

Pertanika Journal of

# SOCIAL SCIENCES & HUMANITIES

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Pertanika Journal of Social Sciences & Humanities
Pertanika Journal of Social Sciences & Humanities

# PERTANIKA JOURNAL OF SOCIAL SCIENCES & HUMANITIES

## About the Journal

### *Overview*

Pertanika Journal of Social Sciences & Humanities is the official journal of Universiti Putra Malaysia. It is an open-access online scientific journal. It publishes original scientific outputs. It neither accepts nor commissions third party content.

Recognised internationally as the leading peer-reviewed interdisciplinary journal devoted to the publication of original papers, it serves as a forum for practical approaches to improve quality on issues pertaining to social and behavioural sciences as well as the humanities.

Pertanika Journal of Social Sciences & Humanities currently publishes 6 issues a year (*March*, *April*, *June*, *September, October* and *December*) periodical that considers for publication original articles as per its scope. The journal publishes in **English** as well as in **Bahasa Melayu** and it is open for submission by authors from all over the world.

The journal is available world-wide.

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Pertanika Journal of Social Sciences & Humanities aims to develop as a pioneer journal for the social sciences with a focus on emerging issues pertaining to the social and behavioural sciences as well as the humanities. Areas relevant to the scope of the journal include Social Sciences—architecture and habitat, consumer and family economics, consumer law, education, media and communication studies, political sciences and public policy, population studies, psychology, sociology, and tourism; Humanities—arts and culture, dance, language and linguistics, literature, music, philosophy, and sports.

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Pertanika Journal of Social Sciences & Humanities was founded in 1993 and focusses on research in social and behavioural sciences as well as the humanities and its related fields.

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To publish journal of international repute.

### *Mission*

Our goal is to bring the highest quality research to the widest possible audience.

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We aim for excellence, sustained by a responsible and professional approach to journal publishing. Submissions can expect to receive a decision within 120 days. The elapsed time from submission to publication for the articles averages 180 days. We are working towards decreasing the processing time with the help of our editors and the reviewers.

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Pertanika Journal of Social Sciences & Humanities is now over 32 years old; this accumulated knowledge and experience has resulted the journal being abstracted and indexed in SCOPUS (Elsevier), Clarivate Web of Science (ESCI), EBSCO, DOAJ, Agricola, ASEAN CITATION INDEX, ISC, Microsoft Academic, Google Scholar, and MyCite.

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Most scientific papers are prepared according to a format called IMRAD. The term represents the first letters of the words ***I**ntroduction*, ***M**aterials and Methods*, ***R**esults*, ***A**nd **D**iscussion*. IMRAD is simply a more 'defined' version of the "IBC" (*Introduction*, *Body*, *Conclusion*) format used for all academic writing. IMRAD indicates a pattern or format rather than a complete list of headings or components of research papers; the missing parts of a paper are: *Title*, *Authors*, *Keywords*, *Abstract*, *Conclusions*, *References*, and *Acknowledgement*. Additionally, some papers include *Appendices*. For manuscripts in **Bahasa Malaysia**, the title, abstract and keywords should be written in both **English** and **Bahasa Malaysia**.


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The *Introduction* explains the scope and objective of the study in the light of current knowledge on the subject; the *Materials and Methods* describes how the study was conducted; the *Results* section reports what was found in the study; and the *Discussion* section explains meaning and significance of the results and provides suggestions for future directions of research. The manuscript must be prepared according to the journal's **Instruction to Authors** (http://www.pertanika.upm.edu.my/Resources/regular_issues/Regular_Issues_Instructions_to_Authors.pdf).

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As articles are double-blind reviewed, material that may identify authorship of the paper should be placed only on page 2 as described in the first-4-page format in Pertanika's Instruction to Authors (http://www.pertanika.upm.edu.my/Resources/regular_issues/Regular_Issues_Instructions_to_Authors.pdf).

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authors. If a revision is indicated, the editor provides guidelines to the authors to attend to the reviewers' suggestions and perhaps additional advice about revising the manuscript.

4. The authors decide whether and how to address the reviewers' comments and criticisms and the editor's concerns. The authors return a revised version of the paper to the Chief Executive Editor along with specific information describing how they have addressed the concerns of the reviewers and the editor, usually in a tabular form. The authors may also submit a rebuttal if there is a need especially when the authors disagree with certain comments provided by the reviewers.
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# Foreword

Welcome to the first issue of 2026 of the Pertanika Journal of Social Sciences and Humanities (PJSSH)!

PJSSH is an open-access journal for studies in the field of Social Sciences and Humianities published by Universiti Putra Malaysia Press. It is independently owned and managed by the university for the benefit of the world-wide science community.

This issue contains 25 regular articles. The authors of these articles come from different countries namely China, India, Indonesia, Iran, Malaysia, Pakistan, Philippines, Saudi Arabia, and Vietnam.

A regular article titled "Pembangunan Aplikasi Pembelajaran 'Pro Kata Kerja' Berlandaskan Model Air Terjun" presents the development of a mobile learning application designed to enhance the mastery of derived verbs among pupils in Tamil vernacular schools. Grounded in the Waterfall Model and supported by Error Analysis Theory and Cognitive Information Processing Theory, the study identifies critical gaps in students' understanding of verb affixes and responds with a gamified, interactive digital solution tailored to Generation Alpha learners. The findings demonstrate that technology-driven pedagogical innovation can significantly improve grammar acquisition in a systematic and engaging manner. The detailed information of this article is presented on page 91.

An article entitled "Identity Dilemma of Light-Skinned Black Protagonist in England in Never Far from Nowhere by Black British Writer Andrea Levy" examines the complex identity negotiation of Vivien, a light-skinned Black protagonist, within postcolonial England. Drawing on Frantz Fanon's concept of epidermalisation of inferiority and Tajfel and Turner's theory of social categorisation, the study demonstrates how colonial racial hierarchies and contemporary social perceptions intensify the protagonist's fragmented sense of belonging. The findings highlight the phenomenon of double marginalisation experienced by light-skinned Black individuals, both within white society and the Black community, thus enriching scholarship on race, identity, and postcolonial subjectivity. Further details of the study can be found on page 119.

Another significant contribution titled "Internalising the External: The Transition from Social Stigma to Self-Stigma Among Malaysian B40 Adolescents" explores the psychosocial mechanisms through which socio-economic stigma is experienced, interpreted, and gradually internalised among Malaysian adolescents from B40 families. Employing a qualitative phenomenological design, the study reveals that stigma does not automatically translate into self-stigma; rather, it develops through processes of social comparison, shame, and anticipatory judgement before becoming embedded in self-evaluation. By situating stigma within Malaysia's socio-cultural and economic context, the study provides a nuanced and process-oriented understanding of identity formation among marginalised youth. The detailed information of this article is presented on page 331.

We anticipate that you will find the evidence presented in this issue to be intriguing, thought-provoking and useful in reaching new milestones in your own research. Please recommend the journal to your colleagues and students to make this endeavour meaningful.

All the papers published in this edition underwent Pertanika's stringent peer-review process involving a minimum of two reviewers comprising internal as well as external referees. This was to ensure that the quality of the papers justified the high ranking of the journal, which is renowned as a heavily-cited journal not only by authors and researchers in Malaysia but by those in other countries around the world as well.

We would also like to express our gratitude to all the contributors, namely the authors, reviewers, and Editorial Board Members of PJSSH, who have made this issue possible.

PJSSH is currently accepting manuscripts for upcoming issues based on original qualitative or quantitative research that opens new areas of inquiry and investigation.

**Editor-in-Chief**
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# English Acquisition through the Lens of Attitude and Emotional Intelligence among Pre-university Learners

**Huay Woon You* and Nor Azman Ahmad Adzrie**

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## ABSTRACT

As technology has advanced, English has emerged as the universal language of communication. Acquiring proficiency in English is essential, and the attitude towards learning English is considered a crucial factor influencing the learning outcomes. Given the importance of education in moulding students' psychological well-being, knowledge of emotions has received increased attention. Hence, the emotional aspects of learners, which impact various areas of daily life, warrant further investigation. This study examines the influence of attitude towards English acquisition and emotional intelligence on academic performance and language proficiency among pre-university learners. Academic performance is assessed based on grade point average (GPA), and language proficiency is assessed by the Malaysian University English Test (MUET) band score. To achieve this, 116 pre-university learners were randomly selected, and data on attitudes, academic performance, language proficiency and emotional intelligence were collected through a questionnaire survey. The results indicate that females scored higher in emotional intelligence compared to males. Additionally, females are more likely to experience fear or unpleasant emotions while learning English than their male counterparts. Attitude towards English acquisition emerged as the only significant predictor that enhanced the model's predictive capability for MUET band scores. The study concludes by emphasising the importance of learners' attitudes in shaping their English language learning process, suggesting that greater awareness in this area could lead to more effective language acquisition and improved educational outcomes. Implications drawn from the current study suggest that integrating emotional intelligence and attitudes towards English acquisition can help learners develop positive academic performance. Finally, this study is projected to be useful for educators and policymakers.

*Keywords:* Emotional intelligence, English acquisition, grade point average, Malaysian University English Test (MUET), pre-university learners

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## INTRODUCTION

Education is considered a powerful instrument that improves the socio-cultural life of a country and plays an important role in human development. Education must be planned in a manner that provides learners with the ability to read, write, and perform arithmetic. In the context of education, learning is the process of acquiring new values, abilities and knowledge, enabling learners to realise their greatest potential (You, 2018). It encompasses various techniques, such as note-taking, memorisation and observation (Taheri et al., 2019). A well-structured learning process is required for understanding and mastering a subject matter.

Learning and mastering a language is important, as it is a tool for communication and is essential in the learning process to facilitate the learner's understanding of the subject matter. The rapid advancement of science and technology and globalisation have transformed the English language landscape and its use in Malaysia. Malaysians need to learn the English language because it is widely used in daily activities, including education and administration. In Malaysia, the English language is formally used as a second language and is regarded as an important part of the education system in the country. As such, the English language has been introduced in early education.

The use of the English language has become increasingly important in higher education. One of the crucial parts is the proficiency of the language, which can be described as the learner's ability to use English meaningfully. The English language performance of the students will be evaluated based on the Malaysian University English Test (MUET) (Nopiah et al., 2011). The MUET's result is one of the criteria being considered during the application to enrol in public universities in Malaysia. The pre-university programme serves as a transitional stage for students' post-high school education, marking the beginning of their higher education journey. The students will take their MUET during the pre-university programme. Moreover, there is a significant difference in learning style between high school and pre-university programmes, including the medium of learning and teaching instruction (Wong & You, 2023).The primary objective of pre-university education is to equip students with the necessary skills and knowledge to excel in university-level studies. During this phase, students adapt to changing environments while managing academic challenges. In addition, pre-university learners experience studying away from home for the first time. They must take charge of their daily activities, such as time management, without parental or guardian supervision, which indirectly affects their learning process and emotional competencies.

Emotional intelligence refers to a set of cognitive abilities that enable individuals to perceive, manage and utilise emotional information (D'Amico et al., 2020). It is more precisely defined as a collection of emotional and cognitive abilities, including the ability to perceive emotions accurately,

manage one's and others' emotions, and utilise emotional knowledge. It is essential for a learner to regulate, control and manage the academic environment successfully. This is particularly important for pre-university learners, as they need to manage their studies and emotions simultaneously when studying away from home and getting along with new classmates. This highlights the importance of emotional intelligence in the learning process. Being emotionally intelligent can enhance life in various ways, such as improving decision-making and stress management (Santhosh & Basha, 2022). This capability is also essential in solving academic problems.

In the evolving field of language teaching theories and practices, the attitude of learners is crucial to optimise the learning outcomes and is increasingly taking centre stage. A learner's attitude can be defined as a set of feelings towards the use of the language, which can either facilitate or hinder learning. It has been known that attitude is one of the main aspects that affect language learning (Sadia et al., 2021). Hence, learners are less likely to acquire a second language if they have a negative attitude towards it. In this context, attitude is considered an important variable, specifically attitude towards English acquisition.

The academic performance of students in educational centres is a key goal in the development of all educational programmes. It is typically used to measure student achievement across various academic subjects, with learners' academic success being based on their capabilities and task completion. Academic performance has been commonly measured through continuous exams or evaluations, with the most frequently used indicator being the grade point average (GPA). It is also regarded as one of the most important indicators of a student's success, which potentially influences financial aid in the short term and career prospects in the long term.

This study focusses on the interplay between attitude in English acquisition and emotional intelligence in relation to academic performance among pre-university learners. By identifying attitudes towards English and emotional intelligence among learners, educators can take necessary measures to review the instructional design and, thus, prevent future problems to a certain extent. As Bouaziz (2020) suggested in the study, problem-solving and analytical skills are crucial; however, emotional intelligence and a positive attitude towards learning a language are equally important qualities for learners to excel in their academic journey. This study addresses a significant and timely topic in the field of language acquisition. The findings will provide a better understanding of the role of attitudes and emotional intelligence in improving academic performance among pre-university learners.

The present study, which focusses on pre-university students, will address the following research objectives:

1. To describe emotional intelligence dimensions and to compare the differences of emotional intelligence dimensions between gender among pre-university learners.
2. To describe attitudes towards English acquisition and to compare the differences of attitudes towards English acquisition between gender among pre-university learners.
3. To examine the relationship between emotional intelligence with MUET band score and GPA.
4. To examine the relationship between attitude towards English acquisition with MUET band score and GPA.
5. To evaluate the significant predictors of GPA and MUET band scores.

The research hypotheses are as follows:

H1 : There is a significant difference between gender and emotional intelligence among pre-university learners.

H2 : There is a significant difference between gender and attitudes towards English acquisition among pre-university learners.

H3 : There is a significant relationship between emotional intelligence with MUET band score and GPA.

H4 : There is a significant relationship between attitude towards English acquisition with MUET band score and GPA.

H5 : Emotional intelligence and attitude towards English acquisition are significant predictors of GPA and MUET band scores.

## LITERATURE REVIEW

### The Importance of English in Higher Education in Malaysia

As a result of globalisation, the importance of the English language, which has been labelled as the global trade language, has become more abundantly clear. This shows that the English language occupies a unique position as the global language of communication. In addition, English has become integral to the educational system and various aspects of life, particularly in business and trade. In today's digital age, knowing English is crucial for achieving international status.

Malaysia is among Asian countries that have adopted a bilingual education system to ensure that national and international needs and challenges are balanced through language education policy (Othman & Chuah, 2021). By offering education programmes in English, students can participate in an international research community where a significant amount of scientific work is published in English (Alias et al., 2018). This reveals that mastery of the English language is important and will be influenced by various elements, such as attitude towards language acquisition and emotional intelligence.

The English language has been taught as a second language in primary and secondary schools in Malaysia. Second language acquisition is commonly defined as the process by which an individual learns a language that is different from their native language or first language. In

general, the acquisition of a second language follows the first language. According to Liando and Tatipang (2022), second language acquisition is much more learned than acquired compared to first language acquisition.

Recent studies have shown that native English speakers and those who speak English as a second or foreign language require advanced proficiency in the English language. Currently, many programmes deliver lessons through English-medium instruction. In Malaysia, MUET is implemented as a standardised test that measures learners' English proficiency to assess their suitability for admission to an undergraduate degree programme. The Malaysian Education Blueprint 2015–2025 (Higher Education) emphasises the importance of English proficiency among undergraduates to enhance their competitiveness. Researchers in various disciplines, such as Ag-Ahmad et al. (2024) and Yee and Periasamy (2019), have increasingly focused on identifying the influence of MUET test scores on students' academic performance.

Academic success relies heavily on a smooth transition from high school to university, particularly during the first year after high school. However, numerous studies have revealed that learners are increasingly less prepared for higher education. According to Okwuduba et al. (2021), a learner's ability to achieve autonomy in the learning process is a critical factor in their academic success. Furthermore, it is emphasised that self-directed learners tend to achieve greater success than those who struggle to self-monitor their education. Therefore, the pre-university programme plays a crucial role, making it valuable to conduct a cross-sectional study among pre-university learners, as this offers possibilities for early intervention (You et al., 2021)

## Previous Studies on Attitude to Language Learning and Emotional Intelligence

Attitude is one of the key success factors in language learning, encompassing students' feelings, beliefs, and behavioural tendencies (Metsärinne & Kallio, 2016). It has a lasting impact on students, as their attitudes play a key role in shaping their perspective on the subject they are learning. Students who develop a positive attitude towards the subject will actively participate in class discussions, ask questions and look for extra resources (Hannula et al., 2016; Svenningsson et al., 2018). Kandati and Tatipang (2021) examined the effect of virtual teaching on attitudes towards English as a second language acquisition. Their results indicated that virtual teaching had a positive impact on students' attitudes, although this impact requires ongoing monitoring. Zulfikar et al. (2019) investigated students' attitudes towards face-to-face English learning using a qualitative method, selecting six English Department students for semi-structured interviews. The results revealed that students exhibited positive attitudes towards English learning. However, the study highlighted potential bias because the respondents were exclusively from the English Department.

Many research studies have highlighted that the attitudes of a learner are crucial throughout the academic journey (You, 2017). Attitudes of learners towards learning are core areas of interest to understanding the psychology of students. Ramzan et al. (2023) studied the relationship between classroom enjoyment and students' attitudes towards learning English. The study found that students' attitudes towards learning English and their enjoyment of the classroom were significantly correlated.

The ability to recognise, control and regulate emotions is known as emotional intelligence (Fredrickson, 2001). This process of management, regulation and adaptation ability allows an individual to grow intellectually, socially and emotionally. Recent research on emotional intelligence has garnered increasing attention. Studies have shown that students with high levels of emotional intelligence are more likely to perform well academically compared to their peers (Mohamed et al., 2022). Educational institutions, including schools and universities, invest significant time and resources in helping students enhance their social and emotional skills, such as emotional intelligence (You et al., 2025). These programmes aim to improve academic performance while also fostering personal growth.

Thao et al. (2023) investigated the impacts of emotional intelligence on English language acquisition among 105 students majoring in English from a university in Vietnam. The results showed that emotional intelligence has a significant impact on language learning outcomes. Furthermore, Quílez-Robres et al. (2023) conducted a systematic review to examine the relationship between emotional intelligence and academic performance. A comprehensive analysis of the existing literature was undertaken, consisting of 27 articles, 28 samples and 13,909 participants. The findings revealed that emotional intelligence is a valuable predictor of academic performance. These studies indicate that emotional intelligence affects the well-being of a student.

Hashim et al. (2020) studied the role of self-esteem in determining English language proficiency levels. Their study demonstrated how students who have low self-esteem frequently face significant barriers in learning the English language due to academic challenges and psychological issues like speaking anxiety and feelings of inferiority in comparison to their more proficient peers. Furthermore, Haider et al. (2020) highlighted the role of internal motivation and interpersonal interaction in language learning among secondary school students. This reveals that mastery of the English language is important and will be influenced by various elements, such as attitude towards language acquisition and emotional intelligence.

To briefly summarise, previous studies have shown that differences, such as in emotional intelligence and attitude towards the English language, among learners, are also of great relevance in having a positive

impact on language acquisition among university students. Given that English is the primary language of instruction and learning in most educational institutions, attitudes towards English acquisition and emotional intelligence are critical factors to consider when assessing academic achievement. This paper will explore the roles of attitude towards English acquisition and emotional intelligence in academic performance among pre-university students.

While numerous studies have examined the relationship between emotional intelligence and academic performance, there is limited exploration of how this relationship interacts with attitudes towards English acquisition, specifically among pre-university students. Furthermore, prior research often focusses on either emotional intelligence or language attitudes as isolated constructs. Thus, this study aims to investigate and report on the attitudes towards English acquisition and emotional intelligence in relation to academic performance among pre-university learners. This can be expressed in the following research questions: (1) What are the emotional intelligence dimensions, and is there a gender difference among pre-university learners? (2) What are the attitudes towards English acquisition, and is there a gender difference among pre-university learners? (3) What is the relationship between emotional intelligence with MUET band score and GPA? (4) What is the relationship between attitude towards English acquisition with MUET band score and GPA? (5) What are the significant predictors of GPA and MUET band scores?

## METHODS

### Research Design

To address the research questions, this study adopts a quantitative research design. Research on attitudes aims to uncover individuals' feelings and thoughts about a particular subject, which plays a significant role in the behavioural sciences, where the objective is to discover and understand human behaviour. Meanwhile, research on emotional intelligence refers to a set of cognitive abilities that allow individuals to perceive, understand, express, and manage emotional information. Individuals who can comprehend their emotions are able to maintain a better view of life. A quantitative research design, utilising a face-to-face questionnaire survey, was employed in this context. The questionnaire consisted of questions or statements to which the participants were expected to respond, either by writing their answers or selecting from pre-existing options. This method enabled the participants to provide self-reported data. Additionally, this provides an opportunity for participants to ask any questions about the questionnaire.

### Population and Sample

This study was conducted in a pre-university centre. The requirement to enter the pre-university programme is the attainment of at least an A in English in the Sijil Pelajaran Malaysia (SPM), a national examination administered at the end of secondary education in Malaysia. A pre-university programme serves as a bridge between secondary school and higher education,

preparing students with the knowledge and skills needed for university-level studies and ensuring a smooth transition in their learning. A total of 116 pre-university students participated in this study. The students were in their second semester of the 2020/2021 academic year. The pre-university students are required to take the MUET during their studies. The MUET results indicate English proficiency, encompassing four skills: Reading, writing, listening, and speaking (You et al., 2017). All participants were informed about the study, and those who participated were required to provide informed consent prior to the study. Participation was entirely voluntary, and participants had the right to decline at any time without consequence. Moreover, the participation was anonymous.

A simple random sampling method was used to select the participants in this study. Figure 1 illustrates the flowchart explaining the population and sample of 156 students in the pre-university programme. Among them, 30 were selected through a simple random sampling method for the pilot study. A total of 126 questionnaires were distributed for data collection, yielding a response rate of 97.62%, with three students declining to participate. Seven students declined to participate in the informed consent form. Consequently, 116 students are included in this study, with a response rate of 92.06%.

**Data Collection**

This study utilised two instruments to address the research aims. The questionnaire comprised three sections: (1) demographic information about the participants, such as gender, MUET band score and overall GPA from the first semester; (2) emotional intelligence; and (3) attitudes towards English acquisition.

Before data collection, a pilot test was conducted to evaluate the reliability of the questionnaire statements. A sample of 30 students was randomly selected for this purpose. Reliability was measured using Cronbach's Alpha (α), $0.6 \leq \alpha \leq 0.7$, indicating an acceptable level and $0.7 \leq \alpha \leq 0.9$, indicating a good level of reliability (You, 2022). The Cronbach's alpha reliability index for emotional intelligence and attitude towards English acquisition were 0.848 and 0.740, respectively, in a sample of 30 individuals. This indicates that all items demonstrated an acceptable level of reliability.

The Assessing Emotions Scale, also known as the Emotional Intelligence Scale, was constructed by Schutte et al. (2009). A 33-item assessment was used to evaluate emotional intelligence. The scale has four dimensions: (1) perception of emotion (ten items), (2) managing own emotions (nine items), (3) managing others' emotions (eight items) and (4) utilisation of emotion (six items). Participants rated themselves on a five-point scale, from 1 = strongly disagree to 5 = strongly agree. Scores could range from 33 to 165, with higher scores indicating higher levels of emotional intelligence.

An instrument adapted from a study by Ahmed (2015) was used to identify participants' attitudes towards English acquisition. The items were in question

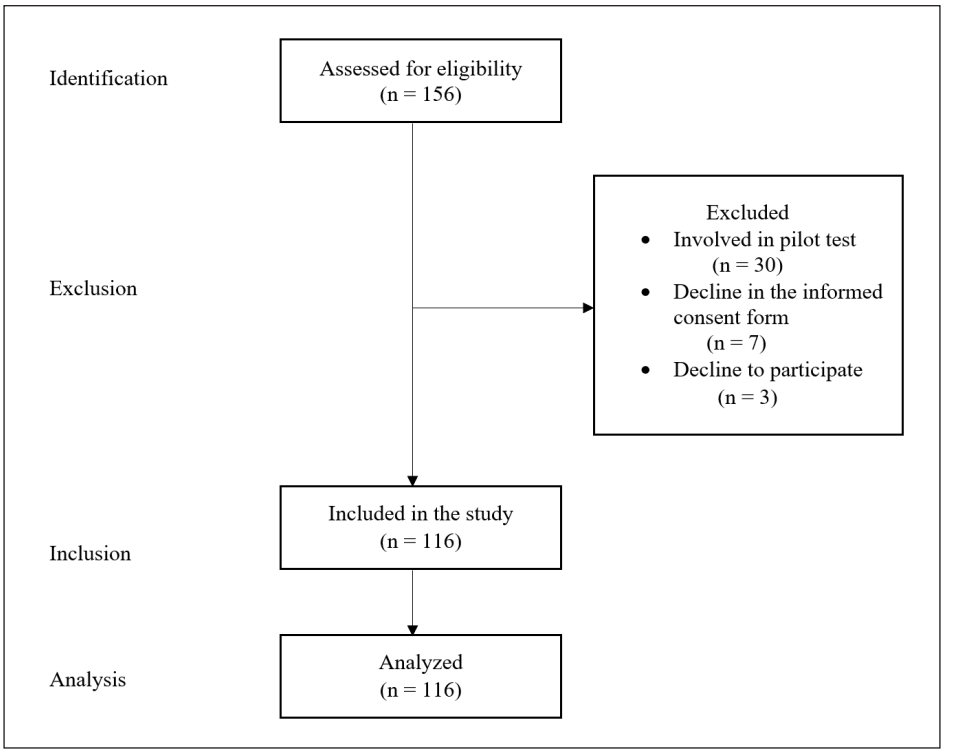



*Figure 1.* A flowchart explaining the population and sample

form (Ahmed, 2015) and have been adapted into a statement form in this study. For example, "Do you think that learning English will help the growth of your mind" (Ahmed, 2015) has been adapted to "I think that learning English will help the growth of my mind" in this study. The domains (i.e., topics) covered in the instrument questionnaire included: (1) learners' attitudes towards the use of English (five items), (2) learners' experience with English language learning (two items), (3) learner's attitude towards teaching methodology (four items), and (4) learners' preference for language skills (seven items). Participants could choose one of the options based on a four-point Likert scale (with 1 = disagree, 2 = somewhat disagree, 3 = somewhat agree and 4 = agree) for Domains 1, 3, and 4. One item from domain 2 offered an open-ended response option, while another was a yes/no question. Here, the items in domain 1 are to evaluate the learners' attitude, for example, "I think that learning English will help me achieve higher academic achievements". In addition, the items in Domain 2 can be interpreted as learners' preference for a particular methodology, for example, "I like to learn English through "grammatical rules" and "vocabulary memorisation." Meanwhile, the items in Domain 4 can be interpreted as learning preferences, for

instance, "In learning English, I want to focus on 'listening' only." The instrument used in this study to measure emotional intelligence and attitude towards English acquisition is shown in Appendices A and B, respectively.

### Data Analysis

Different statistical analyses were conducted using IBM SPSS Statistics 24 to address the research objectives. Based on the implemented questionnaire method, the collected data are primary. The study utilised a combination of categorical and numerical data. Different statistical analyses were used according to the type of data. Descriptive statistics, including mean and standard deviation, were used to examine the variables under consideration. Inferential analyses, such as hypothesis tests, were employed to examine the statistical differences between genders in terms of emotional intelligence and attitudes towards English acquisition. Pearson's correlation analysis was employed to investigate the relationship between the variables examined in this study. Finally, regression analysis was conducted to estimate the extent to which MUET band scores and overall GPAs could be predicted by emotional intelligence and attitudes towards English acquisition.

## RESULTS

This study included 66 female participants (56.9%) and 50 male participants (43.1%). Table 1 reveals that among the 116 participants, 17 (14.7%) achieved Band 3 in the Malaysian University English Test (MUET), while 80 (69.0%) were in Band 4, and 19 (16.4%) attained Band 5. Therefore, most participants scored Band 4 in the MUET. Regarding the grade point average (GPA) from the first semester, only three participants (2.6%) had a GPA between 2.50 and 2.99. Most participants fell within the GPA range of 3.00 to 3.66, while 32 participants (27.6%) scored between 3.67 and 4.00. On average, the participants obtained a GPA of 3.50. In general, females dominate in all the MUET band scores and GPAs, except for the students with a GPA of 2.50–2.99.

Table 1
*Distribution of MUET band score and GPA by gender*

| | | Male n(%) | Female n(%) | Toal n(%) | Mean (SD*) |
|---|---|---|---|---|---|
| **MUET Band Score** | 3 | 4 (3.4) | 13 (11.2) | 17 (14.7) | 4.02 (0.559) |
| | 4 | 39 (33.6) | 41 (35.3) | 80 (69.0) | |
| | 5 | 7 (6.0) | 12 (10.3) | 19 (16.4) | |
| **GPA** | 2.50–2.99 | 2 (1.7) | 1 (0.9) | 3 (2.6) | 3.50 (0.261) |
| | 3.00–3.66 | 34 (29.3) | 47 (40.5) | 81 (69.8) | |
| | 3.67–4.00 | 14 (12.1) | 18 (15.5) | 32 (27.6) | |

*Note*: SD = standard deviation

### Analysis of Emotional Intelligence Dimensions and Gender Differences

Table 2 presents the descriptive data (in means and standard deviations) and test statistics using the t-test for gender differences in the dimensions of emotional intelligence, which addresses the first research question in this study. The results indicate that females scored higher than males across all measures of emotional intelligence, including total emotional intelligence. Furthermore, a statistically significant difference was observed between genders in the dimension of managing others' emotions, as well as in overall emotional intelligence.

Table 3 displays the total score distribution for the four dimensions of emotional intelligence of males and females. The first and second entries of each cell in Table 3 in columns 2 to 5 represent the number of male and female learners, respectively, who obtained the total score indicated in column 1. For example, there are two males and one female with a total score of 18 for the utilisation of emotion (Row 5 and Column 5). According to Table 3, the highest total score obtained is 48 for the perception of emotions. On the contrary, the utilisation of emotion has the lowest total score, which is 14.

### Analysis of Attitudes towards English Acquisition and Gender Differences

To answer the research question about learners' attitudes towards acquiring the English language, Table 4 presents a comparative analysis of the data on attitudes towards English acquisition among male and female participants. The results show that females scored higher in the first three domains. For Domains 1, 3, and 4, a higher mean value signifies a more positive attitude. In contrast, for Domain 2, a higher mean value indicates that learners have experienced fear or unpleasant feelings when learning English. No significant difference was found between genders in their attitudes towards English acquisition.

Table 5 outlines the source of fear or unpleasant feelings in learning English

Table 2
*Mean, standard deviation, and significance difference among genders for the assessing emotions scale*

| Dimensions of Emotional Intelligence | Males Mean (SD*) | Females Mean (SD*) | Test Statistics on Gender Differences |
|---|---|---|---|
| Perception of emotion | 3.7040 (0.43937) | 3.8303 (0.32721) | -1.706 |
| Managing one's own emotions | 3.6600 (0.48010) | 3.8081 (0.52751) | -1.556 |
| Managing others' emotions | 3.6225 (0.59947) | 3.8826 (0.41306) | -2.631** |
| Utilisation of emotion | 3.9267 (0.57059) | 3.9470 (0.48407) | -0.207 |
| Total | 3.7127 (0.40449) | 3.8581 (0.33017) | -2.131** |

*Note:* SD = standard deviation
** $p < 0.05$

Table 3
*Total score for dimensions of emotional intelligence by gender*

| Total Score | Perception of Emotion | Managing One's Own Emotions | Managing Others' Emotions | Utilisation of Emotion |
|---|---|---|---|---|
| 14 | | | | (1, 0) |
| 15 | | | | (0, 1) |
| 16 | | | (1, 0) | |
| 17 | | | | (1, 0) |
| 18 | | (0, 1) | | (2, 1) |
| 19 | | | (1, 0) | (4, 3) |
| 20 | | | (1, 0) | (2, 3) |
| 21 | | (1, 0) | | (3, 7) |
| 22 | | | | (2, 8) |
| 23 | | | (1, 0) | (6, 7) |
| 24 | | (1, 0) | (6, 1) | (10, 8) |
| 25 | | (1, 1) | (3, 4) | (4, 11) |
| 26 | | (1, 3) | (1, 2) | (4, 8) |
| 27 | | (2, 1) | (1, 1) | (5, 2) |
| 28 | (1, 0) | (1, 4) | (8, 7) | (4, 5) |
| 29 | (1, 0) | (2, 0) | (4, 7) | (1, 0) |
| 30 | (2, 0) | (4, 2) | (5, 7) | (1, 2) |
| 31 | (1, 1) | (1, 3) | (3, 7) | |
| 32 | (4, 0) | (7, 3) | (3, 8) | |
| 33 | (2, 3) | (5, 10) | (5, 3) | |
| 34 | (4, 4) | (9, 6) | (0, 8) | |
| 35 | (5, 6) | (3, 4) | (2, 4) | |
| 36 | (1, 4) | (3, 3) | (2, 5) | |
| 37 | (5, 9) | (1, 6) | (2, 2) | |
| 38 | (5, 10) | (3, 4) | | |
| 39 | (2, 6) | (1, 9) | (1, 0) | |
| 40 | (6, 10) | (2, 4) | | |
| 41 | (5, 3) | (2, 0) | | |
| 42 | (1, 1) | (0, 1) | | |
| 43 | (2, 5) | | | |
| 44 | (1, 2) | (0, 1) | | |
| 45 | (1, 1) | | | |
| 46 | | | | |
| 47 | | | | |
| 48 | (1, 1) | | | |

Table 4
*Mean, standard deviation, and significance difference among genders for the attitude towards English acquisition*

| Domain in Acquiring English | Males Mean (SD*) | Females Mean (SD*) | Test Statistics on Gender Differences |
|---|---|---|---|
| Learners' attitudes towards the use of English | 3.5280 (0.41357) | 3.6333 (0.39626) | -1.391 |
| Learners' experience with English language learning | 0.24 (0.431) | 0.32 (0.469) | -0.920 |
| Learners' attitudes towards teaching methodology | 3.0750 (0.42633) | 3.1364 (0.45822) | -0.736 |
| Learners' preferences for language skills | 2.6000 (0.57434) | 2.5433 (0.61800) | 0.504 |

*Note*: SD = standard deviation

based on experiences. Among the 116 students surveyed, 83 (71.6%) reported no such negative experiences. However, the most common source for those who did was a lack of confidence (17.2%). This was followed by a fear of being judged by others (5.2%) and a fear of making mistakes (3.4%) during the English learning process.

## Correlation Analysis between Emotional Intelligence with MUET Band Score and GPA

Pearson's correlation test was used to examine the relationships between emotional intelligence and MUET band score, as well as GPA, among the 116 participants. The results are displayed in Figure 2.

Figure 2 reveals a significant positive correlation between the dimensions of emotional intelligence and overall emotional intelligence. This indicates that an increase in one dimension of emotional intelligence is associated with an increase in another. Furthermore, the significant relationship suggests that a positive correlation exists within the broader population. A significant positive relationship is also observed between MUET band score and GPA. Conversely, a non-significant correlation is found between emotional intelligence and MUET band score and GPA. Meanwhile, there is a weak

Table 5
*Source of the fear or unpleasant feelings in learning the English language from experience among learners*

| Source | Frequency (n) | Percentage (%) |
|---|---|---|
| Learning grammar | 1 | 0.9 |
| Fear of making mistakes | 4 | 3.4 |
| Lack of confidence | 20 | 17.2 |
| Fear of being judged by others | 6 | 5.2 |
| Teaching method by instructors | 2 | 1.7 |

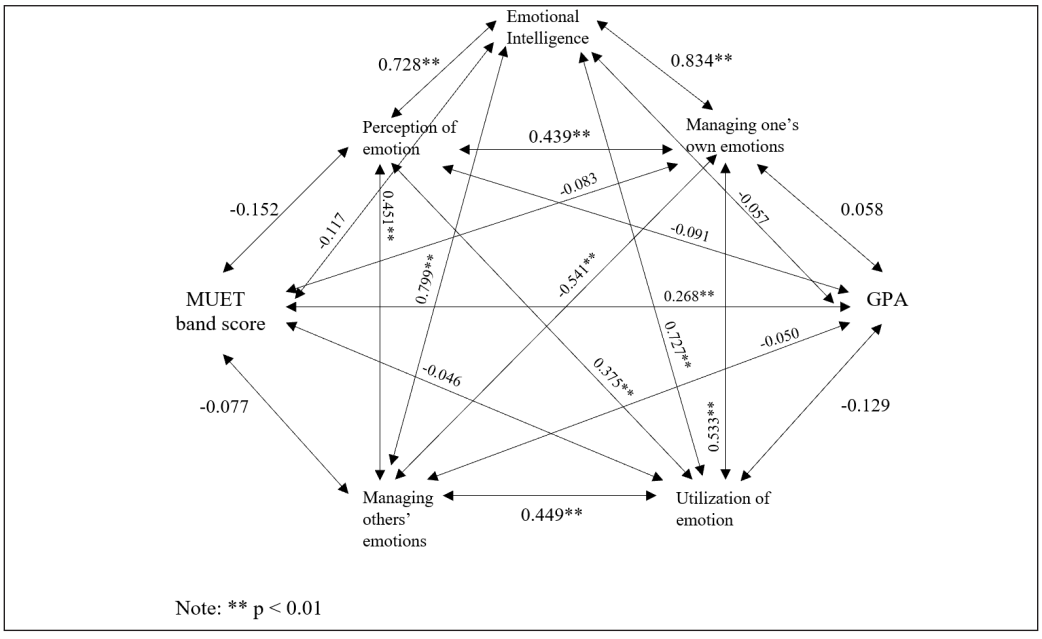



*Figure 2.* Pearson correlation between emotional intelligence, MUET band score, and GPA

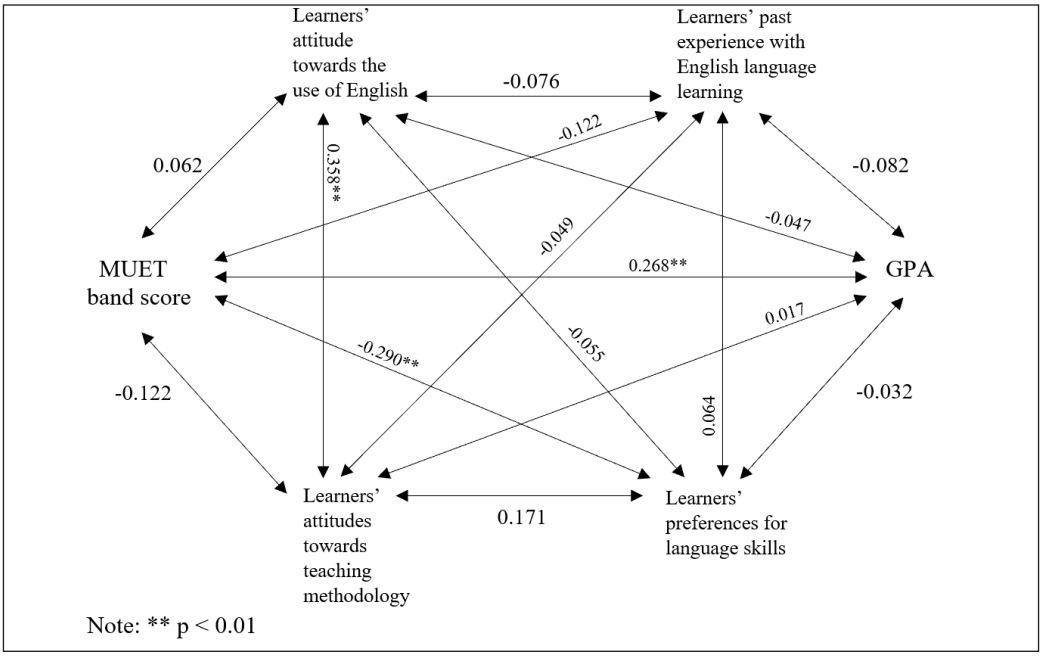



*Figure 3.* Pearson correlation between attitude towards English acquisition, MUET band score and, GPA

negative correlation between MUET band score and emotional intelligence. A similar trend is observed between the dimensions of emotional intelligence and overall emotional intelligence with GPA, except for a weak positive correlation between GPA and managing one's emotions.

## Correlation Analysis between Attitude towards English Acquisition with MUET Band Score and GPA

Here, the relationship between attitude towards English acquisition and MUET band score, as well as GPA, was investigated to answer the fourth research question in this study. Figure 3 indicates weak to moderate negative or positive correlations between attitude towards English acquisition, MUET band score, and GPA. A significant positive correlation is observed between learners' attitudes towards English and their attitudes towards teaching methodology. In contrast, a significant negative correlation is observed between the MUET band score and learners' attitudes towards language skills preferences. This may be due to learners having different preferences for the strategies used in the English language learning process.

## Significant Predictors of GPA and MUET Band Scores

To estimate the proportion of variance in GPA that can be accounted for by emotional intelligence and attitude towards English acquisition, a standard multiple regression analysis (MRA) was conducted. The results indicated that emotional intelligence and attitude towards English acquisition collectively explained a non-significant 0.04% of the variability in GPA, $F (2, 113) = 0.224$, $p = 0.800$. Table 6 presents the unstandardised (B) and standardised (β) regression coefficients, as well as the squared semi-partial (or "part") correlations ($sr^2$) for each predictor in the regression model.

To estimate the probability of MUET band scores among pre-university learners, a multinomial logistic regression was performed. The analysis utilised questionnaire data on emotional intelligence and attitudes towards English acquisition to estimate the probability of learners' MUET band scores. The coefficients for the model's predictors are detailed in Table 7. As shown, attitude towards English acquisition was the only predictor that significantly enhanced the model's predictive capability. In

Table 6
*Unstandardised (B) and standardised (β) regression coefficients and squared semi-partial correlations ($sr^2$) for each predictor in a regression model predicting GPA*

| Variable | B [95% CI] | β | $sr^2$ |
|---|---|---|---|
| Emotional intelligence | -0.036 [-0.170, 0.097] | -0.051 | 0.00 |
| Attitude towards English acquisition | -0.021 [-0.168, 0.126] | -0.028 | 0.00 |

Table 7
*Predictor coefficients for the model predicting MUET band score*

| MUET Band Score[a] | | b | SE(b) | Exp(b) | 95% CI |
|---|---|---|---|---|---|
| Band 4 | Emotional Intelligence | -0.630 | 0.765 | 0.533 | 0.119, 2.388 |
| | Attitude towards English acquisition | 1.526 | 0.808 | 0.217 | 0.045, 1.060 |
| Band 5 | Emotional Intelligence | -0.806 | 0.965 | 0.447 | 0.067, 2.963 |
| | Attitude towards English acquisition | 2.592 | 1.100 | 0.075* | 0.009, 0.647 |

[a]The reference category is Band 3
*$p < 0.05$

addition, the findings allow us to determine that attitude towards English acquisition significantly predicts whether a learner falls into Band 5 versus Band 3.

## DISCUSSION

The subjects involved in this study are pre-university learners from a public university. Most learners achieved Band 4 in the Malaysian University English Test (MUET) and a GPA in the range of 3.00–3.66 (Table 1). This suggests that most learners are achieving satisfactory academic performance. Notably, no candidates attained Band 6, which signifies an excellent level of English proficiency. This suggests that achieving Band 6 is challenging, as it denotes a very high level of English competence (Hasni, 2023). Although the learners obtained at least an A in English during high school, this does not guarantee good performance in MUET. According to the data provided by the Department of Academic Management (2016), over 500 students have taken the MUET more than twice. This suggests that, in addition to learning strategies, other dimensions, such as emotional intelligence and attitude towards English acquisition, should be monitored periodically. Additionally, students should be required to continue learning English to achieve good performance in the MUET.[1]

### Research Question 1. What are the emotional intelligence dimensions, and is there a gender difference among pre-university learners?

The Assessing Emotions Scale is a 33-item self-report survey designed to measure four dimensions of emotional intelligence, with higher scores reflecting greater emotional intelligence. The four dimensions are as

[1] In the United States education system, all college students are required to enrol in College English or Freshman English courses to prepare them for academic writing unless they have already taken equivalent courses in high school and scored well *High School Classes Required for College Admission. National Association for College Admission Counselling.*

follows: "Perception of Emotion" focusses on interpreting emotions through non-verbal cues such as body language or facial expressions; "Managing One's Emotions" explores the ability to regulate and appropriately respond to one's own emotions; "Managing Others' Emotions" addresses how one responds to the emotions of others; and "Utilisation of Emotions" examines how effectively one can leverage emotions to identify opportunities or generate innovative ideas. Table 2 shows that females scored higher in all four dimensions and total emotional intelligence than males. Our findings are consistent with the study of Bibi et al. (2016), who found that females are more emotionally responsive than males. One possible reason females score high on emotional intelligence is that they are socialised not to express their emotions directly and handle all problems with a calm attitude. According to Ullah et al. (2023), emotional intelligence is negatively related to perceived academic stress, which indirectly enhances academic performance. Similar results are also observed in this study. Meanwhile, females dominate in the MUET band score and GPA, except for the student with a GPA of 2.50–2.99.[2] The hypothesis t-test for gender differences in the four dimensions and total emotional intelligence reveals significant differences between males and females in managing others' emotions and total emotional intelligence.

**Research Question 2. What are the attitudes towards English acquisition, and is there a gender difference among pre-university learners?**

Table 4 presents data on attitudes towards English acquisition. Females reported more negative past experiences, such as fear or unpleasant feelings related to learning English, compared to males. This suggests that males view learning English as an enjoyable challenge, have more confidence in their abilities and experience less worry than females. The findings align with those of Reilly and Sánchez-Rosas (2021), which indicate that the average positive experience was significantly higher for males than for females.

This study also includes three other domains in the participants' acquisition of English. Higher mean scores for these three variables indicate a more positive attitude towards English acquisition. Firstly, as shown in Table 4, females exhibit a more positive attitude towards the use of English than males. Similar findings are observed in the domain of attitudes towards teaching methodology, where females tend to prefer certain methodologies over males. Here, the methodologies mentioned in the questionnaire were included, such as learning through grammatical rules and vocabulary memorisation, as well as learning English in an "All English" environment, to name a few. Conversely, male learners tend to have a more positive attitude towards language skills than females, suggesting the need to include a greater focus on language skills in the

[2] There are two males and one female who scored a GPA of 2.50–2.99 (Table 1).

teaching curriculum for males. Nonetheless, there is no significant difference between genders regarding attitudes towards English acquisition. This result is consistent with the study by Aziz and Barjesteh (2020), who found that gender does not significantly affect students' attitudes toward learning English.

Among the 116 learners, 33 (28.4%) reported experiencing fear or unpleasant feelings when learning English. The primary source of these feelings was a lack of confidence in learning English, followed by fear of being judged by others and fear of making mistakes during the English learning process (Table 5). These results are supported by Adamson (2024), who noted that when the language of instruction is unfamiliar to learners, students tend to be reluctant to speak or remain passive in class. For students learning English as a second or foreign language, speaking and interacting in the language can be distressing, often leading them to remain silent observers in many situations. The findings of this study offer educators new insights into addressing these fears by incorporating strategies into the curriculum to alleviate such concerns.

**Research Question 3. What is the relationship between emotional intelligence with MUET band score and GPA?**

Figure 2 presents a correlation analysis between emotional intelligence with MUET band score and GPA. There is a significant positive correlation between each dimension of emotional intelligence and overall emotional intelligence. Similarly, a significant positive correlation exists between MUET band score and GPA, suggesting a general positive correlation in the population. Meanwhile, Hamdzah et al. (2020) have elucidated a significant and positive relationship between the dimensions of emotional intelligence. On the contrary, a non-significant and weak negative correlation was found between emotional intelligence and MUET band score, as well as GPA. However, a weak positive correlation was found between GPA and managing one's emotions. This suggests that learners with a high level of emotional self-management will score a higher GPA compared to those with a low level of emotional self-management.

