oleh 'orang dalam' di pejabat tanah itu sendiri. Dengan menggunakan modus sedemikian, proses penipuan akan menjadi lebih cepat dan lancar tanpa disyaki oleh mana-mana pihak. Artikel ini mengupas penglibatan penjawat awam dalam kes penipuan pindah milik tanah dan modus yang digunakan di dalam tindakan itu. Beberapa solusi dicadangkan dalam mengatasi masalah ini dari berlaku lagi pada masa akan datang. Kajian ini menggunakan metod kajian perpustakaan di mana karya-karya tertentu akan dirujuk. Laporan akhbar juga akan dijadikan sebagai sumber data di dalam penulisan ini.*

Kata Kunci: *Penipuan, Pindah Milik Tanah, Pejabat Tanah, Penjawat Awam, Modus, SPRM*

Pengenalan

Pada tahun 2025, Malaysia digemparkan dengan pendedahan sindiket penipuan pindah milik tanah secara tidak sah di Selangor. Kes ini melibatkan kerjasama antara 'orang dalam' pejabat tanah dan pihak luar, termasuk kemungkinan penglibatan golongan profesional seperti peguam. Sehingga Januari 2025, seramai 17 individu, termasuk tujuh penjawat awam dari Pejabat Daerah dan Tanah (PDT) Klang, telah ditahan bagi membantu siasatan (Siakapkei, 2025).

Antara modus operandi yang digunakan sindiket ini adalah mereka dipercayai mengeksploitasi peralihan sistem pengurusan tanah dari manual ke sistem e-Tanah dengan memanipulasi rekod untuk memasukkan nama pemilik palsu dan memadam rekod asal (Kosmo Digital, 2025). Akibat dari masalah ini Kerajaan Negeri Selangor telah menanggung kerugian besar akibat pertindihan hak milik tanah, seterusnya memaksa pembayaran pampasan kepada pihak terjejas (Astro Awani, 2025). Setakat ini, kes penipuan pindah milik tanah secara tidak sah di Selangor pada tahun 2025 tidak mempunyai nama rasmi seperti "Operasi" atau "Kod Kes" yang diumumkan kepada umum.

Walau bagaimanapun, media dan pihak berkuasa sering merujuknya sebagai "Kes Kartel Pindah Milik Tanah Selangor" atau "Kes Penipuan Pindah Milik Tanah Secara Tidak Sah". Status siasatan: Siasatan masih dijalankan oleh Jabatan Siasatan Jenayah Komersial (JSJK) Bukit Aman, dengan usaha mengesan individu lain yang disyaki terlibat dalam kegiatan ini (Utusan Malaysia, 2025). Walaupun tiada nama rasmi diberikan, kes ini telah menarik perhatian umum dan pihak berkuasa kerana melibatkan kerugian besar dan penyalahgunaan sistem pentadbiran tanah.

Ulasan Karya

Penipuan Pindah Milik Tanah Dan Kes Tersohor Boonsoom Boonyanit & Ors. Lwn Adorna Properties (M) Sdn Bhd [2001]

Menurut Kanun Tanah Negara Akta 828, sebarang transaksi melibatkan tanah, termasuk pindahmilik, hendaklah didaftarkan mengikut perosedur yang telah ditetapkan di pejabat tanah. Maka undang-undang hanya akan mengambilkira nama yang telah sah didaftarkan dalam dokumen hakmilik, sebagai pemilik tanah yang sah. Mengikut seksyen 340(1) Kanun Tanah Negara Akta 828, undang-undang akan memberikan hakmilik takboleh sangkal kepada pihak yang namanya telah sah didaftarkan di pejabat tanah. Seterusnya mengikut seksyen 340(2) Akta 828, menyatakan bahawa hakmilik takboleh sangkal hanya boleh diketepikan apabila terbukti tanah diperolehi secara tidak sah, palsu atau melalui penipuan.

Kes *Boonsoom Boonyanit lwn Adorna Properties Sdn Bhd* adalah merupakan kes yang agak kontroversi membincangkan tentang masalah penipuan pindah milik tanah di Malaysia. Kes ini membincangkan tentang kisah lot tanah yang dimiliki oleh Boonsom (warga Thailand) telah dipindahkan secara fraud oleh seseorang yang menyamar sebagai Boonsom kepada pihak Adorna Properties S/B (Adorna). Kes ini mendapat perhatian apabila Mahkamah Persekutuan memutuskan pihak Adorna mendapat hakmilik takboleh sangkal ke atas tanah milik Boonsoom walaupun terbukti hakmilik dipindahkan kepada Adorna secara penipuan. Perjuangan menuntut semula tanah Boonsoom bermula pada tahun 1989 dan kemudiannya diteruskan oleh ahli keluarganya setelah beliau meninggal pada tahun 2001. Beberapa usaha yang dilakukan oleh Boonsoom dan keluarganya bagi mendapatkan kembali tanahnya atau gantirugi atas kehilangan tanah.

Seterusnya, Kerajaan Malaysia telah mencapai penyelesaian secara baik (*amicable settlement*) dengan waris mendiang Boonsom Boonyanit pada Oktober 2018 berhubung kes itu. Penyelesaian ini dicapai setelah waris Boonsom mengemukakan notis kepada kerajaan Malaysia pada 31 Julai 2017, mendakwa bahawa negara telah melanggar obligasi perjanjian pelaburan di bawah Perjanjian ASEAN 1987 mengenai Promosi dan Perlindungan Pelaburan. Notis tersebut menyatakan bahawa Malaysia gagal memberikan layanan adil dan saksama serta perlindungan penuh terhadap pelaburan Boonsom (EdgeProp, 2025). Walau bagaimanapun, jumlah pampasan yang dibayar oleh kerajaan Malaysia tidak didedahkan kepada umum, kemungkinan besar kerana terikat dengan perjanjian kerahsiaan antara kedua-dua pihak. Tiada maklumat rasmi tersedia mengenai sama ada pampasan tersebut telah dibayar sepenuhnya (Penang Property Talk, 2021).

Kes ini telah menarik perhatian ramai kerana keputusan Mahkamah Persekutuan pada tahun 2001 yang memihak kepada Adorna, walaupun pemindahan hak milik tanah tersebut dilakukan melalui penipuan. Keputusan ini kemudian dibatalkan oleh Mahkamah Persekutuan pada tahun 2010 melalui kes *Tan Ying Hong lwn Tan Sian San* [2010], yang menetapkan bahawa pemilik asal berhak mendapatkan semula hartanah mereka jika dapat membuktikan pemindahan tersebut berlaku melalui penipuan atau pemalsuan.

Penjawat Awam Dan Penipuan Tanah Di Malaysia

Beberapa penjawat awam di Malaysia telah terlibat dalam kes penipuan dan salah guna kuasa berkaitan urusan tanah. Berikut adalah antara kes-kes yang dilaporkan:

1. Bekas Timbalan Pendaftar Hakmilik Pejabat Tanah dan Galian (PTG) Perak: Rozali Che Mahmud (bukan nama sebenar).

Pada April 2024, Rozali Che Mahmud, bekas Timbalan Pendaftar Hakmilik di Pejabat Tanah dan Galian (PTG) Perak, didakwa di Mahkamah Sesyen Ipoh atas pertuduhan menipu status Tanah Rizab Melayu seluas 649.2 hektar di Mukim Sitiawan, Manjung. Beliau didakwa memperdaya Lembaga Tanah Ladang Negeri Perak untuk mempercayai bahawa tanah tersebut bukan Tanah Rizab Melayu, yang mendorong kelulusan permohonan pecah sempadan tanah kepada syarikat swasta. Kesalahan ini didakwa dilakukan pada tahun 2012 (Sinar Harian, 2024).

2. Penjawat Awam di Sabah

Pada Jun 2025, seorang penjawat awam dan seorang pesara jabatan kerajaan di Sabah ditahan oleh Suruhanjaya Pencegahan Rasuah Malaysia (SPRM) kerana disyaki terlibat dalam rasuah berkaitan permohonan tanah. Mereka didakwa meminta dan menerima rasuah berjumlah kira-kira RM66,000 untuk memproses permohonan dan melakukan banciaan lot tanah di bawah skim tanah milik kerajaan negeri, walaupun tidak mempunyai kelayakan untuk berbuat demikian (Kosmo Digital, 2025).

3. Penjawat Awam di Negeri Sembilan

Pada Jun 2024, seorang penjawat awam di Negeri Sembilan ditahan reman oleh SPRM kerana disyaki meminta dan menerima rasuah kira-kira RM10,000 sebagai dorongan untuk menguruskan permohonan tanah di negeri tersebut. Suspek berusia sekitar 30-an ditahan ketika hadir memberi keterangan di pejabat SPRM Negeri Sembilan (Astro Awani, 2024).

4. 13 Individu Termasuk Penjawat Awam di Selangor

Pada Januari 2025, seramai 13 individu, termasuk penjawat awam, ditahan selepas polis menerima laporan mengenai kegiatan pindah milik tanah secara tidak sah di Selangor. Sindiket ini dipercayai mengeksploitasi sistem dengan memadam dan menghilangkan rekod penting pindah milik tanah yang didalangi oleh kakitangan pejabat berkenaan. Kes ini disiasat di bawah Seksyen 420 Kanun Keseksaan atas kesalahan pemalsuan dan penipuan (Utusan Malaysia, 2024).

5. Terdapat kes penipuan pindah milik tanah di Kelantan yang melibatkan penjawat awam: Kes Penipuan Pindah Milik Tanah di Kota Bharu

Pada 31 Mei 2024, dua penjawat awam bersama tiga individu lain telah ditahan kerana disyaki terlibat dalam kes penipuan pindah milik tanah di Kota Bharu. Mangsa, seorang wanita yang juga pengarah sebuah syarikat tempatan, mengesyaki berlaku pemalsuan tandatangan adik-beradiknya dalam Borang 14A bagi pindah milik tanah milik keluarga mereka seluas 0.051 hektar. Tanah tersebut telah dijual kepada tiga pembeli tanpa pengetahuan ahli keluarga lain, menyebabkan kerugian dianggarkan sebanyak RM400,000. Kesemua suspek berusia antara 29 hingga 52 tahun telah direman selama enam hari dan disiasat di bawah Seksyen 420 Kanun Keseksaan (Selangor Kini, 2024).

6. Kes melibatkan penjawat awam di Pahang yang terlibat dalam penipuan berkaitan urusan tanah.

Kes Rasuah Berkaitan Perlombongan Bauksit: Pada Januari 2016, dua pegawai Pejabat Tanah dan Galian (PTG) Pahang telah didakwa di Mahkamah Sesyen Kuantan atas tuduhan menerima rasuah berkaitan aktiviti perlombongan bauksit haram. Mereka didakwa menerima suapan

sebagai balasan untuk melindungi aktiviti perlombongan haram tersebut. Salah seorang pegawai didakwa menerima wang tunai RM30,000 daripada seorang ejen pengusaha lombong haram, manakala seorang lagi didakwa bersubahat dalam kesalahan tersebut (Benar News, 2017).

Di dalam semua kes yang disenaraikan di atas, penglibatan penjawat awam amat ketara dalam kes penipuan pindah milik tanah. Ini adalah kerana mereka dianggap orang yang mempunyai akses yang agak mudah kepada dokumen yang tersimpan di pejabat tanah. Mereka juga mempunyai peluang mengakses maklumat di dalam sistem e Tanah atau di dalam Sistem Pendaftaran Tanah Berkomputer (SPTB). Peluang yang ada ini digabung bersama dengan sifat tamak dan keperluan yang melebihi kemampuan yang ada pada setiap individu penjawat awam itu sendiri. Maka terhasillah satu pakatan dan perancangan bersama pihak luar dan ‘orang dalam’ pejabat tanah itu sendiri dalam melakukan kesalahan ini. Jika penjawat awam itu seorang yang amanah dan bersih, tiada sifat tamak dan mementingkan poket sendiri, perkara ini tidak akan berlaku.

Modus Operandi Penipuan Pindah Milik Tanah

Terdapat beberapa pendekatan penipuan tanah seperti ditunjukkan dalam **Jadual 1**.

Kes	Kesalahan Penjawat Awam	Hukuman / Denda	Lokasi / Agensi Terlibat
Kes 1 (2014)	Menggunakan dokumen palsu untuk tuntutan tanah projek pembinaan jalan.	Didenda RM14,000 oleh Mahkamah Khas Rasuah.	Pejabat Pemungut Hasil Tanah, Jabatan Tanah & Ukur Keningau, Sabah
Kes 2 (2016)	- Tuntutan pampasan tanah palsu bernilai RM111,000.- Terima suapan: juruteknik (RM54,000) & pesara (RM12,000) untuk proses permohonan dan bancian tanah.	Ditahan & didakwa di Mahkamah Sesyen Khas Rasuah Tawau.	Jabatan Tanah & Ukur, Sabah (Skim Pekebun Kecil Madai Baturong, Kunak)
Kes 3 (2022–2023)	Meminta & menerima rasuah RM25,000 untuk permohonan tanah (siasatan, pengukuran ulasan teknikal).	Ditahan reman oleh SPRM untuk permohonan tanah E-Haram sempadan, siasatan lanjut.	SPRM Terengganu, Haram

1. Penjawat Awam Didenda RM14,000 Kerana Mengemukakan Dokumen Palsu
Seorang Pembantu Tadbir di Pejabat Pemungut Hasil Tanah, Jabatan Tanah dan Ukur Keningau, Sabah, didenda RM14,000 oleh Mahkamah Khas Rasuah kerana menggunakan dokumen palsu untuk mendapatkan bayaran tuntutan kawasan tanah yang terlibat dalam projek pembinaan jalan pada tahun 2014 (Utusan Borneo, 2024).

2. Penjawat Awam Ditahan Kerana Tuntutan Pampasan Tanah Palsu Bernilai RM111,000 (Kosmo Gigital, 2024).

Seorang penjawat awam di Sabah ditahan oleh Suruhanjaya Pencegahan Rasuah Malaysia (SPRM) kerana disyaki mengemukakan tuntutan palsu untuk mendapatkan bayaran pampasan

tanah. Seorang juruteknik dan seorang pesara Jabatan Tanah dan Ukur Sabah didakwa di Mahkamah Sesyen Khas Rasuah Tawau atas pertuduhan menerima suapan wang tunai berjumlah RM54,000 dan RM12,000 masing-masing, sebagai dorongan untuk memproses permohonan dan melakukan bancian tanah di bawah Skim Pekebun-Pekebun Kecil Madai Baturong (SPPKMB) Kunak pada tahun 2016 (Buletin TV3, 2025).

3. Tiga Penjawat Awam Ditahan Kerana Rasuah Berkaitan Permohonan Tanah E-Haram di Terengganu. SPRM Terengganu menahan reman tiga penjawat awam kerana disyaki meminta dan menerima rasuah bernilai kira-kira RM25,000 antara tahun 2022 dan 2023, bagi memudahkan urusan permohonan tanah E-Haram. Mereka terlibat dalam siasatan, pengukuran sempadan, dan penyediaan ulasan teknikal bagi tanah yang dimohon (Malaysia Kini, 2024).

Kes-kes ini menunjukkan bahawa penglibatan penjawat awam dalam penipuan dan rasuah berkaitan urusan tanah adalah isu serius yang memerlukan perhatian dan tindakan tegas daripada pihak berkuasa. Langkah-langkah seperti pengukuhan sistem pengurusan tanah, pemantauan yang lebih ketat, dan pendidikan integriti kepada penjawat awam adalah penting untuk mencegah kejadian seumpama ini pada masa hadapan (Sinar Harian, 2024).

Seperti kes yang dilaporkan di Pahang berkaitan dengan rasuah dalam sektor perlombongan, ia menunjukkan keperluan untuk pemantauan yang lebih ketat dan sistem yang lebih telus dalam pengurusan tanah bagi mencegah penipuan dan penyalahgunaan kuasa oleh penjawat awam. Kes ini menyorot isu serius berkaitan integriti dalam pengurusan tanah, terutamanya apabila melibatkan pemalsuan dokumen rasmi seperti Borang 14A. Ia juga menunjukkan keperluan mendesak untuk memperketatkan sistem pemantauan dan pengesahan dalam urusan pindah milik tanah bagi mengelakkan penipuan dan kerugian kepada pemilik asal.

Langkah Pencegahan Yang Telah Dijalankan Oleh Pihak Berkuasa

Kementerian Sumber Asli dan Kelestarian Alam (NRES) telah mengambil langkah proaktif dengan memperkenalkan sistem pentadbiran tanah secara elektronik (e-Tanah) untuk mengurangkan risiko pemalsuan dan penipuan dalam urusan pindah milik tanah. Sistem ini telah mula dilaksanakan di beberapa negeri termasuk Pahang.

Mantan Menteri NRES, Nik Nazmi Nik Ahmad, telah mengakui bahawa isu penipuan pindah milik tanah yang melibatkan pegawai dan kakitangan agensi kementerian tersebut telah berlarutan sekian lama. Beliau menegaskan bahawa tindakan akan diambil terhadap pegawai Pejabat Tanah dan Galian (PTG) yang terlibat dengan sindiket penipuan tersebut. Sebagai langkah pencegahan, kementerian sedang dalam proses melakukan transisi kepada sistem pentadbiran tanah secara elektronik (e-Tanah) bagi mengurangkan risiko pemalsuan serta penipuan hak milik tanah.

Tindakan Susulan oleh Kerajaan Negeri

Kerajaan negeri contohnya Kerajaan Negeri Selangor akan melaksanakan audit dan siasatan dalaman menyeluruh terhadap semua agensinya untuk mengenal pasti sebarang kelemahan dalam sistem pengurusan tanah (Malaysia Kini, 2024). Pada kebiasaannya, jika siasatan dalaman dijalankan, siasatan akan dapat mengenal pasti pelaku kepada masalah itu. Maka pelaku akan ditangkap dan dikenakan hukuman. Selain itu beberapa langkah telah diambil

untuk peningkatan keselamatan sistem dan memperketat sistem pentadbiran tanah bagi mengatasi penipuan pindah milik tanah. Langkah ini perlu untuk menghalang pihak yang melakukan penipuan ini dari terus mengulangi perlakuan tersebut (Selangor Kini, 2025).