**Research Question 4. What is the relationship between attitude towards English acquisition with MUET band score and GPA?**

Figure 3 illustrates the relationship between attitude towards English acquisition and MUET band score, as well as GPA. Figure 3 indicates a significant positive correlation between learners' attitudes and their attitudes towards teaching methodology. Conversely, a significant negative correlation was found between the MUET band score and learners' attitudes towards preferences for language skills. This suggests that learners who score higher on the MUET show a weaker preference for specific language skills, while those with lower scores have a stronger preference for certain aspects of language learning. Higher MUET scorers

may feel more confident in their overall English proficiency, leading them to focus less on specific language skills. In contrast, lower scorers may prioritise certain skills they struggle with. Incorporating skills such as listening or speaking requires additional resources, including textbooks and specially trained teachers. The findings in this research are consistent with those of Sukri et al. (2023), who investigated students' attitudes towards MUET in terms of their preferred language skills. Although the MUET provides equal weightage to the four language skills, i.e., listening, reading, speaking, and writing, students placed speaking as their highest preference. One reason may be that speaking skills are a vital communication tool for interacting with others, which involves many aspects, and it is more than just pronouncing words.

**Research Question 5. What are the significant predictors of GPA and MUET band scores?**

Table 6 shows that emotional intelligence and attitude towards English acquisition together do not account for any additional variance in GPA beyond what would be expected by chance. The unstandardised regression coefficient for emotional intelligence is -0.036, indicating that after controlling for attitude towards English acquisition, a 1-unit increase in emotional intelligence results in a predicted 0.036-unit decrease in GPA. The standardised regression coefficient for emotional intelligence is -0.051, suggesting that a one standard deviation increase in emotional intelligence results in a 0.051 standard deviation decrease in GPA. These findings imply that emotional intelligence does not account for variance in GPA beyond that explained by attitude towards English acquisition, which is also non-significant.

Table 7 assesses which independent variables significantly predict whether a student obtains Band 4 or Band 5 (i.e., the comparison group) versus Band 3 (i.e., baseline). The predictor of attitude towards English acquisition is significant and negative ($b = 2.592$, $SE(b) = 1.100$, $p < 0.05$). This indicates that for each 1-unit increase in this variable, the log odds of a learner achieving Band 5 (relative to Band 3) are predicted to increase by 2.592 units. The odds ratio is 0.075, showing that as scores on this predictor increase, the odds of achieving Band 5 change by a factor of 0.075. Overall, these results suggest that learners with a positive attitude towards English acquisition are less likely to obtain Band 3 and more likely to achieve Band 5 compared to learners with a less positive attitude towards English acquisition.

**Summary and Recommendations**

The primary objective of this study was to investigate the significance of emotional intelligence and attitude towards English acquisition on GPA and MUET band scores. Our study provides empirical evidence that the attitude towards English acquisition emerged as a significant predictor, enhancing the model's predictive capability for MUET band scores. This suggests that it is crucial

to nurture a positive and good attitude in learners, providing the essential support and emotional training to enhance the learning experience. Apart from delivering the syllabus for the course, educators need to integrate and prepare appropriate methods which can be used to enhance the teaching process. Meanwhile, learners need to have a positive attitude toward learning and should discuss any problems they encounter with their educators. Here, English language proficiency is measured by MUET band score, and GPA measures academic performance. According to the correlation analysis, a significant positive correlation exists between the MUET band score and GPA. This illuminates the fact that proficiency in the English language has an impact on students' academic performance. Hence, English language skills must be integrated into the design of the syllabus for the course, depending on the type of the course and programme.

It should be noted that the number and distribution of the responses were the primary limitations of this study. As a result, the findings are more reflective of the learners in this study and do not represent the entire population of learners in pre-university programmes. In addition, due to time constraints, this study was limited to a particular pre-university centre and age group. Upcoming studies may include various age groups to have a better understanding of the effects (if any) of emotional intelligence and attitude towards English acquisition on GPA and MUET band score. In addition, the correlation between English performance in secondary school and MUET band scores in pre-university can be examined to assess transition readiness from secondary to tertiary education. Meanwhile, the interaction between learners' emotional intelligence and teaching styles is worth further exploration. Examining the long-term effects of positive attitudes on language acquisition is also a worthwhile area for future study.

**Theoretical Contribution**

This study contributes to the theoretical understanding of affective factors in second-language acquisition by empirically linking emotional intelligence and attitudes toward English learning to academic performance and language proficiency indicators, which are MUET band scores and GPA, respectively. Drawing on the Socio-Emotional Learning (SEL) Theory, the findings underscore the importance of emotional competence, particularly in managing self and others' emotions, as a foundational skill that supports not only interpersonal interactions but also academic success. The gender differences observed, with females scoring higher in emotional intelligence and GPA, suggest socialisation patterns and emotional regulation strategies that are consistent with SEL's emphasis on emotional scaffolding. These insights highlight the necessity of affective-focussed pedagogical strategies in language education, where emotional readiness and positive learning dispositions play a central role in performance outcomes. By emphasising emotional and attitudinal dimensions, this study encourages a shift

from traditional cognition-centric models to a more holistic framework for understanding learner success in multilingual academic environments.

Moreover, the results lend empirical support to Ajzen's Theory of Planned Behaviour (TPB), with particular emphasis on the component of "attitude toward the behaviour". In this context, learners' positive attitudes toward English acquisition are shown to significantly impact their academic performance, suggesting that behavioural intentions, shaped by emotional readiness and belief systems, play a vital role in educational success. The integration of emotional intelligence and attitude variables into the regression model provides a robust framework for predicting outcomes, positioning this research at the intersection of emotion, cognition, and behaviour. Although emotional intelligence was not a significant predictor of GPA when attitude variables were accounted for, subtle associations between GPA and particular dimensions, most notably, emotional regulation, suggest the possibility of a partial mediation model. This provides future research to investigate how emotional self-regulation interrelates with academic resilience and performance outcomes.

## CONCLUSION

The current study investigated the impact of emotional intelligence and attitudes towards English acquisition on the GPA and MUET band scores among pre-university learners. Here, the academic performance and English language proficiency were represented by GPA and MUET band scores, respectively. Gender differences have always been a key field of research. Significant differences were found between genders concerning the management of others' emotions and total emotional intelligence. This provides a useful lens for looking at the way males and females express their emotions. However, no significant gender differences were observed in attitudes towards English acquisition.

A substantial proportion of learners (17.2%) reported experiencing fear or unpleasant feelings due to a lack of confidence in learning English. The study's results indicated a significant positive correlation between the dimensions of emotional intelligence and overall emotional intelligence. Additionally, a significant positive correlation was found between learners' attitudes towards teaching methodology and their attitudes towards the use of English. Similarly, a significant positive correlation was observed between GPA and MUET band scores, suggesting that the MUET band score tends to increase as GPA increases and vice versa. This implies that English proficiency is important for academic performance.

In contrast, a significant negative correlation was found between learners' preferences for language skills and MUET band scores. Attitude towards English acquisition emerged as the only significant predictor of MUET band scores, underscoring the necessity of fostering positive attitudes among learners. Educators should, therefore, recognise and address learners' attitudes towards English

acquisition, providing the necessary support and emotional training to enhance their learning experience. This approach can raise learners' awareness of the importance of a positive attitude in learning English. The findings from this study are useful for educators and policymakers in designing the syllabus.

It is important to note that this study focussed solely on attitudes and emotional intelligence among pre-university learners. Future research should explore new perspectives, such as the interaction between learners' and educators' emotional intelligence. Additionally, including learners from other degree programmes, such as bachelor's and master's degree programmes, may provide further insights.

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# Social Influence, Hand Hygiene Awareness, and E-wallet Continuance Intention

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## ABSTRACT

Understanding the adoption of cashless payments through e-wallets requires exploring various perspectives, especially from a health risk standpoint. Previous studies have not sufficiently addressed the role of hand hygiene awareness and its complex relationship with subjective norms (or social influence) and continuance intention. Therefore, the purpose of this study is to examine the continuance intention in e-wallet usage, with a focus on the health perspective, specifically hand hygiene awareness. In this study, we collected data from 320 Touch 'n Go e-wallet users in Malaysia through an online survey and convenience sampling. We used Partial Least Squares (PLS) path modelling to test the research model. Our findings show that subjective norms positively influence both hand hygiene awareness and perceived usefulness. Moreover, hand hygiene awareness significantly affects both perceived usefulness and continuance intention to use e-wallets. Theoretically, these results extend existing technology acceptance literature by integrating a health-oriented perspective, particularly in relation to hand hygiene awareness. From a practical perspective, this study provides valuable insights for practitioners on how to promote hygiene behaviour within platform design to retain e-wallet users.

*Keywords:* e-wallet, hand hygiene, health risk, social influence, subjective norms, technology acceptance

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## INTRODUCTION

Advancements in mobile payment technology have revolutionised electronic cashless payments, particularly through

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e-wallets. E-wallets on smartphones enable users to make electronic payments, transfers, and refunds. The use of e-wallets has become increasingly prevalent due to their convenience and ability to facilitate quick, seamless transactions (Fatonah et al., 2018; Nizam et al., 2018). The rapid adoption of e-wallets has also led to higher conversion rates for businesses, as reduced customer waiting times enhance the overall user experience.

In terms of e-wallet adoption, there is a significant disparity across countries due to differences in consumer attitudes, payment infrastructure, and regulatory environments. E-wallets and digital payments serve as tools to increase citizens' access to financial services and boost economic activity, particularly in developing economies (Kasri et al., 2022). China currently exhibits a high adoption rate of e-wallets and is transitioning into a cashless society (Ye & Zhao, 2024). In Malaysia, e-wallets are generally popular among the younger population, but the overall adoption rate of digital payments remains relatively low (Alam et al., 2021; Balakrishnan & Shuib, 2021; Munikrishnan et al., 2024). The Malaysian government has continued to encourage the public to adopt e-wallets as part of its vision to achieve a cashless society (Balakrishnan & Eesan, 2024).

The value and risk barriers influence the use of mobile payment services (Karim et al., 2020). Prior research has extensively applied the Technology Acceptance Model (TAM) to identify the factors driving e-wallet adoption (e.g., Folkinshteyn & Lennon, 2016; Slade et al., 2015; Trivedi, 2016). E-wallets not only enable users to make payments but also allow them to track transactions. On one hand, e-wallet adoption can be attributed to an instrumental or practical perspective, where users find e-wallets or mobile payments easy to use while ensuring security (Amin, 2007; Lew et al., 2020; Pertiwi et al., 2020; Tian et al., 2023). On the other hand, social influence also plays a role, as some consumers feel social pressure to adopt e-wallets due to societal expectations (Rosli et al., 2023; Tian et al., 2023). Additionally, prior studies suggest that individual differences significantly affect the acceptance of e-wallets (Lew et al., 2020; Rosli et al., 2023; Shaikh & Amin, 2025).

In 2018, mobile payments began gaining traction in Malaysia, though e-wallet adoption was still in its infancy (Aji et al., 2020). The COVID-19 pandemic accelerated the adoption of e-wallets, particularly in Malaysia. During the pandemic, many consumers shifted their purchasing habits to online marketplaces and mobile payment (Dinesh & MuniRaju, 2021; Munikrishnan et al., 2024). The World Health Organisation (WHO) also encouraged the public to use cashless payments as a means to promote hand hygiene and help prevent the spread of COVID-19. In line with this, the Malaysian public was reported to have a high level of hand hygiene awareness during the pandemic (Azlan et al., 2020).

To reiterate, the Technology Acceptance Model (TAM) is widely used to examine the factors influencing e-wallet acceptance and

continuance intention. However, the existing literature has largely overlooked the role of health risks, particularly hand hygiene awareness, in conjunction with subjective norms in e-wallet adoption. Specifically, our review indicates that no prior studies have explored the intricate relationships between hand hygiene awareness, subjective norms, and TAM-related variables. To address this knowledge gap, the aim of this research is to examine continuance intention by integrating hand hygiene awareness into TAM, offering a novel perspective in the context of consumer behaviour and consumerism.

## LITERATURE REVIEW

### Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a broadly used theory for predicting the adoption of new technology within a group or organisation (Venkatesh & Davis, 1996, 2000). TAM includes several internal variables, such as behavioural intention to use (BI), perceived usefulness (PU), and perceived ease of use (PEOU) (Figure 1). PU and PEOU are conceptualised as factors influencing the intention to use technology. PU reflects a user's subjective perception of whether a technology can enhance job performance, while PEOU reflects a user's perception of whether a technology is easy to use. Additionally, PEOU influences PU—when users perceive a technology as easier to use, they tend to perceive it as useful. External variables are expected to influence both PU and PEOU and subsequently affect the intention to use the technology.

Building on TAM, Venkatesh and Davis (2000) introduced TAM2, which incorporates two key processes: (i) cognitive instrumental and (ii) subjective norms. The aim of TAM2 is to identify external factors that predict perceived usefulness (PU), perceived ease of use (PEOU), and intention to use, with a particular focus on cognitive instrumental and social influence processes. The model is valuable for examining the effect of these determinants on technology acceptance, as users' experiences increase over time with continued use of the

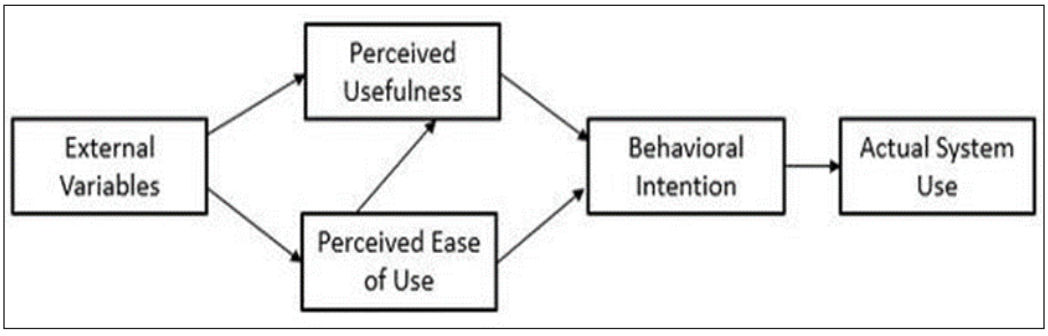



*Figure 1.* Technology acceptance model
*Source:* Venkatesh and Davis (1996)

technology. Prior research has confirmed that cognitive instrumental and subjective norms are indispensable external factors influencing technology acceptance within TAM2 (Wu et al., 2011).

Subsequently, Venkatesh et al. (2003) evaluated several variations of the TAM model and unified them into the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT bears strong resemblance to TAM, with the key differences being that it incorporates subjective norms (SN) into social influence, perceived ease of use (PEOU) into effort expectancy, and perceived usefulness (PU) into a performance expectancy construct. UTAUT identifies several key mechanisms: social influence, effort expectancy, performance expectancy, and facilitating conditions. These four mechanisms are moderated by factors such as age, gender, experience, and voluntariness, all of which influence technology adoption and intention to use.

## Emerging of Mobile Payment and E-wallet Use

Mobile payments refer to the use of a mobile device to conduct a payment transaction, where money or funds are transferred from the payer to the recipient either through an intermediary or directly, without an intermediary (Mallat, 2007). Mobile payment systems have evolved significantly over the past decade due to technological advancements and innovations.

At present, smartphones enable various mobile payment options through technological capabilities, including e-wallet applications. Karim et al. (2020) define an e-wallet as a digital application that keeps a person's credit (or debit) card information to make electronic transactions. A e-wallet can also be understood as a digital version of a leather wallet in which it can store money, cards, coupons, and receipts digitally.

The use of e-wallets can lead to cost reductions while providing convenience for transactions (Nizam et al., 2018). E-wallets offer benefits such as quicker payouts, better tracking, transparent transactions, lowered time consumption, cost savings, and boosted trust, which are advantageous for both vendors and consumers. Several studies have demonstrated that e-wallets provide both convenience and benefits to users (Al-Saedi et al., 2020; Mallat, 2007; Nizam et al., 2018; Teng & Khong, 2021). This reason is that the cashless payment system, where users do not need to pay for purchases with physical cards or cash. In Malaysia, Touch 'n Go, Boost, BigPay, GrabPay, WeChat Pay, and AEON Wallet are the most popular and commonly used e-wallets (Karim et al., 2020).

It is worth noting that COVID-19 had a significant impact on both social and businesses in human societies (Aji et al., 2020). During the pandemic, many countries, including Malaysia, implemented lockdowns as a preventative measure. The World Health Organisation (WHO) encouraged contactless payments in business activities. There was a notable increase in mobile commerce and e-commerce shopping globally during the pandemic (Pantelimon

et al., 2020). Additionally, consumers began seeking more convenient and secure shopping experiences. As a result, e-wallet usage saw significant growth, particularly in Malaysia.

## HYPOTHESES DEVELOPMENT

### Subjective Norms (SN)

Subjective norms (social influence) refer to the tendency of individuals to perform behaviours that are endorsed by significant peers within their social environment (Ajzen, 2020; Amin, 2022). Subjective Norms are also understood as societal pressure on a person to adopt a certain behaviour.

Subjective norms have been shown to enhance perceived usefulness through the processes of internalisation and identification (Venkatesh & Davis, 2000). Even if individuals do not personally favour a behaviour, they may choose to engage in it due to social pressure. Therefore, we expect that e-wallet users experience social pressure from important individuals within their social circle, influencing their perception of the usefulness of e-wallet usage. Thus:

> H1: Subjective norms exhibit a positive effect on perceived usefulness.

Subjective norms are a powerful element in the social influence process, meaning that the behaviour of e-wallet users can be significantly affected by their colleagues and peers. Studies in healthcare settings have suggested that subjective norms can increase the intention to practice hand hygiene among healthcare professionals (Heydarizadeh et al., 2021; Pessoa-Silva et al., 2005). In Malaysia, the public perceived hygiene as an important protective measure against COVID-19 during the pandemic (Azlan et al., 2020). During this period, we expect that improper hand hygiene practices among e-wallet users would likely be disapproved of by their significant peers. Thus:

> H2: Subjective norms exhibit a positive effect on hand hygiene awareness.

### Hand Hygiene Awareness (HHA)

Hand hygiene is a crucial preventive measure against infectious diseases, including COVID-19 (Thomas et al., 2021). However, adherence to hand hygiene practices remains a challenge for the public. A recent study found that only about 40% of healthcare professionals followed proper hand hygiene protocols (Heydarizadeh et al., 2021). This phenomenon can be attributed to factors such as inadequate education, insufficient training, and heavy workloads.

The Malaysian public has been reported to maintain a high level of hand hygiene during the pandemic (Azlan et al., 2020). Increased fear and panic may lead individuals to overinflate their risk perceptions regarding COVID-19 transmission (Pratiwi et al., 2022; Salih et al., 2023). As a result, it is expected that individuals will be more self-regulated in practicing disease preventive behaviours, including wearing masks, practicing social distancing, and maintaining hand hygiene (Lee et al., 2020).

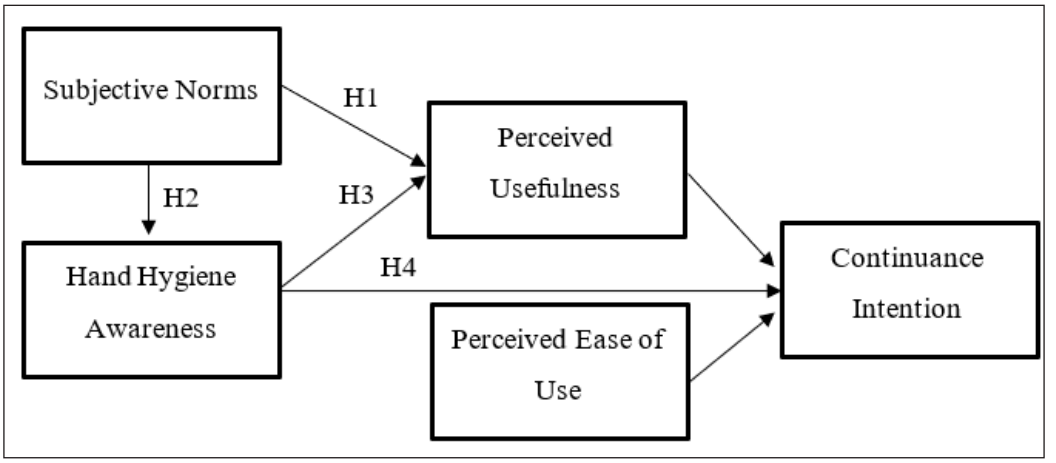



*Figure 2.* Research model

Contactless payment methods, such as e-wallets, offer consumers a way to enhance hand hygiene and reduce the spread of COVID-19. It is likely that e-wallet users exhibited a heightened level of hand hygiene awareness during this period, as they perceived the use of e-wallets to provide instrumental benefits in preventing the transmission of viruses. Therefore, the following hypotheses are proposed:

H3: Hand hygiene awareness exhibits a positive effect on perceived usefulness.

H4: Hand hygiene awareness exhibits a positive effect on continuance intention.

Based on the hypotheses outlined above, a research framework is proposed (Figure 2).

## METHODS

### Sample and Data Collection

In this study, data were collected through an online questionnaire conducted in 2022, prior to the declaration of the end of the public health emergency during the COVID-19 pandemic. The aim of this research was to assess the continuance intention of using e-wallets in Malaysia. In 2022, there were approximately 17.8 million e-wallet users in Malaysia (IDC, 2023). We used a-priori sample size calculator (for structural equation models) to calculate the minimum sample size based on the number of latent variables and indicators (Soper, 2025). The resulting minimum sample size for the model was 173. Due to social distancing measures and movement restrictions during the COVID-19 pandemic, convenience sampling was employed. Questionnaires were distributed via Facebook, Telegram, and WhatsApp. The researchers also encouraged family, friends, and peers who had used the Touch 'n Go (TnG) e-wallet to participate in the survey anonymously. Ultimately, 320 usable responses were obtained from consumers who had used the TnG e-wallet in Malaysia, exceeding the minimum required sample size.

### Research Instruments

The questionnaire was divided into two sections. The first section collected demographic data from respondents, while the second section assessed their perceptions regarding perceived usefulness, perceived ease of use, subjective norms, hand hygiene awareness, and continuance intention to use the TnG e-wallet.

Perceived usefulness measures the extent to which a consumer believes that using the TnG e-wallet can enhance the efficiency and effectiveness of completing transactions. Perceived usefulness (3 items) was adapted from Ramos-de-Luna et al. (2016).

Perceived ease of use measures the degree to which a consumer believes that using the TnG e-wallet would be free of effort. Perceived ease of use (4 items) was adapted from Ramos-de-Luna et al. (2016).

Subjective norms measure the perceived social pressure to use the TnG e-wallet. Subjective norms (3 items) were adapted from Ramos-de-Luna et al. (2016).

Continuance intention measures a consumer's intention to continue using the TnG e-wallet. Continuance intention (3 items) was adapted from Zhao et al. (2016).

Hand hygiene awareness measures the recognition of the importance of proper hand hygiene practices to prevent the spread of infectious diseases. Hand hygiene awareness (3 items) was adapted from van de Mortel (2009).

All measurement items for multi-item variables were assessed using a five-point Likert scale: strongly disagree (=1), disagree (=2), slightly agree (=3), agree (=4), and strongly agree (=5) (Amin, 2022).

## RESULTS

### Demographic Profile of Respondents

A total of 320 respondents participated in this study (Table 1). Of these, 65.9% were male and 34.1% were female. Most respondents (69.1%) were aged between 21 and 24 years, followed by 22.5% in the 17 to 20 age group, and 8.4% in the 25 to 30 age group. The questionnaire also revealed that 95.6% of respondents had attained a university education. In terms of occupation, 88.8% of respondents were students, 6.6% were employed in non-governmental companies, and the remaining participants had various other occupations.

### Measurement Model

In this study, we used Partial Least Squares-Structural Equation Modelling (PLS-SEM) to assess the measurement models (Table 2). The measurement models were evaluated based on outer loadings, internal consistency, and convergent validity to ensure they met the required criteria for reliability and validity (Hair et al., 2019). First, the outer loadings for each construct exceeded 0.7, indicating that indicator reliability was achieved for all reflective constructs (Hair et al., 2019). Second, internal consistency of the constructs was assessed using two measures: Cronbach's alpha (CA) and composite reliability (CR). Internal consistency evaluates the reliability of a set of indicators within reflective

Table 1
*Demographic profile*

| Demographic | Characteristics | Frequency | Percentage (%) |
|---|---|---|---|
| **Gender** | Male | 211 | 65.9 |
| | Female | 109 | 34.1 |
| **Age** | 17-20 years old | 72 | 22.5 |
| | 21-24 years old | 221 | 69.1 |
| | 25-30 years old | 27 | 8.4 |
| **Education Level** | Senior high school | 14 | 4.4 |
| | College / University | 288 | 90 |
| | Graduate school and above | 18 | 5.6 |
| **Occupation** | Student | 284 | 88.8 |
| | Employee of a non-government company | 21 | 6.6 |
| | Self-employed | 4 | 1.3 |
| | Public institutions | 1 | 0.3 |
| | Others | 10 | 3.1 |
| **Monthly Income** | No income | 266 | 83.1 |
| | RM1000 – RM3000 | 40 | 12.5 |
| | RM3001 – RM6000 | 9 | 2.8 |
| | RM6001 – RM9000 | 2 | 0.6 |
| | More than RM9000 | 3 | 0.9 |

constructs. The results showed that the values for Cronbach's alpha and composite reliability for all constructs surpassed the minimum threshold of 0.7, confirming the internal consistency of the reflective constructs.

Finally, convergent validity was assessed to determine whether an item is positively correlated with other items in the same reflective construct (Hair et al., 2019). This validity was measured using the Average Variance Extracted (AVE), where values are expected to exceed 0.50 (Hair et al., 2019). The results indicate that all AVE values are greater than 0.50 (Table 2), confirming that convergent validity has been achieved for all constructs.

On the other hand, discriminant validity was evaluated to ensure that each construct is distinct from others within the path model. The Fornell-Larcker criterion was applied, demonstrating that the square root of the

AVE for each construct is larger than its correlations with other constructs (Table 3) (Fornell & Larcker, 1981). Additionally, the Heterotrait-Monotrait (HTMT) ratio was examined, with all values falling below the recommended threshold of 0.85, thereby confirming discriminant validity (Table 4) (Hair et al., 2019). These results indicate that the path model exhibits adequate discriminant validity.

## Analysis of Structural Model

We used a bootstrapping procedure (5,000 resamples) to estimate the path coefficients, explained variance (R-Square), and predictive relevance (Q-Square) (Hair et al.,

Table 2
*Measurement model*

| Construct | Item | Outer Loadings | CA | CR | AVE |
|---|---|---|---|---|---|
| **Subjective Norm (SN)** | SN1 | 0.91 | 0.91 | 0.94 | 0.85 |
| | SN2 | 0.93 | | | |
| | SN3 | 0.93 | | | |
| **Hand Hygiene Awareness (HHA)** | HHA1 | 0.85 | 0.81 | 0.89 | 0.72 |
| | HHA2 | 0.86 | | | |
| | HHA3 | 0.84 | | | |
| **Perceived Usefulness (PU)** | PU1 | 0.92 | 0.85 | 0.91 | 0.77 |
| | PU2 | 0.92 | | | |
| | PU3 | 0.79 | | | |
| **Perceived Ease of Use (PEOU)** | PEOU1 | 0.87 | 0.91 | 0.94 | 0.80 |
| | PEOU2 | 0.90 | | | |
| | PEOU3 | 0.91 | | | |
| | PEOU4 | 0.89 | | | |
| **Continuance Intention (CI)** | CI1 | 0.91 | 0.88 | 0.93 | 0.81 |
| | CI2 | 0.88 | | | |
| | CI3 | 0.91 | | | |

*Note.* Cronbach's Alpha (CA); Composite Reliability (CR); Average Variance Extracted (AVE)

Table 3
*Fornell and Lacker's Criterion*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| **1. SN** | 0.921 | | | | |
| **2. HHA** | 0.267 | 0.851 | | | |
| **3. PU** | 0.560 | 0.343 | 0.878 | | |
| **4. PEOU** | 0.418 | 0.392 | 0.607 | 0.892 | |
| **5. CI** | 0.615 | 0.363 | 0.641 | 0.539 | 0.901 |

2019). The results of the path analysis are shown in Table 5 and illustrated in Figure 3. The overall explanatory power (R-Square) of the structural model indicates that it accounts for 10.6% of the variance in hand hygiene awareness, 37.4% in perceived usefulness, and 46.8% in continuance intention. Additionally, the (unreported) Q-Square values for all constructs are greater than 0, confirming that the model has sufficient predictive relevance for the endogenous constructs (Hair et al., 2019).

The results indicate that hypotheses H1, H2, H3, and H4 are supported (Table 5). The significant pathways demonstrate that hand hygiene awareness positively influences both perceived usefulness and continuance intention. Additionally, subjective norms have a positive impact on both perceived usefulness and hand hygiene awareness.

## DISCUSSION

The adoption of e-wallets in Malaysia accelerated during the COVID-19 pandemic, a period when health risks became a significant social concern. This study investigates the role of health and social perspectives in shaping consumer behaviour, specifically focusing on the continuance intention to use e-wallets.

Our first hypothesis (H1) posited that subjective norms have a positive effect on perceived usefulness among e-wallet users. Our findings reveal a positive relationship

Table 4
*Heterotrait-monotrait (HTMT) ratio*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| **1. SN** | | | | | |
| **2. HHA** | 0.311 | | | | |
| **3. PU** | 0.633 | 0.412 | | | |
| **4. PEOU** | 0.458 | 0.456 | 0.685 | | |
| **5. CI** | 0.686 | 0.428 | 0.736 | 0.600 | |

Table 5
*Structural model analysis*

| Relation (Hypothesis) | Path Coefficient | P-value | Conclusion |
|---|---|---|---|
| SN → PU (H1) | 0.494 | <0.01 | H1 Supported |
| SN → HHA (H2) | 0.326 | <0.01 | H2 Supported |
| HHA → PU (H3) | 0.235 | <0.01 | H3 Supported |
| HHA → CI (H4) | 0.135 | <0.01 | H4 Supported |
| PU → CI | 0.456 | <0.01 | |
| PEOU → CI | 0.220 | <0.01 | |

*Note.* Subjective Norm (SN); Hand Hygiene Awareness (HHA); Perceived Usefulness (PU); Perceived Ease of Use (PEOU); Continuance Intention (CI)

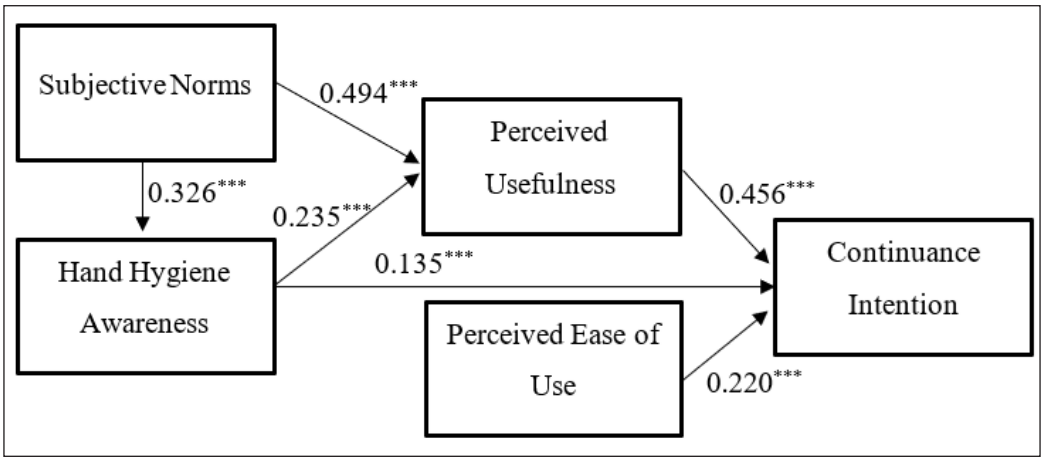



*Figure 3.* The results of research model
*Note.* ***p < 0.01

between subjective norms and perceived usefulness, consistent with prior research in technology acceptance (Izuagbe et al., 2019; Kumar et al., 2020). Subjective norms influence individuals to adopt a behaviour when they perceive it positively and believe that important others expect them to engage in it. The COVID-19 pandemic accelerated e-wallet adoption in Malaysia, and as a collectivist society, social influence through subjective norms appears to shape individuals' perceptions of e-wallet usefulness.

The second hypothesis (H2) proposed that subjective norms positively impact hand hygiene awareness during the COVID-19 pandemic. Our findings suggest that subjective norms positively influence hand hygiene awareness. E-wallet users may acquire strong knowledge about hand hygiene through informal learning processes from their peers. Subjective norms further strengthen hand hygiene awareness among Malaysians e-wallet users. These findings provide preliminary evidence that hand hygiene awareness may play a role like social factors, which are known antecedents of technology acceptance.

The third hypothesis (H3) proposed that hand hygiene awareness has a positive impact on perceived usefulness in the context of e-wallet continuance intention. Hand hygiene awareness is positively linked to perceived usefulness, consistent with previous findings that consumers prefer contactless payment methods for hygiene reasons (Beretta & Neuberger, 2021). Czeisler et al. (2020) argue that individuals adopt hand hygiene practices as preventive measures to reduce the transmission of COVID-19. Our study confirms that the Malaysian public perceives electronic payments to achieve instrumental benefits, particularly maintaining good hygiene to prevent the spread of the virus. As consumers perceive e-wallet usage as

beneficial for achieving this instrumental goal, hand hygiene awareness appears to be an antecedent of e-wallet (or technology) acceptance.

The fourth hypothesis (H4) proposed that hand hygiene awareness positively influences consumers' continuance intention to use e-wallets during the COVID-19 pandemic. This study confirms that hand hygiene awareness positively influences the continuance intention of e-wallet usage. During the pandemic, the Malaysian public became more cautious and adhered to strict hand hygiene practices to prevent virus transmission. Previous research has demonstrated that users' attitudes and health awareness significantly impact mobile application usage (Francioni et al., 2022). Similarly, hospital nurses in Hong Kong exhibited heightened hand hygiene awareness during the COVID-19 outbreak (Sin & Rochelle, 2022). Our findings suggest that greater self-hygiene awareness strengthens the intention to continue using e-wallets in Malaysia. This highlights that individual health awareness can be as important as established technology acceptance model (TAM) variables, such as perceived usefulness (PU) and perceived ease of use (PEOU), in exerting a direct causal role on continuance intention.

## CONCLUSION

This study aimed to address a knowledge gap in technology acceptance by incorporating a health perspective into e-wallet adoption research. Specifically, it examined the continuance intention to use e-wallets, with a focus on hand hygiene awareness. Our findings indicate that subjective norms positively influence both hand hygiene awareness and perceived usefulness among e-wallet users. Additionally, hand hygiene awareness has a positive impact on both perceived usefulness and the continuance intention of using e-wallets. Overall, this study underlines the importance of both health risk and social factors in sustaining e-wallet adoption.

### Theoretical Contributions

Our study offers several significant theoretical contributions to the Technology Acceptance Model (TAM) literature by integrating underexplored perspectives on health risks and social influences. First, while individual risk has become a prominent perspective in technology acceptance, health risk remains largely understudied. This research addresses this gap by proposing and confirming that hand hygiene awareness is a crucial individual risk factor that influences e-wallet adoption. We provide empirical evidence that consumers' hand hygiene awareness was a major determinant of mobile payment adoption during the COVID-19 pandemic. In doing so, our study is among the first to integrate a health risk perspective—specifically, hand hygiene awareness—into the technology acceptance framework, thereby broadening the scope of factors considered in technology adoption research.

Second, this study provides novel insights into the role of social processes, particularly subjective norms, in influencing

both hand hygiene awareness and mobile payment adoption. While existing TAM literature recognises the role of subjective norms in explaining technology acceptance, its link with health risk factors has been missing. Our findings demonstrate that subjective norms, as a form of social influence, enhance hand hygiene awareness, which in turn increases the continuance intention to use e-wallets. This suggests that leveraging subjective norms can be an effective social strategy to promote both public health behaviours and the adoption of contactless payment technologies.

Finally, our research provides empirical evidence for the causal effects of subjective norms and hand hygiene awareness on perceived usefulness. We show that consumers are aware of the instrumental logic behind the common value of society (i.e., subjective norms) when it comes to e-wallet adoption. Furthermore, higher hand hygiene awareness also translates into an enhanced perceived usefulness of e-wallets. These results suggest that consumers are capable of cognitively assessing the effort and potential rewards associated with a technology, which is ultimately reflected in their perception of its usefulness.

### Limitations and Recommendation For Future Research

This study has several key limitations. First, it relied solely on an online questionnaire and convenience sampling, thus limit the generalisability of the findings to the broader population. Second, the study was conducted during the COVID-19 pandemic, a time of heightened public health awareness. As a result, health awareness levels may differ in a post-pandemic context, potentially affecting e-wallet adoption patterns. Third, our findings are specific to the Malaysian population, which may have a relatively high level of hygiene awareness compared to other regions. Future research could address these limitations by examining sociocultural differences in other countries (Siame et al., 2024). Additionally, it would be interesting to explore other health perceptions could provide deeper insights into users' attitudes toward e-wallet adoption beyond hygiene awareness.

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# Integrating Javanese Philosophy into Islamic Education: A Case Study of *Mikul Dhuwur, Mendhem Jero* (Uplift the Dignity, Bury the Secret)

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## ABSTRACT

This study explores the integration of the Javanese cultural philosophy *Mikul Dhuwur, Mendhem Jero* into the Islamic education curriculum in Central Java, Indonesia, and its impact on character development. Employing a qualitative case study design, the research focusses on three Islamic schools that incorporate local cultural values alongside Islamic teachings. The study involves educators, students, and community leaders, selected through purposive sampling to provide rich insights into the integration process. Data were collected through semi-structured interviews, observations, and document analysis, and analysed using thematic analysis. The findings reveal that Mikul Dhuwur, Mendhem Jero, which emphasises respect for elders and humility, is systematically integrated into subjects like Akhlāq (Islamic ethics) and social studies, as well as extracurricular programmes. This integration harmonises cultural and religious values, fostering students' moral and cultural development. Teaching strategies such as storytelling, proverbs, and role-playing are employed to make lessons engaging and relatable. The study highlights the challenges of balancing cultural education with modern academic demands and the need for enhanced

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teacher training in culturally responsive pedagogy. By aligning local wisdom with Islamic teachings, the schools provide a holistic understanding of identity, promoting cultural heritage and moral growth.

*Keywords:* Character development, culturally responsive pedagogy, Islamic education, Javanese philosophy, *Mikul Dhuwur Mendhem Jero*

## INTRODUCTION

Islamic education in Indonesia is deeply interwoven with the diverse cultural traditions of its societies. Among these, Javanese culture holds a prominent place, characterised by its rich philosophical and ethical traditions, which continue to shape social values and practices (Kismini et al., 2023; Prasetya & Junanah, 2018). One of the most significant Javanese philosophical principles is *Mikul Dhuwur, Mendhem Jero*, often translated as "uplift the dignity, bury the secret." This principle emphasises honouring elders and ancestors while maintaining discretion about their imperfections. In the context of Islamic education, integrating this philosophy serves as a means to preserve cultural heritage while fostering moral and spiritual development among students (Haryadi et al., 2024).

Indonesia's historical experience with Islam has resulted in a syncretic approach to religious education, where Islamic teachings have been harmonised with local traditions rather than replacing them entirely (Ricklefs, 2012). This integration is particularly evident in *pesantren* (Islamic boarding schools), which have played a pivotal role in adapting Islamic teachings to Javanese cultural norms (Malik & Maslahah, 2021). Scholars argue that maintaining this balance is crucial to ensuring the relevance of Islamic education in Indonesia's multicultural society (Azra, 2004; Lukens-Bull, 2005).

The philosophy of *Mikul Dhuwur, Mendhem Jero* is deeply embedded in Javanese ethics, emphasising filial piety, respect for elders, and social harmony. When contextualised within Islamic education, this principle resonates with key Islamic values, such as *birr al-wālidayn* (dutifulness to parents) and *'iffah* (maintaining dignity and self-restraint). This alignment suggests that Javanese philosophy can serve as a valuable pedagogical tool in character education, helping students internalise Islamic moral principles through culturally relevant frameworks (Hanaris et al., 2023; Murjito et al., 2015).

By examining the integration of *Mikul Dhuwur, Mendhem Jero* into Islamic education, this study seeks to explore its role in shaping students' character, its impact on moral development, and the challenges faced by educators in its implementation. The findings of this research contribute to the broader discourse on cultural preservation in Islamic education, offering a model for balancing global and local values in a pluralistic society.

In recent years, Javanese philosophy, including the concept of *"Mikul Dhuwur, Mendhem Jero,"* has gained attention not only as a cultural value but also as a form of social capital that underpins educational and community development within the Javanese society (Andriyanto et al., 2022; Kismini et al., 2023; Sudiyana et al., 2023; Zulfiati et al., 2021). This framing is relatively novel in Indonesian educational discourse, as it situates local wisdom within the broader theoretical context of social capital, which emphasises the role of shared norms, trust, and networks in facilitating collective action and social cohesion (Bourdieu, 1986; Putnam, 2000). Philosophically, this approach challenges scholars to move beyond descriptive accounts of cultural practices and engage with the ethical and epistemological dimensions embedded in Javanese philosophy (Kuntowijoyo, 1984). The integration of *"Mikul Dhuwur, Mendhem Jero"* as a framework for educational social capital thus requires a nuanced philosophical discussion that bridges indigenous wisdom with contemporary social theory, offering a culturally specific yet universally relevant perspective on character education and moral development. This study endeavours to address this challenge by articulating the philosophical foundations of the concept and exploring its implications for educational practice.

## LITERATURE REVIEW

### Islamic Education and Cultural Integration

Islamic education in Indonesia has historically embraced cultural hybridity, allowing for the fusion of religious and local traditions (Azra, 2004). The spread of Islam in Java, facilitated by the *Walisongo* (nine saints), was marked by a peaceful adaptation of Islamic teachings to pre-existing cultural practices (Rizqi & Muchtar, 2023). This process of acculturation resulted in a distinctive form of Javanese Islam that is both inclusive and moderate (Hasanah & Rahmah, 2024). Various scholars have examined how this integration manifests in education, particularly within *pesantren*, which serve as key institutions in preserving both religious and cultural identities (Andes, 2024; Malik & Maslahah, 2021).

### Character Education in Islamic Pedagogy

Character education (*tarbiyah akhlāqiyah*) is central to Islamic pedagogy, emphasising the development of virtues such as respect, responsibility, and integrity in accordance with Islamic ethical teachings (Al-Attas, 1980; Halstead, 2004, 2007). In Islamic education, the integration of *akhlāq* (ethics) and *'ilm* (knowledge) is essential to foster students' moral and spiritual growth (Rabbani et al., 2024; Zuraidah et al., 2024). Recent studies have highlighted the effectiveness of incorporating local wisdom into character education, demonstrating how indigenous values can reinforce Islamic ethical teachings (Fakhrurrozi et al., 2023; Mainuddin et al., 2023).

### *Mikul Dhuwur, Mendhem Jero* in Ethical and Educational Contexts

The principle of *Mikul Dhuwur, Mendhem Jero* reflects core Javanese ethical values that

align with Islamic teachings. Traditionally, this philosophy has served as a guide for maintaining familial and social harmony by promoting discretion and respect for elders (Hanaris et al., 2023). In educational settings, this principle can be used to cultivate ethical decision-making, social responsibility, and gratitude among students (Arif et al., 2023; Murjito et al., 2015).

Scholars have explored how local wisdom, including *Mikul Dhuwur, Mendhem Jero*, can be incorporated into modern educational curricula. Ethno-pedagogy, which integrates cultural heritage into education, has been shown to enhance students' character development and cultural awareness (Sakti et al., 2024). Similarly, the inclusion of Islamic ethical values in Indonesia's *Merdeka Curriculum* for English as a Foreign Language (EFL) teaching has proven effective in fostering both academic success and moral development (Hasibuan et al., 2024). Studies also indicate that *pesantren* have successfully blended traditional Islamic teachings with local cultural values to reinforce Islamic identity in a globalised world (Fatahillah et al., 2023).

### Theoretical Perspectives on Cultural Integration in Education

There are two key theoretical frameworks inform this study, i.e., cultural hybridity theory and character education theory. Cultural hybridity theory, as proposed by Bhabha (1994), examines how different cultural elements blend to create new, contextually relevant practices.

Character education theory, as outlined by Lickona (2009), emphasises the role of education in instilling moral virtues. *Mikul Dhuwur, Mendhem Jero* aligns with this framework by fostering respect, gratitude, and ethical discretion—values central to both Javanese and Islamic ethics (Mainuddin et al., 2023; Sukardi, 2016).

The integration of *Mikul Dhuwur, Mendhem Jero* into Islamic education presents a compelling model for character development that is both culturally and religiously grounded. By leveraging local wisdom alongside Islamic teachings, educators can cultivate students' moral integrity while preserving cultural heritage. This literature review provides a foundation for understanding the interplay between Javanese philosophy and Islamic education, offering insights into best practices for incorporating indigenous values into contemporary pedagogical frameworks.

## METHODS

This study employs a qualitative case study design to explore the integration of the Javanese cultural philosophy *Mikul Dhuwur, Mendhem Jero* into the Islamic education curriculum, focussing on its impact on character development and the challenges encountered during implementation. A qualitative case study approach is particularly appropriate for investigating complex social phenomena within their natural contexts, allowing for an in-depth understanding of the dynamic interplay between cultural values and educational practices (Creswell & Poth, 2016; Yin, 2018)

## Research Subjects

The research was conducted in three Islamic schools in Central Java, Indonesia, selected purposively for their active incorporation of local cultural values alongside Islamic teachings. The three Islamic schools selected for this study are located Central Java, a region known for its strong integration of Islamic traditions and Javanese culture. These schools represent a diversity of Islamic educational models, including one *madrasah aliyah* (Islamic senior high school), one *madrasah tsanawiyah* (Islamic junior high school), and one integrated Islamic school that combines national curriculum with Islamic boarding school (*pesantren*) values. The schools are affiliated with *Nahdlatul Ulama*. They were purposively chosen due to their explicit inclusion of local wisdom, especially *Mikul Dhuwur, Mendhem Jero*, within both formal and informal curricula. This technique ensures that the participants have sufficient knowledge and experience to provide rich and meaningful data (Palinkas et al., 2015).

The research subjects include educators (teachers and school leaders), students, and community leaders who are actively involved in the integration of *Mikul Dhuwur, Mendhem Jero* into educational practices. Educators were chosen for their role in designing and delivering lessons that incorporate this cultural principle, while students were included to provide insights into their experiences and character development. Community leaders were selected to offer perspectives on the broader social and cultural context of this integration. The subjects included 15 participants: 6 educators, 6 students (representing different age groups and grade levels), and 3 community leaders.

## Data Sources and Data Collection Methods

Data of this study were collected from multiple sources to ensure a rich and comprehensive understanding of the phenomenon. These sources included semi-structured interviews with educators, students, and community leaders; participant observations of classroom activities, school events, and community interactions; and document analysis of curricula, and lesson plans.

### *Interviews*

Semi-structured interviews were conducted with 15 participants, including educators, students, and community leaders. The interview questions focussed on participants' perceptions of the principle's integration, its influence on students, and the challenges encountered in its application. Semi-structured interviews provided flexibility to explore participants' insights while maintaining a structured focus on the research objectives (Kvale & Brinkmann, 2015).

### *Observations and Document Analysis*

Classroom activities, school events, and community interactions were observed to understand how *Mikul Dhuwur, Mendhem Jero* is practiced in daily educational settings, focussing on teacher, student

interactions, and use of cultural content (Creswell & Poth, 2016). Complementing this, key documents such as curricula and lesson plans were analysed to trace explicit and implicit references to the philosophy and its alignment with Islamic teachings, providing contextual data that supported and triangulated the findings (Bowen, 2009).

### Data Analysis

Thematic analysis was employed to analyse the collected data, following Braun and Clarke's (2006) six-step framework: familiarisation, generating initial codes, searching for themes, reviewing themes, defining themes, and writing the report. This systematic approach facilitated the identification of patterns related to the philosophical integration, pedagogical implications, and implementation challenges of *Mikul Dhuwur, Mendhem Jero* in Islamic education.