Solusi Masalah Penipuan Pindah Milik Tanah

Terdapat beberapa cadangan untuk memperbaiki imej penjawat awam di Malaysia, khususnya melibatkan isu integriti dan kepercayaan awam, seperti ditunjukkan dalam **Rajah 1**.



1. Ketelusan & Akauntabiliti Sistem:

Dalam melaksanakan prinsip ketelusan dan akauntabiliti sistem, beberapa siri audit dalaman dan bebas perlu diadakan di jabatan yang berisiko tinggi seperti bahagian tanah, unit hasil dan bahagian perolehan. Audit dalaman ini perlu dijalankan secara berkala dalam memastikan segala urusan yang dilaksanakan di setiap unit adalah menurut prosedur operasi standard yang telah ditetapkan di pejabat tanah. Jika pengawasan yang dibuat itu berkala, kemungkinan untuk berlakunya penipuan pengurusan tanah ini adalah tipis kerana proses pengauditan akan dilakukan setiap masa.

Selain itu paparan awam status permohonan tanah, lesen & bantuan melalui portal rasmi juga amat berguna untuk mengurangkan ruang dan peluang untuk "urus dalam". Ini kerana setiap permohonan bakal diketahui status dan kedudukannya secara umum.

Sistem rekod digital bersepadu (e-Tanah, e-Perolehan) juga perlu dilaksanakan di mana setiap pengguna sistem itu boleh mengakses status permohonan dengan log pengguna terperinci. Hal ini boleh mengawal sistem itu dari diakses oleh pihak lain yang tiada log pengguna.

2. Penambahbaikan Tatakelola

Dalam isu penambahbaikan tatakelola, terdapat cadangan Pindaan Peraturan 4(2) P.U. (A) 395 supaya penjawat awam melapor konflik kepentingan dengan lebih tegas. Penjawat awam seharusnya tidak boleh berada dalam satu konflik kepentingan antara tugas hakikinya sebagai penjawat awam dan kedudukannya di dalam kapasiti lain. Namun demikian, jika ada, maka penjawat awam wajib melaporkannya kepada pihak atasan.

Selain itu Jawatankuasa Integriti Bebas perlu diwujudkan dalam setiap agensi, ia bukan hanya terdiri daripada pegawai dalaman semata-mata.

3. Penguatkuasaan & Hukuman Tegas

Di dalam dunia moden pada masa sekarang, penjawat awam juga telah menjadi subjek yang tidak kebal kepada hukuman. Ia sesuatu yang berbeza dengan waktu dahulu. Jika berlaku permasalahan berkaitan penipuan pengurusan tanah, maka penjawat perlu digantung tugas segera jika disiasat SPRM atau didakwa di mahkamah. Proses ini bakal mengambil masa tertentu bergantung kepada penyisatan yang dijalankan, dan jika terbukti bersalah, maka penjawat perlu dikenakan hukuman sewajarnya.

Selain itu, penjawat juga perlu disenarai hitam dalaman (blacklist) bagi mereka yang terbukti melanggar etika, walau tanpa sabitan.

Untuk tindakan yang lebih keras, nama pesalah integriti boleh didedah di portal awam (dengan justifikasi undang-undang).

4. Pendidikan dan Budaya Kerja

Penjawat awam juga perlu dididik supaya lebih berintegriti dalam melaksanakan pekerjaan mereka.. Latihan wajib tahunan integriti perlu diadakan dalam memastikan mereka bekerja dengan bersih, cekap, ikhlas dan amanah. Selain itu pengurusan konflik kepentingan perlu diterapkan bagi memberi kesedaran tentang kedudukan mereka sebagai penjawat awam dan keperluan menguruskan konflik kepentingan dengan bagus dan betul..

Kempen dalaman seperti “Amanah Itu Rezeki” atau “Takut SPRM, Takut Tuhan” perlu dibuat supaya setiap penjawat sedar tentang kedudukan mereka. Di samping itu juga, sistem ganjaran (reward system) bagi jabatan/kakitangan berprestasi dan bebas aduan rasuah bagus diadakan dalam menghargai prestasi kerja yang terbaik di kalangan penjawat awam yang mengamalkan integriti dan bebas rasuah.

5. Saluran Aduan Rakyat yang Selamat & Mesra.

Di dalam perkara berkaitan aduan rakyat, satu sistem Hotline atau sistem aduan online yang tanpa nama (anonymous) boleh diadakan dalam memberi peluang kepada individu yang mengalami masalah penipuan tanah atau mempunyai maklumat berkaitan masalah penipuan tanah. Sistem aduan online ini tidak menyatakan nama sebenar dan perlindungan kepada pemberi maklumat diperkuat melalui pindaan Akta Whistleblower 2010. Setiap aduan yang dibuat perlu direspon dalam waktu 7 hari bekerja dengan melalui nombor rujukan terbuka.

6. Pemantauan Luar

Memandangkan terlalu banyak kes penipuan pinbdah milik tanah berlaku di semua negeri di Malaysia, SPRM perlu diberi kuasa untuk melakukan audit rawak berkala terhadap agensi berisiko. Dan ia akan memberikan satu respon kepada pihak pejabat tanah bahawa mereka perlu berhati-hati dengan pengurusan dan pentadbiran di pejabat sendiri bagi mengelakkan mereka berada dalam radar pemantauan SPRM.

Ombudsman atau pemantau bebas juga boleh dilantik bagi jabatan strategik seperti Pejabat Tanah, pejabat tanah dan saliran air, Jabatan Kastam, Imigresen dan beberapa pejabat berisiko yang lain.

7. Cadangan SPTB

Memetik cadangan Asiah Bidin, et. al. mencadangkan aplikasi terhadap SPTB hendaklah diperkukuh dan pihak pentadbiran tanah diharapkan dapat mematuhi garis panduan keselamatan sistem SPTB bagi mengatasi penyelewengan dan penipuan dalam urusan tanah. Beliau menambah, dokumen hak milik perlu disimpan dan dikawal dengan teratur, serta akses terhadap dokumen ini perlu dihadkan. pengawalan sistem komputer perlu juga dipertingkatkan dan akses kepada dokumen berkaitan dalam SPTB perlu dihadkan mengikut keperluan kakitangan yang bertugas di pejabat tanah sahaja Selain itu dicadangkan, cetakan Hak Milik Daftar disimpan dalam pangkalan data sebagai imej dengan fungsi Read-Only dan sebarang pencerobohan dapat dikesan secara automatik. Semua aktiviti dalam pangkalan data dipantau menerusi modul keselamatan yang merekodkan semua aktiviti berkaitan data dan aplikasi (Asiah Bidin, et.al., 2019).

Nasihat kepada Pemilik Tanah

- a) Semakan berkala: Pemilik tanah disarankan untuk menyemak status hak milik tanah mereka secara berkala melalui sistem e-Tanah atau pejabat tanah terdekat.
- b) Simpan dokumen penting: Pastikan semua dokumen berkaitan tanah disimpan dengan selamat dan mudah diakses.
- c) Laporkan aktiviti mencurigakan: Sekiranya terdapat sebarang aktiviti mencurigakan berkaitan hak milik tanah, segera laporkan kepada pihak berkuasa.

Kesimpulan

Isu penipuan pindah milik tanah telah menjadi barah dalam sistem pentadbiran tanah negara. Situasi ini menunjukkan bahawa isu penipuan dan salah guna kuasa dalam urusan tanah adalah masalah serius yang memerlukan perhatian dan tindakan tegas daripada pihak berkuasa. Terdapat pihak-pihak yang tidak bertanggungjawab termasuk kakitangan di pejabat tanah bertindak membuat penipuan identiti pada kad pengenalan, passport juga geran/suratan hakmilik sama ada secara manual atau secara sistem komputer. Pihak ini memanipulasi identiti tuan tanah yang sebenar dan seterusnya membuat perjanjian jualbeli menjual hartanah dengan harga ratusan ribu ringgit. Sungguhpun siasatan telah dibuat oleh pihak berkuasa namun masalah ini masih berleluasa. Langkah-langkah pencegahan yang dilaksanakan oleh kerajaan seperti pendigitalan sistem, pemantauan yang lebih ketat, dan pendidikan integriti kepada penjawat awam adalah penting untuk mencegah kejadian seumpama ini pada masa hadapan.

Dengan pelaksanaan langkah-langkah ini, diharapkan isu penipuan dan rasuah dalam pengurusan tanah dapat dikurangkan, seterusnya meningkatkan kepercayaan rakyat terhadap agensi kerajaan.

Penghargaan

Penulis mengucapkan terima kasih kepada Universiti Utara Malaysia atas sokongan sumber untuk menyiapkan artikel ini.

Rujukan

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6th Penang International Multidisciplinary Conference 2025

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PEMBUBARAN PERKAHWINAN: ANALISIS LAPORAN BERTULIS PEJABAT KADHI BESUT, 1972 SEHINGGA 1978

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Abstrak: Kertas kerja ini mengenai pembubaran perkahwinan melalui tuntutan fasakh. Analisis berdasarkan laporan bertulis Pejabat Kadhi Besut dari tahun 1972 sehingga 1978. Laporan berkenaan diperolehi di Arkib Negara Malaysia Cawangan Terengganu. Perbincangan artikel ini mengupas sebanyak 19 buah kes tuntutan fasakh yang dipilih secara rawak. Perbincangan dalam tempoh tujuh tahun ini menumpukan kepada dua perkara. Pada bahagian pertama menerangkan tentang latar belakang pasangan isteri iaitu pihak pendakwa dan suami yakni pihak yang didakwa. Antara inti pati yang diperkatakan seperti tempat asal, umur, tempoh masa ditinggalkan, status perkahwinan dan keluarga serta pekerjaan pasangan. Sementara itu bahagian kedua pula menghuraikan mengenai faktor yang menyebabkan isteri membuat aduan kepada pihak pejabat kadhi yang mana perbincangan dicerakinkan kepada masalah pengabaian nafkah dan tanggungjawab, penyelewengan dalam poligami dan menghilangkan diri untuk tempoh masa tertentu. Kajian lanjutan perlu dilakukan kerana maklumat mengenai pekerjaan dan mengapa tempoh tuntutan mengambil masa yang lama masih belum lengkap. Selain itu peranan Pejabat Kadhi Besut dalam menangani isu permasalahan berkaitan pasca pembubaran perkahwinan perlu dinilai kembali. Hal ini penting bagi menjaga kebajikan pelbagai pihak terutama wanita dan anak-anak.

Kata kunci: Pembubaran, Perkahwinan, Melayu, Kadhi, Terengganu

Pendahuluan

Perkahwinan merupakan satu ikatan murni antara seorang lelaki dan wanita untuk hidup bersama dalam sebuah rumah tangga. Kedua-dua pihak perlu berusaha untuk menjaga ikatan tersebut agar terus berkekalan. Namun, begitu kadang-kadang rumah tangga bergolak disebabkan pelbagai perkara yang tidak dijangka. Apabila keadaan memerlukan, perceraian mungkin menjadi jalan terakhir selepas semua usaha untuk menyelamatkan hubungan tersebut menemui kegagalan. Terdapat beberapa kaedah perceraian yang dibenarkan dalam Islam iaitu talak, perceraian taklik, khuluk (tebus talak) dan juga perceraian dengan menggunakan kuasa Mahkamah yang dipanggil sebagai fasakh (Nurhidayah Muhd Hashim, 2006, xiii).

Statistik yang dikeluarkan oleh Jabatan Perangkaan Malaysia menunjukkan perceraian di Malaysia masih berada pada paras yang membimbangkan. Purata kes perceraian yang direkodkan sepanjang tahun 2014 sehingga 2017 adalah sebanyak 50,978 kes setahun bagi pasangan Islam. Pada tahun 2017, Selangor mencatat kes tertinggi dengan 12,204 kes, seterusnya Johor dengan 4,588 kes, Kelantan 3,652 kes dan Kedah 3,474 kes. Sementara itu,

Jabatan Kehakiman Mahkamah Syariah telah mengeluarkan satu rekod yang menunjukkan bahawa purata perceraian bagi tahun 2018 adalah sebanyak 156 pasangan pada setiap hari.

(Syafiyah Iqlima binti Mohd Nadzri, 2020). Kes perceraian di Malaysia merekodkan peningkatan yang luar biasa sejak Perintah Kawalan Pergerakan (PKP) dilaksanakan. (*Sinar Harian*, 2020). Namun, dari sudut sejarah isu perceraian bukan merupakan sesuatu yang baharu. Kadar perceraian khususnya dalam kalangan orang Melayu yang tinggal di Pantai Timur Semenanjung Malaysia seperti Kelantan dan Terengganu adalah tinggi. (G.W. Jones, 1981).

Kertas kerja ini mengetengahkan isu perceraian fasakh berdasarkan analisis ke atas 19 buah laporan bertulis pihak *Pejabat Kadhi Besut* dari tahun 1972 sehingga 1978. Penulis mencerakinkan perbincangan kepada asal-usul, umur, tempoh masa, status perkahwinan dan keluarga, pekerjaan serta faktor berlaku tuntutan fasakh dalam kalangan wanita Melayu Islam pada tempoh tersebut.

Kajian Literatur

Terdapat pelbagai kajian mengenai perkahwinan dan perceraian. Antaranya kajian tersebut ada yang menyarankan agar pihak berautoriti seperti mahkamah Syariah dan pejabat agama Islam negeri memainkan peranan penting dalam menangani dan membendung kadar perceraian. Nik Noraini Nik Badli Shah mengkaji peruntukan yang berhubung dengan undang-undang substantif dan masalah yang mungkin timbul di bawah peruntukan tersebut. Diperkatakan perkara lain yang berhubung dengan aspek ekonomi undang-undang keluarga, seperti pembahagian aset suami isteri atau harta sepencarian, dan juga hal-hal pewarisan serta nafkah harta pusaka si mati. Secara lebih terperinci buku yang bertajuk *Undang-Undang Keluarga: Nafkah dan Hak-hak Kewangan* lain ini memperkatakan mengenai peruntukan undang-undang, latar belakang sejarah dan perkembangannya, serta cadangan bagi diadakan pembaharuan pada masa hadapan, dan bahagian yang memperkatakan kes-kes sebenar yang biasa dibawa ke mahkamah di bawah peruntukan yang berkenaan. (Nik Noraini Nik Badli Shah, 1992).

Buku karya Rozi binti Bainon yang berjudul *Wanita: Penghapusan Diskriminasi dari Perspektif Islam dan Undang-undang Malaysia* memberi tumpuan khusus dalam bidang undang-undang keluarga dan perkara yang berkaitan dengannya. Melalui peruntukan Perkara 16 Konvensyen 1980, telah dijadikan garis panduan memandangkan asasnya ialah sama rata antara lelaki dan wanita. Ketakseragaman undang-undang keluarga Islam di negara ini dijadikan bahan untuk mengeksploitasi beberapa perkara seperti poligami dalam kalangan orang Islam. Pembahagian harta pusaka orang Islam disifatkan sebagai tidak adil dan berat sebelah terhadap wanita oleh orang yang tidak memahami konsep pembahagian faraid dalam Islam. Keadilan undang-undang sering kali dikaitkan dengan orang yang mentadbirkan undang-undang itu. Keadilan undang-undang hanya boleh ditegakkan jika undang-undang tersebut ditadbirkan secara adil oleh orang yang telah diberikan Amanah. (Rozi binti Bainon, 1999).

Sementara itu, Shamsuddin Suhor, melalui karyanya yang bertajuk *Panduan Akta Membaharui Undang-undang Perkahwinan dan Perceraian 1976*, pula memfokuskan prosedur perkahwinan dan perceraian untuk orang bukan Islam di Malaysia iaitu melalui Akta

Membaharui Undang-undang (Perkahwinan dan Perceraian) 1976 juga dikenali dengan Akta 164. Secara lebih terperinci buku ini memberi panduan tentang hal-hal kekeluargaan termasuklah perkahwinan monogami, sekatan-sekatan perkahwinan, perceraian, nafkah suami isteri dan perlindungan kanak-kanak. Setiap fakta atau maklumat diberikan beberapa contoh kes yang dibicarakan di mahkamah dan ini akan memberi kefahaman yang mendalam untuk pembaca umum terutamanya kesan terhadap keputusan mahkamah. (Shamsuddin Suhor, 2011).

Buku yang bertajuk *Perceraian Secara Fasakh: Konsep dan Amalan di Malaysia* hasil karya Nurhidayah Muhd Hashim menyentuh tentang peruntukan fasakh di dalam Akta Undang-undang Keluarga Islam (Wilayah-Wilayah Persekutuan) 1984 serta kes-kes yang dibicarakan di Mahkamah Syariah Wilayah Persekutuan Kuala Lumpur secara khusus. Ini menyebabkan ramai yang beranggapan bahawa fasakh adalah hak eksklusif kaum wanita di dalam sesebuah rumah tangga. Namun begitu, melalui Pindaan 2005, suami juga diberi ruang untuk menggunakan kaedah fasakh dalam membubarkan perkahwinan dengan alasan-alasan yang diperuntukkan. Adakah benar fasakh adalah hak mutlak kaum wanita?. Apakah alasan-alasan yang diterima di sisi fuqaha mazhab terdahulu? Bagaimana perlaksanaan fasakh di Mahkamah dan apakah prosedur yang perlu diikuti sekiranya seseorang ingin membuat tuntutan fasakh?. Persoalan-persoalan tersebut dirungkai di dalam buku ini. (Nurhidayah Muhd Hashim, 2006).

Isu mengenai perceraian fasakh dirasakan masih relevan untuk dibicarakan kerana perceraian dari dahulu sehingga kini masih berterusan bahkan statistik menunjukkan kadar perceraian semakin meningkat terutamanya pada tempoh PKP dan pasca PKP. Kajian ini, merupakan usaha kecil untuk memberi input mengenai latar belakang dan faktor pasangan suami isteri bercerai secara fasakh dengan menganalisis kes laporan bertulis pihak pejabat Kadhi Besut dari 1972 sehingga 1978. Sungguh pun tempoh masa tersebut telah lama berlalu namun, kita perlu belajar dari sejarah kerana sejarah itu merupakan cerminan hidup. Kajian ini diharapkan dapat menyumbang kepada pembangunan strategi dan usaha pihak berautoriti untuk mengurangkan kadar perceraian dan meminimalkan bilangan kes yang berlaku di Malaysia.