To ensure validity and reliability, this study applied methodological triangulation across interviews, observations, and document analysis, and conducted member checking to confirm the accuracy of findings (Bowen, 2009; Denzin, 2012).

## RESULTS AND DISCUSSION

### The Integration of Javanese Philosophy *Mikul Dhuwur, Mendhem Jero* into the Curriculum

The findings reveal that *Mikul Dhuwur, Mendhem Jero,* a Javanese philosophy emphasising respect for elders and humility, has been systematically integrated into the curriculum of the Islamic schools studied. This integration is particularly evident in *Akhlāq* (Islamic ethics), social studies, and extracurricular programmes designed to strengthen students' moral and cultural development (Table 1).

Table 1
*The integration of Javanese philosophy Mikul Dhuwur, Mendhem Jero into the curriculum*

| Aspect | Implementation | Teaching Strategies | Supporting Theories |
|---|---|---|---|
| ***Akhlāq* (Ethics) Education** | Integrated into lessons on *birr al-wālidayn* (respect for parents) and humility. Quranic verses (e.g., Quran 17:23) used to connect Islamic teachings with Javanese values. | Storytelling, use of proverbs, and role-playing to illustrate values. | Culturally responsive pedagogy (Dallavis, 2011; Gay, 2010; Rahman et al., 2024); Narrative cognition theory (Bruner, 1996). |
| **Social Studies** | Used to contextualise historical and social narratives by analysing figures like Ki Hajar Dewantara and local proverbs such as "Becik ketitik ala ketara." | Discussion-based learning, analysis of historical figures, and the use of culturally relevant materials. | Multicultural education (Banks, 2016); Sociocultural theory (Vygotsky, 1978). |

Table 1 *(continued)*

| Aspect | Implementation | Teaching Strategies | Supporting Theories |
|---|---|---|---|
| **Extracurricular Programmes** | Activities such as community service and traditional arts performances reinforce values of respect and humility in real-life contexts. | Experiential learning through hands-on engagement in community projects and cultural events. | Experiential learning theory (Dewey, 1938). |
| **Storytelling as a Teaching Method** | Teachers use narratives from Javanese culture and Islamic traditions, e.g., the story of Sunan Kalijaga. | Engaging stories to bridge abstract concepts with students lived experiences. | Narrative cognition theory (Bruner, 1996). |
| **Use of Proverbs to Reinforce Values** | Proverbs like "Ajining dhiri saka lathi, ajining raga saka busana" are used to teach ethical communication and behaviour. | Reflection and discussion of proverbs in relation to daily life. | Sociocultural theory (Vygotsky, 1978). |
| **Role-playing for Practical Application** | Students act out real-life scenarios that require humility and respect. | Simulation of ethical dilemmas to promote critical thinking and moral application. | Experiential learning theory (Kolb, 1984). |
| **Collaborative Learning to Build Community** | Group projects emphasise respect for others' ideas and leadership with humility. | Cooperative discussions and teamwork-based assignments. | Cooperative learning theory (Johnson & Johnson, 2009). |

*Note. Akhlāq* (Ethics) education: Harmonizing cultural and religious values

The incorporation of *Mikul Dhuwur, Mendhem Jero* into *Akhlāq* education demonstrates how Islamic schools align cultural values with Islamic principles. Document analysis showed that lesson plans explicitly referenced the philosophy within topics on *birr al-wālidayn* (respect for parents) and humility. One lesson, for instance, required students to analyse Quranic verses like "*Wa qaḍā rabbuka allā ta'budu illā iyyāhu wa bil-wālidayni iḥsānā*" (Quran 17:23), linking respect for elders in Islamic teachings with the local concept of honouring family and community traditions.

Teachers emphasised the importance of integrating local wisdom with Islamic teachings, reflecting a philosophical synthesis that resonates with Javanese ethical thought. This synthesis is rooted in the Javanese concept of *rukun* (harmonious social order) and *tepa selira* (empathetic reciprocity), which emphasise maintaining social harmony through respect and humility (Geertz, 1961; Koentjaraningrat, 1985). By embedding these values within Islamic ethics, educators foster a dialogical relationship between indigenous philosophy and religious doctrine, creating a culturally grounded moral framework that supports character formation (Kuntowijoyo, 1984).

Teachers emphasised the importance of integrating local wisdom with Islamic teachings. As one educator stated:

> "*We teach students that respect for parents and elders is not just a cultural expectation but a command in Islam. By connecting Javanese traditions like 'Mikul Dhuwur, Mendhem Jero ' to Islamic principles, we help them appreciate their cultural heritage within a religious framework.*" (Teacher A)

This approach reflects culturally responsive pedagogy, which integrates students' cultural backgrounds into learning to deepen engagement and meaning (Dallavis, 2011; Gay, 2010; Rahman et al., 2024). Using storytelling and proverbs as part of *Mikul Dhuwur, Mendhem Jero* helps students internalise ethical values and connect their cultural identity (Bruner, 1996) with Islamic faith.

### *Social Studies: Contextualising Local Wisdom*

In social studies, *Mikul Dhuwur, Mendhem Jero* was used to contextualise historical and social narratives. Observations revealed that teachers encouraged students to discuss historical figures who embodied these values, such as Ki Hajar Dewantara, a Javanese educator who emphasised humility and community service. Lesson materials also included local proverbs that reinforced these teachings. For instance, the proverb "*Becik ketitik ala ketara*" (Good deeds will be visible; bad deeds will be evident) was used to explain the consequences of ethical and unethical behaviour in society.

This pedagogical approach draws on the Javanese values of *rukun* (social harmony) and *gotong royong* (mutual cooperation), as well as Ki Hajar Dewantara's philosophy of *among* (nurturing) and *tepa selira* (empathetic reciprocity) to foster moral and social responsibility (Geertz, 1961; Koentjaraningrat, 1985; Kuntowijoyo, 1984). By integrating local wisdom like the proverb "*Becik ketitik ala ketara*," which highlights accountability, teachers help students connect cultural identity with ethical learning and community values (Banks, 2016).

Students reported feeling a stronger sense of pride in their heritage as a result of these lessons. One student shared:

> "*Learning about Javanese traditions in our social studies class makes me realise how much wisdom our culture has. It's not separated from Islam—it's part of who we are.*" (Student B)

This sentiment illustrates how the curriculum's philosophical grounding enables students to perceive their cultural heritage and religious faith as intertwined rather than separate domains, fostering an integrated identity that supports both personal and communal development. Such integration is essential in nurturing character and social cohesion in a pluralistic society.

### *Extracurricular Programmes: Beyond the Classroom*

Beyond formal lessons, schools implemented extracurricular programmes to reinforce *Mikul Dhuwur, Mendhem Jero.* Activities such as community service projects and traditional arts performances were organised to encourage students to practice respect and humility in real-life settings. During a community service event observed in this study, students collaborated with local elders, demonstrating deference and gratitude through their interactions.

This holistic approach to curriculum integration draws on Javanese values like *gotong royong* (mutual cooperation) and *rukun* (social harmony), fostering respect, collective responsibility, and cultural identity among students (Geertz, 1961; Koentjaraningrat, 1985). Aligned with Dewey's (1938) experiential learning theory, activities such as community service and cultural performances help students internalise these values through real-life practice.

## Teaching Strategies

Teachers employed a variety of culturally grounded teaching strategies to convey the values of *Mikul Dhuwur, Mendhem Jero,* making the lessons engaging and relatable for students. These strategies included storytelling, the use of proverbs, and role-playing activities.

### *Storytelling as a Teaching Method*

Storytelling was one of the most effective methods observed in this study. Teachers used stories from Javanese culture and Islamic traditions to illustrate the principles of *Mikul Dhuwur, Mendhem Jero.* For example, one teacher narrated the story of Sunan Kalijaga, a Javanese Islamic saint known for his humility and respect for his teachers. During an interview, the teacher explained:

> "*Stories resonate with students because they provide concrete examples of how values like respect and humility can be practiced. They also help bridge the gap between abstract concepts and students' daily lives.*" (Teacher C)

This approach is deeply rooted in Javanese philosophical traditions where storytelling *(carita)* serves as a vital medium for transmitting *ngelmu* (knowledge) and *tatakrama* (ethical conduct). The narrative form aligns with Bruner's (1996) theory of narrative cognition, which posits that storytelling helps learners organise and understand experiences. By embedding ethical values within culturally familiar stories, teachers facilitate not only cognitive understanding but also emotional and moral engagement, fostering internalisation of these principles in a way that resonates with students' cultural identity (Geertz, 1961; Kuntowijoyo, 1984).

This approach is supported by Bruner's (1996) theory of narrative cognition, which posits that storytelling helps learners organise and understand experiences. By presenting values within the context of familiar narratives, teachers made the lessons both memorable and meaningful.

### *Using Proverbs to Reinforce Values*

Javanese proverbs were frequently incorporated into lessons to reinforce the values of *Mikul Dhuwur, Mendhem Jero.* During a classroom observation, a teacher introduced the proverb "*Ajining dhiri saka lathi, ajining raga saka busana*" (One's worth is determined by their words, and their dignity by their attire) in a lesson about ethical communication and personal presentation. Students were encouraged to reflect on how this proverb applied to their behaviour in school and at home.

One student remarked during an interview:

> "*These proverbs help us understand what is expected of us as Javanese Muslims. They are simple but very powerful.*" (Student D)

These proverbs encapsulate core Javanese values like *tepa selira* (empathetic reciprocity) and *rukun* (social harmony), serving as concise philosophical maxims that guide behaviour and social interaction (Koentjaraningrat, 1985). By reflecting on these sayings, students engage in moral reasoning that connects traditional wisdom with contemporary ethical challenges, supporting the development of character in a culturally grounded manner (Vygotsky, 1978).

### *Role-playing for Practical Application*

Role-playing activities provided students with opportunities to practice the values of *Mikul Dhuwur, Mendhem Jero* in simulated scenarios. For example, in one observed *Akhlāq* lesson, students acted out a scenario in which they had to resolve a conflict between peers while showing respect and humility. The activity prompted students to think critically about their actions and their impact on others.

Teachers reported that role-playing helped students internalise the values being taught. As one teacher explained:

> "*When students act out these scenarios, they are not just learning about values—they are practicing them. This helps them apply what they've learned in real-life situations.*" (Teacher D)

This method aligns with Kolb's (1984) experiential learning theory, which emphasises learning through concrete experience and reflective observation. In the Javanese context, role-playing also resonates with the concept of *ngalap berkah* (seeking blessings through proper conduct) and *sabar* (patience), encouraging students to embody virtues through active participation. Such embodied learning fosters moral agency and prepares students to navigate social relationships with empathy and humility, bridging cultural philosophy and practical ethics (Dewey, 1938).

### *Collaborative Learning to Build Community*

Collaborative learning activities were also observed as a key strategy for teaching *Mikul Dhuwur, Mendhem Jero.* Teachers often assigned group projects that required students to work together and practice respect for one another's ideas. For example, during a group discussion about the application of humility in leadership,

students shared examples from their own lives and discussed how these principles could guide their future actions.

This strategy resonates deeply with Javanese philosophical concepts such as *gotong royong* (mutual cooperation) and *rukun* (social harmony), which emphasise the importance of collective responsibility and maintaining harmonious interpersonal relationships within the community (Geertz, 1961; Koentjaraningrat, 1985). By engaging students in collaborative tasks, teachers fostered an environment where these values were not only taught but actively practiced, reinforcing social cohesion and mutual respect as lived experiences.

This strategy aligns with D. Johnson and R. Johnson's (2009) theory of cooperative learning, which emphasises the social and cognitive benefits of working in groups. By fostering collaboration, teachers created a classroom environment where students could practice the values of *Mikul Dhuwur, Mendhem Jero* in their interactions with peers.

Moreover, the collaborative learning approach reflects the Islamic educational principle of *'urf* (custom), which permits the integration of local cultural practices that harmonise with Islamic values (Al-Qaradawi, 2001). This integration exemplifies how Javanese wisdom and Islamic ethics converge to nurture character development, promoting humility, respect, and communal responsibility as foundational virtues.

Dealing with the findings of the integration of the Javanese cultural philosophy *Mikul Dhuwur, Mendhem Jero* into the Islamic education curriculum, it shows that this study aligns with existing literature on culturally responsive teaching and character education. For example, Gay (2010) highlights the importance of integrating students' cultural backgrounds into teaching practices to enhance learning outcomes and affirm cultural identity. Similarly, Lickona (2009) emphasises the role of experiential learning in character education, which is evident in the use of storytelling, proverbs, and role-playing in this study.

Furthermore, recent studies underscore that embedding cultural values into Islamic education curricula not only strengthens students' cultural identity but also enhances moral and spiritual development (Halim, 2021; Munawar & Nursobah, 2024; Murjito, 2015). The collaborative learning activities observed in this study exemplify sociocultural approaches that enrich students' understanding of religious and ethical values while fostering a strong sense of community and shared purpose. Character education is effectively promoted through such interactive and culturally grounded pedagogies that cultivate moral knowledge, emotions, and behaviours (Syarnubi et al., 2023).

## The Impacts of Integrating Javanese Philosophy *Mikul Dhuwur, Mendhem Jero* into the Curriculum

The integration of the values embedded in *Mikul Dhuwur, Mendhem Jero* has had a profound impact on students in the Islamic schools studied. This philosophy, emphasising respect for elders, humility,

and cultural preservation, has influenced students' behaviours, attitudes, and sense of cultural identity. The findings indicate that these impacts extend beyond the classroom, shaping students' interpersonal relationships, engagement with their community, and overall character development (Table 2).

### *Increased Respect for Elders and Peers*

One of the most significant impacts observed was the students' heightened sense of respect for elders and peers. This respect manifested in various ways, such as improved manners, active listening, and collaborative behaviour. During classroom observations, students consistently addressed their teachers and elders using polite language and adhered to formal cultural greetings, such as the *sungkeman* (a gesture of respect in Javanese culture). This behaviour reflects the successful internalisation of *Mikul Dhuwur, Mendhem Jero* through curriculum integration and extracurricular activities.

This phenomenon can be philosophically understood through the lens of Javanese *unggah-ungguh* (ethical conduct) and *tepa selira* (empathetic reciprocity), which emphasise the relational nature of respect as

Table 2
*The impacts of integrating Javanese philosophy Mikul Dhuwur, Mendhem Jero into the curriculum*

| Key Impact Areas | Findings | Supporting Theories & Literature |
|---|---|---|
| **Increased Respect for Elders and Peers** | Students demonstrated improved manners, active listening, and adherence to cultural etiquette, such as sungkeman. These behaviours extended to their families and communities. | Lickona (2009) - Character Education; Vygotsky (1978) - Sociocultural Theory |
| **Fostering Collaboration and Empathy** | Classroom activities like role-playing helped students develop empathy and teamwork. They became more receptive to different perspectives and practiced conflict resolution with respect and humility. | Johnson & Johnson (2009) - Cooperative Learning Theory |
| **Participation in Cultural Preservation Activities** | Students actively engaged in traditional ceremonies (selamatan), arts performances (wayang kulit, gamelan), and community service, strengthening their cultural connection and responsibility. | Banks (2016) - Multicultural Education; Dewey (1938) - Experiential Learning Theory |
| **Strengthening Identity and Belonging** | Students developed a stronger sense of cultural and religious identity, recognising the alignment between Javanese traditions and Islamic values. | Tajfel (2010) - Social Identity Theory; Al-Qaradawi (2001) - 'Urf in Islamic Education |
| **Broader Implications for Character Education** | The integration of local wisdom into education enhanced students' moral development, teamwork, and critical thinking, despite challenges like awareness and infrastructure. | Aziz & Rachmawati (2024); Mansur & Sholeh (2024); Sulasmono (2010); Miranti et al. (2018) |

a dynamic, reciprocal process that sustains social harmony *(rukun)* and collective well-being (Geertz, 1961; Koentjaraningrat, 1985). The act of sungkeman is not merely ritualistic but embodies a profound acknowledgment of social hierarchy balanced with humility, reflecting the core of *Mikul Dhuwur* (uplift the dignity) and *Mendhem Jero* (bury the secret) as lived ethics.

Teachers noted that these changes were particularly evident in students' interactions with their families and communities. For instance, Teacher A explained during an interview:

> "*Parents have shared with us how their children now show more respect at home. They greet their elders with warmth, seek their advice, and are more considerate in their actions. It's clear that the lessons in school are being applied in their daily lives.*" (Teacher A)

Students themselves expressed an awareness of these changes. In an interview, one student commented:

> *"We've learned that showing respect isn't just about following rules—it's about valuing the people around us. It feels good to know we're continuing traditions that are meaningful to our families."* (Student C)

This aligns with Lickona's (2009) framework for character education, which emphasises the cultivation of virtues such as respect and responsibility. Moreover, Vygotsky's (1978) sociocultural theory elucidates how cultural tools and mediated social interactions shape cognitive and moral development. Here, *Mikul Dhuwur, Mendhem Jero* functions as a cultural tool that scaffolds students' internalisation of social norms and moral responsibility, bridging individual development with communal values.

### *Fostering Collaboration and Empathy*

Respect for peers was another notable outcome, as observed in group-based activities within the classroom. Students exhibited a greater willingness to collaborate, share ideas, and support one another. For example, in a role-playing exercise designed to practice conflict resolution, students demonstrated empathy by actively listening to their peers' perspectives before suggesting solutions. This activity provided a practical application of the values taught in class and helped students build stronger relationships with their classmates.

Teacher C highlighted the importance of these exercises:

> *"Role-playing allows students to experience the value of humility and respect first-hand. They learn how to approach conflicts with a calm and understanding attitude, which strengthens their friendships and teamwork."* (Teacher C)

The integration of collaborative learning strategies aligns with D. Johnson and R. Johnson's (2009) cooperative learning theory, which emphasises the social and

cognitive benefits of group interactions. Beyond this, the practice resonates deeply with the Javanese concept of *gotong royong* (mutual cooperation), a foundational cultural value that underscores collective responsibility and social interdependence (Koentjaraningrat, 1985). This cultural framework nurtures *rukun* (social harmony) and *tepa selira* (empathetic reciprocity), fostering an environment where collaboration is not merely a task but a moral and social imperative.

Philosophically, this approach reflects Dewey's (1938) experiential learning theory, which posits that knowledge and values are best internalised through active participation and reflection within social contexts. By embedding *Mikul Dhuwur, Mendhem Jero* within collaborative learning, students do not only acquire cognitive skills but also develop affective dispositions such as humility, respect, and empathy—qualities essential for sustaining harmonious interpersonal relationships and community cohesion.

### *Participation in Cultural Preservation Activities*

Another significant impact of the integration of *Mikul Dhuwur, Mendhem Jero* is the students' increased participation in cultural preservation activities. Through events such as traditional ceremonies, arts performances, and community service projects, students developed a stronger connection to their cultural heritage and a sense of belonging within their communities.

Engagement in Traditional Ceremonies During observations of a traditional *selamatan* ceremony (a Javanese communal prayer event), students played an active role in organising and participating in the event. Tasks included preparing offerings, reciting prayers, and performing traditional dances. These experiences provided students with opportunities to practice the values of respect and humility in a culturally significant context.

In interviews, students expressed pride in their involvement. One student shared:

> *"Participating in ceremonies like the selamatan reminds me of the importance of our traditions. It's a way to honour our ancestors and keep our culture alive."* (Student E)

Promotion of Traditional Arts Participation, such as *wayang kulit* (shadow puppetry) and *gamelan* (Javanese orchestra), further enriched students' understanding of their cultural heritage. During an observation of a gamelan performance at a school event, students demonstrated not only technical skill but also a deep respect for the art form and its cultural significance. Teachers emphasised the importance of these activities in fostering discipline and teamwork.

Teacher B explained:

> *"Traditional arts teach students patience, focus, and respect for the group. These are not just cultural lessons—they are life skills that align with the values of Mikul Dhuwur, Mendhem Jero."* (Teacher B)

This engagement transcends mere participation; it is a form of identity

work that situates students within a living tradition, fostering continuity and resilience of cultural heritage (Banks, 2016). The experiential nature of these activities aligns with Dewey's (1938) emphasis on learning through doing, while also embodying the Javanese philosophical principle of *nguri-uri budaya* (preserving culture) as a moral and communal responsibility. Such involvement nurtures a sense of belonging and ethical commitment that extends beyond the classroom into the wider community.

### *Strengthening Identity and Belonging*

The combined effects of these activities fostered a stronger sense of identity and belonging among students. Interviews and observations revealed that students who engaged in cultural preservation activities were more likely to express pride in their heritage and a commitment to maintaining these traditions. This finding aligns with Tajfel (2010) social identity theory, which posits that individuals derive a sense of self-esteem and belonging from their membership in social and cultural groups.

Students also highlighted how these experiences deepened their understanding of the connection between cultural and religious values. One student remarked:

> *"At first, I thought our culture was separate from Islam, but now I see how they support each other. Learning about Mikul Dhuwur, Mendhem Jero has helped me appreciate both my religion and my culture more deeply."* (Student F)

This synthesis of cultural and religious identity reflects the principle of *'urf* (custom) in Islamic education, which recognises the importance of local traditions in shaping ethical and spiritual development (Al-Qaradawi, 2001). By harmonising Javanese wisdom with Islamic teachings, schools provide students with a holistic framework for identity formation that honours both heritage and faith. This dual identity fosters resilience, moral grounding, and a sense of belonging that is vital in multicultural and pluralistic societies.

The findings of this study align with existing literature highlighting the importance of integrating local wisdom and cultural values into character education in Indonesian schools. Research shows that incorporating local traditions, such as Sundanese culture and Islamic principles, into the curriculum enhances students' moral development, cultural identity, and academic engagement (Aziz & Rachmawati, 2024; Mansur & Sholeh, 2024). Schools have successfully implemented character education through various activities, including project-based learning, cultural expos, and community practices like *sedekah bumi* (Aziz & Rachmawati, 2024; Sulasmono, 2010). These approaches foster values such as religiosity, social responsibility, tolerance, and patriotism (Sulasmono, 2010). The integration of local wisdom into education not only preserves cultural heritage but also contributes to students' holistic development, improving teamwork, critical thinking, and creativity (Aziz & Rachmawati, 2024). While

Table 3
*The challenges and colutions of integrating Javanese philosophy Mikul Dhuwur, Mendhem Jero into the curriculum*

| Challenges and Solutions | Description |
|---|---|
| **Balancing Traditional Values with Modern Educational Demands** | The integration of *Mikul Dhuwur, Mendhem Jero* into the national curriculum faces difficulties due to the emphasis on standardised competencies (math, science, English) over local philosophical values. Teachers struggle to find time within rigid lesson plans, while parents often prioritise academic success over cultural education. |
| **Limited Teacher Training on Integrating Cultural Values** | Teachers lack the necessary training to incorporate *Mikul Dhuwur, Mendhem Jero* into lessons effectively. Traditional teaching methods (lectures, storytelling) are used but do not engage students in critical thinking about cultural values. Teacher training programs currently focus more on academic subjects and classroom management rather than culturally responsive pedagogy. |
| **Aligning Traditional Values with the National Curriculum (Solution)** | A potential solution is contextualising *Mikul Dhuwur, Mendhem Jero* within existing subjects such as Civics, Religious Studies, and Character Education. Using case studies and ethical discussions, educators can bridge cultural and academic objectives. |
| **Involving Parents and Stakeholders (Solution)** | Schools can conduct awareness programmes to highlight the long-term benefits of cultural education. Community engagement initiatives have shown success in shifting parental perspectives to support cultural learning alongside academics. |
| **Enhancing Teacher Training on Integrating Cultural Values (Solution)** | Professional development programmes should focus on culturally responsive teaching strategies, including inquiry-based learning, role-playing, and project-based learning. Workshops should equip teachers with innovative methods to integrate *Mikul Dhuwur, Mendhem Jero* effectively into the curriculum. |

challenges exist, such as student awareness and infrastructure limitations, the overall impact of culturally-rooted character education is positive, suggesting its potential for wider implementation in Indonesian schools (Mansur & Sholeh, 2024; Miranti et al., 2018).

## The Challenges of Integrating Javanese Philosophy *Mikul Dhuwur, Mendhem Jero* into the Curriculum

Integrating the Javanese philosophy of *Mikul Dhuwur, Mendhem Jero* into the curriculum presents significant challenges due to the complexity of balancing traditional values with modern educational demands. These challenges are compounded by balancing traditional values with modern educational demands and limited teacher training on culturally responsive pedagogy (Table 3).

### *Balancing Traditional Values with Modern Educational Demands*

One of the primary challenges in embedding *Mikul Dhuwur, Mendhem Jero* into the curriculum is aligning traditional values with the national curriculum, which prioritises standardised learning outcomes. The

national curriculum in Indonesia emphasises measurable competencies in subjects such as mathematics, science, and English, leaving limited room for the incorporation of local philosophical concepts.

As observed during a curriculum planning session at one of the schools, teachers expressed concerns over the lack of flexibility in lesson plans to include cultural values. Teacher A noted:

> *"We want to teach students about the importance of Mikul Dhuwur, Mendhem Jero, but the curriculum is already packed with so many topics. It's hard to find time for cultural lessons when we're pressured to complete the syllabus."* (Teacher A)

This tension illustrates a common challenge in education systems, where standardised curricula often marginalise local wisdom and cultural contexts (Gay, 2010). It is not only a logistical issue but also an epistemological one: how to design curricula that meaningfully integrate indigenous knowledge alongside mainstream academic content.

Moreover, parents and stakeholders sometimes prioritise academic achievement over cultural education. During an interview, a parent stated:

> *"While I value Javanese culture, I want my child to excel in subjects that will help them secure a good job in the future. Cultural lessons are important, but they shouldn't come at the expense of academic success." (Parent B)*

This perspective underscores the societal pressures schools face to produce graduates competitive in modern job markets, often side-lining cultural education. It reflects a neoliberal discourse that equates education primarily with economic utility, sometimes neglecting the holistic development of students as culturally grounded and ethically aware individuals.

### *Limited Teacher Training on Integrating Cultural Values*

Another significant challenge lies in the limited training that teachers receive in integrating cultural values into their pedagogy. While many teachers are passionate about preserving *Mikul Dhuwur, Mendhem Jero*, they often lack the necessary skills and resources to effectively incorporate these values into their teaching practices.

During classroom observations, it became evident that teachers relied heavily on traditional methods such as lectures and storytelling to convey cultural lessons. While these methods are valuable, they do not fully engage students or facilitate critical thinking about the application of cultural values in contemporary contexts. Teacher B admitted:

> *"We've been teaching cultural values the way we were taught, but I feel we need more innovative strategies to make these lessons relevant to today's students."* (Teacher B)

This insight aligns with Lickona's (2009) framework for character education, which stresses that effective moral and

cultural education requires comprehensive teacher preparation that equips educators with pedagogical tools to foster critical engagement and ethical reasoning. Without such training, teachers struggle to bridge the gap between inherited cultural knowledge and modern educational approaches that emphasise student-cantred learning and critical inquiry.

Additionally, document analysis of teacher training programmes revealed that cultural education is often treated as a secondary priority. Workshops and seminars focus primarily on academic subjects and classroom management, with little attention given to culturally responsive teaching. This lack of institutional support further hinders the effective integration of *Mikul Dhuwur, Mendhem Jero*.

This challenge reflects the need for culturally responsive pedagogy, which views students' cultural backgrounds as assets in learning (Gay, 2010; Ladson-Billings, 1995). Without such training, teachers may struggle to adapt lessons or engage students meaningfully with local values.

Integrating cultural values like *Mikul Dhuwur, Mendhem Jero* into Indonesia's education system offers opportunities to strengthen character and national identity (Arief, 2015), yet faces challenges such as curriculum rigidity and limited teacher training (Ghufron, 2010; Fitriadi et al., 2024). Addressing these requires curriculum reform, professional development, and stakeholder engagement to balance cultural preservation with modern educational demands (Yamin, 2017).

## CONCLUSION

This study enriches the discourse on culturally responsive Islamic education by demonstrating how the Javanese philosophy *Mikul Dhuwur, Mendhem Jero* can serve as a hybrid framework that bridges local wisdom with Islamic moral teachings. Although the study did not initially employ a formal theoretical assumption, the findings contribute to cultural hybridity theory (Bhabha, 1994) by showing how indigenous values and religious principles can co-exist and create new cultural meanings in education. Moreover, it aligns with character education theory (Lickona, 2009) by illustrating that character formation is most effective when grounded in students' cultural identity, fostering virtues like respect, humility, and social responsibility. By contextualising local wisdom within Islamic pedagogy, the study also reinforces the notion that character education is a dynamic process shaped by cultural narratives and social context, adding depth to the theoretical understanding of moral development in multicultural societies.

Practically, the integration of *Mikul Dhuwur, Mendhem Jero* into Islamic education has proven to nurture students' respect for elders and peers, deepen their cultural and religious identity, and encourage active participation in preserving cultural heritage. The use of teaching methods such as storytelling, proverbs, role-playing, and collaborative projects effectively bridges cultural knowledge with daily practice, making character education more engaging and meaningful. However, challenges

remain, including the rigidity of the national curriculum and limited teacher training in culturally responsive pedagogy. Addressing these requires systemic support: curriculum flexibility, professional development focussed on cultural integration, and stronger partnerships with parents and community leaders. Overall, this integration demonstrates that local wisdom is not merely supplementary content but a vital pedagogical resource for holistic education that honours both cultural heritage and religious values.

This study highlights the transformative potential of integrating local wisdom into Islamic education, encouraging a shift from static moral instruction to dynamic, student-cantered approaches. Teachers equipped with concrete pedagogical frameworks, such as inquiry-based discussions, role-playing, and interdisciplinary lessons, can help students critically engage with cultural values and apply them to real-life ethical dilemmas, thereby deepening understanding and character development.

This research was limited to three Islamic schools, which may not reflect the broader educational context in Indonesia. The qualitative design, while offering rich insights, limits the generalisability of findings. Additionally, reliance on self-reported data from participants could introduce bias.

Future research could explore the long-term impact of integrating local wisdom on students' character development and academic achievement across a broader range of school contexts to better understand its sustained effectiveness. It would also be valuable to conduct comparative studies between schools that incorporate cultural values and those that do not, in order to evaluate differences in student engagement, identity formation, and overall learning experiences. Additionally, further investigation into innovative and student-cantered teaching strategies, such as inquiry-based learning, interdisciplinary integration, and reflective practices, could offer practical insights on how to blend cultural education with modern pedagogical approaches, ensuring its continued relevance in an increasingly dynamic educational landscape.

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# Penelitian Sistematik Kajian Intervensi Promosi Kesihatan Mental Belia: Jurang Kandungan, Pendekatan dan Pengukuran Domain Penjagaan Kendiri

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## ABSTRAK

Belia adalah aset negara yang berpotensi meningkatkan ekonomi melalui pencapaian akademik dan kemahiran kerjaya. Mendepani abad ke-21 mencabar belia dari aspek kehidupan, ekonomi dan kerjaya yang memberi impak kepada tahap kesihatan umum terutamanya kesihatan mental. Masalah kesihatan mental ini terus meningkat pada tahap membimbangkan walaupun pelbagai inisiatif telah dilaksanakan. Kajian sistematik ini menggunakan pangkalan data literatur elektronik PubMed dan Scopus dengan carian mulai 1 Jan 2018 hingga 31 Dec 2024 dengan menggunakan PRISMA-ScR berdasarkan populasi belia di kolej dan universiti (P), penggunaan aplikasi digital (I), isu atau jurang intervensi kesihatan mental sedia ada sebagai konteks (C), dan keberhasilan intervensi berdasarkan domain sebagai output (O). Artikel dipilih berdasarkan kriteria: jurnal penuh dapat diakses, dalam bahasa Inggeris atau Melayu serta semakan kepada kajian primer berfokuskan jurang kandungan; pendekatan dan pengukuran domain penjagaan kendiri melalui intervensi aplikasi digital. Lapan artikel memenuhi kriteria semakan kualiti. Terdapat tiga artikel dari Malaysia; satu dari Singapura; satu dari Kanada; satu dari Afrika Selatan dan dua dari Amerika Syarikat. Satu artikel menggunakan kaedah campuran, empat percubaan terkawal rawak, satu kuasi-eksperimen dan dua kaedah kuantitatif. Kekurangan sokongan daripada ahli keluarga, dan masyarakat setempat, kurang ketersediaan sokongan lingkungan untuk belia, masalah kehidupan serta tekanan kepada pencapaian akademik dan peluang kerjaya yang kurang memuaskan merupakan antara pengukuran domain jurang keberhasilan yang dikenalpasti.

*Kata Kunci:* Belia, domain, intervensi, jurang, kesihatan mental

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# *Systematic Review of Youth Mental Health Promotion Intervention Studies: Gaps in Content, Approach, and Measurement of Self-care Domains*


## *ABSTRACT*

*Youth is a national asset that has the potential to improve economic growth through academic achievement and career skills. The 21st century challenges youth from aspects of life stress, economy deprivation, and career enhancement that impact the level of general health, especially mental health. The mental health problem continues to rise at an alarming level despite various initiatives being implemented. A systematic review using the electronic literature databases PubMed and Scopus was conducted from 1 Jan 2018 to 31 Dec 2024 using PRISMA-ScR based on the youth population in colleges and universities (P), digital applications usage (I), existing mental health intervention issues or gaps as context (C), and intervention achievement based on the domain as output (O). Articles were selected based on the following criteria: full-text journals of English or Malay languages, primary studies that focussed on content gaps; approach and self-care domain measurement through digital application interventions. Eight articles met the quality assessment checklist criteria. There were three from Malaysia; one from Singapore; Canada and; South Africa and another two from United States. Only one article using mixed methods, there were four using randomised controlled trials, one quasi-experiments, and two quantitative methods. Lack of support from family members and the local community, insufficient environmental support for youth to practice healthy lifestyles in promoting mental health, facing life event problems, emphasis on academic achievement, and less satisfactory career opportunities are among the factors identified in the output measurement.*


Keywords: *Intervention, gaps, mental health, self-care domain, youth*

## LATAR BELAKANG KAJIAN

Isu kesihatan mental yang kian meningkat secara mendadak tanpa kawalan hari ini berlaku hampir di semua negara sejak tahun 2020, yang sering dikaitkan dengan impak pandemik COVID-19. Perubahan drastik seperti sekatan, kehilangan pekerjaan, penutupan sekolah dan institusi pendidikan serta kegawatan ekonomi menjadi faktor utama yang menyumbang kepada krisis kesihatan mental di Malaysia (Gopinathan et al., 2022) seperti stres, kebimbangan dan kemurungan dalam kalangan belia khususnya. Selain itu, golongan belia juga turut berdepan dengan risiko gangguan mental yang mengakibatkan mereka lebih terdedah kepada kadar jangkitan HIV yang tinggi, penggunaan bahan dan keganasan yang tinggi sebagaimana di laporkan di Afrika Selatan (Mindu et al., 2023). Terdapat beberapa faktor lain yang menyumbang kepada peningkatan masalah kesihatan mental. Masalah stigma peribadi, penyakit mental yang tidak

dirawat, lewat atau bertangguh dalam mendapatkan perkhidmatan kaunseling (Lars et al., 2024; Zulkiply et al., 2023) dan rawatan kesihatan mental; masalah kewangan; ketidaksamaan sosio-ekonomi; kurang akses kepada perkhidmatan kesihatan (Henderson et al., 2013) serta isu pengangkutan bagi mereka yang tinggal di kawasan pendalaman dan luar bandar sering dilaporkan. Secara tidak langsung, faktor ini telah menjadi jurang utama yang menghalang keberhasilan dan kejayaan sesuatu intervensi kesihatan mental yang dijalankan oleh pihak bertanggungjawab.

Perasaan tekanan atau sinonimnya dikenali sebagai stres merujuk kepada ketegangan mental, emosi dan fizikal yang dialami oleh individu yang tidak dapat menangani situasi semasa serta memberi ancaman negatif terhadap dirinya (Tay et al., 2022). Kebimbangan pula merujuk perasaan takut, gementar dan gelisah apabila bertindak balas terhadap tekanan yang dirasai menyebabkan seseorang berpeluh, tegang, dan mempunyai degupan jantung yang cepat. Manakala, kemurungan pula adalah satu keadaan seseorang mengalami episod tekanan dalam tempoh berpanjangan yang diikuti dengan simptom *dysthymia* seperti mood yang rendah, kehilangan minat, kurang keseronokan serta tidak bertenaga seperti orang yang sihat mental (World Health Organisation, WHO; 2021). Justeru itu, objektif utama kajian sistematik ini adalah untuk mengenalpasti jurang kandungan, pendekatan dan pengukuran domain penjagaan kendiri dalam intervensi promosi kesihatan mental belia sedia ada di dalam dan luar Malaysia.

## SOROTAN KAJIAN

Menurut keputusan yang diperoleh daripada Kajian Kesihatan dan Morbiditi Kebangsaan, lebih sepertiga (29.2%) rakyat Malaysia berumur 18 tahun ke atas mengalami masalah kesihatan mental (Institute of Public Health, 2019). Menteri Kesihatan Malaysia juga turut mengesahkan bahawa talian bantuan psikososial telah menerima 307,673 panggilan sejak Mac 2020, dengan 74.3% daripada pemanggil menghubungi khusus untuk meminta sokongan emosi serta kaunseling kerana kebimbangan, tekanan dan kemurungan. Belia murung berleluasa dalam kalangan mereka yang berumur 18 tahun ke atas, dengan 2.3% terjejas (kira-kira 500,000 orang) (Gopinathan et al., 2022). Kajian Institut Penyelidikan Pembangunan Belia Malaysia berkaitan Indeks Belia Malaysia (IBM'22) mendapati skor indikator kesihatan mental hanya 88.56% dengan skor domain kesejahteraan mental dan fizikal pula hanya pada aras 72.23%.

Di peringkat global, Tinjauan Tekanan dan Kesihatan Afrika Selatan turut mendedahkan sebanyak 16.5% belia di negara tersebut mengalami gangguan mental biasa yang terdiri daripada simptom kebimbangan, gangguan mood, kawalan impuls dan kecenderungan penggunaan bahan terlarang seperti dadah. Manakala, laporan kesihatan Finland pula melaporkan bahawa sebanyak 14.4% belia, melawati pusat perkhidmatan kesihatan mental untuk mendapatkan sokongan (Tornivuori et al., 2023). Belia sering mengelak daripada mendapatkan bantuan professional dan

khidmat kaunseling yang disediakan di sekolah dan universiti sebaliknya mencuba untuk meringankan beban emosi dengan penggunaan bahan terlarang seperti vaping, merokok, pengambilan alkohol dan dadah (Talebi et al., 2013). Antara penyebab kepada kelewatan mendapatkan rawatan kesihatan mental adalah disebabkan takut akan stigma persepsi dan penerimaan masyarakat terhadap diri mereka, rasa malu, persepsi negatif terhadap kerahsiaan data peribadi, ketidakpastian akan keberkesanan rawatan atau terapi (Ibrahim et. al., 2020). Belia sering beranggapan orang lain tidak memahami masalah mereka, berpandangan bahawa masalah tekanan cuma simptom biasa, kurang pemahaman mengenai penyakit dan keperluan mendapatkan rawatan dengan segera, sesi rawatan yang terhad, senarai menunggu yang lama, pernah diberikan layanan yang buruk, bersikap prejudis dan berat sebelah oleh kakitangan di pusat perkhidmatan kesihatan mental serta rasa mampu menguruskan diri sendiri walaupun kurang pengetahuan berkenaan penjagaan kesihatan mental secara kendiri (Harrer et. al., 2019).

Kajian menunjukkan gangguan kemurungan merupakan penyumbang terbesar kepada kesihatan yang tidak membawa maut dengan prevalens 4.5% hingga 18.5% dalam tempoh 12 bulan atau setahun (Harrer et al., 2021). Gangguan kebimbangan disenaraikan sebagai penyakit keenam yang berisiko dialami belia dan ia berada pada tahap kritikal bagi negara yang mempunyai golongan muda berpendapatan rendah dan sederhana (Zulkiply et al., 2023). Belia di Malaysia juga tidak terkecuali terutamanya pelajar universiti, yang dianggarkan 29.2% mengalami gangguan mental dan 11.0% lagi mengalami tahap kemurungan yang kronik (Ibrahim et al., 2020). Berdasarkan kepada beberapa kajian terdahulu, gangguan tekanan tinggi pula dilaporkan berleluasa dalam kalangan belia berumur 18 tahun hingga 34 tahun melebihi 75% sehingga hampir 60.8% pelajar kolej mengalami kebimbangan, 38.2% berasa sangat tertekan menyebabkan mereka sukar berfungsi dengan baik serta 10.4% mempunyai keinginan yang serius untuk cubaan membunuh diri (Huberty et al., 2019) yang menjadi faktor utama peningkatan kes kematian dalam kalangan belia (15 tahun hingga 24 tahun).

Masalah stigma sosial, sumber pengetahuan yang terhad, kesuntukan masa; kekurangan keterbukaan emosi, bimbang privasi diketahui umum serta masalah pendapatan atau kekangan kewangan merupakan penyumbang terbesar kepada risiko kesihatan mental dalam kalangan belia terutamanya di Malaysia sehingga mengakibatkan kemurungan biasa bertukar menjadi kemurungan yang kronik (Tay et al., 2022). Malahan, pelajar – pelajar di kolej mahupun universiti yang diberi kebebasan autonomi oleh ibu bapa dan keluarga turut terbeban dengan tuntutan dan harapan mereka seperti belajar mengurus kewangan, mengimbangi beban kerja akademik seiring dengan aktiviti kokurikulum di institusi akademik serta membuat pilihan kerjaya pada hujung semester (Huberty et al., 2019). Tuntutan ini menyebabkan golongan belia kerap mengalami kebimbangan, kesunyian, kemurungan, gangguan tidur,

cuba mengambil minuman alkohol, kurang senaman dan aktiviti fizikal, tabiat pemakanan yang tidak sihat dan timbul idea atau keinginan membunuh diri apabila gagal mengawal emosi dan tekanan hidup (Lattie et al., 2020).

## METODOLOGI KAJIAN

### Strategi Carian

Protokol kajian semakan sistematik terhadap penyelidikan asal kajian menggunakan data primer telah didaftarkan di bawah skop sintesis tanpa meta-analisis (SWiM) dalam sistem PROSPERO (Daud et al., 2024). PubMed dan Scopus telah digunakan sebagai pangkalan data utama bagi mengumpulkan kajian dalam bidang kesihatan berimpak tinggi bagi membantu proses penerbitan jurnal. Carian ulasan adalah berdasarkan TITLE-ABS-KEY (garis ATAU gariskan ATAU menggariskan) DAN (jurang ATAU halangan ATAU cabaran ATAU isu) DAN (intervensi pendidikan kesihatan mental ATAU strategi pengurusan kesihatan mental ATAU intervensi kendiri) DAN (stres ATAU tekanan) (Kebimbangan ATAU *Anxiety*) DAN (Kemurungan ATAU *Depression*) DAN (dalam kalangan) DAN (belia ATAU orang muda ATAU remaja). Jadual 1 menunjukkan kaedah dan instrumen kajian.

### Pemilihan Kajian

Berpandukan tajuk dan abstrak kajian serta kriteria kemasukan iaitu artikel berbentuk jurnal, ditulis dalam bahasa Inggeris atau Melayu, dan diterbitkan antara 1 Januari 2018 dan 31 Disember 2023 telah dipilih melalui kaedah saringan dan penilaian secara teliti. Artikel berbentuk *review, editorial, commentary, atau conference abstrac*t tanpa teks penuh dan kajian yang tidak berkaitan secara langsung dengan objektif kajian ini adalah dikecualikan. Model PICO diaplikasi bagi mengenalpasti populasi sasaran, jenis intervensi, kumpulan perbandingan untuk intervensi, dan hasil kajian dipilih (Jadual 2).

Jadual 1
*Kaedah dan instrumen kajian*

| No. | Kaedah | Alat / Instrumen |
|---|---|---|
| 1 | Pendaftaran | PROSPERO |
| 2 | Strategi Carian | *Sintesis tanpa meta-analisis (SWiM)* (Campbell et al., 2020) |
| 3 | Pemilihan Kajian | Model PICO (populasi=belia 18 - 30 tahun; Intervensi= aplikasi digital penjagaan kesihatan mental; Output kajian=domain dan jurang intervensi) |
| 4 | Pengekstrakan Data | Model CIPP (C=penyusunan kandungan; I=jurang intervensi; pendekatan dan pengukuran domain; P= Proses implementasi; P=hasil produk yang sedia diuji) |
| 5 | Penilaian Kualiti | *Alat Penilaian Kaedah Campuran (MMAT=mixed methods appraisal tool)* (Hong et. al., 2018) |
| 6 | Dapatan Kajian (termasuk kajian) | Carta Alir PRISMA 2020 |

Jadual 2
*Penerangan strategi PICO*

| Akronim | Definisi | Penerangan |
|---|---|---|
| P | Populasi rujukan | Belia berumur 18-30 tahun yang tidak diketahui tahap kesihatan mental<br>Kriteria pengecualian: belia mempunyai rekod masalah atau gangguan kesihatan mental |
| I | Intervensi | Aplikasi digital sedia ada yang dibangunkan sebagai strategi penjagaan kesihatan mental |
| C | Kawalan dan perbandingan | Kumpulan kawalan adalah belia yang menerima penjagaan piawai atau tidak melalui proses intervensi |
| O | Dapatan kajian | Ketidakberhasilan dan ketidakberkesanan pelaksanaan aplikasi digital kesihatan mental (kenalpasti jurang intervensi) |

### Pengekstrakan Data

Kriteria Model CIPP (Lee et al., 2019) telah diaplikasikan dalam menentukan pelbagai kaedah dan disiplin untuk penilaian program. Bagi proses pengekstrakan data, piawaian Model CIPP telah digunakan oleh pengarang pertama (NIAMD), diikuti dengan semakan oleh pengarang kedua (RS) bagi pengesahan data yang diekstrak.

### Penilaian Kualiti

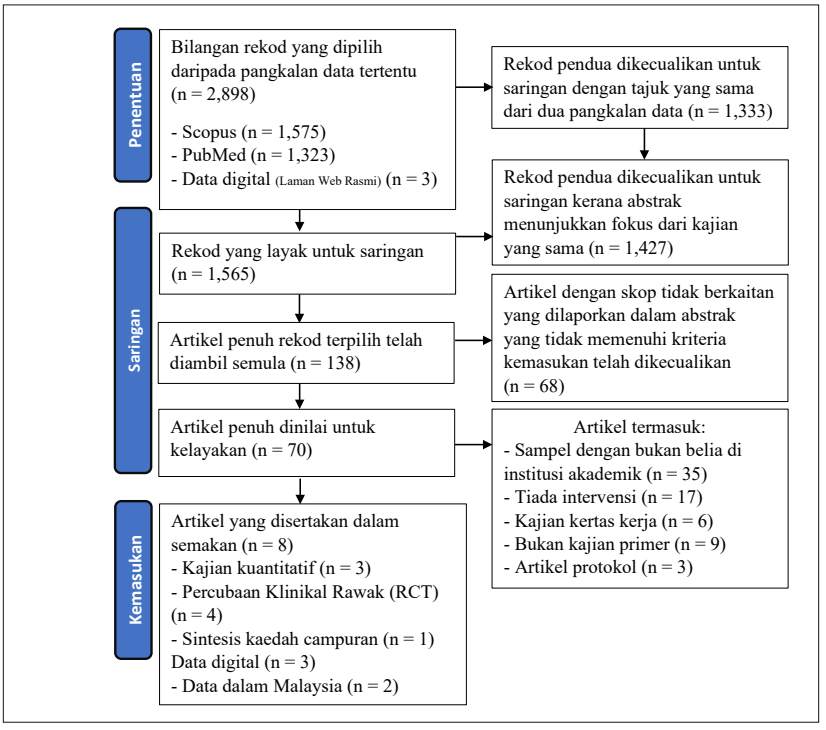
Satu kaedah ringkas dinamakan Alat Penilaian Kaedah Campuran (MMAT) (Hong et al., 2018) yang digunakan bagi mengekstrak sorotan kajian serta membantu penyelidik memilih kajian empirikal berkualiti secara kritis bagi mengelakkan risiko berat sebelah dalam penilaian kualiti kajian. Selain itu, lima reka bentuk penyelidikan telah dimasukkan dalam MMAT dengan mengasingkan kertas teori, artikel berbentuk ulasan dan kertas bukan empirikal tidak berkaitan dengan kajian serta data digital melalui laman web (sesawang) rasmi bagi meneruskan penilaian kualiti.