Hasil dan Perbincangan

Pihak yang mendakwa (isteri) membuat laporan kepada pejabat Kadhi Besut kerana ditinggalkan oleh pihak yang didakwa (suami) pada tempoh masa tertentu dalam usaha menentukan status perkahwinan mereka yang dibaratkan digantung tidak bertali. Perbincangan memfokuskan kepada tempat asal, umur, tempoh masa ditinggalkan, status perkahwinan dan keluarga serta pekerjaan suami. Selain itu, kertas kerja ini turut membincangkan mengenai pelbagai faktor yang menyebabkan berlaku tuntutan pihak wanita untuk membubarkan perkahwinan.

i- Tempat Asal

Pihak isteri berasal dari pelbagai kawasan di Besut. Antara Kawasan berkenaan seperti Balik Bukit Jerneh, kampung Kuala Setiu, kampung Lubok Kawah, kampung Kedai Jabi, Jalan kampung Raja, Jalan Pasir Akar, kampung Gong Nangka, kampung Gong Bayor, kampung Gong Kapas, kampung Teluk Budu, kampung Rahmat Chalok, kampung Seberang Kastam, kampung Pak Wong, kampung Gong Penaga, kampung Rahmat Chalok dan kampung Lapan

Kejur. Sementara pihak suami berasal dari pelbagai kawasan di Terengganu dan luar Terengganu. Sila lihat Jadual 1 seperti berikut;

Jadual 1: Asal-Usul Yang Mendakwa (Isteri) Dan Yang Kena Dakwa (Suami)

Bil	No.Fail	Asal-Usul Isteri	Asal-Usul Suami
1	23/72	Tiada maklumat	408, Bukit Goh Kuantan, Pahang
2	8/73	Balik Bukit Jerleh, Besut	Kampung Janga Besar, Dungun, Terengganu
3	28/73	Kampung Kuala Setiu, Mukim Guntong, Besut	Kampung Jambu Bongkok, Dungun, Terengganu
4	7/74	Kampung Lubok Kawah, Batu 2, Jalan Pasir Akar, Jerleh, Besut	Kampung Beladau, Padang Kolam, Kuala Terengganu
5	31/74	Kampung Kedai Jabi Besut	122 Jalan Hilir Mersing, Johor
6	8/75	92-C, Jalan Kampung Raja, Chabang Tiga, Jerleh, Besut	Kampong Kemasin, Bachok, Kelantan
7	31/75	Jalan Pasir Akar, Kampung Cherang Meliling, Jerleh, Besut	d/a Polis Daerah, Dungun, Terengganu
8	36/75	Kampung Gong Nangka, Bukit Kenak, Besut	Pasir Puteh, Kelantan
9	29/76	Kampung Gong Bayor, Tembila, Besut	d/a Pak Mat (Encik Mohamad), Sub Konterek, Dalam Belok, Sungai Gawi, Ulu Terengganu
10	4/77	Kampung Gong Kepas, Kampung Raja, Besut	d/a Penjara Pengkalan Chepa, Kota Bharu, Kelantan
11	9/77	Seberang Barat, Kuala Besut	Kampung Pantai Baharu Bachok, Kelantan
12	52/77	Jalan Pasir Akar, Kampung Gong Nangka, Jerleh	Kampung Gong Gunchil, Semerak, Pasir Puteh, Kelantan
13	59/77	Kampung Telok Budu, Kuala Besut	Kampung Pulau Ribu, Gong Nering, Jerleh, Besut
14	5/78	No. 28 Kampung Rahmat Chalok, Besut	Kampung Kubang Itek Tunjong, Kota Bharu, Kelantan
15	8/78	Kampung Seberang Kastam Besut	Kampung Oh, Jabi, Besut, Terengganu
16	18/78	Kampung Pak Wong, Besut	Kampung Pengkalan Buluh, Besut Terengganu
17	34/78	Kampung Gong Penaga, Bt. Petri, Besut	Penjara Pudu, Kuala Lumpur
18	37/78	Kampung Rahmat Chalok, Besut	Manik Urai, Kuala Krai, Kelantan
19	43/78	Kampung Lapan Kejur, Pasir Akar, Besut	Kelantan & Raw Malaysia, Sandakan Camp, Sandakan Sabah

Sumber: Diubahsuai daripada fail *Pejabat Kadhi Besut* dari 1972 sehingga 1978.

Berdasarkan 19 buah kes, terdapat seramai lapan orang suami berasal dari Terengganu. Seramai tiga orang berasal dari Dungun (8/73, 28/73, 31/75) dan tiga orang dari Besut (59/77, 8/78, 18/78) dan masing-masing seorang dari Kuala Terengganu (7/74) dan Ulu Terengganu (29/76).

Selain itu terdapat seramai 11 orang dalam kalangan mereka berasal dari luar Terengganu. Mereka yang berasal dari Kelantan berjumlah seramai tujuh orang. Mereka datangnya dari jajahan Pasir Putih seramai dua orang (36/75, 52/77), Kota Bharu dua orang (4/77, 5/78) dan Bachok juga dua orang (8/75, 9/77) serta seorang dari Kuala Krai (37/78). Selain itu terdapat masing-masing seorang dari Pahang (23/72), Johor (31/74), Kuala Lumpur (34/78) dan Sabah (43/78).

ii- Umur

Seramai 15 orang dapat diketahui umur mereka. Sementara empat orang lagi tidak ditemui maklumat. Berdasarkan 15 orang tersebut menunjukkan usia wanita yang paling muda ialah 17 tahun sementara paling tua berusia 46 tahun. Sementara pasangan lelaki pula paling muda berusia 24 tahun dan paling tua berusia 40 tahun. Sila lihat jadual 2 berikut;

Jadual 2: Umur Yang Mendakwa (Isteri) Dan Yang Kena Dakwa (Suami)

Bil	No.Fail	Asal-Usul Isteri	Asal-Usul Suami
1	8/73	38	42
2	28/73	21	25
3	31/74	30	24
4	8/75	22	24
5	31/75	23	35
6	29/76	20	24
7	4/77	23	27
8	9/77	17	26
9	52/77	37	40
10	59/77	46	32
11	5/78	21	28
12	8/78	17	29
13	18/78	22	33
14	34/78	20	31
15	43/78	24	34

Sumber: Diubahsuai daripada fail Pejabat Kadhi Besut dari 1972 sehingga 1978.

Jadual 2 menunjukkan usia paling muda bagi wanita ialah 17 tahun (2 orang). Mereka yang berusia 20 sehingga 24 tahun seramai 9 orang. Masing-masing seorang berusia 30, 37, 38 dan 46 tahun. Usia bagi lelaki pula 24 tahun seramai (3 orang), 25 tahun (1 orang), 26 tahun (1 orang), 27 tahun (1 orang), 28 tahun (1 orang) dan 29 tahun (1 orang). Ini bermakna usia perkahwinan bagi lelaki ialah antara 24 sehingga 29 tahun. Mereka yang berusia 31 sehingga 35 tahun seramai lima orang dan masing-masing seorang berusia 40 dan 42 tahun. Jelasnya, umur wanita lebih muda daripada lelaki kecuali dua orang yang berusia 46 tahun dan 30 tahun. Sementara pasangannya pula masing-masing berusia 32 dan 24 tahun.

iii- Tempoh masa ditinggalkan oleh yang kena dakwa (suami)

Berdasarkan 19 kes yang dilaporkan kepada pihak pejabat Kadhi Besut, terdapat 17 kes diketahui tempoh masa ditinggalkan sementara dua kes lagi tidak diperolehi tempoh masa.

Selain itu, pihak isteri membuat laporan setelah ditinggalkan oleh suami selama empat bulan. Sila lihat jadual 3 seperti berikut;

Jadual 3: Tempoh Masa Ditinggalkan Oleh Yang Kena Dakwa (Suami)

Bil	No.Fail	Tempoh masa ditinggalkan
1	8/73	4 bulan 2 hari
2	28/73	6 bulan 20 hari
3	7/74	4 bulan
4	31/74	7 bulan 6 hari
5	8/75	17 bulan 22 hari
6	31/75	7 bulan
7	29/76	7 bulan
8	4/77	3 tahun
9	9/77	5 bulan 15 hari
10	52/77	14 bulan
11	59/77	5 bulan
12	5/78	1 tahun 2 bulan 14 hari
13	8/78	7 bulan
14	18/78	1 tahun 14 hari
15	34/78	Lebih 4 bulan
16	37/78	6 tahun
17	43/78	3 tahun 5 bulan 19 hari

Sumber: Diubahsuai daripada fail *Pejabat Kadhi Besut* dari 1972 sehingga 1978.

Jadual 3 menunjukkan seramai tiga orang wanita membuat laporan ke pejabat kadi kerana ditinggalkan oleh suami dalam tempoh empat bulan (3/74) dan empat bulan dua hari (8/73) serta seorang dicatat sebagai lebih empat bulan (34/78). Seramai dua orang ditinggalkan untuk tempoh lima bulan (59/77) dan lima bulan 15 hari (9/77) dan seorang untuk tempoh enam bulan 12 hari (28/73) serta seramai tiga orang untuk tempoh tujuh bulan (31/75, 29/76, 8/78) dan seorang tujuh bulan enam hari (31/74). Ini menunjukkan sebanyak 10 kes daripada 17 kes atau lebih kurang (59 peratus) yang dilaporkan tempoh masa ditinggalkan antara empat bulan sehingga tujuh bulan. Jelasnya, terdapat kesedaran dalam kalangan wanita untuk menentukan status mereka dan membuat tuntutan berkaitan nafkah zahir dan batin.

Sementara itu, seramai empat orang tinggal berasingan dengan pasangan antara 12 sehingga 17 bulan (18/78, 5/78, 52/77, 8/75). Selain itu, seramai dua orang tidak tinggal bersama pasangan selama tiga tahun dan lebih (4/77, 43/78) serta seorang tinggal berasingan selama enam tahun (37/78). Ini bermakna sebanyak tujuh kes mereka yang membuat laporan telah tinggal berasingan dengan pasangan antara satu tahun sehingga enam tahun. Maknanya lebih kurang 41 peratus, hidup bersendirian berstatus isteri tanpa suami.

Berdasarkan analisis ke atas laporan tersebut menunjukkan tempoh paling singkat ditinggalkan suami ialah selama empat bulan dan paling lama ialah selama enam tahun.

iv- Status Perkahwinan dan Keluarga

Analisis ke atas laporan pihak yang mendakwa menunjukkan kebahagiaan alam rumah tangga tidak berpanjangan. Harapkan panas hingga ke petang rupanya hujan di tengah hari. Sila lihat analisis anggaran tempoh masa perkahwinan seperti jadual 4 berikut;

Jadual 4: Status Perkahwinan dan Perceraian

Bil.	No.Fail	Tarikh berkahwin	Tarikh Ditinggalkan	Tempoh masa perkahwinan (anggaran)
1	8/73	23/6/63	15/10/72	9 tahun
2	28/73	22/12/72	22/1/73	1 bulan
3	7/74	10/11/70	2/10/73	3 tahun
4	31/74	10/12/73	10/2/74	2 bulan
5	8/75	10/6/72	18/9/73	1 tahun
6	31/75	9/74	2/3/75	6 bulan
7	36/75	7/9/74	23/11/74	2 bulan
8	29//76	28/8/71	Jan 76	4 tahun
9	4/77	26/12/68	Pertengahan 74	5 tahun 6 bulan
10	9/77	26/3/75	12/9/76	1 tahun 6 bulan
11	52/77	7/6/75	Julai 76	1 tahun
12	59/77	30/6/74	Jun 77	3 tahun
13	5/78	3/11/76	4/11/76	1 hari
14	8/78	20/2/77	10/7/77	5 bulan
15	18/78	13/8/70	12/4/77	6 tahun 8 bulan
16	34/78	7/11/75	15/1/78	3 tahun
17	37/78	17/2/72	Pertengahan Julai 72	5 bulan
18	43/78	18/1/69	19/2/75	6 tahun

Sumber: Diubahsuai daripada fail *Pejabat Kadhi Besut* dari 1972 sehingga 1978.

Jadual 4 menunjukkan terdapat 18 kes diketahui tempoh masa perkahwinan mereka sementara satu kes lagi tidak diperolehi maklumat. Terdapat pasangan yang bercerai dalam tempoh sehari perkahwinan (5/78). Seorang bercerai dalam tempoh sebulan (28/73). Dua orang selama dua bulan (31/74, 36/75). Dua orang lagi selama lima bulan dan seorang selama enam bulan.

Sementara itu terdapat usia perkahwinan selama setahun seramai dua orang (8/75, 52/77), dan setahun enam bulan seorang (9/77). Selama tiga tahun seramai tiga orang (7/74, 59/77, 34/78), empat tahun seorang (29/76), lima tahun enam bulan (4/77), seorang selama enam tahun (43/78) dan seorang lagi selama enam tahun lapan bulan (18/78). Seorang selama sembilan tahun (8/73).

Kesimpulannya, berdasarkan 18 kes menunjukkan usia perkahwinan pada julat satu bulan sehingga enam bulan berjumlah seramai enam orang, tempoh masa setahun sehingga tiga tahun berjumlah enam dan empat tahun sehingga enam tahun berjumlah empat. Ini menunjukkan perceraian berlaku pada usia perkahwinan yang baharu. Sementara itu tempoh masa perkahwinan paling singkat ialah sehari dan paling lama selama sembilan tahun.

v- Pekerjaan Pihak Yang Kena Dakwa (Suami)

Maklumat pekerjaan mengenai pihak suami tidak banyak diperolehi. Hanya empat orang yang diketahui pekerjaan. Sementara 15 orang lagi tiada maklumat mengenai pekerjaan mereka. Sila lihat jadual 5 berikut;

Jadual 5: Pekerjaan Pihak Yang Kena Dakwa (Suami)

Bil	No.Fail	Pekerjaan
1	31/75	Polis Marine
2	36/75	Guru
3	29/76	Sub Kontraktor
4	43/78	Askar

Sumber: Diubahsuai daripada fail *Pejabat Kadhi Besut* dari 1972 sehingga 1978.

Jadual 5 menunjukkan seramai tiga orang yang bekerja di jabatan kerajaan sebagai guru, polis dan askar. Sementara seorang bekerja sebagai sub kontraktor. Sementara itu pihak yang mendakwa (isteri) tidak terdapat maklumat mengenai latarbelakang pekerjaan mereka.

vi- Faktor Tuntutan Perceraian Pihak Yang Mendakwa (Isteri)

Terdapat pelbagai faktor yang mencetuskan perceraian antaranya pengabaian nafkah dan tanggungjawab, penyelewengan dalam poligami dan menghilangkan diri.

a- Pengabaian nafkah dan tanggungjawab

Seorang wanita yang berusia 20 tahun berasal dari Kampung Gong Bayor, Tembila, Besut. Beliau telah berkahwin dengan lelaki yang berusia 24 tahun berasal dari kampung Dalam Belok, Sungai Gawi, Ulu Terengganu. Menurut wanita tersebut suami beliau bekerja sebagai sub kontraktor dan meninggalkan beliau sejak hampir tujuh bulan tanpa memberi atau mengirim apa-apa nafkah perbelanjaan. (*Pejabat Kadi Besut*, 29/76).

Selain perbelanjaan berupa keperluan asas, terdapat kes tuntutan nafkah mengandung. Seorang wanita yang berusia 23 tahun berasal dari Jalan Pasir Akar, Kampung Cherang Meliling, Jerleh, Besut telah membuat tuntutan kepada suami beliau yang bekerja sebagai anggota polis marine di Dungun, Terengganu. Menurut wanita yang sarat mengandung tujuh bulan tersebut mereka telah berkahwin pada September 1974 dan bercerai di pejabat kadi Dungun pada 2 March 1975. Semasa bercerai beliau mengandung enam bulan. Menurut wanita tersebut lagi sejak bercerai pada 2 March 1975 sehingga April 1975 suami beliau tidak mengirim atau memberi apa-apa nafkah perbelanjaan mengandung. Di dalam tuntutannya wanita tersebut meminta mahkamah agar mengarahkan pihak yang didakwa membayar nafkah kandungan anak sebanyak \$100 sebulan bagi tiap-tiap bulan. (*Pejabat Kadi Besut*, 31/75).

Pengabaian nafkah dan tanggungjawab suami juga dapat diperhatikan dalam kes nafkah edah. Seorang wanita yang berasal dari Kampung Gong Nangka, Bukit Kenak, Besut, Terengganu telah berkahwin dengan pasangannya pada 7 September 1974. Namun, malangnya pada 23 November 1974 mereka telah bercerai. Dengan kata lain perkahwinan mereka hanya bertahan selama tiga bulan sahaja sebelum pihak yang didakwa telah melafazkan cerai dengan talak satu. Pihak yang mendakwa menuntut yang kena dakwa supaya membayar nafkah sebanyak \$60

sebulan atau kadar yang difikir patut serta munasabah oleh mahkamah. (*Pejabat Kadi Besut*, 36/75).

Terdapat dalam kalangan lelaki yang mengabaikan tanggungjawab memberi nafkah kepada anak yang di bawah jagaan mantan isteri. Seorang wanita telah membuat tuntutan nafkah terhadap dua (2 orang) anak dengan kadar \$40 sebulan. Tuntutan tersebut dibuat berdasarkan fasal 118 (1) undang-undang 4/55. Selain itu, tuntutan tersebut dibuat kerana yang kena dakwa tidak menjelaskan bayaran baki tertunggak dari tarikh (10.6.1972 sehingga 5.6.1975) selama tiga tahun yang berjumlah \$711. Menurut wanita itu, beliau tidak berpuashati kerana mantan suaminya hanya memberi nafkah melalui kiriman pos berdaftar sebanyak \$20.00 sebulan sedangkan kedua-dua anak mereka telah bersekolah. Menurutnya lagi yang didakwa berkemampuan untuk memenuhi tuntutan yang dikemukakannya kerana beliau “tidak termasuk dalam golongan orang susah.” (*Pejabat Kadi Besut*, 23/72).

Sikap tidak bertanggungjawab suami dapat juga diperhatikan di dalam kes wanita yang berusia 46 dan berasal dari Kampung Telok Budu, Kuala Besut. Beliau telah berkahwin dengan seorang lelaki berusia 32 tahun atau lebih muda 14 tahun daripadanya yang berasal dari Kampung Pulau Ribu, Gong Nering, Jerneh, Besut. Perkahwinan mereka hanya bertahan selama tiga tahun selepas yang mendakwa membuat keputusan meninggalkan suaminya selama lima bulan akibat tidak tahan kerana selalu dipukul oleh yang didakwa. Beliau membuat permohonan perceraian Tuntutan Taklik Talak fasal 105 (1) undang-undang 4/55. (*Pejabat Kadi Besut*, 59/72).