## DAPATAN KAJIAN

### Ciri-ciri Kajian

Berdasarkan kepada hasil semakan bukti kajian yang diperolehi daripada dua pangkalan laman data utama yang dipaparkan pada Rajah 1, sebanyak 2,898 artikel berkaitan intervensi kesihatan mental telah dikenalpasti, dianggarkan hanya 1,333 artikel sahaja yang dikekalkan selepas proses pengecualian artikel pendua dilakukan. Seterusnya, semakan kedua dibuat berdasarkan kepada pengecualian kepada tahun penerbitan, abstrak tidak berkaitan serta objektif kajian yang tidak relevan. Saringan semakan semula mendapati hanya 8 artikel Sahaja beserta dengan 3 data digital rasmi berkaitrapat dengan kajian dan memenuhi kriteria pemilihan (Jadual 3).

Berdasarkan kepada senarai semak SWiM, beberapa kategori artikel yang berjaya dinilai dan diringkaskan terdiri daripada dua kajian kuantitatif, satu kajian *Quasi-experimental*, satu kajian kaedah campuran serta sebanyak empat kajian lagi




*Rajah 1.* Gambar rajah alir pada pengekstrakan data menggunakan Carta Alir PRISMA 2020

merupakan Percubaan Klinikal Rawak. Tiada kajian kualitatif yang terpilih bagi ulasan sistematik ini. Seterusnya, semua kajian menggunakan Model Intervensi Internet dan Sesawang Pendidikan (Hamdani et al., 2022; Mindu et al., 2023; Zulkiply et al., 2023), namun, terdapat satu kajian mengaplikasikan teori seperti Tingkah Laku Kognitif dan Reka Bentuk Sistem Persuasif (Gopinathan et al., 2022) dalam penyelidikan mereka. Kajian semula mencatatkan seramai 1,416 belia yang tidak diketahui masalah kesihatan mental terdiri daripada 782 dalam kumpulan intervensi dan 634 dalam kumpulan kawalan. Ringkasan dapatan kajian, termasuk maklumat PICO, bukti semakan sistematik artikel, serta perbandingan intervensi kesihatan mental di peringkat Malaysia dan antarabangsa, domain intervensi pakej pendidikan penjagaan diri untuk kesihatan mental belia, ditunjukkan dalam Jadual 4 hingga Jadual 6 dan Rajah 2.

## PERBINCANGAN

Data epidemiologi yang telah dikeluarkan oleh pihak Kementerian Kesihatan Malaysia (KKM) pada tahun 2015 telah mengenalpasti berlakunya peningkatan masalah Kesihatan mental adalah terdiri daripada golongan belia sebanyak tiga kali ganda berbanding pada tahun 1990-an daripada 10% kepada 29% (Gopinathan et al., 2022). Ini adalah

Jadual 3
*Senarai 8 artikel terpilih bagi kajian semakan sistematik*

| Bil. | Penulis | Tajuk | Jenis Kajian (Negara) | Saiz Sampel |
|---|---|---|---|---|
| 1 | Zulkiply et al. (2023) | *Effect of 'Kuat' a Theory and Web-Based Health Education Intervention on Mental Health Literacy among Universiti Students: A Study Protocol.* | RCT (Malaysia) | N = 122 (61 kumpulan intervensi dan 61 kumpulan kawalan) |
| 2 | Mindu et al. (2023) | *Digital Mental Health Interventions for Young People in Rural South Africa: Prospects and Challenges for Implementation* | Kajian Kaedah Campuran (Afrika Selatan) | N = 93 |
| 3 | Ibrahim et al. (2020) | *The Effectiveness of a Depression Literacy Programme on Stigma and Mental Help-Seeking among Adolescents in Malaysia: A Control Group Study with 3-Month Follow-Up.* | Kajian Kuasi-eksperimen (Malaysia) | N = 101 (53 kumpulan intervensi dan 48 kumpulan kawalan) |
| 4 | Lindow et al. (2020) | *The Youth Aware of Mental Health Intervention: Impact on Help-seeking, Mental Health Knowledge, and Stigma in U.S. Adolescents* | RCT (Amerika Syarikat) | N = 436 (286 dari Montana, 150 dari Texas) |
| 5 | Tay et al. (2022) | *Impact of the HOPE Intervention on Mental Health Literacy, Psychological Well-being and Stress Levels amongst University Undergraduates: A Randomised Controlled Trial* | RCT (Singapura) | N = 174 (57 peserta setiap kumpulan) |
| 6 | Lee & Jung (2018) | *Evaluation of an Mhealth Apps (Destressify) on university Students' Mental Health: Pilot Trial* | Kajian Kuantitatif (Kanada) | N = 163 (86 kumpulan kawalan; 77 kumpulan intervensi) |
| 7 | Gopinathan et al. (2022) | *Awareness of Behavioural Intervention Strategies in Curbing Mental Health Issues among Youth in Malaysia* | Kajian Kuantitatif (Malaysia) | N = 103 |
| 8 | Huberty et al. (2019) | *Efficacy of the Mindfulness Meditation Mobile App "Calm" to Reduce Stress among College Students: Randomised Controlled Trial.* | RCT (Amerika Syarikat) | N = 88 (43 kumpulan intervensi dan 45 kumpulan kawalan) |

Jadual 4
*Maklumat kajian berdasarkan PICO*

| P (Populasi Kajian) | I (Intervensi Kajian) | C (Kawalan Kajian) | O (Kesan Kajian) |
|---|---|---|---|
| Belia prasiswazah di universiti<br>Pelajar sarjana sepenuh masa<br>Remaja (NGO - sekolah berasrama penuh) | Program pendidikan kesihatan mental menggunakan booklet<br>Aplikasi kesihatan mental mudah alih atau digital<br>Sesi menjawab soal selidik dalam talian | Senarai menunggu; penjagaan piawai (tidak menerima sebarang intervensi) | Domain sebagai faktor masalah kesihatan mental<br>Jurang intervensi sedia ada |

Jadual 5
*Jadual bukti semakan sistematik artikel*

| Rujukan Artikel | Konteks Matlamat/ Objektif Strategi-PICO | Input Kumpulan Intervensi (IG) Kumpulan Kawalan (CG) Masa & Susulan Instrumen/ Aplikasi | Proses Limitasi/Jurang Intervensi Domain Penjagaan Kendiri | Produk Tindakan/Cadangan (Penambaikan Intervensi) |
|---|---|---|---|---|
| Zulkiply et al. (2023) | **Objektif:** untuk menilai keberkesanan aplikasi dan kualiti hidup dalam kalangan pelajar universiti. | **IG:** Menggunakan aplikasi *DeStressify* 5 hari seminggu selama 4 minggu dengan arahan yang baik<br>**CG:** Senarai menunggu<br><br>**Masa & Susulan:** Sebelum dan selepas 8 minggu<br>**Instrumen:** Soal selidik | **Limitasi/Jurang:**<br>- Kesan penutupan dan penyekatan COVID-19<br>- Bebanan isu kesihatan mental<br>- Kurang pengetahuan mengenai kesihatan mental<br>- Kekurangan sokongan moral semasa program intervensi<br>- Kaedah penyampaian intervensi tidak berkesan<br>- Tiada aktiviti susulan dilakukan<br>**Domain:**<br>1. Celik kesihatan mental<br>2. Epidemiologi dan faktor risiko gangguan mental<br>3. Tanda; gejala kebimbangan dan kemurungan<br>4. Perkhidmatan penjagaan kesihatan mental yang tersedia<br>5. Strategi bantu diri.<br>6. Keberkesanan intervensi pendidikan kesihatan | - Laman web intervensi ini perlu dikekalkan untuk terus memberi sokongan bagi menambahkan keberkesanan intervensi terhadap pengguna. |
| Mindu et al. (2023) | **Objektif:** untuk menguji keberkesanan awal, kebolehlaksanaan dan kebolehterimaan Aplikasi mudah alih CalmApp terhadap kesan intervensi | **IG:** Guna Aplikasi *CalmApp* sekurang-kurangnya 10 minit setiap hari<br>**CG:** Senarai menunggu | **Limitasi/Jurang:**<br>- Tahap literasi dan kesedaran rendah<br>- Tiada pengalaman menggunakan aplikasi digital<br>- Kegagalan melihat keperluan dan kepentingan kegunaan teknologi digital<br>- Kurang yakin terhadap tahap kerahsiaan identiti<br>- Masalah kewangan dan jaringan internet<br>- Terikat dengan sesuatu kepercayaan atau agama<br>- Penerangan program intervensi yang tidak jelas | - Menyediakan intervensi berasaskan media sosial yang relevan dari segi budaya, boleh diakses dengan percuma, lebih privasi dan mesra pengguna untuk meningkatkan penggunaan dalam kalangan belia. |

Jadual 5 *(sambungan)*

| Rujukan Artikel | Konteks Matlamat/ Objektif Strategi-PICO | Input Kumpulan Intervensi (IG) Kumpulan Kawalan (CG) Masa & Susulan Instrumen/ Aplikasi | Proses Limitasi/Jurang Intervensi Domain Penjagaan Kendiri | Produk Tindakan/Cadangan (Penambaikan Intervensi) |
|---|---|---|---|---|
| | | **Masa & Susulan:** Sebelum dan selepas 12 minggu<br>**Instrumen:** Soal selidik | **Domain:**<br>1. Maklumat kesihatan mental<br>2. Akses kepada perkhidmatan kesihatan mental<br>3. Akses kepada peranti digital<br>4. Pengetahuan tentang intervensi kesihatan mental digital<br>5. Keutamaan untuk perkhidmatan kesihatan mental digital<br>6. Halangan kepada penggunaan inovasi kesihatan mental digital | |
| Ibrahim et al. (2020) | **Objektif:** untuk menilai keberkesanan program literasi kemurungan, stigma, dan sikap mencari pertolongan dalam | **IG:** menerima intervensi literasi kemurungan dalam bentuk aktiviti kumpulan kecil, ceramah penerangan, dan video animasi | **Limitasi/Jurang:**<br>- Celik kesihatan mental rendah<br>- Latar belakang sosio-ekonomi rendah<br>- Kekurangan akses kepada maklumat pendidikan<br>- Kehilangan data – data tertentu<br>- Lebih fokus kepada penggunaan analisis per-protokol berbanding intervensi penuh | Intervensi perlu dibuat penambaikan dengan membuat perbandingan intervensi antara dua kumpulan berbeza serta tindakan susulan dengan dibekalkan aktiviti fizikal |
| | kalangan remaja dengan pendapatan isi rumah bulanan RM3900 sebulan atau kurang (B40) di Malaysia. | **CG:** tiada intervensi<br>**Masa & Susulan:** Sebelum dan selepas tiga (3) bulan<br>**Instrumen:** Soal selidik | **Domain:**<br>1. Kemurungan dan celik kesihatan mental<br>2. Tahap stigma<br>3. Tahap sikap mencari pertolongan mental<br>4. Tahap kepercayaan terhadap kesihatan mental<br>5. Keberkesanan program literasi kemurungan | dan bahan bacaan sebagai panduan seperti sesi kaunseling, buku kecil dan pamplet. |

Jadual 5 *(sambungan)*

| Rujukan Artikel | Konteks Matlamat/ Objektif Strategi-PICO | Input Kumpulan Intervensi (IG) Kumpulan Kawalan (CG) Masa & Susulan Instrumen/ Aplikasi | Proses Limitasi/Jurang Intervensi Domain Penjagaan Kendiri | Produk Tindakan/Cadangan (Penambaikan Intervensi) |
|---|---|---|---|---|
| Lindow et al. (2020) | **Objektif:** untuk menentukan kebolehlaksanaan dan penerimaan intervensi pencegahan bunuh diri sejagat dan promosi kesihatan mental. | **IG:** Kelas individu selama 3 atau 5 minggu, mengikut manual terperinci<br>**CG:** Penjagaan standard diterima<br><br>**Masa & Susulan:** Sebelum dan selepas tiga (3) bulan<br>**Instrumen:** Soal selidik | **Limitasi/Jurang:**<br>- Masalah stigma<br>- Peningkatan tingkah laku bunuh diri<br>- Intervensi kurang efektif menangani tingkah laku mencari bantuan dengan profesional kesihatan mental dari semasa ke semasa<br>- Aktiviti sokongan tidak disediakan sepanjang intervensi<br>- Tiada pra-pengujian sebagai data kawalan<br><br>**Domain:**<br>1. Tingkah Laku Mencari Bantuan<br>2. Niat Mencari Bantuan<br>3. Pencarian Bantuan Kesihatan Mental dan Pengetahuan Sumber<br>4. Stigma Berkaitan Kesihatan Mental | Intervensi akan datang perlu ditambahbaik dengan memfokuskan kepada komponen perlindungan terhadap bunuh diri, tingkah laku mencari pertolongan, stigma dan celik kesihatan mental dalam kalangan skala populasi belia yang lebih besar. |
| Tay et al. (2022) | **Objektif:** untuk menilai keberkesanan intervensi HOPE dalam kalangan dewasa muda di sebuah universiti di Singapura | **IG:** Empat sesi dalam talian selama dua minggu<br>**CG:** Petikan inspirasi dalam talian | **Limitasi/Jurang:**<br>- Celik kesihatan mental yang rendah<br>- Masalah stigma<br>- Akses lokasi kajian terhad<br>- Pemilihan dan penyertaan populasi terhad<br>- Kesan intervensi tidak tepat dan tidak jelas | Penyelidik mencadangkan intervensi yang lebih menfokuskan kepada aspek mendapatkan bantuan, pemulihan rawatan dan mengurangkan beban penyakit dari semasa ke semasa dalam kalangan belia sekolah, guru dan kaunselor sekolah serta belia yang didiagnos dengan penyakit mental. |

Jadual 5 *(sambungan)*

| Rujukan Artikel | Konteks Matlamat/ Objektif Strategi-PICO | Input Kumpulan Intervensi (IG) Kumpulan Kawalan (CG) Masa & Susulan Instrumen/ Aplikasi | Proses Limitasi/Jurang Intervensi Domain Penjagaan Kendiri | Produk Tindakan/Cadangan (Penambaikan Intervensi) |
|---|---|---|---|---|
| | | **Masa & Susulan:** Sebelum dan selepas dua (2) bulan **Instrumen:** Soal selidik | **Domain:** 1. Celik kesihatan mental 2. Faktor yang mempengaruhi literasi kebimbangan dan kemurungan 3. Stigma peribadi 4. Tekanan dan kesejahteraan psikologi | |
| Lee & Jung (2018) | **Objektif:** untuk menentukan kesan strategi intervensi tingkah laku dalam peningkatan kesihatan mental dalam kalangan belia di Malaysia. | **IG:** Strategi intervensi tingkah laku melalui soal selidik **CG:** sama dengan Kumpulan IG | **Limitasi/Jurang:** - Bebanan kesihatan mental - Penurunan kualti hidup dan kualiti tidur - Lokasi kajian tidak digariskan dengan tepat - Akses keberkesanan program tidak dikenalpasti - Kriteria responden tidak spesifik, terlalu rawak | Intervensi perlu ditambahbaik dari segi pengenalan konsep dan mekanisme penggunaan aplikasi digital dengan lebih meluas serta pengujian terhadap keberkesanan dan penerimaan populasi belia sebagai ukuran kepuasan pengguna. |
| | | **Masa & Susulan:** Sebelum dan selepas dua (2) bulan **Instrumen:** Soal selidik disediakan menggunakan Borang *Google* dan diedarkan melalui sosial media. **Instrumen:** Soal selidik | **Domain:** 1. Tekanan, kebimbangan dan kemurungan 2. Kualiti Tidur 3. Kualiti hidup 4. Produktiviti Kerja 5. Penilaian Aplikasi | |

Jadual 5 *(sambungan)*

| Rujukan Artikel | Konteks Matlamat/ Objektif Strategi-PICO | Input Kumpulan Intervensi (IG) Kumpulan Kawalan (CG) Masa & Susulan Instrumen/ Aplikasi | Proses Limitasi/Jurang Intervensi Domain Penjagaan Kendiri | Produk Tindakan/Cadangan (Penambaikan Intervensi) |
|---|---|---|---|---|
| Gopinathan et al. (2022) | **Objektif:** untuk mengenalpasti cabaran intervensi kesihatan mental berasaskan telefon mudah alih untuk golongan muda di kawasan Ingwavuma. | **IG:** Pendekatan individu; lawatan ke rumah oleh CRA Data dikumpul secara digital menggunakan Kobo Collect. | **Limitasi/Jurang:**<br>- Keadaan kesihatan mental, berfikir untuk membunuh diri dan kemurungan<br>- Kepercayaan tinggi kepada pantang larang sosial<br>- Tiada galakan dan sokongan memohon bantuan psikososial<br>- Kurang respons positif daripada pusat kesihatan mental<br>- Kesedaran rendah terhadap pengetahuan intervensi tingkah laku | Intervensi bagi menangani pandangan dan stigma masyarakat terhadap pantang larang sosial mengenai aduan atau laporan kesihatan mental dicadangkan oleh penyelidik dengan peningkatan penggunaan teknologi digital, strategi promosi kesihatan serta tingkah laku meminta bantuan psikososial dengan lebih meluas. |
| | | **CG:** Sama dengan Kumpulan IG<br>**Masa & Susulan:** Sebelum dan selepas enam (6) hari<br>**Instrumen:** Soal selidik | **Domain:**<br>1. Gangguan sosial; motivasi rakan sebaya; kemudahan akses untuk membantu; rasa kekitaan dan kesedaran<br>2. Perubahan mood. Fikiran, perasaan, dan tindakan | |
| Huberty et al. (2019) | **Objektif:** untuk menilai kesan intervensi pendidikan kesihatan berasaskan teori dan web terhadap literasi kesihatan mental dalam kalangan pelajar asasi universiti awam di Malaysia. | **IG:** Teori 'Kuat' - intervensi pendidikan kesihatan berasaskan teori dan web<br>**CG:** Penjagaan standard | **Limitasi/Jurang:**<br>- Populasi kajian tidak menyeluruh<br>- Penggunaan bahasa terhad<br>- Penyampaian intervensi yang masih lemah dan tidak kerap<br>- Objektif intervensi tidak jelas | Pengujian terhadap kebolehlaksanaan dan keberkesanan aplikasi digital kesitan mental yang boleh diakses bagi tempoh lama dan singkat perlu dibangunkan bagi menangani masalah kesihatan mental dalam kalangan belia. |

Jadual 5 *(sambungan)*

| Rujukan Artikel | Konteks Matlamat/ Objektif Strategi-PICO | Input Kumpulan Intervensi (IG) Kumpulan Kawalan (CG) Masa & Susulan Instrumen/ Aplikasi | Proses Limitasi/Jurang Intervensi Domain Penjagaan Kendiri | Produk Tindakan/Cadangan (Penambaikan Intervensi) |
|---|---|---|---|---|
| | | **Masa & Susulan:** Sebelum dan selepas satu (1) bulan **Instrumen:** Soal selidik | **Domain:** 1. Tekanan 2. Kemahiran Kesedaran 3. Belas kasihan diri 4. Kebolehlaksanaan | |

Jadual 6
*Jadual ringkasan perbandingan intervensi kesihatan mental sedia ada antara peringkat Malaysia dan peringkat luar Malaysia/ Antarabangsa (Data digital-laman web rasmi)*

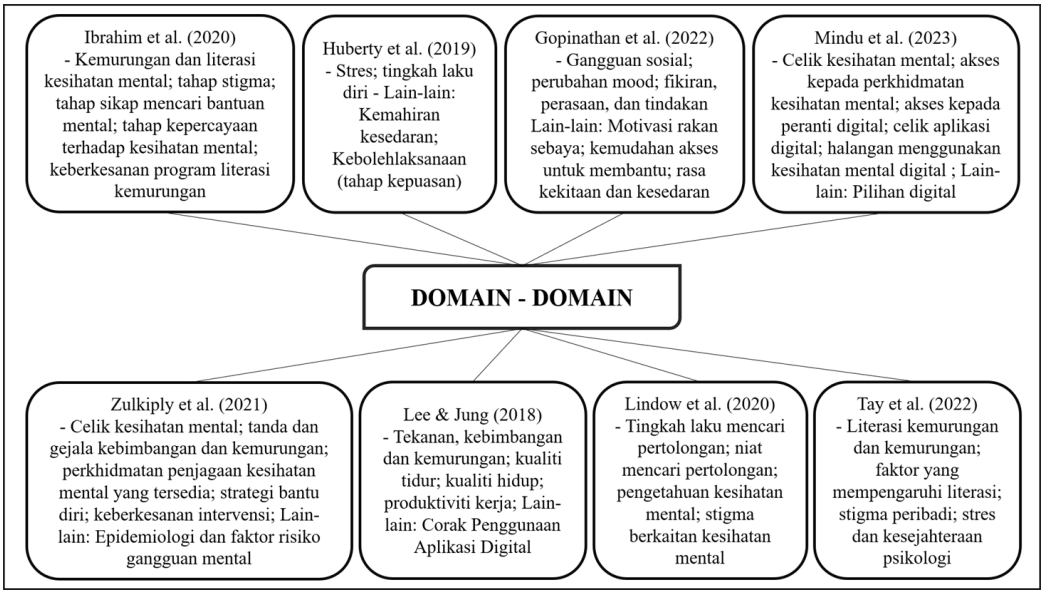
| Bil. | Malaysia | | | Luar Malaysia/ Antarabangsa (World Health Organistion, 2023); (Nursal, 2022) |
|---|---|---|---|---|
| | **Institut Penyelidikan Pembangunan Belia Malaysia (IYRES), (Kementerian Belia & Sukan, 2023)** | **Kementerian Kesihatan Malaysia (KKM) (Kementerian Kesihatan Malaysia, 2021)** | **Kementerian Pendidikan Malaysia (Kementerian Pendidikan Malaysia, 2021)** | |
| 1 | - International Conference for Youth 2023 (YOURS2023) | - Kerjasama KKM - MERCY Malaysia sediakan perkhidmatan talian bantuan sokongan psikososial sejak 25 Mac 2020.<br><br>- Talian ini dikendalikan oleh Pegawai Psikologi Kaunseling KKM, dibantu oleh sukarelawan pegawai psikologi agensi-agensi lain dan NGO. | - Kementerian Pendidikan Malaysia (KPM) - Kit Intervensi Minda kkSihat di Sekolah Rendah dan Sekolah Menengah, 2021 | WHO - World Mental Health Day, 10 October 2023, *"Our minds, our rights"* |
| 2 | - Garis Panduan Menangani Isu Kesihatan Mental Belia, 2023 | - KKM - Pusat Komuniti Kesihatan Mental (MENTARI), Kempen Media Let's TALK Minda Sihat serta Perkhidmatan e-Sokongan Psikologi.<br><br>- KKM, Jabatan Kemajuan Islam Malaysia (JAKIM) – KSK Care Centre; MyCareCovid-19<br>KKM & Kementerian Pembangunan Wanita, Keluarga dan Masyarakat (KPWKM) – talian KASIH 15999<br><br>- KKM - Sokongan Psikososial Covid-19 Sabah 088-338088<br><br>- KKM – talian HEAL 15555 Helpline | - Kementerian Pendidikan Malaysia (KPM) - Modul Program Intervensi Minda Sihat (PRISMA) Sekolah Menengah (RENDAH), Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013 - 2025 | - Pelan Tindakan Kesihatan Mental WHO 2013-2030 |

Jadual 6 *(sambungan)*

| Bil. | Malaysia | | | Luar Malaysia/ Antarabangsa (World Health Organistion, 2023); (Nursal, 2022) |
|---|---|---|---|---|
| | **Institut Penyelidikan Pembangunan Belia Malaysia (IYRES), (Kementerian Belia & Sukan, 2023)** | **Kementerian Kesihatan Malaysia (KKM) (Kementerian Kesihatan Malaysia, 2021)** | **Kementerian Pendidikan Malaysia (Kementerian Pendidikan Malaysia, 2021)** | |
| 3 | - Laporan Kesejahteraan Belia Harapan Masa Depan, 2018 | - *Mental Illness Awareness and Support Association* (MIASA) – perkhidmatan percuma kepada golongan B40 atas talian<br><br>- *Malaysian Relief Agency* (MRA) – talian bantuan psikologi dan kaunseling | | - Kempen Kesedaran Kesihatan Mental 2020 oleh Persekutuan Bola Sepak Antarabangsa (FIFA) bersama ASEAN |
| 4 | - Bengkel bersama Agensi Negeri/ Daerah dan Ketua Kejiranan bagi membincangkan keperluan Projek Pelaksanaan Strategi Intervensi | - Angkatan Belia Islam Malaysia (ABIM), Rahmah Support Team - Talian Rahmah 011-5773 1036 | | - Rangka Kerja Strategik ASEAN 2020 untuk Kecemasan Kesihatan Awam |
| 5 | - Forum Belia Kebangsaan Menangani Jenayah dan Gengsterisme – IYRES – KBS (28 September 2013) | - Perkhidmatan Kesihatan Mental dan Sokongan Psikososial atau MHPSS *(Mental Health Psychosocial Support Service)* turut disediakan di klinik/hospital/pusat kesihatan untuk kumpulan sasar.<br><br>(i) Pendidikan kesihatan mental atau Psychoeducation melalui web chat/ messenger dan QR Code<br><br>(ii) Saringan kesihatan mental dalam kalangan petugas kesihatan melalui borang *google link* | | - Pelan Hala Tuju Kerjasama Kesihatan Mental ASEAN-Australia 2021 |

Jadual 6 *(sambungan)*

| Bil. | Malaysia | | | Luar Malaysia/ Antarabangsa (World Health Organistion, 2023); (Nursal, 2022) |
|---|---|---|---|---|
| | **Institut Penyelidikan Pembangunan Belia Malaysia (IYRES), (Kementerian Belia & Sukan, 2023)** | **Kementerian Kesihatan Malaysia (KKM) (Kementerian Kesihatan Malaysia, 2021)** | **Kementerian Pendidikan Malaysia (Kementerian Pendidikan Malaysia, 2021)** | |
| | | (iii) Sesi *Psychological First Aid* (PFA) dilaksanakan kepada petugas kesihatan secara individu atau berkumpulan<br><br>(iv) Memberikan sokongan emosi, sokongan psikososial, psiko-spiritual dan *Grief Counseling* kepada keluarga pesakit Covid-19 yang meninggal dunia<br><br>(v) Melaksanakan intervensi kaunseling dalam petugas kesihatan dan pesakit serta ahli keluarga mereka | | |
| 6 | - Laporan *Understanding the Anxieties & Desires of Malaysia Youth*, 2012 | - Kerjasama KKM - MERCY Malaysia sediakan perkhidmatan talian bantuan sokongan psikososial sejak 25 Mac 2020.<br><br>- Talian ini dikendalikan oleh Pegawai Psikologi Kaunseling KKM, dibantu oleh sukarelawan pegawai psikologi agensi-agensi lain dan NGO. | | - ASEAN Work Plan on Youth 2021-2025 & ASEAN Youth Development Index (YDI) 2021 |




*Rajah 2.* Domain intervensi pakej pendidikan penjagaan diri untuk kesihatan mental belia

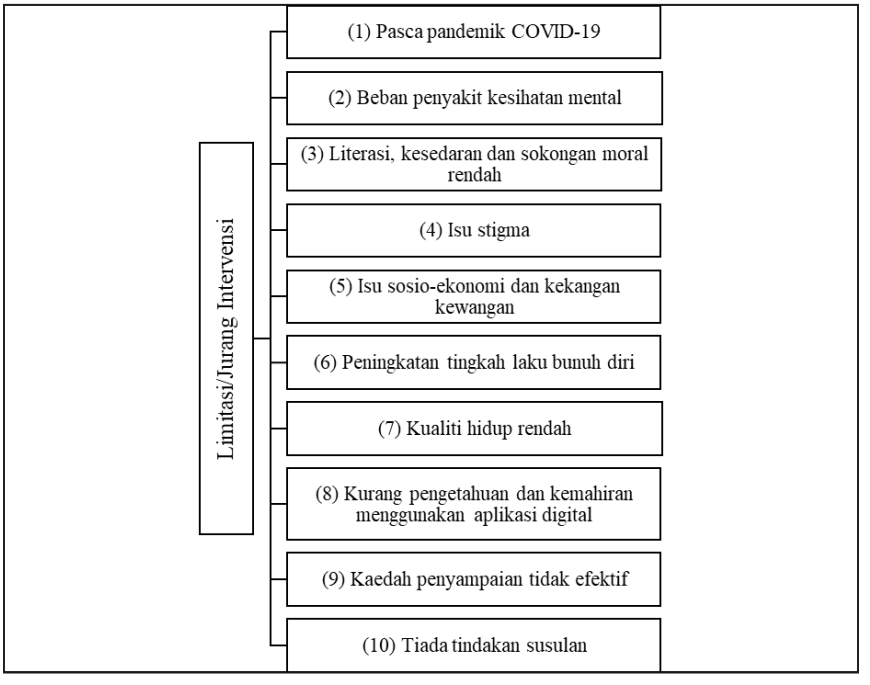
berpunca daripada tahap pemikiran yang sangat skeptikal di mana kebanyakkan masyarakat mempunyai stigma bahawa mereka yang ingin mendapatkan rawatan atau perkhidmatan kesihatan mental adalah individu yang bermasalah dan tidak layak berada dalam kumpulan sosial mereka. Jauh berbeza dengan budaya negara barat yang lebih terbuka dan bersikap positif. Walaupun pelbagai pendedahan, informasi dan pendekatan intervensi penjagaan kesihatan mental dijalankan di Malaysia dan luar negara, namun masih terdapat jurang dalam pelaksanaan tersebut dari segi tahap literasi kesihatan mental; keinginan untuk mendapatkan bantuan psikososial; penggunaan teknologi aplikasi digital yang memerlukan akses kebolehcapaian internet yang stabil serta pemulihan dan penjagaan kendiri secara menyeluruh. Justeru itu, amat penting untuk menggariskan jurang atau domain yang menjadi faktor penghalang kepada keberhasilan sesuatu intervensi kesihatan mental dalam kalangan belia. Hasil penelitian sistematik kajian ini menemukan beberapa jurang kandungan, pendekatan dan pengukuran sebagai keputusan analisa kandungan serta ringkasan perbandingan intervensi kesihatan mental sedia ada antara peringkat malaysia dan peringkat luar malaysia/antarabangsa melalui data digital - laman web rasmi.

## KEPUTUSAN ANALISIS KANDUNGAN

### Mengenalpasti Jurang Intervensi Kesihatan Mental Belia

Berdasarkan kepada kajian yang telah dianalisa melalui semakan semula ini, penyelidik dapat menyimpulkan terdapat

sepuluh aspek yang menjadi jurang intervensi kepada pusat perkhidmatan kesihatan mental menangani masalah kesihatan mental dalam kalangan belia kerana masih menunjukkan penurunan yang memberangsangkan dan tidak mencapai target populasi secara menyeluruh. Pasca pandemik COVID-19 telah dinyatakan dalam penyelidikan terdahulu di mana ia penyebab utama intervensi masih gagal diikuti dengan bebanan masalah kesihatan mental; literasi dan kesedaran belia; isu stigma; faktor sosio-ekonomi dan kualiti hidup; kecenderungan membunuh diri meningkat serta berpunca daripada ketidakberkesanan penggunaan aplikasi digital. Belia gagal didedahkan dengan pengalaman penggunaan aplikasi digital secara intensif tanpa panduan lengkap, kaedah penyampaian kurang efektif daripada pegawai bertugas serta tiada sokongan moral dan tindakan susulan dibuat sepanjang tempoh intervensi dijalankan. Justeru itu, penyelidik menggariskan beberapa domain penting sebagai strategi pencegahan yang boleh membantu untuk membuat penambahbaikkan terhadap intervensi penjagaan kesihatan mental kendiri bagi penyelidikan lain pada masa akan datang. Rajah 3 menunjukkan jurang intervensi penjagaan kesihatan mental belia.




*Rajah 3.* Jurang intervensi penjagaan kesihatan mental belia

**Mengenalpasti Pengukuran Domain Penjagaan Kendiri**

Dalam ulasan ini, lapan (8) artikel telah dinilai dan diringkaskan berdasarkan model CIPP. Kajian ini mengenal pasti enam kumpulan domain utama intervensi untuk penjagaan diri kesihatan mental: (1) status kesihatan mental dan prevalens (tekanan, kebimbangan, dan kemurungan); (2) literasi dan maklumat kesihatan mental; (3) hasil akademik; (4) cabaran dan halangan kesihatan mental; (5) kualiti hidup – tanda dan gejala masalah kesihatan mental dan (6) keberkesanan pendidikan kesihatan (aplikasi digital). Berdasarkan hasil ulasan dan domain yang telah dipertimbangkan, satu hipotesis boleh dibuat bahawa intervensi menjadi lebih berkesan dalam mengurangkan simptom kemurungan dan meningkatkan impak positif terhadap kesihatan mental yang lain jika dibandingkan dengan kumpulan kawalan yang hanya menerima psikopendidikan berasaskan internet dan penjagaan standard (Harrer et al., 2019).

Selain menggunakan aplikasi digital secara maya, masalah kesihatan mental juga bertambah baik dengan intervensi bersemuka yang disertai dengan bimbingan ahli terapi atau kemudahan interpersonal yang lain berbanding dengan bantuan sendiri di mana intervensi ini amat sesuai bagi pendekatan penjagaan berperingkat yang sedang dinilai untuk kajian berterusan dalam tempoh tertentu (Michelson et al., 2020). Penggunaan aplikasi mudah alih, seperti aplikasi *m-health*, berpotensi menjadi pendekatan yang efektif dalam menyampaikan intervensi berskala memandangkan majoriti golongan muda kerap menggunakan peranti mudah alih (Newbold et al., 2020). Dapatan kajian lain pula menunjukkan celik kemurungan, sikap terhadap mendapatkan bantuan, mengurangkan stigma diri terhadap mendapatkan bantuan mental serta mengurangkan kepercayaan negatif terhadap penyakit mental selepas mengikuti program intervensi adalah lebih baik dalam kalangan belia (Lindow et. al., 2020). Dalam temu bual maklum balas pula, kajian terdahulu berjaya mengenalpasti, dengan bantuan perisian aplikasi, tahap kebolehgunaan yang tinggi, lebih cekap dalam masa yang singkat serta lebih menarik perhatian golongan belia menggunakannya (Lattie et al., 2020). Seterusnya, ulasan lain turut melaporkan bahawa intervensi literasi kesihatan mental amat membantu belia menambahkan pengetahuan dan informasi kebimbangan dengan lebih baik serta berlakunya peningkatan terhadap tingkah laku mencari pertolongan dan rawatan mental jika perlu. Malahan, literasi kesihatan mental yang baik juga telah dikaitkan dengan status kesihatan mental yang baik (Zulkiply et al., 2023).

Namun, berbeza dengan gangguan sosial, motivasi rakan sebaya, kemudahan akses untuk membantu, rasa kekitaan dan kesedaran tidak menunjukkan kepentingan positif terhadap teknologi intervensi tingkah laku yang digunakan untuk meningkatkan kesihatan mental, tetapi lebih berkesan terhadap pendekatan secara fizikal atau bersemuka (Gopinathan et al., 2022). Justeru itu, dapatan kajian semasa terkini sangat menyokong idea dan usaha pakar

kesihatan awam serta badan profesional sekiranya intervensi kesihatan mental yang mudah diakses dengan pendekatan yang lebih umum dilaksanakan di seluruh sekolah dan institusi akademik dengan lebih meluas bagi memberikan impak terbaik dalam menangani masalah kesihatan mental dalam kalangan belia (Tornivuori et al., 2023).

## LIMITASI KAJIAN

Penggunaan hanya kertas bertulis Inggeris kerana tiada kajian berkaitan dalam Bahasa Melayu ditemui dalam kedua pangkalan data dan tahun penerbitan terhad meletakkan limitasi pada ulasan ini. Walaupun begitu, semakan ini berjaya menemui penemuan dan maklumat berharga yang boleh digunakan sebagai bahan untuk pembangunan intervensi atau program pendidikan kesihatan mental masa depan dalam kalangan belia di Malaysia. Artikel ini merupakan artikel pertama dalam Bahasa Melayu berkaitan semakan kajian intervensi menggunkana aplikasi promosi kesihatan mental belia.

## KESIMPULAN

Pendidikan penjagaan diri untuk belia mempunyai nilai dan impak positif ke atas penurunan masalah kesihatan mental. Pengetahuan atau maklumat tentang literasi dan informasi kesihatan mental; cabaran dan halangan kesihatan mental; kualiti hidup belia; pencapaian akademik dan keberkesanan program kesihatan mental adalah domain intervensi yang paling banyak digunakan. Oleh itu, domain ini perlu dititikberatkan dalam pembangunan penjagaan dan pengurusan kesihatan mental secara kendiri bagi membangunkan program intervensi terutamanya untuk belia pelajar di kolej dan universiti pada masa hadapan. Secara keseluruhannya, hampir semua kajian menggunakan pendekatan sesi pendidikan dan penyampaian informasi secara berkumpulan melalui atas talian khususnya menerusi aplikasi digital yang dibangunkan khas untuk tangani masalah dan bebanan kesihatan mental dalam kalangan belia di dalam dan luar Malaysia yang telah menunjukkan kesan positif terhadap pengurusan kesihatan mental dari semasa ke semasa.

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# Pembangunan Aplikasi Pembelajaran "Pro Kata Kerja" berlandaskan Model Air Terjun

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## ABSTRAK

Penguasaan kata kerja terbitan dalam kalangan murid Sekolah Jenis Kebangsaan Tamil SJK(T) masih berada pada tahap yang membimbangkan, khususnya melibatkan imbuhan kata kerja awalan meN- dan alomorfnya. Murid sering melakukan kesalahan dalam pembentukan kata kerja terbitan disebabkan pengaruh bahasa ibunda, kurangnya bahan bantu pengajaran yang bersifat digital serta pengajaran yang bersifat konvensional. Justeru kajian ini, dijalankan untuk mengenal pasti keperluan dan seterusnya membangunkan aplikasi mudah alih "Pro Kata Kerja" yang berasaskan pembelajaran interaktif. Kajian ini menggunakan reka bentuk kajian kuantitatif dan kualitatif melalui kaedah ujian bertulis, soal selidik terhadap guru bahasa Melayu dan pemerhatian secara pelibatan. Seramai 100 orang murid Tahun 5 daripada SJK(T) Ladang Kinrara telah dipilih sebagai sampel kajian. Kajian ini disokong oleh Teori Analisis Kesalahan Bahasa oleh Corder (1973) yang menjelaskan bahawa kesalahan bahasa merupakan petunjuk penting dalam memahami proses pembelajaran bahasa kedua. Pembangunan aplikasi pembelajaran berpandukan Model Air Terjun (Royce, 1970) dan disokong oleh Teori Kognitif Pemprosesan Maklumat (Atkinson & Shiffrin, 1968). Dapatan menunjukkan bahawa terdapat keperluan mendesak terhadap bahan bantu pembelajaran yang lebih interaktif, kontekstual dan sesuai dengan generasi Alpha. Aplikasi ini dibangunkan dengan ciri gamifikasi, latihan berdasarkan jenis imbuhan kata kerja, maklum balas serta-merta dan antara muka mesra pengguna. Dapatan kajian membuktikan bahawa pendekatan digital mampu meningkatkan penguasaan tatabahasa secara lebih sistematik dan menarik.

*Kata kunci:* Aplikasi mudah alih, gamifikasi, imbuhan kata kerja, model air terjun, pemprosesan maklumat, pro kata kerja, SJK(T)

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# *Development of the Learning Application "Pro Kata Kerja" based on the Waterfall Model*


## *ABSTRACT*

*The mastery of derived verbs among pupils in Tamil vernacular schools remains at an alarming level, particularly in relation to the verb prefix meN- and its allomorphs. Pupils often commit errors in forming derived verbs due to the influence of their mother tongue, the lack of digital teaching aids, and the predominance of conventional teaching methods. Hence, this study was conducted to identify the needs and subsequently develop a learning application, "Pro Kata Kerja" based on interactive learning. The study employed both quantitative and qualitative research designs through written tests, questionnaires with Malay language teachers, and participatory observation. A total of 100 Year 5 pupils from Ladang Kinrara Tamil Vernacular School were selected as the research sample. This study is underpinned by Corder's (1973) Error Analysis Theory, which explains that language errors are important indicators in understanding second language learning processes. The development of the learning application followed the Waterfall Model (Royce, 1970) and was supported by the Cognitive Information Processing Theory (Atkinson & Shiffrin, 1968). Findings revealed an urgent need for more interactive, contextual, and generation-appropriate learning aids for Generation Alpha. The application was developed with gamification features, exercises based on verb affixes, immediate feedback, and a user-friendly interface. The study's findings prove that digital approaches can enhance grammar mastery in a more systematic and engaging manner.*


Keywords: *Gamification, information, mobile application, Pro Kata Kerja, processing, SJK(T), waterfall model, verb affixes*

## PENGENALAN

Perkembangan teknologi maklumat dan komunikasi (ICT) dalam era Revolusi Industri 4.0 telah mengubah struktur asas sistem pendidikan global. Dalam usaha menghadapi cabaran ekonomi berasaskan pengetahuan dan masyarakat digital, negara-negara di seluruh dunia termasuk Malaysia telah melaksanakan reformasi pendidikan yang menekankan kompetensi abad ke-21. Seiring dengan itu, pendekatan Pembelajaran Abad Ke-21 (PAK21) telah diperkenalkan melalui Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013 hingga 2025 sebagai strategi nasional yang bertujuan membentuk murid yang holistik, seimbang dan berdaya saing di peringkat global. Pendekatan ini menekankan lima elemen asas iaitu komunikasi, kolaborasi, pemikiran kritis, kreativiti dan nilai murni, selaras dengan keperluan murid kini yang perlu mahir dalam pelbagai domain kemahiran rentas disiplin.

Dalam konteks pendidikan bahasa, pendekatan PAK21 menuntut satu anjakan paradigma yang lebih inklusif terhadap keperluan murid semasa, terutamanya dalam aspek pengajaran dan pembelajaran bahasa Melayu sebagai bahasa kedua. Keperluan ini menjadi lebih mendesak apabila mengambil

kira ciri-ciri unik Generasi Alpha, generasi pertama yang dilahirkan dalam era pasca-digital dan berkembang dalam persekitaran teknologi tinggi. Mereka mengadaptasi pola pembelajaran yang sangat berbeza berbanding generasi sebelumnya, iaitu lebih tertarik kepada kandungan bersifat visual, interaktif dan gamifikasi serta menunjukkan keupayaan mengakses maklumat secara kendiri. Dalam situasi ini, pendekatan pengajaran konvensional yang berpusatkan guru, menggunakan buku teks semata-mata dan kurang menitikberatkan elemen interaktiviti didapati tidak lagi relevan untuk memenuhi keperluan pembelajaran generasi ini secara efektif.

Isu penguasaan bahasa Melayu dalam kalangan murid bukan penutur jati, khususnya murid SJK(T) menjadi perhatian utama dalam konteks ini. Penguasaan bahasa Melayu dalam kalangan murid ini masih berada pada tahap membimbangkan, terutamanya dalam aspek pembentukan kata kerja terbitan. Antara kesukaran utama yang dikenal pasti ialah pengaplikasian imbuhan awalan meN- dan variasi alomorfnya yang memerlukan murid memahami peraturan pembentukan kata kerja serta bentuk dasar kata secara mendalam. Dapatan kajian Mahani dan Zaiton (2021) serta Nor Ain dan Farahkhanna (2020) menunjukkan bahawa kegagalan murid mengaplikasikan imbuhan dengan betul memberi kesan langsung terhadap kecekapan bertutur dan menulis dalam bahasa Melayu. Kegagalan menguasai aspek ini bukan sahaja menjejaskan kemahiran menulis dan bertutur, bahkan turut mempengaruhi kefahaman terhadap struktur ayat dan makna keseluruhan dalam sesuatu wacana. Perkara ini dibimbangkan lagi dengan ketiadaan bahan bantu mengajar digital yang kontekstual dan menyeronokkan serta kurangnya intervensi teknologi yang menyasarkan aspek pengimbuhan secara spesifik dan sistematik.

Walaupun Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Bahasa Melayu menekankan kepentingan penguasaan imbuhan sebagai komponen penting dalam penguasaan tatabahasa bahasa Melayu, pelaksanaannya di dalam bilik darjah masih dibelenggu pelbagai kekangan. Warga pendidik menghadapi kesukaran menyediakan bahan pembelajaran yang sesuai, terutamanya untuk murid bukan penutur jati yang mempunyai latar belakang bahasa ibunda yang sangat berbeza dari segi struktur dan bunyi. Justeru terdapat keperluan mendesak untuk memperkenalkan bahan bantu pembelajaran yang bersifat digital, interaktif dan menarik untuk menyokong penguasaan imbuhan kata kerja secara lebih berkesan. Dalam era pasca-pandemik yang menyaksikan lonjakan penggunaan teknologi dalam pendidikan, pembangunan aplikasi pembelajaran untuk tujuan pengajaran tatabahasa dilihat sebagai satu inisiatif strategik dan bersesuaian.

Sehubungan itu, kajian ini dijalankan dengan dua objektif utama. Pertama, pengkaji telah mengenal pasti tahap keperluan terhadap pembangunan bahan bantu pembelajaran yang berkesan bagi aspek imbuhan kata kerja. Kedua,

untuk membangunkan satu aplikasi pembelajaran yang dinamakan "Pro Kata Kerja" berasaskan Model Air Terjun (Royce, 1970) yang berfungsi sebagai alat intervensi inovatif dalam meningkatkan penguasaan imbuhan kata kerja secara lebih tersusun dan menyeronokkan. Kajian ini turut disokong oleh Teori Analisis Kesalahan Bahasa (Corder, 1973) yang menekankan kepentingan menganalisis kesilapan bahasa sebagai indikator dalam proses pembelajaran bahasa kedua serta Teori Pemprosesan Maklumat (Atkinson & Shiffrin, 1968) yang menjelaskan bagaimana maklumat diproses dan disimpan dalam memori jangka pendek dan jangka panjang. Aplikasi pembelajaran ini direka khusus untuk menangani isu penguasaan imbuhan kata kerja dengan menggabungkan elemen gamifikasi, visualisasi dan antara muka mesra pengguna yang selaras dengan kehendak ciri-ciri generasi Alpha.

Kajian ini membawa implikasi signifikan dari aspek akademik, pedagogi dan praktikal. Dari segi akademik, kajian ini dapat memperkaya perbendaharaan ilmu dalam bidang morfologi bahasa Melayu dan menyediakan rujukan berasaskan data empirik tentang penguasaan imbuhan dalam kalangan murid SJK(T). Dari segi pedagogi, aplikasi "Pro Kata Kerja" yang dibangunkan mampu menyokong amalan pengajaran berasaskan teknologi dan memperkukuh pendekatan berpusatkan murid yang menekankan elemen gamifikasi, visualisasi dan maklum balas serta-merta. Aplikasi ini juga memudahkan warga pendidik untuk menyampaikan kandungan tatabahasa secara lebih kontekstual dan menarik. Dari sudut praktikal, hasil kajian ini dapat dijadikan model pembangunan aplikasi pendidikan yang sesuai dilaksanakan dalam konteks sekolah vernakular, malah berpotensi diperluas penggunaannya dalam pelbagai konteks pembelajaran bahasa kedua.