Selain mengalami penderaan fizikal terdapat dalam kalangan wanita yang tertekan emosi. Seorang wanita berusia 21 tahun yang berasal dari Kampung Rahmat Chalok, Besut telah berkahwin dengan lelaki berusia 28 tahun berasal dari Kampung Kubang Itek Tunjong, Kota Bharu, Kelantan. Perkahwinan berlangsung pada 3 November 1976 dan keesokan harinya 4 November 1976 yang kena tuntutan telah meninggalkan kediaman yang menuntut selama satu tahun dua bulan 14 hari. Wanita tersebut mengorbankan usia mudanya dengan mengahwini lelaki yang tidak bertanggungjawab dan lebih malang lagi beliau mengambil masa lebih setahun untuk membuat permohonan cerai. (*Pejabat Kadi Besut*, 5/78).

Seorang wanita yang berasal dari Kampung Rahmat Chalok, Besut telah berkahwin pada 17 Disember 1972. Pasangan beliau berasal dari Manik Urai, Kuala Krai, Kelantan. Perkahwinan mereka bertahan selama lima bulan kerana yang kena dakwa meninggalkan yang mendakwa tanpa nafkah. Wanita tersebut mengambil masa selama enam tahun untuk membuat permohonan perceraian. (*Pejabat Kadi Besut*, 37/78).

Selain itu seorang wanita yang berasal dari Kampung Lapan Kejur, Pasir Akar, Besut telah berkahwin pada 18 Januari 1969 ketika berusia 24 tahun. Pasangan beliau berusia 34 tahun berasal dari Kampung Melor, Kota Bharu, Kelantan. Sepanjang enam tahun perkahwinan beliau tinggal bersama bapa mertua di kampung tersebut. Ini kerana suami beliau bertugas di Sandakan Camp, Sandakan, Sabah. Beliau mengambil masa selama tiga tahun lima bulan 19 hari untuk membuat tuntutan perceraian. (*Pejabat Kadi Besut*, 43/78).

b- Penyelewengan dalam Poligami

Menurut seorang wanita yang berasal dari Kampung Gong Nangka, Bukit Kenak, Besut, Terengganu telah berkahwin dengan seorang guru Sekolah Menengah Gaal, Pasir Puteh. Menurut wanita itu lagi beliau merupakan isteri kedua kepada lelaki berkenaan. Mereka tinggal berasingan, namun suami beliau berulang alik antara rumah beliau dan isteri pertama. Menurut wanita itu lagi selepas lebih kurang tiga bulan menjadi isteri, beliau diceraikan dengan talak satu. Beliau menuntut nafkah sebanyak \$60.00 sebulan atau pada kadar yang difikir patut serta munasabah oleh mahkamah. Ini kerana menurut wanita berkenaan mantan suaminya berkemampuan dengan pendapatan bulanan sebanyak \$610. (*Pejabat Kadi Besut, 36/75*)

Selain itu terdapat seorang wanita berkahwin dengan anggota polis marine. Wanita yang sedang mengandung tujuh bulan itu, juga diceraikan oleh suaminya setelah tinggal bersama selama enam bulan sebagai pasangan suami isteri. Menurut wanita tersebut sejak bercerai hampir sebulan yang lalu suami beliau tidak mengirim atau memberi apa-apa nafkah perbelanjaan mengandung. Beliau menuntut nafkah kandungan anak sebanyak \$100 sebulan bagi tiap-tiap bulan. Menurut wanita itu lagi gaji suami beliau sebanyak \$500 sebulan dan beliau mengandaikan suaminya mampu memenuhi tuntutan. Namun begitu, lelaki tersebut memberi pelbagai alasan untuk mengelak daripada membayar kepada yang menuntut. Menurut lelaki itu lagi beliau mempunyai pelbagai tanggungjawab. Menurut beliau,

“....mempunyai seorang isteri dan seorang anak lelaki berumur 15 tahun masih bersekolah di Maktab Adabi Kuantan, tinggal di asrama dan dikehendaki membayar yuran sekolah sebanyak \$16/= ringgit, wang asrama \$66-60C, wang kocek \$37-40C tiap2 bulan. Gaji baki \$225, bayar hutang TV, sebanyak \$40 tiap2 bulan, baki gaji \$185, belanja wang rokok n belanja dapur rumah. Janji bayar \$15 tiap2 bulan sehingga melahirkan n menambah \$5.00 tiap2 bulan sekiranya beliau memelihara anaknya, jika tidak mahu maka saya akan ambil n pelihara.” (*Pejabat Kadi Besut, 31/75*)

Menurut beliau lagi gaji sebenarnya hanya \$330 dan bukannya \$500 sebagaimana yang dinyatakan oleh yang mendakwa. Alasan tersebut menggambarkan yang lelaki tersebut cuba lari dari tanggungjawab memberi nafkah kepada isteri dan anak yang bakal lahir. Sekiranya tidak mampu beliau sepatutnya berfikir dua kali untuk mengamalkan poligami.

c- Menghilangkan diri

Terdapat dalam kalangan suami yang menghilangkan diri. Hala ini berlaku samaada disedari oleh isteri atau tidak disedari. Selain itu, kehilangan mereka ada yang tidak dapat dikesan untuk tempoh yang lama dan ada yang dapat dikesan.

i- Tidak dapat dikesan

Menjadi suami isteri selama tiga tahun namun isteri tidak mengetahui di mana keberadaan suaminya. Hal ini berlaku kerana yang didakwa keluar rumah tanpa memberitahu isterinya dan dalam tempoh empat bulan isteri beliau tidak menerima perkhabaran. Wanita yang berasal dari Kampung Lubok Kawah, Batu 2, Jalan Pasir Akar, Jerneh, Besut, Terengganu telah melaporkan kepada kadi Besut. (*Pejabat Kadi Besut, 7/74*).

Selain itu, sikap tidak bertanggungjawab suami dapat diperhatikan di dalam kes seorang wanita berusia 22 tahun yang beralamat di no. 92-C, Jalan Kampung Raja, Chabang Tiga, Jerneh, Besut. Perkahwinan beliau dengan lelaki yang berasal dari kampung Kemasin Bachok Kelantan hanya bertahan lebih kurang setahun tiga bulan. Beliau hanya membuat laporan ke pejabat kadhi Besut setelah suaminya meninggalkan beliau selama 17 bulan 22 hari. Ini bermakna tempoh menunggu kepulangan suami lebih lama daripada tempoh tinggal bersama sebagai pasangan suami isteri. Lebih malang lagi dalam tempoh tersebut beliau tidak mengetahui ke mana suami beliau pergi atau tidak dapat dikesan. (*Pejabat Kadi Besut*, 8/75).

Sementara itu seorang wanita berusia 37 tahun yang berasal dari Jalan Pasir Akar, Kampung Gong Nangka, Jerneh, Terengganu membuat tuntutan taklik talak kepada suaminya. Menurut wanita tersebut mereka tidak tinggal bersama sebagai suami isteri selama 14 bulan. Dalam tempoh tersebut beliau tidak mengetahui tempat tinggal si suami, Menurutnya lagi, ibu mertua beliau memaklumkan kepada beliau bahawa suaminya pergi mencari pekerjaan. Menurut wanita itu lagi, suaminya berusia 40 tahun, berasal dari Kampung Gong Gunchil, Semerak, Pasir Puteh, Kelantan. Mereka berkahwin pada 7 Jun 1975 dan mulai Julai 1976 mereka tidak lagi tinggal bersama. Ini bermakna perkahwinan mereka hanya bertahan lebih kurang 13 bulan. (*Pejabat Kadi Besut*, 52/77).

ii- Dapat Dikesan

Berbeza dengan pasangan yang berasal dari Besut ini, mereka menjalani kehidupan berumah tangga lebih kurang selama tujuh tahun. Pada 12 April 1977 beliau dimaklumkan suaminya hilang di laut Pulau Pinang. Setelah menunggu perkhabaran berita mengenai suaminya beliau mengambil masa selama setahun 14 hari untuk melaporkan kepada kadi Besut mengenai status perkahwinan mereka. (*Pejabat Kadi Besut*, 18/78).

Mencari pekerjaan di tempat baharu merupakan salah satu faktor pasangan yang baharu berkahwin lebih kurang dua bulan ini, tidak tinggal bersama. Menurut wanita yang berusia 30 tahun dan berasal dari Kampung Kedai Jabi Besut beliau membuat tuntutan berpisah kerana pasangannya telah meninggalkan beliau selama tujuh bulan enam hari. Menurutnya lagi pasangannya yang berusia 24 tahun tersebut hendak bekerja di Mersing, Johor. (*Pejabat Kadi Besut*, 31/74).