Artikel ini dibahagikan kepada lima bahagian utama. Bahagian pertama memperkenalkan latar belakang, isu kajian, objektif, kepentingan dan struktur artikel. Bahagian kedua membincangkan sorotan kajian terdahulu yang menyentuh isu penguasaan imbuhan kata kerja, kaedah pembelajaran imbuhan kata kerja serta penggunaan teknologi dalam pendidikan bahasa. Bahagian ketiga menerangkan reka bentuk kajian, kerangka teori, lokasi, kaedah pengumpulan data dan analisis. Bahagian keempat membentangkan dapatan kajian serta perbincangan secara kritis terhadap keberkesanan aplikasi yang dibangunkan. Akhir sekali, bahagian kelima merumuskan implikasi kajian dan mencadangkan hala tuju penyelidikan akan datang.

## SOROTAN LITERATUR

### Penguasaan Imbuhan Kata Kerja

Penguasaan imbuhan kata kerja dalam bahasa Melayu merupakan aspek penting dalam pembangunan literasi tatabahasa yang mantap, khususnya dalam kalangan murid sekolah rendah yang mempelajari bahasa Melayu sebagai bahasa kedua. Kajian lepas secara konsisten menunjukkan bahawa murid masih menghadapi kesukaran dalam memahami dan menggunakan imbuhan kata kerja dengan tepat, terutamanya

melibatkan imbuhan awalan dan apitan yang membentuk kata kerja terbitan. Tengku Din dan Kartini (2022) dalam kajian mereka terhadap penggunaan bahasa dalam media sosial, mendapati bahawa kesalahan imbuhan berlaku secara meluas dalam penulisan kapsyen *Instagram* dalam kalangan pengguna muda. Walaupun kajian ini tidak secara langsung menyasarkan murid sekolah rendah, namun dapatan tersebut mencerminkan bahawa kelemahan dalam penguasaan imbuhan bermula sejak peringkat awal persekolahan dan berterusan hingga ke peringkat remaja. Kesalahan penggunaan imbuhan seperti meN-, ber- dan di- bukan sahaja mengganggu struktur dan kejelasan ayat, malah menjejaskan kohesi serta koherensi komunikasi secara keseluruhan. Maka, keperluan kepada satu bentuk intervensi awal yang berkesan, terutamanya bagi murid SJK(T) menjadi sangat penting agar asas tatabahasa mereka dapat dibentuk dengan kukuh sejak awal lagi. Dalam konteks ini, pembangunan aplikasi pembelajaran "Pro Kata Kerja" dilihat sebagai satu pendekatan strategik yang boleh menyokong pembelajaran imbuhan kata kerja secara visual, interaktif dan berulang.

Selanjutnya, kajian oleh Saidatul dan Anne (2021) turut mendedahkan bahawa pelajar sekolah menengah masih belum menguasai penggunaan imbuhan meN-, di- dan ber- serta kelemahan ini dikaitkan dengan kekurangan penguasaan tatabahasa yang kukuh semasa berada di sekolah rendah. Kajian ini memberi petunjuk bahawa isu penguasaan imbuhan adalah berakar umbi daripada fasa pendidikan awal dan jika tidak ditangani secara menyeluruh akan memberi kesan berpanjangan terhadap prestasi pelajar dalam aspek penulisan dan komunikasi. Dapatan ini disokong oleh kajian Aminul Razin dan Subramaniam (2019) yang secara khusus meneliti murid SJK(T). Mereka mendapati bahawa murid gagal mengenal pasti kata dasar yang sesuai dan tidak memahami perubahan makna selepas proses pengimbuhan. Kesalahan yang paling ketara melibatkan penggunaan imbuhan meN- dan akhiran -kan dan keadaan ini dipercayai berpunca daripada latar belakang bahasa ibunda yang sangat berbeza serta kaedah pengajaran yang kurang menekankan pendekatan kontekstual.

Dalam kajian yang lain, Ismai dan Zainon Hamzah (2018) turut mendapati kesalahan penggunaan imbuhan meN- dan di- dalam kalangan murid SJK(C) yang menunjukkan bahawa isu kelemahan penguasaan imbuhan kata kerja ini merentasi jenis sekolah vernakular. Justeru kesemua dapatan ini, menyerlahkan keperluan mendesak terhadap bahan bantu pembelajaran yang bukan sahaja bersifat sistematik, tetapi juga memanfaatkan teknologi moden yang bersesuaian dengan ciri generasi Alpha masa kini. Oleh yang demikian, aplikasi "Pro Kata Kerja" yang dibangunkan dalam kajian ini tampil sebagai satu penyelesaian holistik melalui penyediaan latihan tersusun, digital dan selaras dengan gaya pembelajaran murid semasa.

## Kaedah Pembelajaran Imbuhan

Penguasaan imbuhan kata kerja dalam kalangan murid sekolah rendah, khususnya

murid bukan penutur jati bahasa Melayu memerlukan kaedah pembelajaran yang holistik, berstruktur dan sesuai dengan tahap perkembangan kognitif mereka. Kaedah pengajaran konvensional yang terlalu berpusatkan guru didapati kurang efektif dalam menyampaikan konsep pengimbuhan secara mendalam dan kontekstual. Pelbagai kajian telah mencadangkan pendekatan pedagogi berasaskan teknologi, visualisasi, gamifikasi dan pemikiran aras tinggi sebagai strategi alternatif yang lebih efektif. Sebagai contoh, Tan dan Tasir (2022) menilai keberkesanan penggunaan aplikasi *Plickers* dalam membantu penguasaan imbuhan meN- dan dapatan menunjukkan peningkatan signifikan dari aspek motivasi serta prestasi murid. Begitu juga, kajian oleh Nurul Ariqafitri dan Maisarah Haron (2018) membuktikan keberkesanan penggunaan platform digital seperti *Nearpod* dan *Google Docs* dalam menggalakkan pembelajaran aktif dan kontekstual dalam bilik darjah. Namun begitu, kedua-dua kajian ini hanya memfokuskan kepada jenis imbuhan kata kerja tertentu dan belum mampu menawarkan pendekatan pembelajaran imbuhan yang menyeluruh. Justeru kajian ini, mengambil inisiatif untuk membangunkan aplikasi pembelajaran "Pro Kata Kerja" yang lebih komprehensif, merangkumi enam imbuhan kata kerja utama seperti yang digariskan dalam DSKP iaitu meN-, ber-, ter-, di-, -kan dan -i. Aplikasi ini direka bentuk untuk menyasarkan penguasaan imbuhan kata kerja secara menyeluruh dan sistematik dalam suasana pembelajaran yang menyeronokkan dan berfokuskan murid.

Dalam kajian lain, pendekatan pembelajaran berasaskan pemikiran kritis dan strategi visual turut menunjukkan keberkesanan dalam pengajaran imbuhan. Yusop dan Husainni (2018) melalui pendekatan "Lampu Merah, Lampu Kuning" berasaskan prinsip *Making Thinking Visible* (MTV) mendapati bahawa murid mampu membuat pertimbangan imbuhan secara kontekstual dengan lebih tepat. Perkara ini membuktikan bahawa kemahiran imbuhan tidak seharusnya diasah melalui penghafalan semata-mata, tetapi juga melalui latihan membuat keputusan yang bersifat kritikal. Dalam masa yang sama, teknik mnemonik seperti akrostik yang diperkenalkan oleh Rahaman dan Ibrahim (2017) turut membantu murid mengingat alomorf imbuhan meN- secara lebih sistematik dan berstruktur. Kajian ini turut membuktikan keberkesanan teknik pembayangan dalam membina kefahaman murid terhadap perubahan morfologi imbuhan dalam konteks kehidupan sebenar. Kesemua pendekatan ini memberikan gambaran bahawa pembelajaran imbuhan perlu disampaikan melalui gabungan pelbagai strategi yang dapat merangsang aspek visual, kognitif dan emosi murid secara menyeluruh. Oleh itu, aplikasi "Pro Kata Kerja" dibangunkan untuk menyepadukan elemen-elemen ini secara interaktif dan berperingkat dengan mengambil kira keperluan murid generasi Alpha yang lebih responsif terhadap persekitaran pembelajaran digital dan gamifikasi.

Tambahan lagi, beberapa kajian menekankan pentingnya strategi penyoalan

dan pembelajaran kendiri sebagai elemen utama dalam membentuk pemahaman imbuhan yang kukuh. Ahmad Kamil dan Hussin (2017) menerapkan kaedah penyoalan tertumpu yang merangsang pemikiran induktif murid dalam mengenal pasti fungsi imbuhan secara logik dan bermakna. Sementara itu, Sanisah dan Nuraishah (2017) menunjukkan potensi penggunaan aplikasi *Nearpod* sebagai alat interaktif dalam pengajaran imbuhan awalan peN- dan pendekatan ini dilihat berpotensi untuk diperluaskan kepada imbuhan kata kerja lain. Namun, kesemua kajian ini masih bergantung kepada pengajaran dalam bilik darjah secara fizikal, tanpa wujudnya platform digital khusus yang menyokong pembelajaran imbuhan secara kendiri. Oleh yang demikian, aplikasi "Pro Kata Kerja" direka bentuk untuk menggabungkan pendekatan penyoalan aras tinggi, latihan reflektif, maklum balas serta-merta, dan kandungan tersuai yang mengutamakan keaktifan serta penglibatan murid. Aplikasi ini bertindak sebagai intervensi inovatif yang dibangunkan berasaskan model Air Terjun dengan menyatukan kekuatan pelbagai dapatan penyelidikan terdahulu ke dalam satu platform pembelajaran yang menyeluruh, mesra pengguna dan bersesuaian dengan keperluan murid sekolah rendah masa kini. Kajian ini bukan sahaja menjawab kekangan fokus imbuhan kata kerja secara terasing dalam penyelidikan sedia ada, malah memperkenalkan satu penyelesaian digital yang berpotensi untuk menangani masalah kelemahan penguasaan imbuhan secara holistik.

## Pembangunan Aplikasi Pembelajaran

Perkembangan teknologi digital dalam bidang pendidikan telah mencetuskan transformasi yang ketara terhadap kaedah pengajaran dan pembelajaran, termasuk dalam pengajaran bahasa Melayu sebagai bahasa kedua. Penggunaan aplikasi mudah alih dan platform digital yang berasaskan pendekatan pedagogi interaktif, gamifikasi serta pembelajaran kendiri telah terbukti sebagai strategi yang efektif untuk meningkatkan motivasi, pemahaman dan penguasaan pelajar terhadap pelbagai komponen bahasa. Kajian oleh Ahmad dan Musa (2024) membuktikan bahawa aplikasi interaktif berupaya meningkatkan kemahiran lisan pelajar melalui elemen seperti dialog, rakaman suara dan maklum balas serta-merta. Walaupun fokus utama aplikasi tersebut adalah pada aspek lisan, reka bentuknya yang berasaskan konteks pengguna dan ciri interaktif yang menyeronokkan memberikan inspirasi kepada pembangunan aplikasi lain yang menyasarkan aspek bahasa yang lebih teknikal, seperti tatabahasa dan pengimbuhan. Dalam konteks ini, aplikasi "Pro Kata Kerja" dibangunkan dengan mengambil kira reka bentuk interaktif yang terbukti berkesan ini, lalu diperluaskan skopnya kepada penguasaan imbuhan kata kerja terbitan, aspek yang selama ini kurang diberi perhatian dalam bentuk digital yang menyeluruh. Aplikasi ini tidak hanya menilai jawapan betul atau salah, tetapi turut membimbing murid memahami fungsi imbuhan melalui animasi, latihan berperingkat dan penggunaan senario

kehidupan sebenar yang autentik serta bermakna.

Tambahan pula, Ismail dan Nor (2023) menegaskan keberkesanan penggunaan teknologi mudah alih dalam pengajaran bahasa Melayu di peringkat menengah yang berjaya meningkatkan penguasaan kosa kata dan tatabahasa pelajar melalui aplikasi yang dirancang secara sistematik dan berfokuskan murid. Kajian ini secara tidak langsung menunjukkan potensi besar aplikasi pembelajaran digital dalam memperkukuh struktur bahasa pelajar, terutamanya apabila pendekatan yang digunakan bersifat kontekstual dan interaktif. Walaupun kajian tersebut tertumpu kepada pelajar sekolah menengah, pendekatan pedagogi yang digariskan selari dengan prinsip Pembelajaran Abad ke-21 (PAK21) juga relevan dan sesuai untuk diaplikasikan di peringkat sekolah rendah. Dapatan ini sekali gus memperkukuh rasional kajian ini untuk memperkenalkan aplikasi "Pro Kata Kerja" dalam kalangan murid sekolah rendah. Prinsip berstruktur dan pemajuan kendiri seperti yang diterapkan dalam kajian Tan dan Ong (2022) turut diaplikasikan dalam "Pro Kata Kerja" yang menawarkan tahap-tahap pembelajaran imbuhan secara sistematik daripada asas hingga lanjutan, disokong dengan elemen ganjaran dan penilaian formatif serta-merta. Kajian oleh Lim dan Choo (2019) pula menekankan keberkesanan elemen gamifikasi dalam meningkatkan pelibatan pelajar dalam pembelajaran tatabahasa, satu pendekatan yang turut diadaptasi sepenuhnya dalam aplikasi ini bagi menangani isu kebosanan dan ketakutan terhadap topik imbuhan dalam kalangan murid sekolah rendah.

Secara keseluruhan, walaupun pelbagai kajian telah membuktikan impak positif penggunaan teknologi terhadap penguasaan bahasa Melayu masih wujud kelompangan besar dalam penyelidikan berkaitan pembangunan aplikasi yang memberi fokus khusus terhadap imbuhan kata kerja. Kebanyakan aplikasi sedia ada hanya memberikan tumpuan umum terhadap aspek kosa kata, bacaan atau kemahiran lisan tanpa modul yang benar-benar komprehensif terhadap sistem imbuhan terutamanya imbuhan kata kerja. Oleh itu, pembangunan aplikasi "Pro Kata Kerja" dalam kajian ini adalah signifikan sebagai pelengkap kepada dapatan penyelidikan terdahulu. Aplikasi ini dibina berasaskan Model Air Terjun dan disesuaikan sepenuhnya dengan kandungan DSKP, mengintegrasikan prinsip gamifikasi, pemikiran reflektif, maklum balas serta-merta dan latihan visual untuk membantu murid membina kefahaman mendalam terhadap enam imbuhan kata kerja utama. Kewujudan ciri-ciri mesra murid, fleksibel dan menyeronokkan, aplikasi ini bukan sahaja dapat berfungsi sebagai alat bantu pengajaran guru, tetapi juga sebagai medium pembelajaran kendiri murid dan alat pemantauan kemajuan yang berkesan bagi ibu bapa dan pendidik. Justeru kajian ini, bukan sahaja merintis pembangunan aplikasi pengajaran imbuhan yang komprehensif dalam konteks pendidikan rendah, malah turut menyumbang kepada wacana penyelidikan yang lebih luas tentang keberkesanan inovasi teknologi dalam

memperkukuh penguasaan bahasa Melayu sebagai bahasa kedua.

## METODOLOGI

### Reka Bentuk Kajian

Kajian ini menggunakan reka bentuk kaedah gabungan (*mixed method design*) yang mengintegrasikan kaedah kuantitatif dan kualitatif untuk menjawab dua objektif utama kajian, iaitu (i) mengenal pasti keperluan pembangunan aplikasi pembelajaran "Pro Kata Kerja" dalam kalangan murid SJK(T) dan (ii) membangunkan aplikasi tersebut menggunakan pendekatan Model Air Terjun (*Waterfall Model*). Kaedah kuantitatif digunakan untuk menganalisis tahap penguasaan imbuhan kata kerja murid melalui ujian bertulis dan soal selidik, manakala kaedah kualitatif digunakan untuk menganalisis dapatan pemerhatian pelibatan dan maklum balas guru. Pendekatan ini membolehkan triangulasi data bagi meningkatkan kesahan dan kebolehpercayaan dapatan kajian. Pemilihan kaedah gabungan berasaskan bukti bahawa pendekatan ini dapat meningkatkan kesahan penemuan, memperkukuh asas penciptaan pengetahuan baharu, serta menyediakan data triangulasi yang menyeluruh bagi menyokong dapatan (Hurmerinta-Peltomaki & Nummela, 2006).

Untuk mencapai objektif pertama, kajian keperluan dilaksanakan melalui tiga kaedah pengumpulan data: (1) pengujian, (2) soal selidik dan (3) pemerhatian secara pelibatan. Ujian bertulis dibangunkan untuk mengukur tahap penguasaan murid terhadap imbuhan kata kerja, manakala soal selidik diedarkan kepada guru Bahasa Melayu dan murid bagi mendapatkan pandangan tentang cabaran, kesilapan umum serta keberkesanan kaedah pengajaran sedia ada. Pemerhatian secara pelibatan dijalankan di dalam kelas semasa ujian bertulis kata kerja terbitan dilaksanakan, membolehkan pengkaji meneliti tingkah laku, interaksi murid dan respons spontan terhadap kaedah pembelajaran yang digunakan. Pemerhatian ini berfungsi sebagai pengesahan silang (*cross-validation*) terhadap dapatan soal selidik, sekali gus memberikan gambaran tentang keperluan sebenar murid.

Hasil daripada analisis keperluan ini menjadi asas kepada fasa kedua kajian, iaitu pembangunan aplikasi pembelajaran "Pro Kata Kerja". Proses pembangunan mengadaptasi Model Air Terjun (Winston Royce, 1970) yang menekankan pelaksanaan berurutan secara sistematik. Lima fasa utama model ini ialah:

1. Fasa Perancangan
   Merangka objektif pembangunan, mengenal pasti spesifikasi awal dan sumber yang diperlukan.
2. Fasa Analisis Keperluan
   Meneliti dapatan kajian keperluan bagi menentukan kandungan, fungsi, dan ciri aplikasi yang memenuhi keperluan sasaran.
3. Fasa Reka Bentuk
   Menghasilkan reka bentuk antara muka pengguna (*user interface*) dan aliran interaksi, dengan mempertimbangkan kesesuaian bagi murid sekolah rendah bukan penutur jati bahasa Melayu.

4. Fasa Pembangunan
   Membina aplikasi dengan mengintegrasikan kandunganpembelajaran, elemen multimedia (animasi, audio, visual) dan ciri gamifikasi seperti papan markah dan maklum balas segera.
5. Fasa Pengujian
   Menjalankan *alpha testing* secara dalaman untuk menilai kestabilan fungsi, diikuti beta testing bersama sekumpulan kecil murid bagi menilai keberkesanan dan pengalaman pengguna sebelum pelaksanaan penuh.

Kajian ini hanya memfokuskan empat fasa utama dalam pembangunan aplikasi pembelajaran dan setiap fasa dilaksanakan secara berurutan dan tersusun untuk memastikan kualiti reka bentuk aplikasi serta ketepatannya dengan keperluan pengguna sasaran. Pendekatan ini dipilih kerana kesesuaiannya dalam membangunkan sistem pendidikan digital yang memerlukan struktur pembangunan sistematik dan berasaskan data.

**Teori Kajian**

Kerangka teori bagi kajian ini dibina berasaskan dua teori utama yang saling melengkapi, iaitu Teori Pemprosesan Maklumat oleh Atkinson dan Shiffrin (1968) serta Teori Analisis Kesalahan Bahasa oleh Corder (1973). Teori Pemprosesan Maklumat menekankan bagaimana maklumat dipindahkan daripada memori deria (*sensory memory*) kepada memori jangka pendek (*short-term memory*), seterusnya disimpan dalam memori jangka panjang (*long-term memory*) melalui proses pengekodan, penyimpanan dan pengeluaran semula maklumat. Dalam konteks pembangunan aplikasi pembelajaran "Pro Kata Kerja", teori ini diaplikasikan untuk memastikan reka bentuk kandungan dan strategi penyampaian selari dengan mekanisme pemprosesan maklumat murid. Elemen seperti pengulangan, penyusunan maklumat secara berperingkat, penyediaan maklum balas segera dan penggunaan rangsangan visual serta audio dimasukkan bagi mengukuhkan pemindahan ilmu serta meningkatkan pengekalan pembelajaran dalam memori jangka panjang.

Sementara itu, Teori Analisis Kesalahan Bahasa Corder (1973) digunakan untuk memahami dan menangani kesalahan yang dilakukan oleh murid SJK(T) dalam penguasaan imbuhan kata kerja. Teori ini merupakan salah satu cabang linguistik yang penting dalam kajian pemerolehan bahasa kedua, membolehkan pengkaji mengenal pasti dan mengklasifikasikan kesalahan *interlingual* (kesalahan akibat pemindahan daripada bahasa ibunda) dan *intralingual* (kesalahan akibat faktor dalaman bahasa sasaran) seperti yang dijelaskan oleh Richards et al. (1992). Corder (1973) mengkategorikan empat jenis kesalahan utama, iaitu pengguguran unsur yang perlu, penambahan unsur yang tidak tepat, pemilihan unsur yang salah dan penyusunan unsur yang tidak betul. Pengenalpastian kesalahan ini memberikan maklumat penting kepada pengkaji dan guru tentang kelemahan khusus murid,

sekali gus membolehkan reka bentuk aplikasi pembelajaran "Pro Kata Kerja" disesuaikan untuk memberi penekanan kepada aspek yang paling memerlukan intervensi. Pendekatan ini selaras dengan pandangan Ellis (2008) dan Aini Karim (2007) bahawa analisis kesalahan bahasa dapat membantu dalam merancang strategi pengajaran yang lebih berkesan serta menyumbang kepada peningkatan prestasi murid secara keseluruhan.

Melalui integrasi kedua-dua teori ini, aplikasi "Pro Kata Kerja" bukan sahaja dibangunkan dengan mempertimbangkan keperluan kognitif murid untuk memproses dan mengingati maklumat dengan lebih berkesan, tetapi juga disesuaikan secara khusus untuk menangani kesalahan bahasa yang sering dilakukan. Gabungan ini menghasilkan satu kerangka konseptual yang kukuh, menyokong pembangunan aplikasi pembelajaran yang berstruktur, mesra pengguna, serta berkesan dari segi pedagogi.

## Populasi dan Persampelan

Populasi kajian terdiri daripada 118 orang murid Tahun 5 di SJK(T) Ladang Kinrara, Bandar Kinrara, Puchong, Selangor. Murid Tahun 5 dipilih kerana mereka telah mengikuti kurikulum Bahasa Melayu selama lima tahun dan telah diperkenalkan secara formal kepada imbuhan kata kerja seperti yang digariskan dalam Dokumen Standard Kurikulum dan Pentaksiran (DSKP). Sebanyak 100 orang murid dipilih sebagai sampel kajian menggunakan kaedah pensampelan bertujuan (*purposive sampling*) dengan kriteria pencapaian minimum gred C dalam peperiksaan akhir tahun Bahasa Melayu. Pemilihan ini memastikan peserta mempunyai asas linguistik bahasa Melayu yang memadai untuk menjalani ujian imbuhan kata kerja dan memberikan respons yang sahih dan boleh diukur.

## Lokasi Kajian

Kajian ini dilaksanakan di Sekolah Jenis Kebangsaan Tamil Ladang Kinrara yang terletak di Bandar Kinrara, Puchong, Selangor. Pemilihan sekolah ini sebagai lokasi kajian dibuat berdasarkan pertimbangan strategik dan akademik yang kukuh iaitu, faktor utama: (i) sekolah ini aktif melaksanakan inovasi pengajaran dan pembelajaran, (ii) populasi muridnya mencerminkan kepelbagaian latar sosiobudaya komuniti India bandar, dan (iii) komitmen tinggi pihak sekolah terhadap kerjasama penyelidikan. Faktor-faktor ini menjadikan sekolah tersebut wakil bagi populasi SJK(T) bandar dan sesuai untuk pelaksanaan kajian intervensi berbentuk digital.

## Kaedah Penganalisan Data

Pengumpulan dan penganalisisan data dilaksanakan melalui gabungan kaedah kualitatif dan kuantitatif bagi objektif pertama kajian, iaitu mengenal pasti keperluan pembangunan aplikasi pembelajaran "Pro Kata Kerja" dalam kalangan murid SJK(T). Pendekatan bercampur ini dipilih bagi mendapatkan gambaran komprehensif tentang tahap penguasaan imbuhan kata kerja serta cabaran sebenar yang dihadapi

oleh murid dan guru dalam konteks pembelajaran Bahasa Melayu sebagai bahasa kedua. Menurut Hurmerinta-Peltomaki dan Nummela (2006), kaedah gabungan bukan sahaja meningkatkan kesahan dapatan kajian tetapi turut memperkayakan proses penjanaan pengetahuan melalui triangulasi data.

Instrumen kualitatif merangkumi ujian bertulis imbuhan kata kerja terbitan yang dibangunkan khusus berdasarkan sukatan pelajaran bahasa Melayu sekolah rendah. Ujian ini terdiri daripada empat bahagian utama meliputi imbuhan awalan (meN-, ber-, ter-, di-), imbuhan akhiran (-i, -kan), serta pelbagai bentuk imbuhan apitan. Setiap bahagian menguji keupayaan murid mengenal pasti bentuk imbuhan, membentuk kata kerja terbitan secara tepat dan menggunakannya dalam ayat kontekstual. Ujian dijalankan selama 40 minit, dengan 60 item berformat objektif dan subjektif, setiap satu bernilai satu markah. Skor prestasi murid diklasifikasikan mengikut piawaian Ujian Akhir Sesi Akademik (UASA) yang membahagikan tahap penguasaan kepada enam kategori: Cemerlang (82–100%), Kepujian (66–81%), Baik (50–65%), Memuaskan (35–49%), Mencapai Tahap Minimum (20–34%) dan Belum Mencapai Tahap Minimum (0–19%). Penganalisisan skor ini membolehkan pengkaji mengenal pasti profil prestasi murid, seterusnya merumuskan fokus intervensi yang diperlukan.

Data kuantitatif dilengkapkan dengan instrumen kuantitatif berupa borang soal selidik yang diberikan kepada guru bahasa Melayu di SJK(T). Soal selidik ini mengandungi lima pernyataan utama berkaitan persepsi guru terhadap keperluan penguasaan imbuhan kata kerja, keberkesanan kaedah pengajaran sedia ada, cabaran yang dihadapi, kecenderungan terhadap penggunaan teknologi dalam PdP serta cadangan pembangunan aplikasi khusus. Nilai kebolehpercayaan instrumen diuji menggunakan pekali Alpha Cronbach, manakala analisis data dilakukan secara statistik deskriptif. Hasilnya dipersembahkan dalam bentuk jadual bagi memudahkan interpretasi pola dan perbandingan antara responden.

Selain ujian bertulis dan kaji selidik, pengkaji melaksanakan pemerhatian secara pelibatan untuk menilai tingkah laku, interaksi dan respon murid semasa ujian bertulis kata kerja terbitan berlangsung. Pemerhatian ini memberikan dimensi kontekstual terhadap dapatan kuantitatif dan mengesahkan maklumat yang diperoleh melalui soal selidik guru. Kaedah triangulasi metodologi digunakan bagi menggabungkan data daripada ketiga-tiga sumber ini, memastikan kesahan (*validity*), kebolehpercayaan (*reliability*), dan ketepatan (*accuracy*) dapatan kajian.

Bagi objektif kedua iaitu membangunkan aplikasi pembelajaran "Pro Kata Kerja", pengkaji mengadaptasi Model Air Terjun (*Waterfall Model*) yang diperkenalkan oleh Royce (1970), merangkumi empat fasa utama, perancangan, analisis keperluan, reka bentuk dan pembangunan. Pemilihan model ini berasaskan keperluannya dalam menghasilkan produk digital pendidikan

yang sistematik, terstruktur dan berasaskan data empirikal. Dalam fasa perancangan, objektif aplikasi dirumus berdasarkan kelemahan murid yang dikenal pasti iaitu, kesukaran membentuk kata kerja terbitan yang tepat. Dalam fasa analisis keperluan, data empirikal daripada objektif pertama digunakan untuk menentukan ciri dan fungsi aplikasi termasuk penekanan kepada imbuhan awalan meN- dan alomorfnya, imbuhan apitan serta penggunaan elemen gamifikasi yang sesuai dengan gaya pembelajaran generasi Alpha.

Fasa reka bentuk menekankan pembangunan antara muka mesra pengguna, penggunaan warna yang ceria, ikon yang menarik dan navigasi mudah. Kandungan disusun daripada aras mudah kepada sukar dengan sokongan visual, audio dan maklum balas segera selaras dengan Teori Pemprosesan Maklumat (Atkinson & Shiffrin, 1968) yang menekankan pemindahan maklumat dari memori jangka pendek ke memori jangka panjang melalui pengulangan. Pada masa yang sama, reka bentuk soalan dan aktiviti berasaskan dapatan Teori Analisis Kesalahan Bahasa (Corder, 1973) membolehkan aplikasi memberi penekanan khusus kepada kesalahan yang sering dilakukan murid, seperti pengguguran, penambahan, pemilihan dan penyusunan imbuhan yang tidak tepat.

Akhir sekali, dalam fasa pembangunan, pengkaji menggunakan platform *Google Sites* untuk menghasilkan aplikasi pembelajaran yang boleh diakses melalui pelbagai peranti. Modul interaktif meliputi kuiz, latihan padanan imbuhan dan tugasan berasaskan jenis imbuhan kata kerja, semuanya dibina untuk mengukuhkan pembelajaran kontekstual. Sebelum pelancaran, aplikasi menjalani ujian fungsian dalaman serta semakan pakar bagi memastikan kesahihan kandungan, kestabilan teknikal, reka bentuk yang intuitif dan keberkesanan pedagogi. Hasilnya, aplikasi Pro Kata Kerja bukan sahaja dibina berdasarkan keperluan sebenar murid SJK(T), malah direka secara saintifik, berstruktur dan berpandukan teori pembelajaran yang mantap menjadikannya alat bantu mengajar digital yang berpotensi besar meningkatkan penguasaan imbuhan kata kerja secara menyeronokkan, efektif dan relevan dengan tuntutan pendidikan abad ke-21.

## ANALISIS DAN PERBINCANGAN

Analisis dan perbincangan ini disusun mengikut empat fasa utama Model Air Terjun, bermula dengan fasa perancangan, diikuti analisis keperluan, reka bentuk dan pembangunan aplikasi pembelajaran "Pro Kata Kerja". Setiap fasa dihuraikan berdasarkan dapatan kualitatif dan kuantitatif daripada ujian bertulis, soal selidik guru serta pemerhatian pelibatan murid. Perbincangan turut disandarkan pada Teori Analisis Kesalahan (Corder, 1973) dan Teori Pemprosesan Maklumat (Atkinson & Shiffrin, 1968) untuk menjelaskan jurang pembelajaran yang wujud, keperluan intervensi digital serta keberkesanan aplikasi dari segi pedagogi, teknologi dan motivasi. Pendekatan ini memastikan dapatan kajian dikaitkan secara

langsung dengan literatur terdahulu dan memberikan implikasi yang jelas terhadap pengajaran bahasa Melayu abad ke-21.

**Fasa Perancangan**

Fasa perancangan merupakan tahap paling signifikan dalam Model Air Terjun yang diaplikasikan dalam pembangunan aplikasi pembelajaran "Pro Kata Kerja". Fasa ini berfungsi sebagai asas kepada keseluruhan pelaksanaan kajian yang melibatkan perancangan menyeluruh berkaitan matlamat, skop, keperluan pengguna dan strategi teknikal yang akan digunakan dalam proses pembangunan. Dalam konteks kajian ini, perancangan bermula dengan penetapan objektif pembangunan aplikasi, iaitu membantu murid SJK(T) menguasai imbuhan kata kerja bahasa Melayu melalui pendekatan interaktif, menyeronokkan dan bersesuaian dengan gaya pembelajaran generasi Alpha. Objektif khusus yang dirangka merangkumi usaha meningkatkan penguasaan kata kerja melalui aktiviti gamifikasi, menggalakkan murid berinteraksi aktif dengan aplikasi, menyediakan bahan bantu yang mudah diakses serta memberikan maklum balas serta-merta dalam bentuk permainan bahasa yang membina.

Penilaian keperluan pengguna dijalankan untuk memastikan aplikasi pembelajaran memenuhi keperluan sebenar murid. Proses ini merangkumi kajian literatur terhadap aplikasi pembelajaran bahasa sedia ada, perbincangan dengan guru bahasa Melayu untuk mengenal pasti cabaran pengajaran imbuhan kata kerja dan pemilihan gaya pembelajaran yang sesuai untuk generasi Alpha. Hasil penilaian ini menjadi asas kepada penentuan ciri utama aplikasi seperti penerapan unsur gamifikasi (permainan bahasa, skor pencapaian, cabaran bertahap), pemberian maklum balas serta-merta, reka bentuk antara muka mesra pengguna dan sistem ganjaran bagi meningkatkan motivasi murid selepas menyelesaikan tahap tertentu.

Di samping itu, penilaian terhadap kemungkinan integrasi aplikasi dengan sistem pembelajaran sedia ada turut dilaksanakan. Penyusunan sumber daya manusia juga diberi perhatian dengan mengenal pasti individu penting dalam projek termasuk pakar kandungan Bahasa Melayu bagi memastikan ketepatan isi serta keselarasan dengan Dokumen Standard Kurikulum dan Pentaksiran (DSKP). Satu pelan pengujian yang komprehensif turut dibangunkan, merangkumi ujian fungsional bagi memastikan aplikasi beroperasi seperti yang dirancang, ujian prestasi untuk menilai kelancaran operasi dan ujian kegunaan yang melibatkan murid serta guru sebagai pengguna sebenar. Strategi penyelesaian masalah turut disediakan untuk menangani isu teknikal atau ketidaksempurnaan fungsi, khususnya dalam komponen gamifikasi dan keserasian peranti.

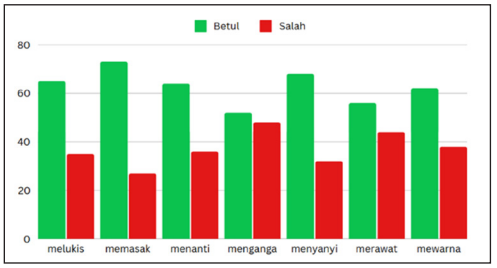
Secara keseluruhannya, fasa perancangan ini memainkan peranan kritikal dalam memastikan pembangunan aplikasi pembelajaran "Pro Kata Kerja" dilaksanakan secara tersusun, efisien, dan berkesan, seterusnya menepati keperluan pengguna sasaran dan menjamin kualiti aplikasi sebelum beralih ke fasa analisis keperluan.

## Fasa Analisis Keperluan

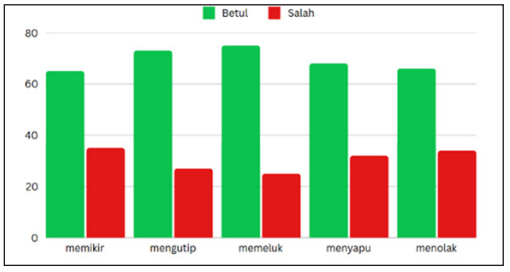
Fasa analisis keperluan bertujuan mengenal pasti secara terperinci masalah pembelajaran imbuhan kata kerja dalam kalangan murid SJK(T) dan merumuskan spesifikasi fungsi aplikasi pembelajaran "Pro Kata Kerja" yang paling relevan. Proses ini dilaksanakan melalui pengumpulan data daripada tiga sumber utama, iaitu ujian bertulis kata kerja terbitan, soal selidik guru Bahasa Melayu dan pemerhatian pelibatan murid.

### *Analisis Ujian Bertulis Kata Kerja Terbitan*

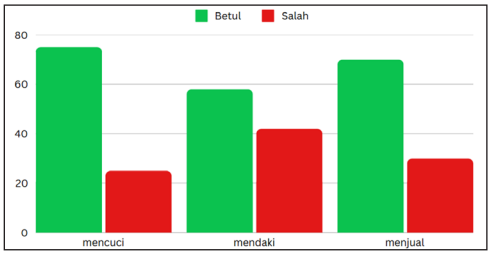
### *Imbuhan Awalan Kata Kerja "meN-"*




*Rajah 1.* Tahap penguasaan alomorf imbuhan awalan me- yang tiada perubahan



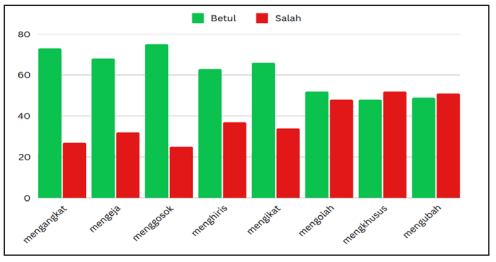

*Rajah 2.* Tahap penguasaan alomorf imbuhan awalan me- yang mengalami perubahan



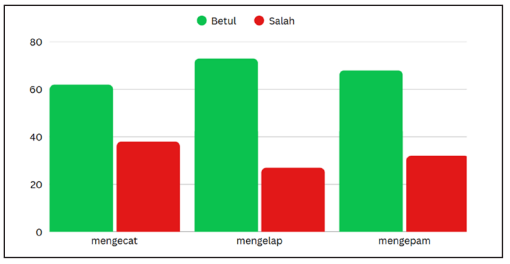

*Rajah 3.* Tahap penguasaan alomorf imbuhan awalan men-




*Rajah 4.* Tahap penguasaan alomorf imbuhan awalan kata kerja mem-




*Rajah 5.* Tahap penguasaan alomorf imbuhan awalan kata kerja meng-




*Rajah 6.* Tahap penguasaan alomorf imbuhan awalan kata kerja menge-

Dapatan kajian mewwwnunjukkan bahawa tahap penguasaan imbuhan awalan meN- dalam kalangan murid SJK(T) masih belum konsisten dengan variasi yang ketara mengikut bentuk alomorf dan ciri fonologi kata dasar. Walaupun terdapat item yang mencapai kadar jawapan betul melebihi 70%, kesalahan yang signifikan masih berlaku, khususnya pada bentuk imbuhan yang melibatkan perubahan fonem atau kata dasar yang jarang digunakan dalam komunikasi harian. Hal ini menandakan bahawa penguasaan imbuhan awalan meN- bukan sahaja dipengaruhi oleh pengetahuan morfologi, tetapi juga oleh tahap pendedahan leksikal dan peraturan perubahan bentuk kata kerja. Berdasarkan kerangka Teori Analisis Kesilapan Corder (1973), kesalahan yang dikenal pasti dapat dikategorikan kepada empat jenis kesalahan utama, iaitu pengguguran unsur yang perlu, penambahan unsur yang tidak tepat, pemilihan unsur yang salah dan penyusunan unsur yang tidak betul. Berdasarkan Rajah 2, pemilihan unsur yang salah kerap berlaku pada kata dasar yang memerlukan penyesuaian fonem tertentu seperti *memikir* (35% salah) atau *menolak* (34% salah), manakala penyusunan unsur yang salah dapat dilihat dalam Rajah 1 iaitu, kes seperti *mewarna* (38% salah). Isu yang sama boleh dilihat dalam Rajah 3 untuk kata kerja terbitan *mendaki* (42% salah). Merujuk Rajah 4, kesalahan penambahan unsur yang tidak tepat pula jelas pada kata pinjaman seperti *memveto* (68% salah) yang jarang ditemui dalam korpus bahasa Melayu sekolah rendah dan kurang didedahkan dalam bahan pengajaran.

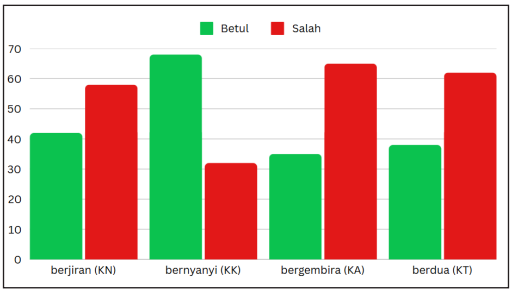
Tahap kesukaran yang tinggi juga dapat dilihat pada item seperti *menganga* dalam Rajah 1 (48% salah), *mengkhusus* (52% salah) dan *mengolah* (48% salah) dalam Rajah 5 yang melibatkan kata dasar dengan gugusan konsonan kompleks dan kata dasar jarang digunakan. Murid cenderung gagal mengenal pasti alomorf yang tepat apabila kata dasar bermula dengan konsonan kompleks yang tidak lazim digunakan, manakala kadar kejayaan yang tinggi pada kata seperti *membaca* yang memperoleh 87% betul (Rajah 4), kata kerja *mencuci* yang mencatatkan 75% betul (Rajah 2) dan perkataan *mengelap* yang memperoleh 73% betul (Rajah 6) membuktikan bahawa pendedahan yang kerap dalam penggunaan konteks harian memudahkan penguasaan imbuhan ini. Kesalahan juga ketara dalam penggunaan imbuhan menge- bagi kata dasar satu suku kata seperti *mengecat* yang mencatatkan 38% salah dan *mengepam* dengan 32% salah (Rajah 6), walaupun peraturan ini khusus dan jarang berubah, menunjukkan bahawa lebih satu pertiga murid masih keliru tentang pembezaan pola imbuhan bagi kata dasar pendek dan panjang.

Secara keseluruhan, analisis ini membuktikan bahawa proses penguasaan imbuhan awalan meN- tidak berlaku secara berkesan, sebaliknya dipengaruhi oleh interaksi antara peraturan morfologi, pengecualian fonologi, tahap pendedahan dan latar belakang bahasa murid. Murid yang lemah cenderung melakukan kesilapan berulang pada bentuk yang sama, menandakan bahawa mereka belum

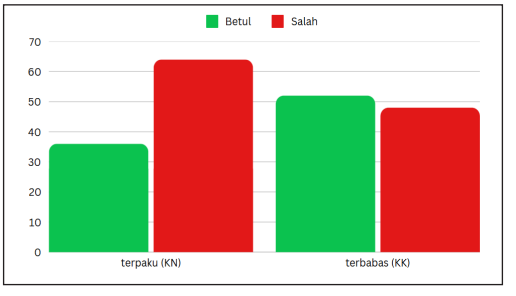
membina representasi mental yang kukuh terhadap corak alomorf meN. Dari sudut pedagogi, dapatan ini menggariskan keperluan kepada intervensi pembelajaran yang tersusun, kontekstual dan berasaskan teknologi. Integrasi dapatan ini ke dalam reka bentuk aplikasi pembelajaran "Pro Kata Kerja" berpotensi mengurangkan kadar kesalahan, meningkatkan ketepatan morfologi dan seterusnya memperkukuh kecekapan bahasa Melayu murid dalam topik imbuhan kata kerja. Melalui pendekatan bersepadu yang menekankan latihan adaptif, pembelajaran kolaboratif dan sokongan visual-audio, kelemahan yang dikenal pasti dalam kajian ini dapat diatasi secara berkesan, selaras dengan tuntutan Pembelajaran Abad ke-21 dan keperluan pembelajaran generasi Alpha.

### *Imbuhan Awalan Kata Kerja "ber-", "ter-" dan "di-"*

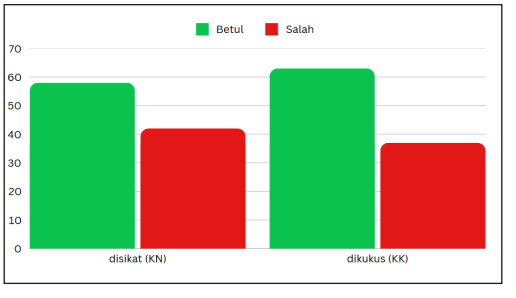
Bahagian ini membuktikan tahap penguasaan imbuhan awalan ber-, ter- dan di- dalam kalangan murid SJK(T) masih berada dalam tahap memuaskan sahaja dengan variasi ketara dari segi peratusan kesilapan bergantung kepada kelas kata dasar dan fungsi imbuhan yang digunakan. Secara umum, murid menunjukkan penguasaan yang lebih baik apabila kata dasar merupakan kata kerja, namun prestasi menurun secara signifikan apabila kata dasar terdiri daripada kata nama, kata adjektif atau kata tugas. Fenomena ini mengesahkan bahawa peraturan pembentukan kata kerja terbitan yang melibatkan perubahan golongan kata memerlukan pemahaman konseptual yang lebih kompleks berbanding pembentukan kata kerja daripada kata kerja asal yang mengekalkan kelas kata yang sama.




*Rajah 7.* Tahap penguasaan imbuhan awalan kata kerja ber-




*Rajah 8.* Tahap penguasaan imbuhan awalan kata kerja ter-




*Rajah 9.* Tahap penguasaan imbuhan awalan kata kerja di-

Berdasarkan Rajah 7, kesalahan tertinggi direkodkan pada item *berjiran* (58%) dan *berdua* (62%) yang masing-masing berasal daripada kata nama

dan kata tugas. Berdasarkan kerangka Teori Analisis Kesilapan Corder (1973), kesilapan ini dikategorikan sebagai misselection atau pemilihan unsur yang tidak tepat. Murid gagal mengenal pasti bahawa imbuhan ber- digunakan untuk menukar kata nama atau kata tugas kepada kata kerja terbitan dengan makna perbuatan atau keadaan yang melibatkan subjek. Sebaliknya, kadar kesalahan rendah seperti pada item bernyanyi yang mencatatkan 32% menunjukkan bahawa murid lebih mudah mengenal pasti imbuhan apabila kata dasar yang digunakan telah tergolong dalam kategori kata kerja. Kesalahan tertinggi bagi imbuhan ber- melibatkan kata adjektif, seperti pada item bergembira (65%), yang menunjukkan kekeliruan mendalam murid terhadap pola pengimbuhan kata sifat, khususnya apabila penggunaannya memerlukan interpretasi makna yang abstrak.

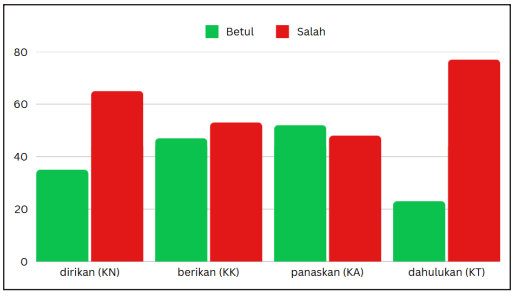
Merujuk Rajah 8 bagi imbuhan awalan kata kerja ter-, kesalahan yang signifikan direkodkan pada kata kerja terpaku (64%) yang berasal daripada kata nama, berbanding terbabas (48%) yang berasal daripada kata kerja. Jurang ini menunjukkan bahawa murid lebih mudah memproses pembentukan kata kerja terbitan daripada kata kerja asal berbanding daripada kata nama. Mengikut Corder (1973), kesilapan ini merupakan pemilihan imbuhan yang tidak tepat dan berpunca daripada kegagalan memadankan fungsi imbuhan ter- dengan konteks semantik kata dasar, khususnya dalam penggunaan untuk menyatakan keadaan atau perbuatan yang berlaku secara tidak sengaja.

Bagi imbuhan awalan di- dalam Rajah 9, pola kesilapan menunjukkan bahawa murid lebih menguasai pembentukan kata kerja pasif daripada kata kerja (*dikukus*, 37% salah) berbanding daripada kata nama (*disikat*, 42% salah). Kesalahan ini mencerminkan kelemahan dalam pemahaman murid tentang transformasi golongan kata melalui pengimbuhan pasif, khususnya apabila kata dasar bukan kata kerja. Berdasarkan kerangka Corder (1973), kesilapan ini juga dikategorikan sebagai pemilihan unsur yang tidak tepat dan dalam beberapa kes sebagai *intralingual errors*, iaitu kesalahan yang berpunca daripada kekeliruan terhadap peraturan imbuhan dalam bahasa sasaran itu sendiri, bukan pengaruh bahasa ibunda.

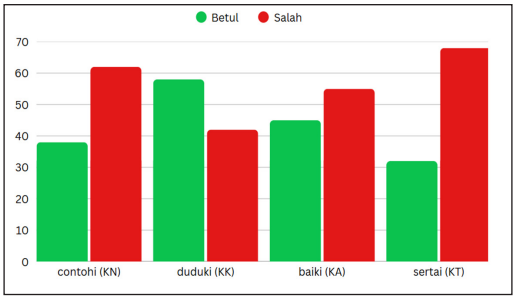
Secara keseluruhannya, analisis ini membuktikan bahawa murid cenderung membuat kesilapan yang lebih tinggi apabila pembentukan kata kerja terbitan melibatkan transformasi kelas kata, terutamanya daripada kata nama, kata adjektif atau kata tugas kepada kata kerja. Sebaliknya, apabila imbuhan digunakan pada kata dasar yang mengekalkan kelas kata asal (misalnya kata kerja → kata kerja), kadar kesalahan menurun dengan ketara.