Selain itu keretakan rumahtangga dikesan kerana pihak yang didakwa menjalani hukuman penjara. Menurut wanita berusia 23 yang berasal dari Kampung Gong Kepas, Kampung Raja, Besut suami beliau menjalani hukuman penjara selama enam tahun di Penjara Pengkalan Chepa, Kota Bharu, Kelantan. Setelah tiga tahun tidak menerima nafkah daripada suaminya yang berusia 27 tahun beliau mengambil keputusan memohon perceraian. (*Pejabat Kadi Besut*, 4/77)

Seorang wanita yang berusia 20 tahun, telah meninggalkan suaminya yang menjalani hukuman penjara di penjara Pudu, Kuala Lumpur. Wanita yang berusia 20 tahun tersebut mengambil keputusan meninggalkan suami beliau dan kembali tinggal bersama ibunya di Kampung Gong Penaga, Bt. Petri, Besut, Terengganu. Beliau berbuat demikian kerana lebih empat bulan tidak menerima nafkah daripada suaminya yang berusia 31 yang menjalani hukuman penjara dan kemudiannya sebagai orang buangan di Kuala Selangor. (*Pejabat Kadi Besut*, 34/78)

Kesimpulan

Konklusinya, laporan Pejabat Kadhi Besut menunjukkan wanita mengemukakan tuntutan fasakh kerana ditinggalkan oleh suami tanpa nafkah zahir dan batin dalam tempoh masa yang lama. Terdapat dalam kalangan mereka tidak mengetahui di mana keberadaan suami mereka dan hal ini menyebabkan kesukaran untuk pihak pejabat Kadhi Besut menyelesaikan masalah yang dihadapi oleh pihak isteri. Mengetahui latar belakang pasangan penting sebelum membuat keputusan untuk mendirikan rumah tangga ini termasuklah latar belakang tempat tinggal dan pekerjaan. Terdapat dalam kalangan isteri yang memberitahu pihak Pejabat Kadhi Besut mereka tidak mengetahui tempat asal suami atau pihak ahli keluarga yang boleh dihubungi untuk mengesan keberadaan pasangan mereka.

Selain itu, tidak terdapat maklumat lengkap mengenai pekerjaan pasangan dan ini jelas daripada 19 kes hanya empat kes sahaja isteri mengetahui pekerjaan suami mereka. Terdapat juga dalam kalangan suami diketahui keberadaan mereka melalui perkhabaran oleh pihak Kadhi Besut di mana mereka sedang menjalani hukuman penjara di luar dari Terengganu iaitu di Kelantan dan Kuala Lumpur. Timbul persoalan di sini apakah kalangan suami tidak bekerja atau tidak mempunyai pekerjaan tetap? dan disebabkan hal ini menyumbang kepada pertengkaran, suami membawa diri keluar dari rumah dan seterusnya tidak pulang. Sekiranya hal tersebut benar ini bermakna tuntutan nafkah anak pasca perceraian sudah tentu gagal direalisasikan kerana ketidakmampuan dalam kalangan suami dari sudut material. Mereka yang mengamalkan poligami juga liat membayar nafkah anak atas alasan menyara keluarga baharu. Perlu kajian mengenai masyarakat Terengganu pada pasca merdeka dan sehingga kini diberi perhatian khasnya yang berkaitan dengan masalah dalam kalangan wanita. Dapatan kajian menunjukkan selain masalah perceraian terdapat juga dalam kalangan wanita yang menjadi pelacur untuk menyara kehidupan. Selain itu mereka juga ada yang terlibat dalam kes khalwat dan bersekedudukan kerana kepincangan daripada sudut agama, moral dan desakan nafkah zahir dan batin.

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AUTHOR INDEX

A

Aaron George Mendoza, 443
Addley Bromeo Bianus, 37
Adel Rabeh Younis, 45
Agus Ariyanto, 455
Aiman Iskandar Jasni, 257
Aini Fatihah Roslam, 324
Alyssa Kyle N. Cañete, 428
Amber Mae Marbella, 428
Amir Shahmi Izham, 257
Anderson Ngelambong, 111
Andrea Isabel T. Lina, 428
Aylin Koyalan, 419
Ayobami Oluwaseun Idowu, 264
Azimah Ahmad Zaki, 16
Azmi Ahmad, 298
Azwen Zuwita Hussin, 580

B

Bao Shi Lian, 37
Bianca Angela Mae Nabos, 443

C

Che Mohd Nasril Che Mohd Nassir, 309
Che Thalbi Md Ismail, 594
Chuyao Wang, 1, 279
Cut Fitrika Syawalina, 455

E

Elizabeth O. Recio, 123
Eva Susanti, 455

F

Fairul Ifnee Othman, 315

Faizan Iza Zainuddin, 350
Farhana Ismail, 350
Farous Izwan Abdul Aziz, 373
Fatiha Illya Mazlan, 552
Flordeliza Libiado, 69
Foad Karimi Ghaleh Jough, 397

H

Hadziroh Ibrahim, 496, 505
Hafinas Halid, 486
Hafizhah Zulkifli, 530, 552
Hamed Faghiri, 242
Hani Salwah Yaakup, 279
Haryati Hasan, 604
Hashim Fadzil Ariffin, 97, 111
Hazalina Hashim, 315
Herlin Anak Aman, 324
Hijattulah Abdul-Jabbar, 151
Husnaina Mailisa Safitri, 455

J

Jagathisvaran Selvanathan, 573
Jamelaa Bibi Abdullah, 29
Jioh Kang, 443

K

Khairiah Mohd Yassin, 543
Khairul Anuar Mohd Ali, 383
Khuzaimah Mat Salleh, 594
Krisma Joyce S. Salazar, 428

L

Lifang Nong, 138
Liu Mengyuan, 111



M

Mardziah Shamsudin, 226
Mary Abigail M. Rosline, 428
Mary Grace Berico, 443
Md Lazim Mohd Zin, 496
Megat Imran Al Yasin, 292
Mei Yuan Law, 195
Mohamad Naimi Mohamad Nor, 490
Mohamad Razlan Md Radzi, 33
Mohamad-Noor Salehuddin Sharipudin, 1
Mohd Haniff Osman, 335
Mohd Salahudin Shamsudin, 486
Mohd Syaifuddin Mohd Alias, 97
Muhamad Aeree Abu Bakar, 515
Muhamad Nazri Borhan, 335
Muhammad Abdullah Omar Ali Alferjany, 45
Muhammad Akramin Kamarul Zaman, 604
Muhammad Anas Mohd Bukhori, 383
Muhammad Iqbal Noor Azman Shah, 257
Muhammad Saufi Anas, 211
Muhammd Zulhilmi Zulkurnain, 211
Muzani Mustapa, 264

N

Nabila Sidni Paroza, 232
Nafisah Ilham Hussin, 604
Najdah Sanusi, 530
Nellie Ismail, 16
Nethya Manoor Garam, 567
Ng Chwee Fang, 292
Niza Tan Mohd Aminuddin, 60
Noor Azmi Mohd Zainol, 463
Nor Adilla Rashidi, 33
Nor Asmalina Mohd Anuar, 211
Nor Azura Adzharuddin, 1
Noraini Othman, 505
Norasrina Johari, 505
Norazlinda Saad, 567, 573, 580, 587

Norhanim Abdul Razak, 409
Norjaya Mohd Yasin, 315
Nur Arzilah Ismail, 335
Nur Haffiza Rahaman, 463
Nur Ismah Dalilah Mohamad, 309
Nur Shafieka Sapan, 84
Nurilyani Othman, 320
Nurul Azniza Nadzari, 211
Nurul Fakhirah Samsir, 309
Nurul Syafiqah Sabarudin, 309

P

Peng Chengqiu, 166
Peter Paul Canuto, 69

Q

Qingchen Dong, 1

R

Rafidah Bahari, 320
Rahimah Hamdan, 279
Rheanon Kenn Nave, 443
Rogis Baker, 257
Roland L. Lladoni, 123

S

Safiah Suhaimi, 257
Saliza Abdul Aziz, 151
Seriaznita Mat Said, 373
Sha Sha Zhang, 292
Shakirah Noor Azlan, 60
Shaqira Nadia Mohd Shukri, 515
Sharifah Nany Rahayu Karmilla Syed Hassan, 309
Shirin Ismail, 481
Siti Haslina Hussin, 350
Sonia Shoar, 419
Sri Maulida, 232
Suhaila Mohamad, 320



Suhaimi Ishak, 490

Surendran Sankaran, 567, 573, 580, 587

Surinder Kaur Satwant Singh, 226

Suriyah Devi Krishnan, 320

Syarifah Azra Budiman, 33

T

Tee Xiao Xi, 166, 180

Tengku Hazirah Tengku Saifudin, 309

Tengku Julia Aishah Tengku Amran Shah, 309

Tharishini Krishnan, 324

Thung Shi Qin, 320

U

Ummul Nisa Zahran, 496

V

Victor Imohnikhe Aligamhe, 264

W

Wan Aishah Wan Mohd Nowalid, 486

Wan Mohd Hirwani Wan Hussain, 383

Wang Miao, 587

Wen Sihui, 180

Wong Tze Xin, 320

Y

Ysabel Kristine S. Lopez, 428

Yusmani Mohd Yusoff, 486

Z

Zaharah Mohamed Rani, 97

Zahir Osman, 315

Zainal Abidin Mohamed, 242

Zainol Bidin, 151

Zarinah Arshat, 16

Zhiyao Guo, 1, 279

Zorah Abu Kassim, 315

Zulkornain Yusop, 242



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