### *Imbuhan Akhiran Kata Kerja "-kan" dan "-i"*

Dapatan kajian dalam Rajah 10 dan Rajah 11 menunjukkan bahawa penguasaan murid terhadap pembentukan kata kerja terbitan dengan imbuhan akhiran masih berada pada tahap rendah, dengan pola kesilapan yang konsisten merentas empat golongan kata dasar iaitu kata tugas, kata nama, kata adjektif dan kata kerja. Berdasarkan kerangka Teori Corder (1973), kesilapan




*Rajah 10.* Tahap penguasaan imbuhan akhiran kata kerja -kan



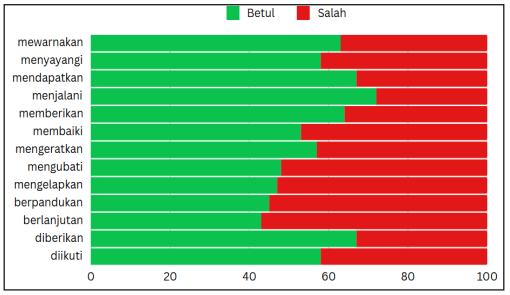

*Rajah 11.* Tahap penguasaan imbuhan akhiran kata kerja -i

ini dapat dibahagikan kepada tiga kategori utama, iaitu kesilapan pemilihan unsur yang tidak tepat, kesilapan penyusunan unsur yang salah dan pengguguran unsur yang perlu. Kesilapan tertinggi direkodkan pada kata dasar yang merupakan kata tugas seperti dahulukan dengan 77% kesalahan dan sertai dengan 68%, diikuti kata dasar kata nama seperti dirikan dengan 65% dan contohi dengan 62%. Bagi kata adjektif, kesilapan masih tinggi seperti pada baiki dengan 55%, manakala kata kerja merekodkan kadar kesilapan terendah namun tetap signifikan, contohnya duduki dengan 42%.

Secara keseluruhan, kelemahan utama murid bukan hanya melibatkan ingatan terhadap bentuk imbuhan, tetapi juga kekurangan pemahaman terhadap sistem morfologi generatif yang membolehkan mereka meramalkan bentuk kata kerja terbitan berdasarkan jenis kata dasar dan fungsi semantik yang diingini. Keadaan ini menuntut pendekatan pengajaran yang lebih eksplisit, berpandukan analisis kesilapan sebenar serta penggunaan teknik perbandingan pola imbuhan merentas kelas kata bagi membina kecekapan morfologi secara sistematik dan meningkatkan ketepatan penggunaan kata kerja terbitan dalam komunikasi lisan dan penulisan.

### *Imbuhan Apitan Kata Kerja*

Analisis menunjukkan bahawa penguasaan murid terhadap pembentukan kata kerja terbitan masih berada pada tahap optimum, khususnya bagi imbuhan apitan me-...-kan, me-...-i, di-...-kan, di-...-i, serta awalan ber- dan ter-. Berdasarkan Teori Analisis Kesilapan Corder (1973), kesilapan murid dapat dikelompokkan kepada tiga kategori utama, iaitu pemilihan unsur yang tidak tepat, penyusunan unsur yang salah dan pengguguran unsur yang perlu. Merujuk Rajah 12, kadar kesilapan tertinggi direkodkan pada imbuhan apitan yang melibatkan kata kerja dan kata adjektif, seperti berlanjutan (57%), mengubati (48%) dan menyayangi (42%) yang berpunca daripada kekeliruan terhadap fungsi imbuhan dan peraturan pembentukan kata. Walaupun bentuk yang lebih kerap digunakan seperti mewarnakan (37% salah) dan diberikan (33% salah) menunjukkan penguasaan lebih baik, kesilapan masih




*Rajah 12.* Tahap penguasaan imbuhan apitan kata kerja

berlaku pada bentuk seperti memberikan dan membaiki, membuktikan cabaran berterusan dalam pemilihan dan penyusunan imbuhan. Kesilapan pada kata adjektif (mengeratkan, membaiki) menonjolkan kelemahan murid dalam transformasi semantik daripada sifat kepada tindakan, manakala kesalahan pada bentuk pasif di-...-i (diikuti) menunjukkan kekaburan dalam memahami perbezaan fungsi di-...-i dan di-...-kan.

Secara keseluruhan, kelemahan ini berpunca bukan sekadar daripada keterbatasan ingatan bentuk imbuhan, tetapi daripada kegagalan membina sistem morfologi generatif. Justeru pengajaran imbuhan perlu bersifat mudah difahami, menekankan hubungan bentuk dan makna merentas kelas kata, menyediakan latihan berasaskan konteks bermakna dan memanfaatkan data kesilapan sebenar bagi meningkatkan kecekapan murid dalam membentuk kata kerja terbitan secara tepat.

### *Analisis Kaji Selidik Keperluan Pembangunan Aplikasi Pembelajaran "Pro Kata Kerja"*

Jadual 1 memaparkan dapatan soal selidik daripada 30 guru Bahasa Melayu sekolah rendah yang turut mempamerkan konsistensi corak keperluan yang dikenal pasti. Nilai min keseluruhan yang tinggi (min = 4.05, SP = 0.84) menunjukkan sokongan padu guru terhadap keperluan bahan bantu mengajar digital yang berstruktur dan interaktif. Skor tertinggi dicatatkan pada pernyataan berkaitan kepentingan penguasaan kata kerja terbitan (min = 4.13) dan keperluan integrasi elemen digital dalam PdPc (min = 4.13), menandakan kesedaran bahawa murid generasi Alpha lebih responsif terhadap pendekatan berasaskan teknologi, gamifikasi, dan visualisasi dinamik. Walaupun kesemua pernyataan berada pada tahap "Tinggi", penekanan guru terhadap keperluan latihan khusus imbuhan

Jadual 1
*Nilai min, sisihan piawai dan tahap interpretasi keperluan pembangunan aplikasi pembelajaran kata kerja terbitan*

| No. | Keperluan Pembangunan Aplikasi Pembelajaran | Min | S.P. | Tahap |
|---|---|---|---|---|
| 1 | Keperluan murid menguasai kata kerja terbitan | 4.13 | 0.86 | Tinggi |
| 2 | Keperluan latihan khusus imbuhan kata kerja | 4.03 | 0.89 | Tinggi |
| 3 | Keperluan kaedah khusus dalam PdPc imbuhan | 4.1 | 0.8 | Tinggi |
| 4 | Keperluan elemen digital untuk generasi Alpha | 4.13 | 0.87 | Tinggi |
| 5 | Keperluan bahan bantu pengajaran imbuhan | 3.87 | 0.82 | Tinggi |
| | Jumlah Keseluruhan | 4.05 | 0.84 | Tinggi |

(min = 4.03) dan bahan bantu mengajar yang sesuai (min = 3.87) memperlihatkan wujudnya jurang yang belum diisi oleh sumber pembelajaran konvensional.

Secara keseluruhan, data ini menggariskan satu keperluan kritikal terhadap intervensi pedagogi yang lebih sistematik, mesra pengguna dan selari dengan tabiat pembelajaran digital murid masa kini. Aplikasi mudah alih "Pro Kata Kerja" muncul sebagai respons strategik yang memenuhi ketiga-tiga dimensi ini: (i) menyediakan latihan imbuhan kata kerja yang komprehensif dan terstruktur mengikut kategori imbuhan; (ii) mengintegrasikan elemen gamifikasi dan interaktiviti untuk meningkatkan motivasi dan penglibatan murid; dan (iii) memudahkan guru melaksanakan PdPc yang bersandarkan data kesilapan sebenar murid. Dengan keupayaan untuk mengisi jurang pedagogi yang wujud, aplikasi pembelajaran ini bukan sahaja berpotensi memperkukuh penguasaan tatabahasa murid secara berkesan, malah menyumbang kepada transformasi ekosistem pengajaran dan pembelajaran bahasa Melayu yang berorientasikan pendidikan abad ke-21, berpaksikan teknologi dan berfokuskan pembelajaran kendiri yang menyeronokkan.

### *Analisis Pemerhatian Keperluan Pembangunan Aplikasi Pembelajaran "Pro Kata Kerja"*

Pemerhatian semasa ujian bertulis memberikan gambaran jelas tentang jurang penguasaan pembentukan kata kerja terbitan dalam kalangan murid SJK(T), khususnya melibatkan imbuhan awalan meN- dan variasi alomorfnya. Merujuk Jadual 2, sebanyak 34.7% murid menunjukkan keraguan ketara, terutama apabila berhadapan dengan kata dasar satu suku kata seperti cat dan pam yang memerlukan imbuhan menge-. Keraguan ini ditunjukkan melalui jeda panjang, gerak mata mencari petunjuk persekitaran atau tindakan meminta bantuan guru, menandakan jurang antara pengetahuan hafalan dan keupayaan aplikasi automatik. Selain itu, 22.9% murid memerlukan pengulangan arahan walaupun telah dibacakan secara kolektif, mencerminkan kelemahan pemahaman teks arahan yang mungkin berkaitan dengan status bahasa Melayu sebagai bahasa kedua dan ketiadaan pendekatan multimodal seperti ilustrasi atau demonstrasi.

Dari segi tumpuan, hanya 57.6% murid mengekalkan fokus konsisten, manakala selebihnya mudah terganggu, selari dengan

Jadual 2
*Analisis pemerhatian responden*

| Aspek Pemerhatian | Bil. Murid | Peratus (%) |
|---|---|---|
| Menunjukkan keraguan ketika menjawab soalan | 41 | 34.7% |
| Memerlukan penjelasan semula arahan soalan | 27 | 22.9% |
| Menunjukkan tumpuan yang konsisten | 68 | 57.6% |
| Menjawab secara rawak tanpa strategi jelas | 33 | 28.0% |
| Mencuba membentuk imbuhan dengan menyebut lisan | 19 | 16.1% |

dapatan kognitif bahawa beban kognitif tinggi dalam tugasan morfologi bahasa kedua menjejaskan fokus. Sebanyak 28.0% murid pula menjawab secara rawak tanpa menganalisis struktur kata dasar, menunjukkan ketiadaan strategi analisis morfologi yang sistematik. Namun, 16.1% murid menggunakan strategi fonologi dengan menyebut perlahan imbuhan dan kata dasar sebelum menulis jawapan, memperlihatkan potensi pembelajaran melalui gabungan saluran visual dan auditif.

Secara keseluruhan, kelemahan penguasaan imbuhan kata kerja terbitan berpunca daripada kesukaran memproses peraturan fonologi meN-, kelemahan memahami arahan tanpa sokongan multimodal, beban kognitif yang tinggi dan ketiadaan strategi analisis morfologi yang mantap. Intervensi melalui aplikasi pembelajaran interaktif seperti "Pro Kata Kerja" berpotensi mengatasi isu ini dengan menyediakan panduan multimodal, memvisualisasikan proses imbuhan, membimbing strategi analisis penggunaan imbuhan kata kerja dan menggabungkan elemen audio, visual serta gamifikasi.

## Fasa Reka Bentuk

Fasa reka bentuk dalam proses pembangunan aplikasi pembelajaran "Pro Kata Kerja" dapat menentukan struktur, fungsi, dan pengalaman pengguna (*user experience*) yang akan mempengaruhi keberkesanan pembelajaran. Berdasarkan model pembangunan berasaskan Model Air Terjun, fasa ini dimulakan dengan penterjemahan keperluan pengguna yang diperoleh daripada fasa analisis keperluan, termasuk dapatan ujian bertulis, pemerhatian dan soal selidik guru kepada spesifikasi teknikal dan pedagogi yang jelas. Reka bentuk aplikasi ini menggabungkan elemen pedagogi bahasa Melayu berasaskan teori pemerolehan bahasa kedua dan prinsip *Instructional Design*, khususnya Model ADDIE, bagi memastikan kandungan dan aktiviti pembelajaran dapat memenuhi keperluan murid SJK(T) yang mempelajari bahasa Melayu sebagai bahasa kedua.

Dari segi kandungan, reka bentuk aplikasi memberi penekanan kepada penguasaan imbuhan kata kerja secara berperingkat, bermula daripada imbuhan awalan (meN-, ber-, di-, ter-), imbuhan akhiran (-kan, -i) sehinggalah kepada imbuhan apitan (meN-…-kan, meN-…-i, di-…-kan, di-…-i). Setiap jenis imbuhan disusun mengikut tahap kesukaran, disertakan contoh kontekstual dan diperkuatkan dengan elemen visual, audio serta interaktiviti bagi menyokong pembelajaran multimodal. Warna-warna tertentu digunakan untuk membezakan kategori imbuhan (contohnya, awalan berwarna biru, akhiran berwarna hijau, apitan berwarna jingga), bagi meningkatkan daya ingatan visual.

Dari perspektif fungsi, reka bentuk aplikasi mengintegrasikan mekanisme penilaian formatif secara automatik, membolehkan murid menerima maklum balas segera terhadap jawapan mereka. Fungsi gamifikasi dimasukkan untuk meningkatkan motivasi intrinsik dan ekstrinsik murid. Modul latihan dirancang dalam bentuk progresif, membolehkan murid bergerak dari tahap asas ke tahap lanjutan mengikut prestasi masing-masing. Selain

itu, elemen audio dan video disediakan bagi menyokong strategi auditif-fonologi yang telah dikenal pasti sebagai salah satu kekuatan pembelajaran murid dalam pemerhatian.

Keseluruhannya, fasa reka bentuk ini memastikan aplikasi pembelajaran "Pro Kata Kerja" bukan sekadar sebuah aplikasi pembelajaran bahasa, tetapi satu platform interaktif yang berasaskan teori pembelajaran, disesuaikan dengan konteks murid dan menyepadukan teknologi pendidikan secara strategik. Reka bentuk yang terancang ini dapat mengatasi kelemahan yang dikenal pasti dalam fasa analisis, meningkatkan keberkesanan PdPc imbuhan kata kerja serta menyumbang kepada pembangunan kemahiran bahasa Melayu yang lebih mantap dalam kalangan murid.

**Fasa Pembangunan**

Fasa pembangunan merupakan fasa penting dalam proses pembangunan aplikasi pembelajaran "Pro Kata Kerja" kerana segala maklumat yang diperoleh dalam fasa analisis keperluan diterjemahkan secara sistematik ke dalam struktur, susun atur kandungan, antara muka pengguna (UI) dan fungsi aplikasi. Tujuan utama pembangunan ini untuk memastikan bahawa aplikasi yang dibangunkan benar-benar memenuhi keperluan murid dari segi pedagogi, kandungan, interaktiviti dan kesesuaian teknologi. Berdasarkan dapatan daripada ujian bertulis, soal selidik guru dan pemerhatian pelibatan, pengkaji mengenal pasti bahawa murid masih keliru dengan bentuk imbuhan awalan seperti meN- dan alomorfnya (me-, men-, mem-, meng-, menge-), serta imbuhan akhiran seperti -i dan -kan. Tambahan pula, pendekatan PdPc yang masih bersifat konvensional, kurang visual dan tidak berpusatkan murid turut menyumbang kepada kesukaran memahami konsep imbuhan dalam kalangan murid SJK(T).

Sebagai tindak balas kepada keperluan ini, aplikasi pembelajaran "Pro Kata Kerja" dibangunkan (Rajah 13) dengan struktur latihan modular mengikut jenis imbuhan, melibatkan latihan untuk imbuhan awalan (meN-, ber-, ter-, di-), imbuhan akhiran (-i, -kan), dan apitan. Setiap modul dirangka dengan paparan pengenalan grafik, animasi pembentukan imbuhan dan latihan interaktif seperti pilihan jawapan serta susun perkataan. Latihan ini direka secara progresif daripada aras mudah hingga sukar. Selain itu, pembangunan antara muka aplikasi memberikan keutamaan kepada aspek mesra murid dan susun atur direka secara minimalis tetapi berwarna ceria dan menggunakan ikon besar untuk memudahkan navigasi. Ilustrasi kartun dan grafik berunsur visual digunakan untuk menerangkan konsep imbuhan secara kontekstual, sesuai dengan keperluan murid tahap dua sekolah rendah.

Penekanan utama dalam pembangunan ini ialah penerapan Teori Kognitif Pemprosesan Maklumat oleh Atkinson dan Shiffrin (1968) yang menjelaskan bagaimana maklumat diproses melalui tiga komponen utama: memori deria (*sensory memory*), memori jangka pendek (*short-term memory*) dan memori jangka panjang (*long-term memory*). Dalam konteks




*Rajah 13.* Halaman keseluruhan aplikasi pembelajaran "pro kata kerja"

aplikasi ini, penyampaian maklumat secara visual dan interaktif membantu memastikan bahawa maklumat imbuhan dapat dikod dan disimpan dalam memori jangka pendek dengan berkesan. Melalui latihan berulang, maklum balas serta-merta serta peneguhan melalui gamifikasi, maklumat tersebut akan dipindahkan ke memori jangka panjang. Reka bentuk yang menggabungkan gambar, animasi, ikon dan teks ini bertujuan untuk meningkatkan pengekalan maklumat imbuhan secara jangka panjang dan memudahkan pemahaman konsep secara praktikal.

Kesimpulannya, hasil dapatan fasa pembangunan ini menunjukkan bahawa aplikasi pembelajaran "Pro Kata Kerja" dibangunkan dengan teliti berdasarkan keperluan pengguna, dapatan empirikal, serta disokong oleh prinsip kognitif dan pedagogi yang mantap. Dengan pembangunan yang menumpukan visualisasi, interaktiviti, struktur modular dan maklum balas serta-merta, aplikasi ini diyakini mampu menjadi alat bantu mengajar yang berkesan dalam membantu murid menguasai imbuhan kata kerja secara lebih menyeronokkan dan berkesan.

## KESIMPULAN

Kajian ini menekankan keperluan terhadap pembangunan aplikasi pembelajaran "Pro Kata Kerja" untuk membantu penguasaan

imbuhan kata kerja dalam kalangan murid SJK(T). Dapatan kajian menunjukkan bahawa murid menghadapi kesulitan dalam mengenal pasti dan membentuk kata kerja terbitan, khususnya dalam penggunaan imbuhan awalan meN-, imbuhan akhiran -kan dan -i, serta imbuhan apitan. Kesilapan ini disebabkan oleh kekurangan pemahaman morfologi dan kekurangan bahan bantu mengajar yang spesifik serta pendekatan PdPc berpusatkan guru.

Aplikasi pembelajaran "Pro Kata Kerja" dibangunkan dengan pendekatan Model Air Terjun yang melibatkan fasa perancangan, analisis keperluan, reka bentuk dan pembangunan. Aplikasi ini menggunakan pembelajaran interaktif dan gamifikasi untuk melibatkan murid dengan kuiz imbuhan, cabaran berperingkat dan maklum balas segera. Penilaian pakar menunjukkan penerimaan positif terhadap reka bentuk grafik, latihan berstruktur dan kemudahan penggunaannya dalam PdPc. Dengan itu, aplikasi ini diharap dapat menyokong penguasaan imbuhan kata kerja dan memperbaiki kelemahan pengajaran yang dikenal pasti dalam kajian ini. Pembangunan aplikasi ini diharap dapat dijadikan model rujukan bagi pembangunan aplikasi pendidikan bahasa yang lain di Malaysia, selaras dengan usaha memperkasakan Pendidikan Berkualiti (SDG 4) dan inovasi teknologi pendidikan (SDG 9).

## Implikasi Kajian

Kajian ini menekankan keperluan pembangunan aplikasi pembelajaran "Pro Kata Kerja" untuk membantu penguasaan imbuhan kata kerja dalam kalangan murid SJK(T). Dapatan kajian menunjukkan bahawa murid menghadapi kesulitan ketara dalam mengenal pasti dan membentuk kata kerja terbitan dengan tepat, khususnya imbuhan awalan meN- dan variasi alomorfnya. Penyebab utama masalah ini adalah kekurangan bahan bantu mengajar yang spesifik, pendekatan PdPc yang masih berpusatkan guru dan kurangnya elemen visual serta interaktif dalam pengajaran. Sebagai respons, aplikasi pembelajaran ini dibangunkan menggunakan pendekatan Model Air Terjun dengan menekankan pembelajaran interaktif dan gamifikasi, menyediakan kuiz, cabaran berperingkat dan maklum balas segera untuk meningkatkan penguasaan imbuhan dalam kalangan murid.

Implikasi kajian ini adalah besar dari pelbagai perspektif. Dari sudut praktikal, aplikasi "Pro Kata Kerja" menawarkan pendekatan inovatif dalam PdPc yang mesra guru dan murid, menjadikan pengajaran imbuhan kata kerja terbitan lebih sistematik dan menarik. Kajian ini juga menyokong integrasi teknologi digital dalam pengajaran tatabahasa, sejajar dengan Pelan Pembangunan Pendidikan Malaysia (PPPM) yang mengutamakan pembelajaran abad ke-21. Dari sudut akademik, kajian ini menyumbang kepada literatur pendidikan bahasa dengan mengemukakan model pembangunan aplikasi berasaskan bukti empirikal serta membuka ruang untuk kajian lanjutan dalam penggunaan aplikasi pendidikan bagi meningkatkan kemahiran bahasa di kalangan pelajar.

## Keterbatasan dan Cadangan untuk Kajian Lanjutan

Walaupun dapatan kajian ini menjanjikan hasil yang positif, terdapat beberapa keterbatasan yang perlu diambil kira. Pertama, ruang lingkup kajian ini adalah terhad kepada kelompok murid dari Sekolah Jenis Kebangsaan Tamil SJK(T) yang mengehadkan kebolehgunaan hasil kajian ini kepada populasi murid yang berbeza, termasuk mereka yang berasal dari latar belakang etnik atau sekolah yang terletak di kawasan bandar. Kedua, kajian ini banyak bergantung kepada data yang diperoleh melalui ujian bertulis, pemerhatian dan soal selidik, yang mungkin tidak sepenuhnya menggambarkan cabaran sebenar yang dihadapi oleh murid dalam penggunaan kata kerja terbitan dalam situasi semula jadi. Ketiga, aplikasi pembelajaran "Pro Kata Kerja" telah dinilai oleh jumlah penilai pakar yang terhad dan penilaian yang melibatkan lebih ramai pihak berkepentingan (seperti guru, murid, dan pakar teknologi pendidikan) dapat memberikan pandangan yang lebih menyeluruh. Akhir sekali, kajian ini tidak mengukur keberkesanan jangka panjang aplikasi tersebut dalam meningkatkan penguasaan imbuhan kata kerja yang memerlukan kajian susulan untuk menilai hasil pembelajaran yang berterusan dari masa ke masa.

Kajian-kajian masa hadapan boleh memperluaskan sampel penyelidikan ini dengan melibatkan lebih banyak murid daripada pelbagai latar belakang dan kawasan untuk meningkatkan kebolehgunaan hasil kajian ini. Di samping itu, kajian lanjut yang mengkaji kesan aplikasi "Pro Kata Kerja" dalam persekitaran bilik darjah sebenar melalui kajian longitudinal akan memberikan maklumat yang lebih mendalam mengenai keberkesanan jangka panjang aplikasi pembelajaran mudah alih dalam penguasaan imbuhan kata kerja. Penyelidikan juga boleh menyelidik potensi penggabungan aplikasi "Pro Kata Kerja" dengan strategi pedagogi lain, seperti pembelajaran berasaskan *blended learning* atau *flipped classroom* untuk menilai keberkesanannya dalam model pengajaran yang berbeza. Selain itu, kajian masa hadapan boleh melibatkan teknik penilaian yang lebih maju, seperti pemantauan pelibatan pengguna dan kemajuan murid melalui analisis data untuk menilai impak aplikasi terhadap pembelajaran secara lebih terperinci. Akhirnya, kajian lanjut boleh memperluas tumpuan kepada maklum balas guru mengenai integrasi alat digital dalam pengajaran bahasa untuk memahami cabaran praktikal serta manfaat penggunaan teknologi dalam meningkatkan pendidikan bahasa.

## PENGHARGAAN

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# Identity Dilemma of Light-skinned Black Protagonist in England in *Never Far from Nowhere* by Black British Writer Andrea Levy

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## ABSTRACT

Light-skinned Black citizens are often perceived as integrating into predominantly white societies more easily than their dark-skinned counterparts. However, the identity dilemma encountered by Vivien, the light-skinned Black protagonist in *Never Far from Nowhere* (1996) by Andrea Levy, challenges this assumption. Vivien's adolescent experiences reveal that her identity struggles are more complex than those of her dark-skinned sister, Olive. While past studies of the novel primarily examine Black characters' social mobility and their varying attitudes toward Black identity, there remains a gap in scholarship regarding how differing social perceptions of the light-skinned protagonist Vivien influence her sense of belonging in England. This study focusses on Vivien's pre-encounter stage in her understanding of Black identity, emphasising how multiple external pressures contribute to the fragmentation of her identity. Frantz Fanon's concept of the "epidermalisation of inferiority" is employed to analyse how the ideology of Black inferiority, rooted in the colonial era, shapes Vivien's negative attitude toward Black identity in postcolonial England. Additionally, Tajfel and Turner's concept of social categorisation is used to investigate how these external pressures affect Vivien's sense of belonging. This study aims to enrich existing research on the double marginalisation experienced by light-skinned Black individuals within predominantly white societies, marginalisation that comes both from white society and from the Black community. The findings suggest that significant divergence exists in how Black citizens' racial identity is perceived both within white society and among Black individuals themselves, further intensifying Vivien's identity dilemma.

*Keywords:* Andrea Levy, black identity, epidermalisation of inferiority, Never Far from Nowhere, social categorisation

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## INTRODUCTION

In contemporary Britain, the national identity of individuals from racial and ethnic minority backgrounds continues to provoke contention and critical discussion. According to Clarke (2023), in "post-racial" Britain, the articulation of Britishness by middle-class white Britons still reflects racial considerations (p. 279). Research involving non-white groups, particularly Black Britons, indicates that "British national identity" remains "racialised as white" and that the sense of belonging among Black citizens is frequently undermined by "cultural exclusion, misrecognition, and racism" (Clarke, 2023, p. 280). Clarke's argument underscores the precarity of national identity for Black citizens in Britain. Although Black individuals born in Britain regard themselves as British, their national identity is complicated by white society's racial discrimination and persistent Black stereotypes. Consequently, developing a secure sense of belonging in Britain becomes challenging for many Black citizens.

The national identity of Black citizens varies across skin tones. Dark-skinned Black individuals encounter more forms of racism compared to light-skinned individuals, who often enjoy relatively greater privileges (Craddock et al., 2023, p. 246; Mirmasoomi & Roshnavand, 2014, p. 56; Phoenix & Craddock, 2022, p. 1016). Studies in the United States reveal that the skin-colour hierarchy positions light-skinned African Americans in higher social and economic roles (Keith & Herring, 1991, p. 760). Lightness also becomes an implicit criterion for assessing beauty, competence, and value within American Black communities (Bond & Cash, 1992, p. 883; Russell et al., 1993, p. 1). However, the situation in Britain is more complex. Although light-skinned Black Britons may seem better able to integrate into white society, they still face significant racialised disadvantages that bar them from full national belonging (Phoenix & Craddock, 2024, p. 151). Light-skinned Black citizens who nearly succeed in assimilating into white society are often reclassified as Black "once their ancestry becomes known, despite having what many perceive as a visibly white appearance" (Spratt, 2023, p. 2). As a result, light-skinned Black citizens in England confront identity dilemmas that can be even more complicated than those faced by their dark-skinned counterparts. While dark-skinned citizens are consistently perceived as Black, perceptions of the identity of light-skinned Black citizens vary drastically among those who encounter them (Song, 2010, p. 279; Thompson, 2020, p. 11).

The presence of Black people in Britain traces back to the transatlantic slave trade and the nation's colonial history (Gabriel, 2007, p. 25). From the arrival of the first English settlers in the West Indies, the British Empire relied on enslaved Africans to provide labour on sugar plantations. Jamaica housed the largest enslaved population among all British colonies. Under white domination and oppression in Jamaica, skin colour became closely associated with presumed attributes: whiteness with superiority, and

Blackness with inferiority (Collins, 2019, p. 118). Miscegenation between African and white populations - often the result of rape - gave rise to a new racial group, the mulattoes. Colonial authorities afforded mulattoes limited access to education and wealth, reinforcing the ideology of white supremacy. By the eighteenth century, Jamaican social values were structured around proximity to whiteness. This skin-colour hierarchy persisted even after Jamaica gained independence (Alleyne, 2002, p. 191; Gabriel, 2007, p. 29).

Following World War II, during the 1950s, African Caribbeans were recruited by the British government to assist in rebuilding the nation. Although they expected preferential treatment as members of the Commonwealth, the reality was starkly different: they faced virulent racism in Britain (Reddie, 2020, p. 73; Small & Solomos, 2006, p. 239). The privileges previously extended to light-skinned individuals in Jamaica did not carry over to the British context. English-born light-skinned Black citizens from immigrant families experienced institutional racism, despite their birthright citizenship. Yet the shared experiences of racial disadvantage have often been overshadowed by the public perception that light-skinned Black Britons enjoy greater privilege. Ultimately, light-skinned Black citizens in England confront identity dilemmas like, though distinctly complicated in comparison with, those faced by their dark-skinned peers.

The identity struggles of light-skinned Black citizens are vividly reflected in *Never Far from Nowhere* (1996) by Andrea Levy. Levy's emphasis on English national identity, rather than British identity, can be linked to Britain's colonial history in Jamaica. For descendants of immigrants from former colonies, Britishness is associated with empire, hierarchy, and racism. After the dissolution of the political projects of Empire and Britain, Englishness became the "only body of cultural symbolic resources" from which Britishness could derive meaning (Asari et al., 2008, p. 12). As a Black English writer of light skin, Levy explores the identity struggles faced by first-generation Jamaican immigrants and second-generation Black citizens born in England. Although Levy was English-born and educated, she often felt like an outsider in her own country (Levy, 2000). In *Never Far from Nowhere* (1996), she examines the identity dilemmas of two England-born Black sisters, light-skinned Vivien and dark-skinned Olive, illustrating that Vivien's identity crisis is more complex in a predominantly white society in England.

Vivien is a young Black citizen in what Cross identifies as the pre-encounter stage, during which individuals lack a deep understanding of their Black identity. In predominantly white societies, Black identity formation involves five stages, each marked by different attitudes toward Blackness. The pre-encounter stage often involves a limited sense of identification with Black culture and, at times, an inclination toward white culture (Cross, 1991, p. 168). Young Black individuals with little understanding of Blackness may distance

themselves from their ingroup when faced with negative pressures (Cross, 1991, p. 168). For light-skinned Black citizens, early experiences, such as how parents address skin colour and the roles of family, friends, and community, significantly shape their racial self-perception (Cunningham, 1997, p. 377). For Vivien, who is a young Black citizen at the pre-encounter stage, her light skin enables her to deny or escape her Black identity. Yet as she navigates adolescence, her understanding of herself depends not only on "who and what [she is]" but also on how others interpret her appearance and identity (Cunningham, 1997, p. 387). Under the conflicting perceptions of white society, her light-skinned mother, her dark-skinned sister, and her white peers, Vivien becomes increasingly confused, undermining her sense of belonging in England.

Previous research shows that some light-skinned Black citizens face double marginalisation from both white society and the Black community (Cunningham, 1997, p. 375). Yet past studies overlook the divergent perceptions of light-skinned Black identity within white society and within Black communities. Existing scholarship on *Never Far from Nowhere* has mainly focussed on Black characters' social mobility and their differing attitudes toward racial identity (Medovarski, 2022, p. 47; Onunkwo & Chig, 2018, p. 705; Tolan, 2022, p. 26). However, only few studies examine how the varied social perceptions of Vivien's light-skinned identity shape her belonging in England. Addressing this gap, the present study employs Fanon's concept of "Epidermalisation of Inferiority" to explore how colonial ideologies of Black inferiority persist in postcolonial England (Fanon, 1986). Additionally, Henri Tajfel and John Turner's concept of "Social Categorisation" is used to analyse how multiple external pressures shape Vivien's sense of belonging (Tajfel & Turner, 1979; Tajfel, 1981; Turner, 2010).

## LITERATURE REVIEW

As one of Andrea Levy's earlier works, *Never Far from Nowhere* (1996) has received less scholarly attention than her later and more popular novels. Existing research on this text is relatively limited and often focusses on the differing experiences of Black individuals with varying skin tones and their attitudes toward racial identity. Onunkwo and Chig (2018) examine the phenomenon of double consciousness in the novel through "the categorisation of psychoanalysis of Freud" (p. 705). They argue that Vivien and her mother, Rose, occupy the "white side" of double consciousness due to their light skin, whereas Olive is situated on the "black side" because of her dark complexion. Pready (2012) analyses the sisters' experiences through the lens of defamiliarised home, arguing that although their encounters differ based on skin tone, both ultimately experience dislocation and unbelonging in England. However, these studies overlook how the divergent perceptions of Vivien's racial identity, both within her family and within white society, shape her racial attitudes and deepen her identity conflict.

Some scholars debate whether *Never Far from Nowhere* (1996) should be classified as

a bildungsroman. Fischer (2004) argues that the novel does fit the bildungsroman model, claiming that Vivien undergoes an identity awakening, progressing from denial of her Black identity and pursuit of white acceptance to an acknowledgment of her Jamaican heritage and a reconstruction of her national identity as English. In Fischer's view, Vivien achieves self-reconciliation. In contrast, Gunning (2014) rejects the classification of the novel as a bildungsroman, asserting that such an interpretation is overly optimistic. According to Gunning, the dual oppressions of race and class prevent Vivien from achieving genuine transformation. Taunton (2014) supports Gunning's stance, describing the sisters' development as a limited bildungsroman constrained largely by their working-class upbringing in a council estate. This study aligns with Gunning and Taunton, situating Vivien in the pre-encounter stage of Black identity formation, a stage characterised by an inability to adopt a positive view of Blackness. Vivien's understanding of race is significantly shaped by multiple external pressures, and thus this study focusses on how differing perceptions within white society and the Black community affect her developing sense of racial identity.

Other scholars concentrate on how Levy and her Black characters negotiate national identity. Medovarski (2022) examines how Levy names herself, her characters, and her texts as English to challenge dominant national narratives and carve out a space for Black citizens in a largely hostile cultural environment. Tolan (2022) explores Levy's interrogation of the figure of the "acceptable immigrant," arguing that Black characters in the novel pursue integration and class mobility through education and employment as means of challenging stigmatising constructions of immigrants. Building on this scholarship, this study focusses specifically on Vivien's attempts to negotiate a positive English national identity through integration with white peers, as well as the racial obstacles that impede this negotiation.

Therefore, this study integrates a postcolonial framework derived from Frantz Fanon with a social psychological framework developed by Henri Tajfel and John Turner to examine the identity struggles of the light-skinned Black protagonist in *Never Far from Nowhere* (1996). It critically investigates how colonial ideologies of Black inferiority continue to shape Vivien's identity in postcolonial England and how multiple external pressures complicate her efforts to negotiate a stable sense of self.

## CONCEPTUAL FRAMEWORK

### Frantz Fanon's Epidermalisation of Inferiority

Frantz Fanon's concept of Epidermalisation of Inferiority provides a crucial lens for understanding the psychological consequences of racial oppression. In *Black Skin, White Masks* (1986), Fanon argues that the inferiority complex experienced by Black people results from long-term subjugation, which causes them to associate their skin colour with negative meanings (p. 118). In the colonial era, white colonisers constructed Blackness as inherently inferior,

attributing any characteristics that failed to align with European ideals of "civilisation" to Black people as a contrasting backdrop to white purity (Fanon, 1986, p. 194). Under the persistent gaze of white society, Black individuals became acutely aware of their devalued racial identity, which generated profound and enduring psychological pressure (Fanon, 1986, p. 110). Those who received a European education often internalised racist ideologies through both schooling and family upbringing (Fanon, 1986, p. 191), gradually developing a sense of inferiority rooted in colonial hierarchies. Fanon further argues that colonialism created deep divisions within Black communities through racial hierarchies and the elevation of whiteness as the standard of cultural superiority. Black individuals who internalised these values often regarded whiteness as synonymous with civilisation, distancing themselves from their racial identity and becoming self-alienated. Those with partial white ancestry attempted to reconstruct their social identity by emphasising their "white blood" in hopes of attaining higher social status (Fanon, 1986, p. 46). Fanon notes that individuals who were "almost white" frequently rejected other Black people to gain recognition from white society (Fanon, 1986, p. 116). However, despite adopting European cultural norms, these individuals remained "not white enough" in the eyes of white society (Fanon, 1986, p. 193), leaving them suspended in a state of racial ambiguity and marginalisation.

## Henri Tajfel and John Turner's Social Categorisation

Henri Tajfel and John Turner's concept of Social Categorisation, a key component of Social Identity Theory (SIT), offers a complementary framework for examining how individuals derive self-concept from group membership. Social identity refers to the part of an individual's self-image that stems from the social groups to which they believe they belong (Tajfel & Turner, 1979, p. 40). Tajfel (1981) describes it as "part of an individual's self-concept which derives from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership" (p. 255). Through social categorisation, individuals classify people into in-groups and out-groups, a process that defines their place in society by systematically including them within certain categories and excluding them from others (Turner, 2010, p. 18). This process generates stereotypes - oversimplified shared images of particular groups (Tajfel, 1981, p. 143) - and fuels in-group favouritism alongside out-group discrimination (Tajfel & Turner, 1979, p. 40). Even the mere awareness of an out-group is sufficient to trigger discriminatory responses (Tajfel & Turner, 1979, p. 38). When individuals experience negative social identity, they are often motivated to seek positive self-esteem by distancing themselves from their current group and aligning with groups perceived as more socially valued (Tajfel & Turner, 1979, p. 40).

## METHODOLOGY

This study examines the identity dilemma encountered by the light-skinned Black protagonist, Vivien, in Andrea Levy's *Never Far from Nowhere* (1996). To achieve this aim, the analysis integrates a post-colonial framework with a social psychological framework. The first objective is to apply Frantz Fanon's concept of "Epidermalisation of Inferiority" to explore how the negative constructions of Blackness established during the colonial era continue to affect Black citizens in post-colonial England. This framework helps illuminate the ways in which such inherited ideologies contribute to Vivien's negative stance toward her own Black identity. The second objective draws on Tajfel and Turner's concept of "Social Categorisation" to investigate how divergent social perceptions of Vivien's racial identity shape her sense of belonging in England. The analysis centres primarily on Vivien, as her light skin and her English-born status form the core of the identity conflict under examination. However, the study also considers the roles of significant supporting characters - her immigrant mother, Rose; her dark-skinned sister, Olive; and her white classmates at grammar school - to assess how their interactions and attitudes influence Vivien's self-perception and belonging. Through this combined framework, the study argues that the lingering negative implications attached to Blackness foster Vivien's rejection of her Black identity. Furthermore, it seeks to demonstrate that the conflicting perceptions of her racial identity from both white society and the Black community contribute to Vivien's internal division and shape her complex sense of belonging in England.

## RESULTS AND DISCUSSION

### Precarious National Identity and Negative Black Identity of the Light-skinned Black Protagonist

Vivien is depicted as a light-skinned Black English girl born in England to Jamaican parents who are first-generation immigrants. Her parents migrated to Britain as part of the British government's post-World War II recruitment initiative to rebuild the nation. Vivien's light skin reflects the complexity of her mixed Jamaican ancestry. Her mother, Rose, is a light-skinned mulatto descended from a formerly enslaved Black woman who later married a fair-skinned man, and from a mother who married a Scottish man. Her father, Newton, comes from a diverse lineage that includes Spanish, Indian, African, and North African ancestry (Levy, 1996, p. 2). This Caribbean heritage results in Vivien's light skin and her sister Olive's dark skin. Throughout the novel, Vivien is depicted as a young adolescent who holds a negative perception of her racial identity within England.

Although born and raised in England, Vivien exhibits uncertainty about her national identity as English. Birthright citizenship does not guarantee a secure sense of belonging for Black citizens in Britain. From an early age, Vivien becomes aware of social hostility through the unfriendly looks and attitudes of white passers-by (Levy, 1996, p. 5). Her awareness reflects Fanon's

argument that Black individuals come to understand their devalued racial identity through the white gaze, which exerts continuous psychological pressure (Fanon, 1986, p. 110). In the 1950s, exclusion toward Black immigrants was pervasive, and Tajfel and Turner's concept of social categorisation is useful in interpreting this phenomenon. Social categorisation "creates and defines the individual's place in society" (Tajfel & Turner, 1979, p. 40) by systematically including some individuals and excluding others (Turner, 2010, p. 18). Post-colonial Britain failed to integrate its diverse ethnic populations into a unified national identity (Asari et al., 2008, p. 1). Black citizens were placed outside the boundaries of "Britishness", a process rooted in colonial ideologies that constructed Blackness as inferior (Fanon, 1986, p. 194). In post-colonial England, these inherited ideologies persist, rendering Black individuals, especially those of Caribbean descent, unwelcome. Consequently, Vivien recognises that white society in England does not regard her or her family as legitimate nationals, but as inferior outsiders, which destabilises her sense of belonging.

In addition to her precarious national identity, Vivien also develops a negative perception of her Black identity. This is shaped not only by the hostile racial environment in England but also by her mother Rose's internalised attitudes toward Blackness. Rose views other Black immigrants as socially inferior and asserts that her family is the "only ones with a bit of class" among Jamaican migrants in England (Levy, 1996, p. 7). Her sense of superiority originates from the colonial-period Jamaican social hierarchy, which stratified individuals according to skin tone and degrees of whiteness (Gabriel, 2007, p. 27). Mulattos were historically valued because their lighter skin signified proximity to white privilege. According to Fanon (1986), colonised Black individuals who internalised white superiority came to valorise Whiteness as civilisation, denying their Black identity and becoming self-alienated. Those with white ancestors often highlighted their "white blood" to elevate their social position (p. 46). Rose similarly uses her family's light skin to distance them from other Black citizens in England. This behaviour reflects her internalisation of colonial racial hierarchies, linking high social status with Whiteness and transmitting to Vivien a devalued understanding of Blackness.

Vivien's internalisation of the ideology of white superiority is significantly shaped by her mother, Rose. Rose attempts to instil this ideology in her daughters by insisting that Black people are "nothing good" (Levy, 1996, p. 7). According to Turner (2010), individuals tend to assign positive characteristics to their ingroup and negative ones to outgroups (p. 30). Rose embodies this process: she internalises racist stereotypes that associate Blackness with negativity and Whiteness with value. Her pursuit of Whiteness is evident in her decision to send her daughters to an all-white school, which she describes as a

"respectable school with decent girls" (Levy, 1996, p. 24). For Rose, "respectability and decency are synonymous with whiteness" (Onunkwo & Chig, 2018, p. 722). Yet Rose simultaneously refuses to categorise her daughters racially; when Olive asks about her identity, Rose replies, "You're not white and you're not black - you're you" (Levy, 1996, p. 13). As Košta (2023) argues, Rose's ambiguous stance places her daughters in a state of confusion regarding their social identity (p. 6). Instead of guiding them toward a confident racial self-concept, she discourages inquiry into their Black identity. As a result, Vivien's negative attitude toward Blackness intensifies. Cunningham (1997) asserts that racial knowledge, transmitted by parents and communities, enables Black youth to develop pride in their racial identity into adulthood (p. 399). However, Vivien's experience is the opposite: confronted with external hostility from white society and internal devaluation of Blackness at home, she is unable, in adolescence, to embrace her Black identity.

The sense of inferiority tied to her Blackness prompts Vivien to evade her racial identity as she attempts to negotiate a national identity as English. This aligns with Tajfel and Turner's argument that negative social identity motivates individuals to seek strategies for positive self-esteem (Tajfel & Turner, 1979, p. 40). When individuals perceive their group membership as devalued, they may attempt to "leave their existing group and join some more positively distinct group" (Tajfel & Turner, 1979, p. 40). Vivien's strategy for attaining a positive national identity is to assimilate into white society. At grammar school, she seeks recognition from white students, and her light skin enables her to "be taken for Italian or Spanish" (Levy, 1996, p. 2). In her efforts to pass, Vivien conceals her Jamaican origins and lies about her family background. Her light skin allows her to avoid immediate categorisation as Black within a racially hierarchical society. However, this evasive posture toward her ethnic heritage generates tension with her sister Olive, whose darker skin precludes similar concealment. The discord between the sisters reflects the broader identity conflict Vivien experiences as she attempts to navigate competing pressures from white society and the Black community.

## Conflicts between the Sisters with Different Skin Tones

Conflicts between Vivien and Olive arise primarily from their opposing attitudes toward Black identity. While Vivien evades her racial identity, Olive openly embraces hers. In response to her mother's denial of their Blackness, Olive asserts that she likes "being black" and wants "to be black" (Levy, 1996, p. 7). Olive's dark skin makes her racial identity immediately visible, and this visibility exposes her earlier and more directly to racial discrimination. Scholars have long noted that dark-skinned Black individuals are more acutely aware of racism in predominantly white societies than their light-skinned counterparts (Edwards, 1973, p. 482). Thus, Olive recognises the marginalised status of Black citizens in

England earlier than Vivien does. This divergence reflects their different stages of racial-identity formation. Vivien inhabits the pre-encounter stage, while Olive possesses a more developed understanding of what Black identity entails in England. Within the all-white grammar school, Olive encounters overt racial discrimination. Teachers stereotype her as less intelligent than her white peers, irrespective of her academic performance. At primary school, they insist that Olive would never "come to anything" because she supposedly cannot "stick at things" (Levy, 1996, p. 25). Even her excellent academic record fails to alter these prejudicial assumptions. These discriminatory experiences cultivate in Olive a growing resentment toward the institution, ultimately prompting her to drop out. Over time, Olive develops anger toward the injustices rooted in racial identity. She rejects any illusion of acceptance by white society and instead affirms her Black identity as a means of resisting racism. In contrast, Vivien distances herself from Blackness because she associates it with negative social meanings. Seeking a positive national identity as English, she strives for upward mobility that she believes will counteract the inferiority linked to her racial and ethnic identity. She therefore constructs her social categories around career and class rather than race, attempting to define her Englishness through class-based achievement rather than racial belonging.

The grammar school further reinforces these divisions by categorising girls into three academic streams, namely A-stream, B-stream, and C-stream, based on academic performance and perceived career prospects. B-stream students occupy a middle position, superior to C-stream but inferior to A-stream. These categories are class-coded and used to assign students a social position. Vivien identifies herself as belonging to the B-stream, envisioning herself as one of the future "top secretaries and personal assistants in the country," while she categorises Olive as a C-stream girl whose prospects are limited to performing "gym" demonstrations and trivial domestic displays such as "what use can be made of a Victoria sandwich" (Levy, 1996, p. 100). Most of Vivien's friends are white B-stream girls, and aligning herself with them enables Vivien to rebuild her self-esteem. Her categorisation aligns with Tajfel and Turner's (1979) argument that individuals place themselves and others into groups to define their social position (p. 40). Vivien categorises herself alongside B-stream white girls to solidify her sense of Englishness. She thus internalises the racialised logic that equates Englishness with Whiteness, assuming that sharing a group identity with white peers secures her own national identity.

However, social categorisation often produces "in-group favouritism and discrimination against the out-group" (Tajfel & Turner, 1979, p. 39). Vivien's categorisation results in discriminatory attitudes toward C-stream girls like Olive, who drops out of school and becomes a young mother (Levy, 1996, p. 99). Vivien claims that:

> "I didn't want to end up like Olive. I didn't want to be at home all day surrounded by steaming nappies, watching a baby playing on the floor. I didn't want to be too tired to get dressed, shuffling around in my dressing-gown and slippers. I didn't want to have a baby sucking at my tits every minute." (Levy, 1996, p. 99)

Vivien equates C-stream status with personal failure and interprets Olive's lack of upward mobility as a matter of poor choices rather than structural inequality. What Vivien fails to grasp is that Olive's struggles are rooted in the systemic anti-Black racism prevalent in England. Vivien's light skin allows her to obscure her Black background and avoid the overt racism that Olive faces. Having experienced less discrimination, Vivien misattributes Olive's hardships to personal shortcomings. She tells her sister, "[y]ou chose to lead your life, and I chose to lead mine" (Levy, 1996, p. 278), a statement that reflects her internalisation of meritocratic narratives while ignoring institutional oppression. Olive, by contrast, recognises the role of racism in shaping their divergent experiences. She voices her frustration plainly: "Vivien's the lucky one - always has been. She never had it as hard as me" (Levy, 1996, p. 6). The sisters' conflict therefore underscores how racialised social structures fracture familial relationships, creating barriers to empathy and mutual understanding between individuals who, despite sharing a family and national context, inhabit radically different racial realities.

The conflicts between the two sisters in the novel largely arise from Vivien's persistent evasion and concealment of her Black identity. A major confrontation occurs when Olive exposes Vivien's lie about her Jamaican origin to Vivien's white boyfriend, Eddie. Vivien's falsehood is rooted in her negative self-image and internalised racial stigma. Fearing discrimination against Black people, she claims to Eddie that she is from Mauritius, a place she knows little about but assumes he will not be "prejudiced against" (Levy, 1996, p. 136). Ironically, Vivien is unaware that Mauritius is also associated with Blackness. As Onunkwo and Chig (2018) observe, Vivien "goes the extra mile to protect her hard-earned delicate white identity" (p. 724). When Olive discovers the lie, she confronts Eddie, informing him that their parents are from Jamaica, not Mauritius, and that Vivien does not "want anyone to know we are black" (Levy, 1996, p. 171). Olive interprets Vivien's attempt to distance herself from Blackness as a betrayal of their racial heritage. Seeking retribution, she demands that Vivien openly admit she is ashamed of her Black identity. Although Vivien is furious at Olive for exposing her deception, she is unable to defend herself because she refuses to confront the reality of her racial identity.

The conflict between the sisters reflects an extension of social categorisation within the family. Their disagreements arise from divergent understandings of Vivien's racial identity. Vivien categorises herself as English while attempting to exclude her racial background from that category.

Her avoidance of Black identity functions as a coping strategy in response to racial inequality rather than a deliberate betrayal of her race. Olive, by contrast, recognises the social categorisation imposed by white society, in which their family is firmly classified as Black. Dark-skinned Black citizens tend to have "a greater sense of racial or ethnic identification" (Edwards, 1973, p. 482), and Olive therefore views Vivien's denial as a rejection of their shared identity. From Olive's perspective, Vivien aligns herself with white society's racist attitudes, making her an outsider to the racial in-group. Olive's anger can be understood through Tajfel and Turner's explanation of "in-group favouritism and discrimination against the out-group" (Tajfel & Turner, 1979, p. 40). For Olive, Black citizens are not inferior but victims of structural racism, and white society is responsible for the inequalities they face. However, Olive fails to recognise that Vivien is also struggling to reconcile her national identity with her racial identity. By evading her Blackness and attempting to assimilate into white society, Vivien seeks to overcome the deep-seated feelings of inferiority attached to her racial identity.

### Failure to Achieve Complete Recognition and Acceptance by Whites

Vivien's attempts to assimilate into white society do not result in her achieving full recognition or sharing the same national identity as white citizens. Her acceptance by white girls, particularly Carol, depends on the fact that her light skin prevents her from being immediately identified as Black. The white girls' acceptance is conditional: it relies on Vivien's assimilationist efforts and her compliant disposition. She consistently imitates their behaviour and complies with their expectations, despite her reluctance. Furthermore, she never discloses her Jamaican origin. Consequently, the white girls categorise her as non-Black. This categorisation rests on superficial features i.e., her light skin allows them to associate her with European identity rather than with "a darkie" (Levy, 1996, p. 88). Their perception reflects Tajfel's notion of stereotypes emerging through social categorisation. Stereotypes function as "an over-simplified mental image of (usually) some category of person, institution or event which is shared, in essential features, by large numbers of people" (Tajfel, 1981, p. 143). Anti-Black stereotypes structure the white girls' thinking, making it difficult for them to associate Vivien with Blackness.

However, once Vivien's Jamaican origin is revealed, the white girls become divided in how they perceive her racial identity. When Vivien finally discloses her background, Pam quickly points out traits she now interprets as markers of Blackness, remarking that Vivien's nose is "big, though" (Levy, 1996, p. 88). Pam's response aligns with Tajfel and Turner's argument that awareness of an out-group's presence is sufficient to provoke discriminatory reactions from members of the in-group (Tajfel & Turner, 1979, p. 38). Exposure to Vivien's real ethnic background prompts some white girls to reclassify her as Black,

placing her at immediate risk of exclusion and prejudice. Carol, however, reassures Vivien by insisting that she is not "a darkie" but "one of us" (Levy, 1996, p. 88). Carol's reaction exemplifies Tajfel and Turner's "in-group favouritism" (Tajfel & Turner, 1979, p. 40). Her acceptance of Vivien depends not on a recognition of Vivien's racial complexity but on Vivien's continued disassociation with Blackness.

Vivien thus remains trapped in an identity dilemma she cannot resolve. Rejecting her Black identity generates guilt and feelings of betrayal, whereas acknowledging it exposes her to racial discrimination and social exclusion. Neither her denial of Blackness nor her efforts to integrate into white society resolve her internal conflict or alleviate her sense of inferiority. By the end of the novel, when Rose asks Vivien where she belongs, Vivien's confusion becomes unmistakable. She responds, "I don't know" (Levy, 1996, p. 281). Vivien ultimately loses her sense of belonging in England, caught between identities yet unable to fully inhabit any of them.

## CONCLUSION

This study challenges earlier scholarship that highlights the privileges typically associated with light-skinned Black individuals in predominantly white societies. In *Never Far from Nowhere* (1996), Vivien's experiences reveal that her identity struggles are far more complex than those of her dark-skinned sister, Olive. Vivien embodies both internalised racism and a profound rupture of self, illustrating that light skin does not automatically yield social advantage. Instead, this study reinforces existing research on the double marginalisation that light-skinned Black individuals may face, being misrecognised or devalued by both white society and the Black community. It further demonstrates that racial divisions operate not only between groups but also within them, shaping identity formation in deeply fragmented ways. This study positions Vivien at the pre-encounter stage of Black identity development. At this stage, she is unable to reconcile the relationship between her racial identity and her desired national identity as English, resulting in a profound loss of belonging. Multiple external pressures, including white society's hostility toward Blackness, her mother's internalised anti-Black attitudes, the conflicts between sisters of different skin tones, and the contradictory responses of her white peers, collectively prevent Vivien from positively identifying with her Black identity. The convergence of these pressures produces a fractured sense of self in which Vivien cannot integrate the divergent ideas imposed upon her.

### Implications of the Study

Through the integration of postcolonial framework and social psychological framework, this study demonstrates how the protagonist's negative attitudes toward Blackness are historically rooted in colonial ideologies of inferiority and socially reinforced through lived experience. Ultimately, Vivien's identity dilemma

in postcolonial England exemplifies the enduring legacy of racial hierarchies constructed during the colonial era. Her inability to form a positive racial identity at the pre-encounter stage obstructs her ability to negotiate a stable and affirming national identity as English. This study, therefore, underscores the necessity of examining identity formation as an intersection of historical, psychological, and socio-political forces.

### Limitations and Recommendations for Future Studies

This study focusses primarily on Vivien, the light-skinned Black protagonist, who is at the stage of pre-encounter of Black identity formation. Future research may further explore how Black individuals at different stages of racial identity development navigate similar pressures, and how these stages shape their negotiations of belonging within postcolonial and multicultural societies.

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# Bibliometric Analysis of Research on Gifted Education

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## ABSTRACT

This bibliometric analysis reviews 3,577 research articles on gifted education from the Scopus database published between 2005 to 2025, identifying trends and circuits of publications in this specialised area. Although gifted education research has grown over the last 20 years, no single bibliometric investigation has concomitantly analysed the changes over time in the publication rates, patterns of collaboration, and the overall development of the subject matter of enquiry on the same using a variety of analytical techniques, which have provided gaps in comprehension of intellectual organisation of the field, geographical concentration and implications of the pandemic era. The study uses VOS viewer software which uses the co-occurrence analysis of keywords, citation analysis, co-citation provides mapping, and collaboration network visualisation. The study reports relatively stable research output: on average, 150-200 articles per year with a significant increase to a bit less than 400 publications in 2021 after the pandemic. The United States leads within this research sphere generating close to five times more publications than any other country centred around the research facility of the University of Connecticut, Purdue University, and William & Mary. Donna Y. Ford is the most prolific researcher (61 publications) far ahead of other researchers. Network visualisations show complex intellectual structures based on central issues of identification strategies, equity concerns, developmental theories, and educational programmeming approaches. Co-citation analysis reveals separate scholarly communities joined by prominent researchers such as, Renzulli, Sternberg, Gardner and Ford, while international collaboration networks, because of increase, are however supremely US-centric. Such results capture the shift in the field of study to move beyond the identification focuss to that of multidimensional study of educational interventions, equity issues, developmental theories, and talent development in diverse populations and contexts.

*Keywords:* Bibliometric analysis, gifted education, publication trend, scopus database

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## INTRODUCTION

Gifted education is a discipline of special expertise dedicated to the specific intellectual, inventive, and developmental needs of pupils who demonstrate gifted abilities and talents. Gifted students usually exhibit improved cognitive ability, creativity, and high levels of task involvement (Renzulli, 2012). According to Davis et al. (2021), gifted students tend to assimilate and analyse information more quickly, think about problems in greater depth and subtlety, and reach more profound comprehension than equally aged pupils. Identification, and cultivation of gifted students' potential is a must in current educational systems around the world. A certain percentage of students; 3-5%, may be gifted, according to the National Association for Gifted Children (2019), but this figure might vary depending on the methods and criteria adopted in identification. To achieve optimal development of gifted students, their educational courses need to incorporate differentiated challenges that promote a depth and complexity, according to VanTassel-Baska and Hubbard (2016).

Research indicates that under optimal conditions, gifted students are under threat of underachievement, disengagement, and psychological distress when there are no effective educational programmes (Siegle et al., 2020). Subotnik et al. (2018) claim that successful developing of gifted abilities can be achieved using intentional educational strategies, dedicated educators, and supportive environment that encourages experiment and creative thought. New accomplishments in our knowledge of neurological development, talent routes, and emerging ideas about intelligence and creativity have triggered continuous progress in the area (Sternberg, 2018). Modern gifted education practices focuss on developing talents in different fields, guarantee cultural competence, and use inclusive approaches, directed to a sufficient identification and development of gifted potential in the population with various backgrounds (Ford, 2013; Plucker & Peters, 2022). Although gifted education has been changing considerably in the last 20 years, the area has not been analysed thoroughly and systematically in terms of its intellectual landscape. Past bibliometric research works have been restricted in a number of ways: (1) they have been limited in time to specific periods (Ai, 2022; Ozcan & Donmez, 2021), (2) they have been short in coverage using a single database (Lo & Porath, 2017), (3) they have not investigated the relations between publication trends, collaboration patterns, and thematic evolution at the same time (Hernández-Torrano & Kuzhabekova, 2020). More so, none of the recent studies examined the effect of COVID-19 pandemic on research productivity and focuss in gifted education. This discontinuity makes it hard to comprehend: the intellectual history of the field, the geographic and institutional hegemony of some locations and organisations, the presence of silos of research rather than coherent scholarly societies, and new areas to which research needs to be extended.

## LITERATURE REVIEW

Bibliometric analysis is now a critical tool for defining the intellectual pathways and patterns in gifted education research. Lay the groundwork for understanding the scholarly structure of gifted student education research was prepared by early studies (e.g., Heller & Menacher, 1992), which examined journals' publications and revealed that well-organised efforts were steered mostly towards North America, with a minimal international collaboration. Digging deeper into this pattern, Hernández-Torrano and Kuzhabekova (2020) analysed 40 years of research and found greater validity in the fact that although research on gifted education had spread across the globe, most of the top research bared-its-teeth from the west, particularly the US.

The multidimensional mapping of gifted education field derived from the inclusive co-citation analysis of Ai's (2022) examination of 1,418 gifted education documents from the Web of Science database from 1980 to 2020. By means of this analysis, the following five domains of primary research were distinguished. The main issues were gifted identification and assessment, creativity and talent development, addressing underrepresentation of minorities, socioemotional well-being of gifted children, and educational practice. Based on this, Lo and Porath (2017) conducted a view of articles in "High Ability Studies" that were published from 1990 to 2016 using bibliometric tools demonstrating a change in the focuss of scholarly interests from psychometrics to social-cultural aspects of giftedness. Chubarova et al. (2022) presented a global analysis of research into gifted education, detecting cultural factors that influence the choice of research issues and underlying theories by comparison of bibliometrics from different countries. They found out that American studies were inclined toward emphasis on identification strategies and programmeming whereas European studies were inclined more toward exploring the psychological traits and developmental pathway of gifted individuals. A review of the articles using CiteSpace software completed by Ozcan and Donmez (2021) based on 493 articles published between 2010-2020 concluded that Asian, European, and North American scholars have different citation networks – the support for cultural differences in research interest.

Using the bibliometric analysis method, Sellman et al. (2021) identified the methodological approaches used in 1,290 articles concerning gifted education published between 2000 and 2020. According to the review most published research (63%) used the quantitative approach with the remaining utilising quantitative and mixed methods in 22% and 15% of the studies, respectively. In addition, Carman (2020) noted that experimental studies had been overwhelmingly outstripped by correlational and descriptive research, which demonstrated a serious research method imbalance. In attempt to examine the emergence of a theoretical framework in gifted education, Coleman et al. (2018) made use of co-word analysis techniques on journals for

more than 4 decades. They discovered that research has shifted from the conventional intelligence focussed perspectives of gift to a greater concentration on developmental and domain specific theories of talent. Other aspects of innovations in gifted education, in particular, development of interdisciplinary relationships were noted by Subotnik et al. (2021) in their connections with neuroscience, positive psychology, and social justice education. An investigation of article counts by Lee et al. (2023) using topic modelling showed that there has been a strong increase in the number of publications on twice-exceptional students, individuals who are gifted and suffer from learning disabilities, as the rate has grown 175% since 2010 and 2022. Brigandi and Bainbridge (2022) added more detail to this emerging area of research through the review of 224 articles concerning twice-exceptionality and determining three major representative angles:The study revealed three principal research themes; the first one was identifying twice-exceptional students; the second was implementing instructional methods; the third was providing support in emotional and social contexts.

Hernández-Torrano et al. (2023) investigated the pattern of collaboration in gifted education research with the help of the co-authorship network in 2,345 published documents over the period between 2010 and 2022. Results from the research revealed the fact that gifted education studies are localised with majority of teams working individually with only 16.7% of the papers being multi-country efforts. Following earlier studies, Hong and Shuyan (2023) discovered analogous trends while studying the social structures of networks and discovering important institutions and scholars connecting different research communities. The contribution of gifted education research was investigated by Plucker and Callahan (2020) with the help of a review of citation rates in 15 journals between 2000 and 2020. They found that there were substantial differences in citation rate, with theoretical contributions cited much more than practical works which may signify the schism of scholar theory and practical usage. Scholarly works demanding extensive reforms in identification procedures drew many citations yet its influence on the direction of educational policies was minimal (Robinson et al., 2021). VanTassel-Baska and Hubbard (2023) described emerging research directions via a bibliometric analysis of articles published between 2018 and 2023, including an increased emphasis on developing STEM talent and engaging in culturally responsive gifted education, using technology in talent identification, and employing psychosocial interventions to gifted students. These shifts in focuss in research reflect the alignment of the field to contemporary shifts in education in equity and technology as well as comprehensive student support that might be the focuss of gifted education in the future.

**Research Question**

The following research questions guided the analysis:

1. What are the time trends of the number of gifted education publications between 2005 and 2025?
2. Who are the most prolific authors (in terms of publication output) in the research of gifted education?
3. What are the top countries (by author affiliations) and universities in terms of publications on gifted education?
4. What are the most gifted published journals in research on education?
5. What intellectual organisations and collaborative networks are present in the study of gifted education as identified using the methodology of keyword co-occurrence analysis, co-citation patterns, and international collaboration mapping?

## METHODOLOGY

Bibliometrics refers to the accumulation, compilation, and analysis of bibliographic data emanating from scientific literature (Verbeek et al., 2002). The analysis includes tracking metrics of the publication outlet and year, category of author (Y. Wu & T. Wu 2017) as well as tools such as co-citation analysis. A coherent literature review holds a repetitive pattern of identification of keywords, database search, and analytical processing to develop bibliographies and credible results (Fahimnia et al., 2015). Methodological steps tend to have to do with determining the top search terms, assessing the first results, and then adjusting any need for more specific searches.

Meier (2011) argues that the fact that journals exist in Clarivate Analytics' Journal Citation Reports (JCR) is an indication of quality. To inform itself on advances in theoretical foundations, this research consulted leading journals and extracted data from the Elsevier Scopus database (Di Stefano et al., 2010; Tan et al., 2014). In order to keep the quality, this research limited the scope to peer reviewed academic journal articles only eliminating books and conference proceedings (Li et al., 2016. Scopus, operated by Elsevier, contains more journals than other databases and it focusses on recent publication (Aghaei Chadegani et al., 2013). The research-accessed 5400 articles from Scopus between 2005 and the half months of 2025. Scopus was the convenient instrument for fetching articles as it offers extensive scope of citation and bibliographic records that are imperative to social sciences and humanities with better journal coverage as compared to other databases (Aghaei Chadegani et al., 2013; Olijnyk, 2015).

### Data Search Strategy

Study employed a screening sequence to determine the search terms for article retrieval. Study was initiated by querying Scopus database with online TITLE-ABS-KEY ( gifted AND education ) AND PUBYEAR > 2004 AND PUBYEAR < 2026 AND ( LIMIT-TO ( SUBJAREA , "SOCI" ) OR LIMIT-TO ( SUBJAREA , "PSYC" ) OR LIMIT-TO ( SUBJAREA , "ARTS" ) OR LIMIT-TO ( SUBJAREA , "COMP" ) OR LIMIT-TO ( SUBJAREA

, "MEDI" ) OR LIMIT-TO ( SUBJAREA , "ENGI" ) OR LIMIT-TO ( SUBJAREA , "MATH" ) OR LIMIT-TO ( SUBJAREA , "HEAL" ) OR LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "PHYS" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) OR LIMIT-TO ( SUBJAREA , "ENVI" ) OR LIMIT-TO ( SUBJAREA , "BIOC" ) OR LIMIT-TO ( SUBJAREA , "MULT" ) OR LIMIT-TO ( SUBJAREA , "IMMU" ) OR LIMIT-TO ( SUBJAREA , "VETE" ) OR LIMIT-TO ( SUBJAREA , "DENT" ) OR LIMIT-TO ( SUBJAREA , "PHAR" ) OR LIMIT-TO ( SUBJAREA , "MATE" ) OR LIMIT-TO ( SUBJAREA , "NURS" ) OR LIMIT-TO ( SUBJAREA , "AGRI" ) OR LIMIT-TO ( SUBJAREA , "CENG" ) OR LIMIT-TO ( SUBJAREA , "EART" ) OR LIMIT-TO ( SUBJAREA , "CHEM" ) OR LIMIT-TO ( SUBJAREA , "ENER" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "NEUR" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "cp" ) OR LIMIT-TO ( DOCTYPE , "bk" ) OR LIMIT-TO ( DOCTYPE , "ch" ) OR LIMIT-TO ( DOCTYPE , "re" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) OR LIMIT-TO ( SRCTYPE , "b" ) OR LIMIT-TO ( SRCTYPE , "p" ) OR LIMIT-TO ( SRCTYPE , "k" ) OR LIMIT-TO ( SRCTYPE , "d" ), As a starting point, 5400 articles were retrieved for review. The criteria were clarified to focuss solely on “gifted education” or “gifted & talented education” – concentrating on students as learners. This refinement yielded 3577 results. Articles in a non-English language and review accounts were also deleted from the collection. A thorough bibliometric analysis was completed based on 3577 articles from the Scopus database, all of which were as of May 2025 and studied gifted education with the perspective of student learning.

**Data Analysis**

Plaintext data such as publication year, publication title, publication details, journal articles, citations, and keywords were retrieved from the Scopus database for works published from 2005 up to May 2025 for analysis. After data extraction, we performed the analysis through VOSviewer software version 1.6.15, able to apply its VOS clustering and mapping algorithms to building graphical representations. It is VOS viewer that is used as an alternative of the Multidimensional Scaling (MDS) method (Van Eck & Waltman, 2010) preserving the principle goal, which is to arrange the items in a low-dimensional space, such that the distance in between any pair represents their similarity and relationship (Appio et al., 2014). The fundamental difference is that MDS mainly calculates similarity measures (Jaccard indexes, cosine, etc.), while VOS uses a more effective strategy for normalisation of co-occurrence frequencies (Van Eck & Waltman, 2007). More precisely, here the ‘association strength’ (ASij) is used during the process:

$$\frac{Asij}{Cij/(WiWj)}$$

The ASij measure is equal to "the ratio between the observed number of co-occurrences of i and j and the expected number of co-occurrences of i and j, assuming independence between i and j" (Van Eck & Waltman, 2010, p. 531). By using this index, VOSviewer provides maps with the emphasis on minimising the total weighted sum of squared distances between all pairs of items. Appio et al. (2016) stated that linlog/modularity normalisation were used in our analysis. The results of the application of VOSviewer's visualisation approaches on the dataset revealed patterns that were developed on the basis of mathematical relations that favoured the analysis of keyword co-occurrence, citation trends and co-citation mappings. Keyword co-occurrence analysis supplements the study of trends in development of the research area over time (Zhao, 2019) and identifies dominant issues in various academic disciplines (Li et al., 2016). Citation analysis allows identifying key research topics, emerging tendencies, and known methods (also exploring how a field's major interests originated) (Allahverdiyev & Yucesoy, 2017). Document co-citation analysis has been highly popular in bibliometrics research (Appio et al., 2016; Fahimnia et al., 2015; Liu et al., 2015). Fahimnia et al. (2015) and Liu et al. , 2015 use network theory to create maps and expose important data patterns (Liu et al., 2015).

## FINDINGS

### What are the Time Trends of the Number of Gifted Education Publications between 2005 and 2025?

Figure 1 plots a 20-year horizon in studies on gifted education, beginning in 2005 and ending in 2025, with 109 articles in 2005, with a sharp drop towards 78

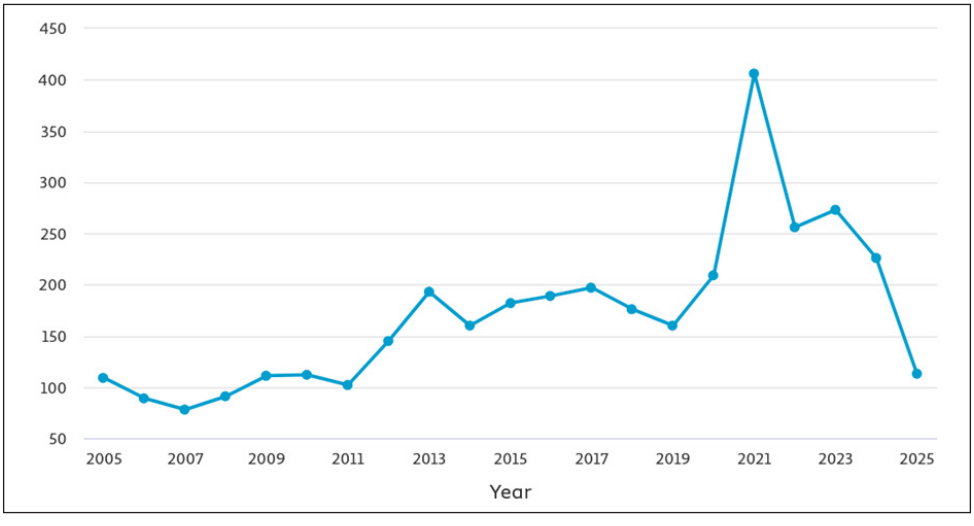



*Figure 1.* Trend of research in gifted education by years

in 2007. Post the first decline, publications continued to grow until by 2013 there were roughly 200 studies a year. Publication rate during 2013-2019 demonstrated slight fluctuations but had remained constant at 150-200 articles annually which indicated successive scholarly interest. According to the Table 1, 2021 recorded a substantial top in publications number with a jump to 400 – twice as much compared with the previous research output. The dramatic increase may be accounted for by the increased attentiveness to gifted education in the wake of the pandemic that led to scholarly examination of its effects on exceptional learners. The temporary peak did not persist long and publication numbers slowly returned to 273 at 2023, before they rapidly dropped to over 113 in 2025. On the whole, the results indicate steady scholarly engagement with significant though short-lived 2021 surge, followed by a recovery to publication levels that are similar to those of two decades ago.

Table 1
*Trend of research in gifted education by years*

| Year | Documents | Percentage |
|---|---|---|
| 2025 | 113 | 3.2% |
| 2024 | 226 | 6.3% |
| 2023 | 273 | 7.6% |
| 2022 | 256 | 7.2% |
| 2021 | 406 | 11.4% |
| 2020 | 209 | 5.8% |
| 2019 | 160 | 4.5% |
| 2018 | 176 | 4.9% |
| 2017 | 197 | 5.5% |
| 2016 | 189 | 5.3% |
| 2015 | 182 | 5.1% |
| 2014 | 160 | 4.5% |
| 2013 | 193 | 5.4% |
| 2012 | 145 | 4.1% |
| 2011 | 102 | 2.9% |
| 2010 | 112 | 3.1% |
| 2009 | 111 | 3.1% |
| 2008 | 91 | 2.5% |
| 2007 | 78 | 2.2% |
| 2006 | 89 | 2.5% |
| 2005 | 109 | 3.0% |

### Who are the Most Prolific Authors (in Terms of Publication Output) in the Research of Gifted Education?

The measure of gifted education research by experts is provided Figure 2. Ranking first in terms of productivity, Ford, D.Y. has produced 61 papers, which also exceed team members. As presented in the Table 2, the next most productive scholar is Peters, S.J. with 37 works. In the middle segment, Olszewski-Kubilius, P. produces 33 documents whereas Gentry, M., Matthews, M.S. and VanTassel-Baska, J. all produce 31 publications each. One can see from the lower part of the graph that Callahan, C.M., Jolly, J.L., Johnsen, S.K., and Moore, J.L. have each produced between 27 and 25 documents in

Table 2
*Most influential author*

| Author | Documents |
|---|---|
| Ford, D.Y. | 61 |
| Peters, S.J. | 37 |
| Olszewski-Kubilius, P. | 33 |
| Gentry, M. | 31 |
| Matthews, M.S. | 30 |
| VanTassel-Baska, J. | 30 |
| Callahan, C.M. | 27 |
| Jolly, J.L. | 27 |
| Johnsen, S.K. | 25 |
| Moore, J.L. | 25 |

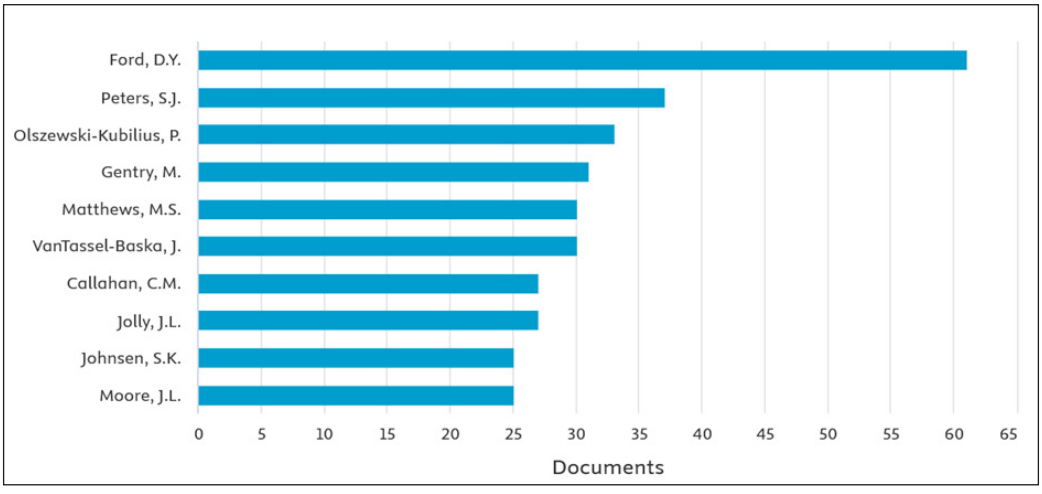



*Figure 2.* Most influential author

gifted education research. This graphic very definitively shows the relative publication output among influential gifted education researchers, something far from equal for Ford, whose output is nearly double anyone else's, comproving her as a voice to be listened to. Upon analysing the data, most of the researchers are found to traverse a pretty consistent publication trajectory, Ford being the exception because she has an extraordinary scholarly output.

Table 3
*Most influential country*

| Country | Documents |
|---|---|
| United States | 1690 |
| Australia | 243 |
| Turkey | 187 |
| United Kingdom | 183 |
| Canada | 132 |
| Germany | 105 |
| Russian Federation | 98 |
| South Korea | 75 |
| Spain | 59 |
| Israel | 57 |

### What are the Top Countries (by Author Affiliations) and Universities in Terms of Publications on Gifted Education?

Figure 3 displays the distribution of research documents published on gifted education throughout the world for ten different countries. With 1,700 documents, the greatest number of publications was done by authors based in institutions located in the United States by a clear margin of leadership, faring more than five times better than second place Australia with 243 documents. Turkey and United Kingdom are each similarly at 200 documents from Australia. Contribution from these other countries is a diminishing mark: Canada publishes 130 papers while Germany produces 105 papers. The Table 3 shows that the Russian Federation, South Korea, Spain and Israel are all documented at less than a 100. This clear disparity highlights

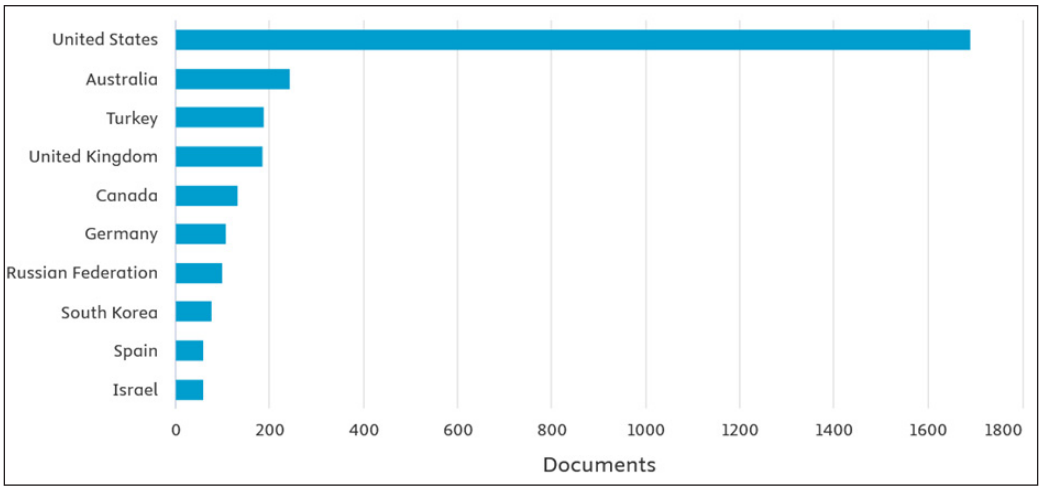



*Figure 3.* Most influential country

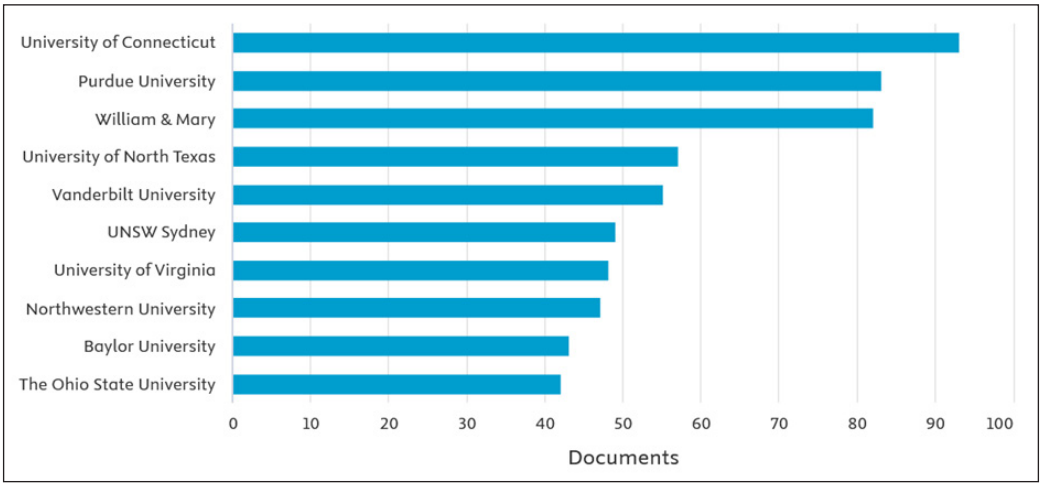



*Figure 4.* Most influential university

the leading role of the United States in the research of gifted education, the leadership probably explainable by early detection and the support of gifted students in the United States, larger funds for this area of study, and feature of a wider academic community, who are specialised in exceptional learners. The wide disparity in research production in the US vis-a-vis other nations points at potential for improved international cooperation in gifted education research.

Figure 4 shows the contributions of highest-contributing universities to gifted education research in relation to the number of documents written. Close to 90 documents have made the University of

Connecticut the highest performer of gifted education research. The Purdue University and William & Mary both excel with each contributing 80 articles and act as the top tier contributors to gifted education research. With almost 60 documents quoted, the University of North Texas takes the average position, while in second place, we have 55 publications belonging to Vanderbilt University. The lower part of the graph shows a phased decrease in document output: The University of Virginia and UNSW Sydney provided 49 documents, followed by Northwestern University with 47 and Baylor University with 43. A clear rank arises from this visual information making the University of Connecticut's Neag centre for Gifted Education and Talent development closely likely to drive its nearest at the top position. In the Table 4, eight American universities in the top ten speak out for the leading role of the United States in the gifted education research, bearing out the word of UNSW Sydney, the only international institution among these highly productive centres.

Table 4
*Most influential university*

| University | Documents |
|---|---|
| University of Connecticut | 93 |
| Purdue University | 83 |
| William & Mary | 82 |
| University of North Texas | 57 |
| Vanderbilt University | 55 |
| UNSW Sydney | 49 |
| University of Virginia | 48 |
| Northwestern University | 47 |
| Baylor University | 43 |

Table 5
*Top contributing journals*

| Source | Documents |
|---|---|
| Gifted Child Quarterly | 182 |
| Gifted Education International | 175 |
| Gifted Child Today | 160 |
| Roeper Review | 147 |
| Journal for the Education of the Gifted | 146 |

**What are the Most Gifted Published Journals in Research on Education?**

As indicated in the Figure 5,the line graph outlines publication outputs in five major gifted education journals over the period 2005-2025. Here, the presentation demonstrates how these top journals display distinctive variation and change in the production of their publications over time. On the other hand, in red there is a peak publication rate of 22 documents in 2016 and consistent publication rate with notable increases in 2019 and 2022 (20 documents both years) presented in Gifted Child Today (in green). Gifted Child Quarterly (red line) has a very variable pattern, including a significant high record level of 18 documents in 2012, after which an ultimate set of changes which all lead to less publications over time. Gifted Education International (blue line) commences with a rather healthy 15 documents in 2005, suffers a sharp decline to virtually no publications in 2011, gradually increases to a stable middle range in the mid-2010s, topping out at 17 documents in 2021, when the numbers start to slide again. The Journal for the Education of the Gifted follows a balanced trajectory:

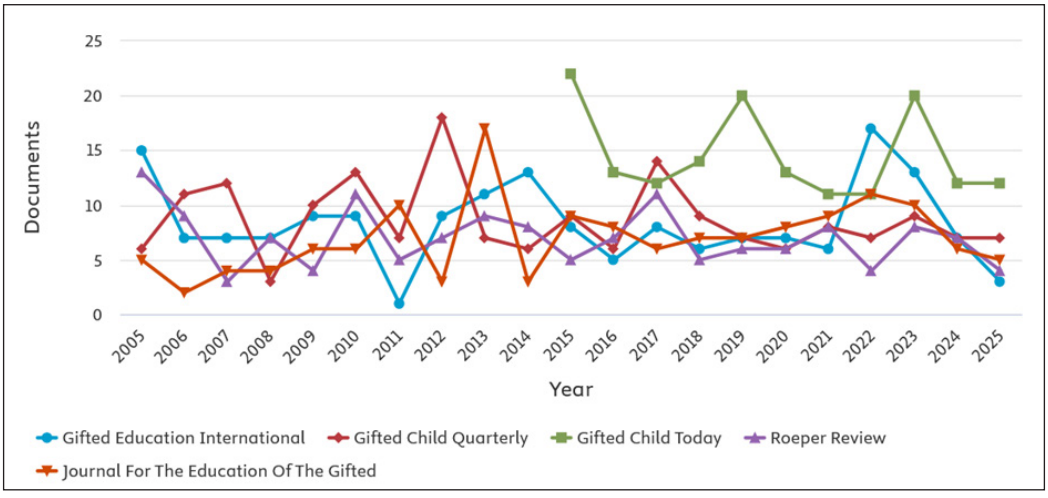



*Figure 5.* Top contributing journals

average number of articles per year, 17 (peak documented in 2013). Highest stability level is shown by Roeper review (purple line): 5-10 pieces of research per year in the 20-year period. As evidenced in the Table 5, this twenty-year analysis shows repeated trends in academic publishing for gifted education, as well as the different levels of influence different journals attained throughout the times because of the changing nature of academia and by presenting Gifted Child Today as the most active periodical in the past years. 488 items, 11 clusters.

## What Intellectual Organisations and Collaborative Networks are Present in the Study of Gifted Education as Identified using the Methodology of Keyword Co-occurrence Analysis, Co-citation Patterns, and International Collaboration Mapping?

### *Co-occurrence*

The dimensions of the bibliometric relations within the area of gifted education research are selectively examined in this Figure 6, revealing the multitude of connections between the central concepts and areas of study, represented as points and lines. In the network's heart is the red cluster that is the gifted education, which links to such important areas of identification, acceleration, equity and underachievement among others depicting the area's main focuss on identifying and supporting gifted children. Around the central cluster of gifted education lie various other interconnected fields of research. The green one focusses on students, engineering education, and computational thinking distinguishing STEM-oriented research in the area. Achievement, child development and developmental considerations dominate the blue cluster. The yellow cluster connects medical education to other issues in education and hosts several smaller clusters focussing on topics such as human computer interaction and self regulated

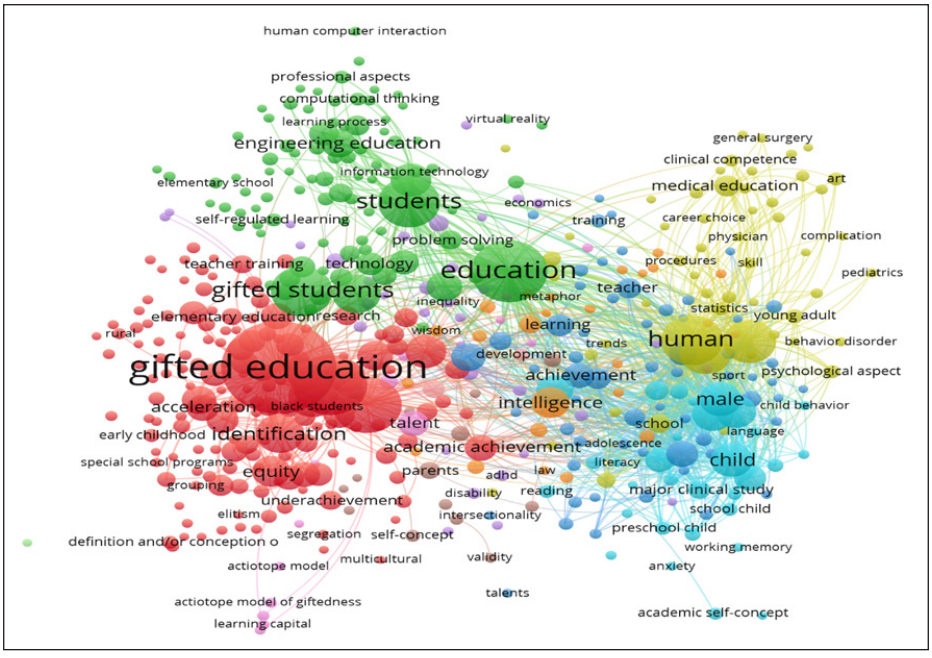



*Figure 6*. Keywords co-occurrence network visualisation map

learning. From the map, it is clear that gifted education research today includes not only the themes of education, but also individual psychological fundamentals, equity, specific methods, as well as various applications. The map is an effective visualisation of the shift from limited concern with selection to an enriched discipline of educational, psychological and social talent cultivation in multiple contexts.

### *Co-citation by References*

Figure 7 presents a co-citation network among the literature base for gifted education, with dissimilar research clusters colour coordinated. The network presents how scholars and researchers interrelate through citation patterns showing the most important hubs such as Subotnik, Olszewski-Kubilius, and Renzulli as hubs of contact between different research communities. The green cluster seems to be concentrated on theoretical frameworks of giftedness (featuring Gardner, Sternberg, and Renzulli) and the red one seems aimed at identification and assessment perspectives (with such researchers as Plucker and Ford). The blue cluster seems to search for developmental and educational methods, and such outstanding personalities as Dai and Vygotsky. This network visualisation shows that the field of gifted education research comprises a complex interaction of various perspectives, so that the field seems to be informed by various theoretical frameworks and methodologies mutually supporting and contesting each other; thus, bespeaking attendances to a

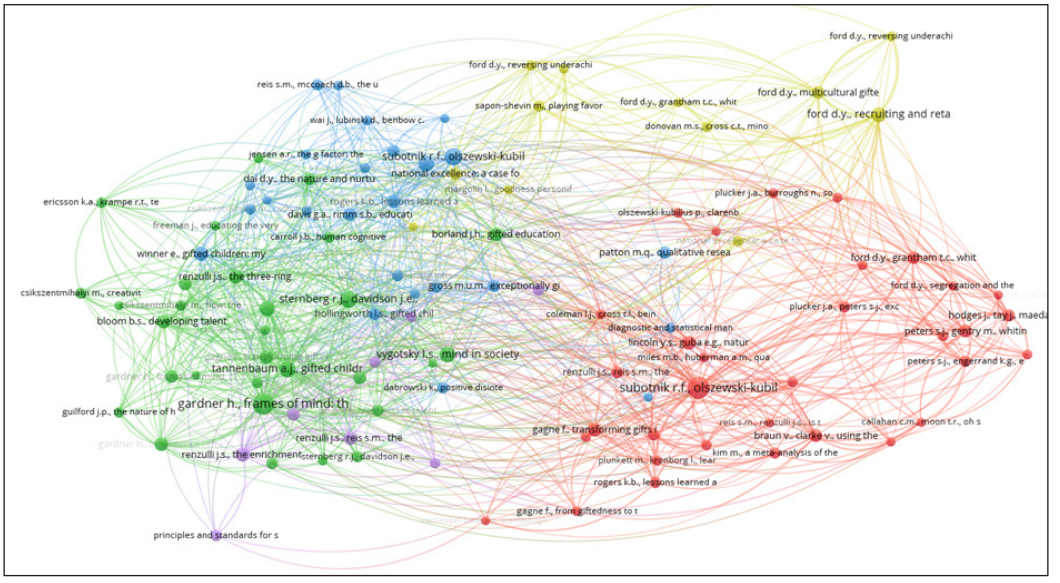



*Figure 7.* Co-citation by references

multidisciplinary nature of research on giftedness and talent development.

### *Co-citation by Authors*

Figure 8 implies co-citation relations between authors in gifted education research, which show a complicated network in which node size reflects citation frequency, and colours correspond to separate scholarly communities. The visualisation shows a number of powerful clusters where Renzulli, Sternberg, Gardner and Ford are powerful centres of intellectual activity. The red cluster seems to be taking on cognitive and developmental theorists (Sternberg, Gardner, and Lubinski), the green cluster (led by Ford) probably deals with equity/diversity in gifted education. The purple/blue areas (Reis and McCoach) seem to denote identification and programmeming paradigms and Renzulli is placed between several research communities as a liaison. This network shows how gifted education scholarship is organised around complementary yet separate theoretical orientations that simultaneously address cognitive development, talent identification, educational programmeming, and social justice issues, while also displaying the intellectual diversity of, and interrelationships between, the field through important scholars whose works transcend individual perspectives.

### *Countries' Collaboration*

In Figure 9, international research collaboration patterns in gifted education studies are illustrated whereby node size represents paper volume and connecting lines indicate collaborative relationships between countries. The United States is presented as a dominant hub, which is

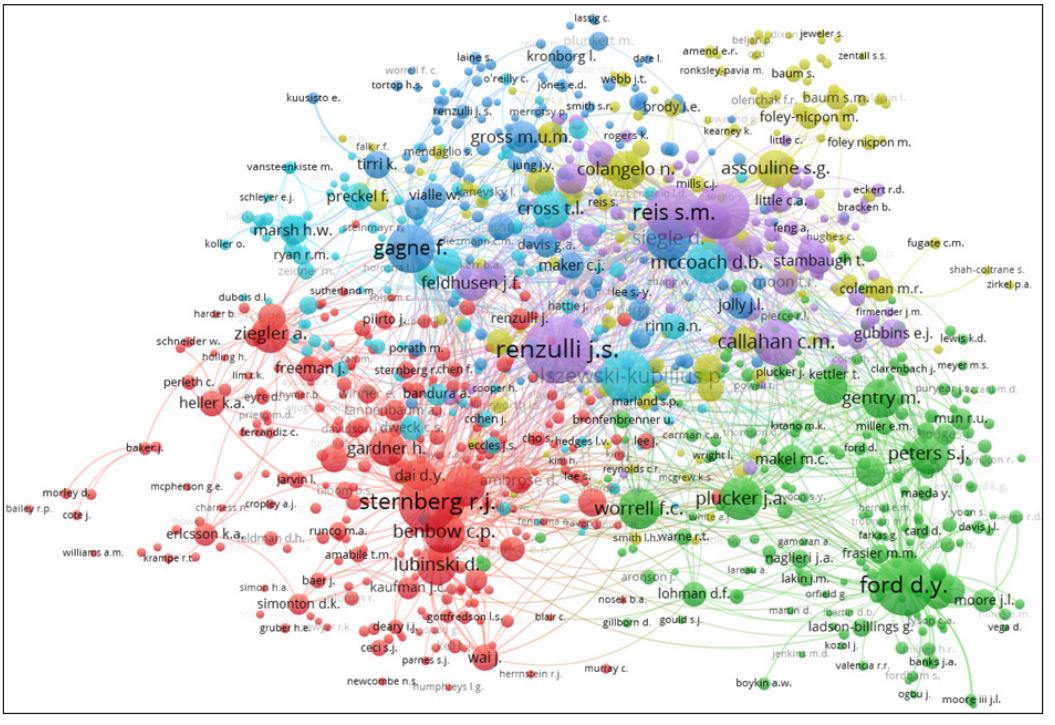



*Figure 8.* Co-citation by authors

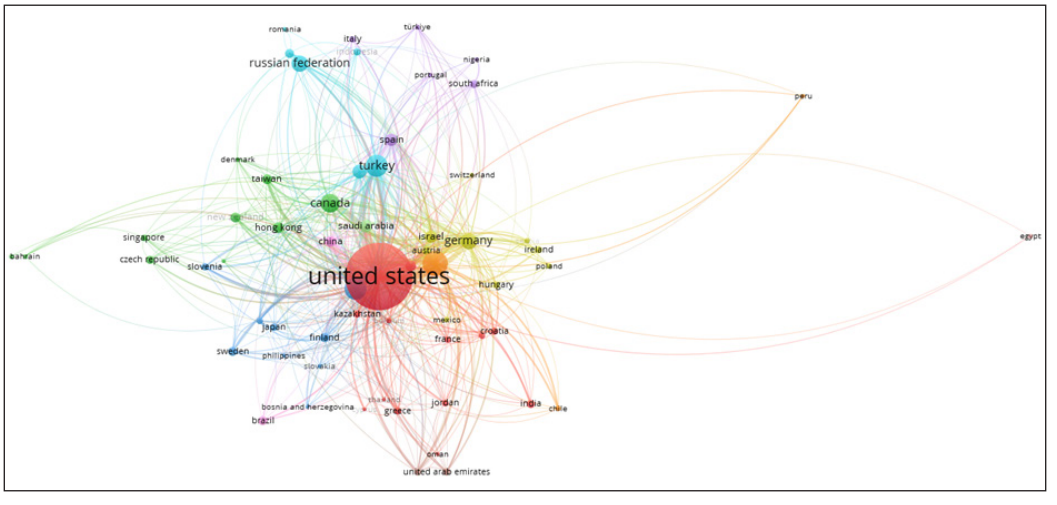



*Figure 9.* Countries' collaboration

centred and characterised with the biggest node size, indicating its large share in the influence and productivity of gifted education research. The network shows a number of distinct collaborative clusters, with close associations between the US and

such countries as Germany, Canada, Turkey, and China, that might be interpreted as prominent research associations. Different coloured links probably relate to a variety of strengths or types of collaborative relations, that exhibit regional grouping for countries of Europe, Asia, and Middle East. The visualisation demonstrates the global nature of the research in gifted education while, at the same time, mapping out the strong reliance of the field on US-focussed knowledge production and collaboration networks. This international mapping of gifted education research collaboration indicates that, although this type of research is increasingly globalised, there is still a place for establishing more extensive collaborations between South and South and weakness in dependencies on traditional research powerhouses.

## CONCLUSION

The detailed bibliometric analysis of the period of 2005 to 2025 of research in gifted education indicates some major patterns and trends in the discipline. Publication trends show generally sustained scholarly interest numbering 150-200 articles per year with an explosive increase in 2021, which was likely a consequence of heightened interest in gifted education, following the pandemic's effect on exceptional learners. This ephemeral high of some 400 publications later settled back to the platitudes of those two decades ago, signifying a field which has suffered no waning of scholarly interest despite the perturbations of quantity published. The analysis then effectively points to a clustering of research leadership, one among scholars and one among institutions. Ford becomes the most prolific researcher with 61 publications well over a half the output of the second most productive scholar (Peters). This dominance implies that some of the dominant voices may unduly determine discourse in the discipline. Likewise, American institutions dominate the gifted education research basket with a vast leadership, and the top tier of institutional contributors is constituted by University of Connecticut, Purdue University and William & Mary. The geographic clustering of research is further reflected in the fact that eight American universities were ranked in the ten most productive universities, while UNSW Sydney was the only international entry.

The understanding of international research landscape in field of gifted education shows considerable differences in the number of contributed countries. The United States leads with almost 1,700 documents more than five times Australia, which publishes with 243 documents in second place. This imbalance is probably a result of early identification and provisions system for gifted learners in the United States, a higher share for funding, as well as a leading academic community that caters to exceptional learners. The visualisation of international research collaboration patterns will only further the confirmation of the United States as the biggest hub (with the strongest relations of collaboration as the US-Germany, the US-Canada, the US-Turkey, and the US-China).

This global mapping shows that, although the field of gifted education and research is becoming more internationalised, there are still many opportunities for the development of South–South collaborative networks, and de-reliance on the more conventional research powerhouses. Analysis of the top journals indicates that the major five journals in gifted education have characteristic publication profile patterns. Gifted Child Quarterly, Gifted Education International, Gifted Child Today, and Roeper Review each have distinct trajectories to tell in the publication outputs for the period of 20 years. The fluctuating situations of stability and productivity in these journals reveal shifting trends in academic focuss and publishing trends among scholars in this area with Gifted Child Today becoming the most vibrant in recent years. These publication places cumulatively define knowledge flow in gifted education by providing the platforms for theoretical innovations, methodological changes, and practical applications. The appearance of the co-occurrence network visualisation illustrates the multiple dimensions of the gifted education research, and interrelated groups of topics about identification, acceleration, equity, underachievement, STEM education, achievement, child development, and medical education. This complex network indicates the disciplines evolution from narrow selection focuss to a rich discipline that encompasses educational, psychological and social domains of talent development within different contexts. Likewise, co-citation patterns by both references and contributors reflect the intellectual variety of the field, with powerful figures such as Subotnik, Olszewski-Kubilius, Renzulli, Sternberg, Gardner, and Ford being important network nodes between various research communities. Such networks illustrate the way gifted education scholarship is structured into complementary but separate theoretical orientations to cognitive development, talent identification, programmeming, and social justice concerns.

At the end, this bibliometric analysis gives a clear picture of the contemporary geography of the scholarly discourse of gifted education research of the past two decades. The results reveal an area of scholarly activity that is sustained, concentrated largely in the North America, with defined publication outlets, and with well-defined networks of intellectual exchange. Based on this, going forward, the field will benefit from more collaboration internationally and especially among researchers in the Global South to diversify perspectives and approaches. In addition, the visualisation of research clusters implies an opportunity for closer integration between theoretical frameworks, identification methodologies, educational interventions and equity considerations. Given that gifted education is in a process of development, the reflected structural patterns might be addressed in such a way that makes gifted education more inclusive and comprehensive in regard to identification and development of gifted potential among diversely placed populations and environments.

## ACKNOWLEDGEMENT

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# Trends and Research Themes regarding the Flow Experience in Social Science: A Comprehensive Bibliometric Analysis

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## ABSTRACT

This study performed a bibliometric analysis to delineate research trends regarding flow experiences from 2000 to 2024. Utilising Mihaly Csikszentmihalyi's comprehensive theoretical framework on flow and addressing the shortcomings of prior research, data were obtained from Google Scholar via two distinct strategies concentrating on the keyword clusters "flow experience" and "flow state." The analysis indicated a substantial rise in flow-related papers, particularly since 2014. Research trends on this subject have also broadened to encompass other domains, like education, sports, technology, and mental health, beyond the conventional realm of psychology. The analysis of keywords and their co-occurrence identified significant clusters of research topics: (1) User-technology interaction, (2) Education, learning, and personal development, (3) Personal experiences, (4) Flow-based games, (5) Video games, anxiety, and achievement. The study ultimately proposes further research avenues, such as the integration of modern technologies, the construction of a comprehensive flow scale, and investigations within certain demographics, occupational settings, health, and sustainable development.

*Keywords:* Bibliometric, co-occurrence analysis, flow experience, VOSviewer

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## INTRODUCTION

The phenomenon of flow, characterised by intense focuss, complete immersion, and deep satisfaction in an activity (Czikszentmihalyi, 1990), has attracted substantial research attention across diverse

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fields over decades. First described by Mihaly Csikszentmihalyi in 1975, flow has been associated with numerous positive outcomes, including enhanced performance, creativity, happiness, and overall well-being. Per Zhang et al. (2024), 2622 documents were catalogued on Scopus from 1982 to 2021, with international researchers progressively elucidating flow through connections to self-determination theory and the technology acceptance model. Among these publications, flow in gaming predominated, followed by technology, where complex features attract user experience. Fundamentally, flow frequently manifests in psychological and behavioural research (Seligman & Csikszentmihalyi, 2000) as an absorptive, positive state (Beard, 2014) with six key traits: intense focuss, merged action and awareness, lost self-consciousness, perceived control, altered time perception, and intrinsic reward (Nakamura & Csikszentmihalyi, 2002).

Since the foundational publications in Csikszentmihalyi (1997), flow has evolved from a concept rooted primarily in psychology into a broad, multidisciplinary construct. Researchers have systematically examined flow across diverse contexts, including education, sports, music, tourism, work, and technology (deMatos et al., 2021; Swann et al., 2018; Tan & Sin, 2019). Several studies have focussed on the development and validation of instruments, such as the Flow State Scale and the Flow State Scale-2, to capture both the state and dispositional aspects of flow, thereby enabling more rigorous empirical investigations.

Parallel to this, flow has been increasingly studied in technology-mediated environments. Early work on hypermedia and online consumer experience showed how interactive systems can facilitate flow-like states (Hoffman & Novak, 1996; Novak et al., 2000). Subsequent research integrated flow with technology-related models by extending the Technology Acceptance Model (TAM) to examine online consumer behaviour, web usage, and e-learning (Hoffman & Novak, 2009; Hsu & Lu, 2004a; Lee, 2010). In digital games and game-based learning, flow has been used to explain immersion, engagement, and learning outcomes (Boyle et al., 2016; Kiili, 2005; Perttula et al., 2017). Other strands of research have examined flow in relation to the problematic uses of technology, such as Internet gaming addiction and its psychological consequences (Kuss & Griffiths, 2011). Together, these developments suggest that flow is now a central construct for understanding human experience in both offline and online settings. Given the rapid expansion of this field, several reviews have attempted to synthesise flow research in specific domains or periods. For instance, Tan and Sin (2019) analysed flow in music contexts, deMatos et al. (2021) provided a conceptual extension of flow experience in tourism. More recently, Zhang et al. (2024) conducted a large-scale bibliometric analysis of flow research over 40 years using Scopus data and identified phases of development and primary thematic directions. These contributions highlight the importance of cross-disciplinary flows

and demonstrate the value of bibliometric approaches for mapping complex, evolving research landscapes.

Despite these advancements, several significant gaps persist in the literature. First, existing bibliometric syntheses are constrained in terms of both temporal and conceptual scope. Zhang et al. (2024) examined publications up to 2021, thereby excluding the most recent surge in flow research, particularly post-2014, from a comprehensive bibliometric framework. Second, previous reviews often concentrated on specific contexts, such as gaming, sports, or tourism, or depended on a single database, which limits our comprehension of the diversification of flow research across various disciplines and theoretical perspectives. Third, although individual studies have investigated the connections between flow and other frameworks—such as its role within positive psychology, its links to user experience in technological contexts, and its application in learning and mental health—there remains a deficiency in an integrated overview that concurrently considers publication trends, key outlets, influential works, and thematic clusters across the broader social science landscape (Koufaris, 2002; Kuss & Griffiths, 2012; Zhang & Wang, 2024). To address these gaps, this study provides a comprehensive bibliometric analysis of flow experience research in the social sciences from 2000 to 2024 to answer the following research questions (RQs):

- (RQ1) What are the current research trends in flow experience studies?
- (RQ2) How are flow-related publications distributed across journals and publishers?
- (RQ3) Which publications or foundational works have been most influential in flow research, and how have they shaped the field's evolution?
- (RQ4) What are the main research themes or clusters in flow literature, based on keyword co-occurrence and other bibliometric analyses?
- (RQ5) What future research directions emerge from these trends and themes in flow research?

This paper follows a five-section structure, with an introduction that establishes the flow experience theory, identifies research gaps, and presents research questions. The Research Method section details the data collection from Google Scholar, extraction processes, and analysis using Microsoft Excel and VOSviewer. The results present findings on publication trends (2000-2024), journal distribution patterns, and research themes, based on reference and keyword analysis. The Discussion synthesises the findings to address the research questions by examining trends, publication patterns, and theoretical developments. The paper concludes with Limitations and Future Research, suggesting directions for future analyses, supported by tables and visualisations illustrating the evolution of flow experience research.

## THEORETICAL FRAMEWORK

Flow theory, developed by Mihaly Csikszentmihalyi, describes a psychological state of optimal experience in which individuals are fully immersed in an activity, feeling cognitively efficient, deeply motivated, and happy. This state, often referred to as flow, is characterised by several key elements: (1) complete absorption, wherein people in flow are wholly focussed on a task that they undertake and are in a merged state of action and awareness (Biasutti, 2011, 2016); (2) intrinsic motivation, wherein flow is intrinsically motivating, which is to say that it is an activity performed for its own sake rather than for external rewards (Pace, 2004; Palomäki et al., 2021); (3) balance of challenge and skill, wherein flow occurs with a balance between an activity's challenges and one's skill level, leading to an individual's sense of control and mastery (Lambert et al., 2013; Maheshwari et al., 2023); (4) clear goals and feedback, wherein having clear goals and immediate feedback is crucial for maintaining flow, as it helps individuals stay focussed and adjust their actions accordingly (Cseh, 2016); and (5) positive experience, wherein flow is associated with positive emotions, peak performance, and often creativity (Chilton, 2013). Thus, flow must be considered not as a fixed experience of satisfaction but as a dynamic equilibrium that requires a constant increase in complexity. Thus, as people increase their abilities, the corresponding difficulties must become more challenging if they are to remain in a state of flow (Ishimura & Kodama, 2009).

Flow is an intrinsically motivated experience, aligned with principles identified in Self-Determination Theory (SDT) (Ryan & Deci, 2000), that views human requirements for competence and autonomy as often being found in experiences that generate flow. Intrinsic motivation, one dimension of SDT, correlates strongly with experiences of flow. For example, in online game-based learning, intrinsic motivation positively influences enjoyment and attentional focuss, both of which are essential for achieving a flow state (Lin et al., 2025). In recent years, flow research has intersected with technology adoption models. Typically, the Technology Acceptance Model (TAM) of Davis (1989) has been applied to understand how flow influences user engagement and acceptance of digital technologies such as online games and e-learning platforms. The extended TAM model based on SDT shows that autonomy and relatedness significantly influence perceptions of ease of use and attitudes toward technology use (Al Oraini, 2024). By combining these frameworks, this study examines the flow literature not only in terms of publication trends but also through the lens of underlying psychological and technological theories, providing a richer foundation for analysing research topics.

## RESEARCH METHOD

### Data Collection

This section discusses the collected database system, the first issue addressed when drafting initial research ideas. Scopus and Web of Science (WoS) data are widely

utilised in bibliometrics, enabling detailed exportation suitable for in-depth analysis (Donthu et al., 2021). Scopus is common since WoS is considered a subset, with most WoS journals also indexed by the larger Scopus. However, Scopus includes more journals pending WoS inclusion, particularly in social sciences and humanities (Mongeon & Paul-Hus, 2015). Other findings indicate Scopus indexes more Brazilian journals than WoS (Miguel et al., 2016) and is more comprehensive overall (Falagas et al., 2008). However, Google Scholar excels in coverage (Gusenbauer, 2018; Martín-Martín et al., 2018). Despite unknown indexing quality and policies, Google Scholar has significantly expanded coverage over the years as a robust scholarly literature database. Caution is still warranted relying on Google Scholar for citations and metrics vulnerable to manipulation, with indexing quality remaining challenging (Halevi et al., 2017). Thus, while suiting this study, Google Scholar required systematic, effective extraction to leverage information while ensuring quality value. Additionally, this comprehensive, multi-source approach can help reduce researcher subjectivity and increase result objectivity (Lim & Kumar, 2023). Creating vivid, comprehensible visual data maps enables evaluating published research output, significance, and quality (Punj et al., 2023).

In summary, this study used Google Scholar as the primary data source, accessed through Publish or Perish software guided by Harzing (2007), to facilitate systematic querying and extraction. Two search strategies were designed to retrieve relevant publications containing the keywords "flow experience", "flow state", or "flow theory" (ensuring the term "flow" appeared in the title for focussed searching in the first strategy). Both searches were limited to the years 2000-2024 and were performed on September 2, 2024. In method 1, the study applied an additional filter requiring "flow" in the publication title, yielding 1,958 initial records. Meanwhile, method 2 applied a broader search strategy without using the title-specific filter, yielding 4,047 records. The results from each method were exported and filtered to remove entries missing the necessary bibliographic information (author, title, year) and duplicate entries. After filtering, 1,846 documents remained in the first dataset (Method 1) and 3,777 documents in the second dataset (Method 2). These two datasets are analysed separately and compared in detail in Table 1 to ensure the accuracy of the results.

To ensure reproducibility and transparency, this study followed the PRISMA 2020 guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). The selection process followed a four-stage process.

Identification: Records were identified from Google Scholar using Harzing's Publish or Perish software to overcome display limitations. The search string detailed in Table 1 provided the total number of articles before filtering (1958 for Approach 1 and 4047 for Approach 2).

Screening: Duplicate records where Google Scholar indexed a single article

Table 1
*Approach to extracting data from Google Scholar*

| Approach | Step | Activity | Description | Tool | Result |
|---|---|---|---|---|---|
| 1 | 1 | Keyword search | Search for keywords "flow experience" or "flow state" or "flow theory" in the title, or keywords of articles. Additional filter: Require the word "flow" to be present in the article title. | Google Scholar | - |
| | 2 | Data extraction | Extract data within a 25-year timeframe (2000-2024). Date of data research: 2/9/2024 | Publish or perish | 1958 documents |
| | 3 | Data filtering | Remove documents with missing information (publication year, author name, article title) or duplicate content. | - | 112 documents removed 1846 documents remaining |
| 2 | 1 | Keyword search | Search for keywords "flow experience" or "flow state" or "flow theory" in the title or keywords of articles. | Google Scholar | - |
| | 2 | Data extraction | Extract data within a 25-year timeframe (2000-2024). Date of data research: 2/9/2024 | Publish or perish | 4047 documents |
| | 3 | Data Filtering | Remove documents with missing information (publication year, author name, article title) or duplicate content. | - | 270 documents removed 3777 documents remaining |

multiple times, such as preprint, school, and journal web versions. The study used software (such as Excel and R Studio) to merge duplicate records.

Inclusion/Exclusion screening: Titles were screened for eligibility. The pre-study excluded articles that were not related to "psychology" or "social sciences". For example, articles on "fluid flow", "cash flow", or "traffic flow" were excluded.

Eligibility: Validity check and data cleaning. The exclusion criteria were as follows: (1) articles without author names; (2) articles missing publication year or journal name; (3) documents that were not scientific articles (e.g., table of contents, preface, letter to the editor); and (4) articles not written in English.

Eliminated: 112 documents from method 1; 270 documents from method two after screening and validity check steps

Inclusion: Number of clean records loaded into VOSviewer to run the analysis (1846 and 3777 articles).

## Data Analysis Method

According to Donthu et al. (2021), bibliometrics employs two main techniques: performance analysis and science mapping. Specifically, performance analysis focusses

on publication statistics like document numbers by year, journal, or country, and citation indicators such as citations per document. Science mapping often utilises network analysis to explore relationships between research components including authors, author connections, keywords, or cited references. Co-occurrence of two components in the same document (e.g. co-listed keywords) indicates a link between them, with link strength directly determined by co-occurrence frequency (higher frequency, stronger link). Linking research components as nodes forms diverse academic networks. This study used Microsoft Excel and VOSviewer for bibliometric analyses suiting Google Scholar parameters (Passas, 2024).

## RESULTS

### Publication and Citation Trends of the Flow

The number of studies conducted over time indicates scholarly interest in a field. Since introducing the concept of flow, Csikszentmihalyi and Figurski (1982) have sought to foster intrinsic motivation and interest through flow in higher-education settings. Per Zhang et al. (2024), flow research long remained limited. Despite this minimal attention, Csikszentmihalyi significantly advanced flow theory, publishing foundational works in 1975, 1990, and 1997. However, flow research has increased substantially in the early 21st century. In both approaches, publications from 2000-2010 accounted for nearly 14% (Figure 1), which was considered the transitional flow study period. As famous authors like Novak et al. (2000) built on Csikszentmihalyi's foundations with influential publications measuring online customer experience through structural modelling, flow research expanded. Koufaris (2002) also published an influential study that applied technology acceptance and flow theory to online consumer behaviour. Additionally, Nakamura collaborated with Csikszentmihalyi on the seminal 2002 publication "The Concept of Flow."

The research trends of the first approach in Figure 1 resemble those of the second data approach, particularly the decline in 2008 and the notable increase in 2012. Both approaches continuously rose and fell until 2019. In 2019, new VR technology flow research trends emerged, given the development premises (Kim & Ko, 2019). Outstanding growth in flow research occurred in 2022 and 2023 for both approaches. However, the first data analysis showed a significant decrease in publications in 2023. Regardless, from 2014 to 2024, publications accounted for over 75% of the total observation period in both data approaches. This trend requires further examination in subsequent keyword and author trend analyses.

Figure 2 visualises divergent early citation trends between the two data approaches. This stems from Novak et al. (2000) highly cited publication on measuring online customer experience through structural modelling, with 5141 citations. The first data approach provided superior filtering but missed influential

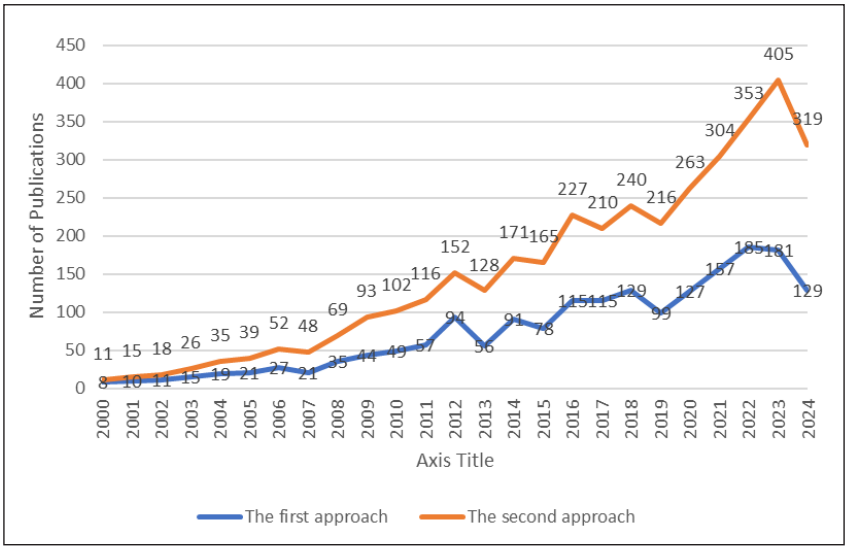



*Figure 1.* Number of publications related to flow according to two data approaches
*Note.* 2024 data is only calculated as of September 2, 2024

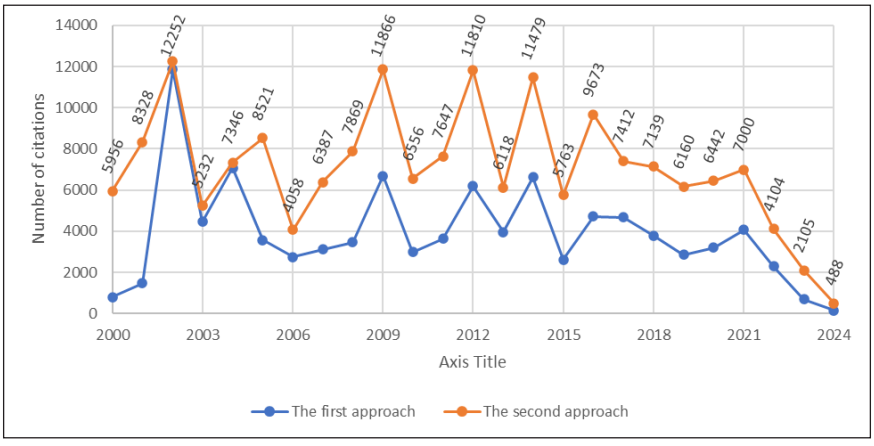



*Figure 2.* Trends of paper's citations for year
*Note*. 2024 data is only calculated as of September 2, 2024

flow studies without "flow" in the title. This continued in 2001 with Moon and Kim (2001) prominent study on website experience, usefulness, and ease of use. However, citation trends became relatively similar after that. Both roughly overlapped from 2002 to 2004, followed by a notable decline until 2008. The declining trend then steadily rose and stabilised through 2021.

## Publication Patterns of Flow Research

The first approach analysed 1846 published documents, with only 43 publishers producing five or more articles with "flow"

Table 2
*Top 10 publishers on the topic of flow*

| Publisher | The first approach | | The second approach | |
|---|---|---|---|---|
| | Count | % | Count | % |
| Springer | 186 | 10.08% | 356 | 9.43% |
| Taylor & Francis | 182 | 9.86% | 318 | 8.42% |
| Elsevier | 148 | 8.02% | 265 | 7.02% |
| Sage | 69 | 3.74% | 127 | 3.36% |
| Emerald | 58 | 3.14% | 119 | 3.15% |
| Frontiers | 51 | 2.76% | 83 | 2.20% |
| IEEE Xplore | 41 | 2.22% | 90 | 2.38% |
| Wiley | 38 | 2.06% | 66 | 1.75% |
| MDPI | 31 | 1.68% | 63 | 1.67% |
| Inderscience | 15 | 0.81% | 29 | 0.77% |
| Total publications | 1846 | 44.37% | 3777 | 40.14% |

Table 3
*Top 10 most published journals flow research in a data-first approach*

| Rank | Journal | TP (Count) | TP (%) | Publisher | TC | TC/TP |
|---|---|---|---|---|---|---|
| 1 | Frontiers in Psychology | 45 | 2.44% | Frontiers | 1651 | 36.69 |
| 2 | Computers in Human Behaviour | 31 | 1.68% | Elsevier | 7561 | 243.90 |
| 3 | Advances in flow research | 19 | 1.03% | Springer | 1588 | 83.58 |
| 4 | Sustainability | 13 | 0.70% | MDPI | 376 | 28.92 |
| 5 | Current Psychology | 10 | 0.54% | Springer | 260 | 26.00 |
| 6 | Journal of Retailing and Consumer Services | 9 | 0.49% | Elsevier | 1448 | 160.89 |
| 7 | Psychology of Music | 8 | 0.43% | Sage | 881 | 110.13 |
| 8 | Information & Management | 5 | 0.27% | Elsevier | 1064 | 212.80 |
| 9 | Journal of Happiness Studies | 5 | 0.27% | Springer | 552 | 110.40 |
| 10 | Telematics and Informatics | 5 | 0.27% | Elsevier | 791 | 158.20 |
| TP: Total Publications, TC: Total Citations | | | | | | |

in the title. In contrast, the second approach identified 77 publishers with over five articles on flow without requiring "flow" in the title, broadening the scope. Table 2 shows that the top 10 journals in both approaches comprise just 40.14-44.37% of total publications, indicating relatively diverse flow publishing with substantial fragmentation across publishers.

Tables 3 and 4 further delineate the flow topics published across journals. In the first approach, "Frontiers in Psychology" accounted for 2.44% of the 1846 total documents, ranking first among flow

Table 4
*Top 10 most published journals flow research follows a second data approach*

| Rank | Journal | TP (Count) | TP (%) | Publisher | TC | TC/TP |
|---|---|---|---|---|---|---|
| 1 | Frontiers in Psychology | 73 | 1.93% | Frontiers | 2332 | 31.95 |
| 2 | Computers in Human Behaviour | 51 | 1.35% | Elsevier | 11095 | 217.55 |
| 3 | Advances in flow research | 21 | 0.56% | Springer | 1827 | 87.00 |
| 4 | Sustainability | 21 | 0.56% | MDPI | 623 | 29.67 |
| 5 | Computers & Education | 18 | 0.48% | Elsevier | 3964 | 220.22 |
| 6 | Journal of Retailing and Consumer Services | 14 | 0.37% | Elsevier | 1722 | 123.00 |
| 7 | Internet Research | 11 | 0.29% | Emerald | 1435 | 130.45 |
| 8 | Psychology of Music | 10 | 0.26% | Sage | 950 | 95.00 |
| 9 | Information & Management | 9 | 0.24% | Elsevier | 1426 | 158.44 |
| 10 | Telematics and Informatics | 9 | 0.24% | Elsevier | 1401 | 155.67 |

TP: Total Publications, TC: Total Citations

publications from 2000 to 2024 (Table 3). This number decreased slightly in the second approach, although the journal still ranked first with nearly 32 citations per publication (TC/TP). The journal Computers in Human Behaviour, published by Elsevier, showed the highest scholarly interest in developing flow, with an average TC/TP of 244 citations per publication.

The top 10 journals accounted for only 6-8% of total publications in both approaches, yet 15-17% of citations. Despite the fragmentation, journals from key publishers still attracted substantial researcher attention, as Table 4's second approach data shows. With just 18 of 3777 (0.48%) documents, “Computers & Education” averaged 220 citations per publication, along with "Computers in Human Behaviour" representing the most cited journals, superior to the other eight in the list. This demonstrates that although Flow originated in psychology, its most significant application value today lies in the human-computer interface (HCI). Flow research in technology receives much more attention (citations) than pure psychology research.

## Research Background, Main Themes, and Trends

### *Reference Analysis*

Table 5 presents the publications from the second approach with 1000+ citations to fully represent the under-filtered studies identified in the citation trend analysis. Csikszentmihalyi has remained integral to flow research, expanding beyond psychology into the study of motivation at work (Csikszentmihalyi, 2002) and updating foundational flow theory through classics. Among the 19 publications with 1000+ citations, Csikszentmihalyi authored three, despite the 2000-2024 focuss on new trends. Moon and Kim (2001) technology acceptance model extension promoting

Table 5
*Flow-related publications with 1000 or more citations*

| Authors | Title | Year | Citations |
|---|---|---|---|
| Moon and Kim (2001) | Extending the TAM for a World-Wide-Web context | 2001 | 6433 |
| Koufaris (2002) | Applying the technology acceptance model and flow theory to online consumer behaviour | 2002 | 5159 |
| Novak et al. (2000) | Measuring the customer experience in online environments: A structural modelling approach | 2000 | 5141 |
| Nakamura and Csikszentmihalyi (2002) | The concept of flow | 2002 | 4963 |
| C.-L. Hsu and H.-P. Lu (2004) | Why do people play online games? An extended TAM with social influences and flow experience | 2004 | 3275 |
| Jennett et al. (2008) | Measuring and defining the experience of immersion in games | 2008 | 2633 |
| Shernoff et al. (2003) | Student engagement in high school classrooms from the perspective of flow theory. | 2003 | 2470 |
| Kiili (2005) | Digital game-based learning: Towards an experiential gaming model | 2005 | 2347 |
| Lee (2010) | Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation-confirmation model | 2010 | 1768 |
| Chen (2007) | Flow in games (and everything else) | 2007 | 1622 |
| Hausman and Siekpe (2009) | The effect of web interface features on consumer online purchase intentions | 2009 | 1558 |
| Boyle et al. (2016) | An update to the systematic literature review of empirical evidence of the impacts and outcomes of computer games and serious games | 2016 | 1535 |
| Nakamura and Csikszentmihalyi (2009) | Flow theory and research | 2009 | 1530 |
| Csikszentmihalyi (2002) | Flow: The classic work on how to achieve happiness | 2002 | 1474 |
| Kuss and Griffiths (2011) | Internet gaming addiction: A systematic review of empirical research | 2012 | 1470 |
| Bakker (2005) | Flow among music teachers and their students: The crossover of peak experiences | 2005 | 1327 |
| Hoffman and Novak (2009) | Flow online: lessons learned and prospects | 2009 | 1291 |
| Sherry (2004) | Flow and media enjoyment | 2004 | 1195 |
| Parboteeah et al. (2009) | The influence of website characteristics on a consumer's urge to buy impulsively | 2009 | 1161 |

website flow experiences tops citations. Many subsequent studies followed this direction, such as integrating TAM and flow in online shopping (Koufaris, 2002) and in online games (Hsu & Lu, 2004b). Online research in this period has attracted many citations, including studies on measuring online flow with structural modelling

(Novak et al., 2000) and digital game-based learning (Kiili, 2005). Building on flow foundations, these authors became trend leaders, a weakness of the Google Scholar data, which lacked collection criteria for deeper co-citation analysis, as discussed in the limitations section.

The second approach enabled a comprehensive analysis of author connections in the 3777 2000-2024 documents. Of 6167 authors, 1131 had two or more, and 248 had four or more publications. Kiili contributed the most with 23 works, followed by Oliveria. Despite ranking third with 15 publications, Csikszentmihalyi received only 12,643 citations from 2000 to 2024. Flow theory pioneer Nakamura ranked second with 7704 citations. Top publisher Kiili also had 4266 citations, ranking fourth after Hsu. Figure 3 details the author's bibliographic grouping.

### *Keyword Analysis*

Keyword analysis can outline relationships among research topics (Zhang et al., 2024) using researchers' essential condensed idea codes to aid quick reader comprehension (Rose et al., 2010). This section uses the 14080 keywords from the second approach's 3777 documents to provide the most comprehensive 2000-2024 trend perspective. Of these, 422 keywords occurred at least ten times, and 228 at least 20 times. Table 6 lists the top 30 most frequent keywords. Flow-related terms, such as flow experience and flow state, dominate the literature review due to the keyword-based approach. Skill and challenge are the most common flow trigger prefixes, whereas clear goals and immediate feedback are less common. Flow dimensions were rarely considered, with only control in Table 6; an important future research proposal is

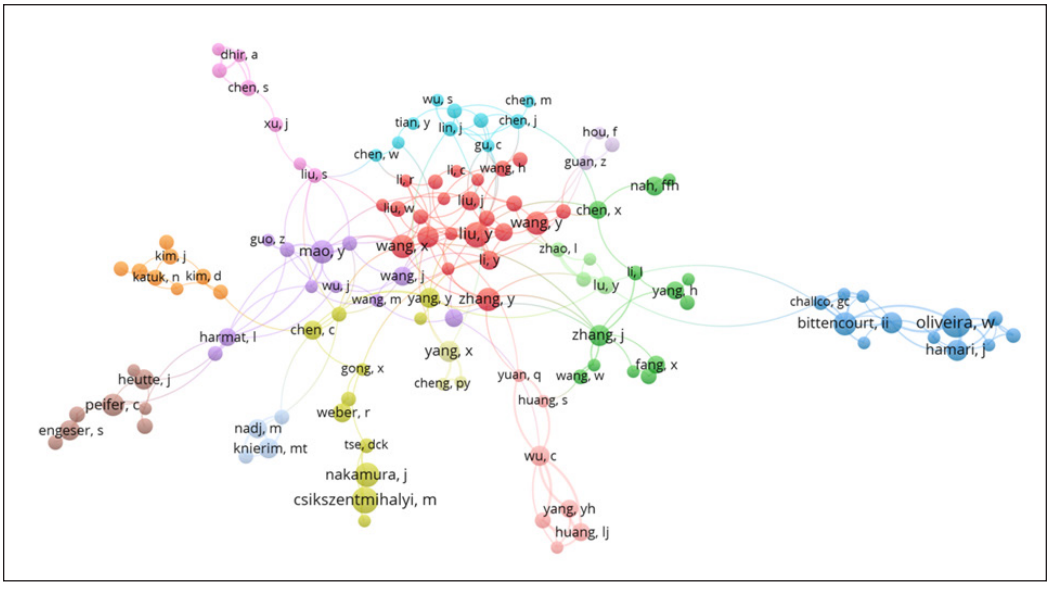



*Figure 3*. Bibliographic clustering

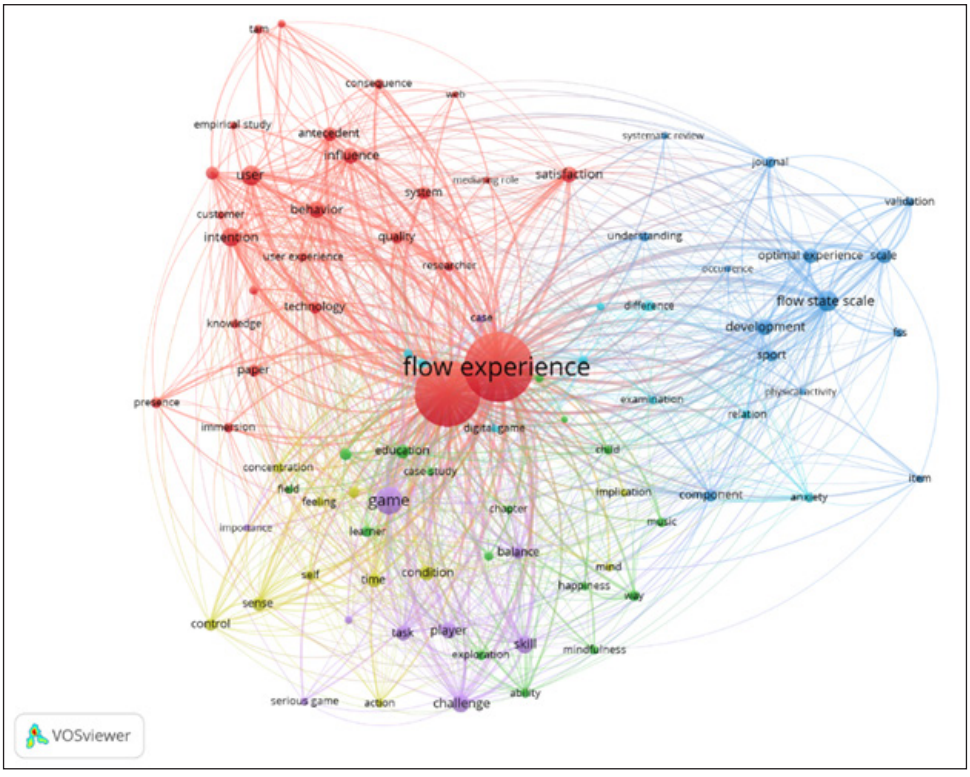



*Figure 4.* Cluster of keyword co-occurrence

Table 6
*Top 30 most co-occurring keywords*

| Rank | Keywords | Frequency | Rank | Keywords | Frequency |
|---|---|---|---|---|---|
| 1 | flow experience | 2890 | 16 | scale | 135 |
| 2 | flow state | 2554 | 17 | condition | 134 |
| 3 | game | 445 | 18 | time | 118 |
| 4 | flow state scale | 257 | 19 | education | 116 |
| 5 | user | 226 | 20 | sense | 114 |
| 6 | intention | 212 | 21 | antecedent | 110 |
| 7 | challenge | 208 | 22 | consumer | 103 |
| 8 | skill | 203 | 23 | balance | 101 |
| 9 | behaviour | 169 | 24 | system | 101 |
| 10 | development | 160 | 25 | sport | 93 |
| 11 | player | 151 | 26 | control | 88 |
| 12 | influence | 148 | 27 | quality | 88 |
| 13 | satisfaction | 148 | 28 | gamification | 87 |
| 14 | optimal experience | 136 | 29 | technology | 82 |
| 15 | task | 136 | 30 | learner | 79 |

Table 7
*Summary of key research topic clusters*

| Cluster | Colour | Key keywords | Core research focuss |
|---|---|---|---|
| User-technology interaction | Red | User experience, satisfaction, intention, technology, system, acceptance | Understanding how digital interfaces (websites, apps) induce flow and how this influences technology acceptance (integration with TAM). |
| Education & personal development | Green | Education, learning, gamification, students, training, mindfulness | Application of flow to improve student engagement, primarily through game-based learning and intrinsic motivation strategies. |
| Flow state measurement | Blue | Flow state, scale, validity, measurement, optimal experience | Methodological research focussed on validating instruments like the Flow State Scale and defining the dimensions of the construct. |
| Gaming & immersion | Purple | Game, player, challenge, skill, enjoyment, serious games | Application of Csikszentmihalyi's channel model to game design; balancing difficulty to maintain player immersion. |
| Psychology & outcomes | Yellow/ Gold | Anxiety, achievement, depression, addiction, subjective well-being | The “dark side” of flow (gaming addiction) and the “light side” (happiness); flow as a buffer against anxiety or a driver of gaming disorder. |

presented in the conclusion. The 2000-2024 context also shows prevalent keywords for games, learning, general work, and sports. Meanwhile, the subjects include users, players, or learners. However, not only the top 30, TAM, and self-determination theory were standard, but they were also represented in the Figure 4 analysis cluster.

VOSviewer's distinct colour clusters represent separate topics through synonym analysis. Using "flow experience" and "flow state", Figure 3's second approach mapping identified corresponding clusters.

The large red cluster (26 items) focusses on user research and technology concepts such as “user experience,” “satisfaction,” “behaviour,” “intention,” “technology,” and “systems,” as shown in Table 7, indicating an interest in understanding, and improving user experience with technology, a key research area in the 2000-2024 period. “Flow experience” is a focuss with many connections, demonstrating its interdisciplinary significance. “User experience” is also a focuss, emphasising user-centred research and development. Further analysis of the red cluster revealed the following:

- User-centric: Core keywords prioritise user experience, satisfaction, behaviour, and intentions, suggesting research on meeting user needs by measuring satisfaction, understanding behaviour, and predicting intentions.
- Technology acceptance: Research may explore factors influencing technology acceptance like knowledge, experience, and social factors.

- Technology's role in user experience: This cluster examines how technology can create positive user experiences, studying concepts like flow state and immersion to design more engaging systems.
- Experimental research methods in online flow experience: Keywords related to experimental research demonstrate the importance of real-world data and analysis to support conclusions on mediating roles of flow experience and technology's connection to users through flow.

The green cluster focusses on education, learning, and personal development, emphasising enjoyable, positive experiences. Keywords indicate an interest in utilising gamification to enhance learning, as well as the roles of positive emotions, mindfulness, and exploration in learning and development. Further explorations include formal and informal learning activities and processes centred around the learner and teacher. Game elements applied to non-game contexts can increase engagement and motivation from a flow perspective. Case studies should be considered for potential cross-disciplinary application. Beyond enhancing learner skills and happiness in learning, various methods to stimulate emotions and enhance mindfulness in flow states are needed. Music represents a proactive approach in learning towards personal development, exploring new paths to help learners perceive things anew. The blue cluster focusses on researching and understanding the flow state, a positive psychological state of complete focuss and immersion in an activity. Keywords signify interest in measuring, evaluating, and validating flow concepts and determining optimal experience factors. Topics in this cluster include further investigating the flow state by measuring, evaluating, and validating related concepts and identifying factors that create optimal experiences with implications across education, sports, and work. This cluster also covers the evaluation and validation of measurement tools, including the development of reliable flow-state scales, which are crucial for practical concept studies and applications.

The gold cluster centres on the concepts of individual subjective experience, including cognitive, emotional, and behavioural elements. The keywords indicate an interest in psychological processes such as attention, concentration, and control, as well as their interactions with emotions and actions. While crucial across fields, individual experience is particularly emphasised in psychology, where the gold cluster indicates how individuals experience the world and themselves through cognitive, emotional, and behavioural processes. Attention and concentration, expressed through focuss and maintenance abilities, can substantially impact performance, learning, and overall experience. Control sense is a key flow component that can influence motivation, self-esteem, and mental health.

Additionally, time is critical for studying human experiences and behaviours, as it can affect perception, feelings, and actions. The purple cluster revolved around

games and flow experience, emphasising Csikszentmihalyi's flow theory. Keywords denote interest in key elements that create flow in games, such as challenge-skill balance, task importance, and player roles. Additionally, the cluster refers to game applications in other domains, such as "serious games." This cluster demonstrates Csikszentmihalyi's seminal flow theory, an essential framework for understanding flow, especially in games, despite its recent emergence (2000). Flow antecedents also include challenge, an integral element in producing flow that requires player effort and skill. The next is skill, which refers to players' ability to address game challenges. However, flow values lie in balancing challenge and skill through specific game tasks and goals. Moreover, future trends should clarify the role of serious games in education, training, and behaviour change beyond entertainment. The blue cluster focusses on the relationship between video games, anxiety, achievement, and other psychological factors. Keywords imply an interest in exploring the impact of video games on players, particularly their emotions and academic performance. Future research should examine both the positive and negative aspects of video games, as well as factors that predict success and interest in other activities. Prominent themes include video games, the link between video game anxiety and achievement, interest, and motivation.

Figure 5 displays frequently co-occurring terms, including flow state scale (243), development (160), optimal experience (136), intention (127), and other common keywords, combining to represent the research area. Nodes denote keywords that appear at least 10 times (van Nunen et al., 2018), with node size indicating co-occurrence frequency. Based on the visual graph and related keywords in Figure 5, we can infer some psychological flow, optimal experience, and flow state research trends from 2000 to 2024:

Early Stage (2000-2010): Focussed on core concepts, with studies likely defining and measuring flow, exploring key components like challenge-skill balance, intense concentration, time awareness loss, and intrinsic rewards. Research targeted applications in education, sports, and art, where this experience was believed to significantly impact performance and creativity. The approach was often qualitative, potentially involving interviews, observations, and diaries to collect subjective data on flow experience.

Mid-stage (2011-2017): Expansion into new areas like the workplace, mental health, and technology to investigate flow's role in well-being and productivity. Increasing use of quantitative methods based on performance measurement. Quantitative methods, such as questionnaires and experiments, can objectively measure flow and test cause-and-effect hypotheses. Research here also emphasised individual factors, such as personality, motivation, and work environment/job design and feedback, that affect flow-state achievement.

Recent Period (2018-2024): Technology integration is the most helpful recent keyword. Research may explore how technologies such as digital games, virtual reality, and artificial intelligence can facilitate or enhance the experience of flow.

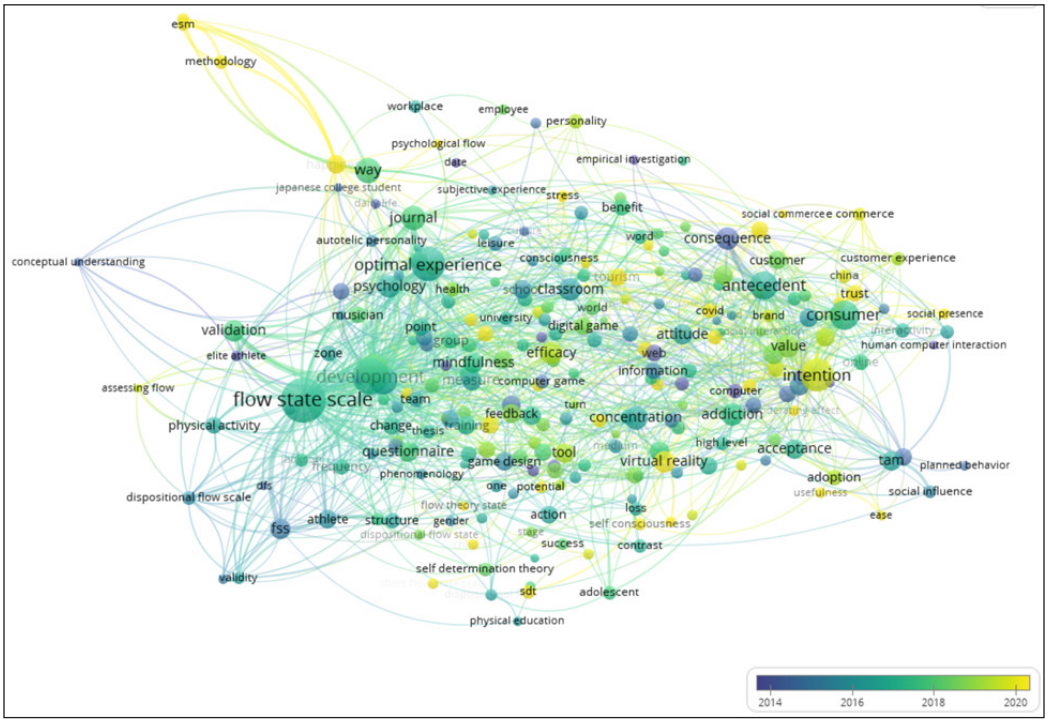



*Figure 5.* Keyword co-occurrence map (at least ten occurrences) from 2000 to 2024

Research orientations are often practical, focussed on developing flow-based interventions and training programmes to improve performance, well-being, and health. Growing interest in sustainable flow experiences has also led to a focuss on understanding flow among specific populations, such as children, the elderly, and those with mental health conditions.

Figure 6 provides an additional perspective showing the density of keywords on the VOSviewer application, which has been classified by frequency of use in the study. The density map for the 2000-2024 survey on flow experience is according to the second approach. According to this simulation, because they are depicted on the map with a darker yellow circle than other keywords, flow state and optimal experience are the concepts of most interest when studying flow. Meanwhile, customers are the subjects of most interest from the perspective of behavioural intentions, trust, and value brought to them. In addition, research trends, including virtual reality, game design, digital games, and tools, are highlighted in the conclusions in the previous section. The flow scale is also an issue to consider when the content value of flow has not been measured uniformly (Ozkara et al., 2017). Scale and the phrase flow state scale need to be more fully clarified in the context of the next trend when the flow value is expressed chiefly through control.

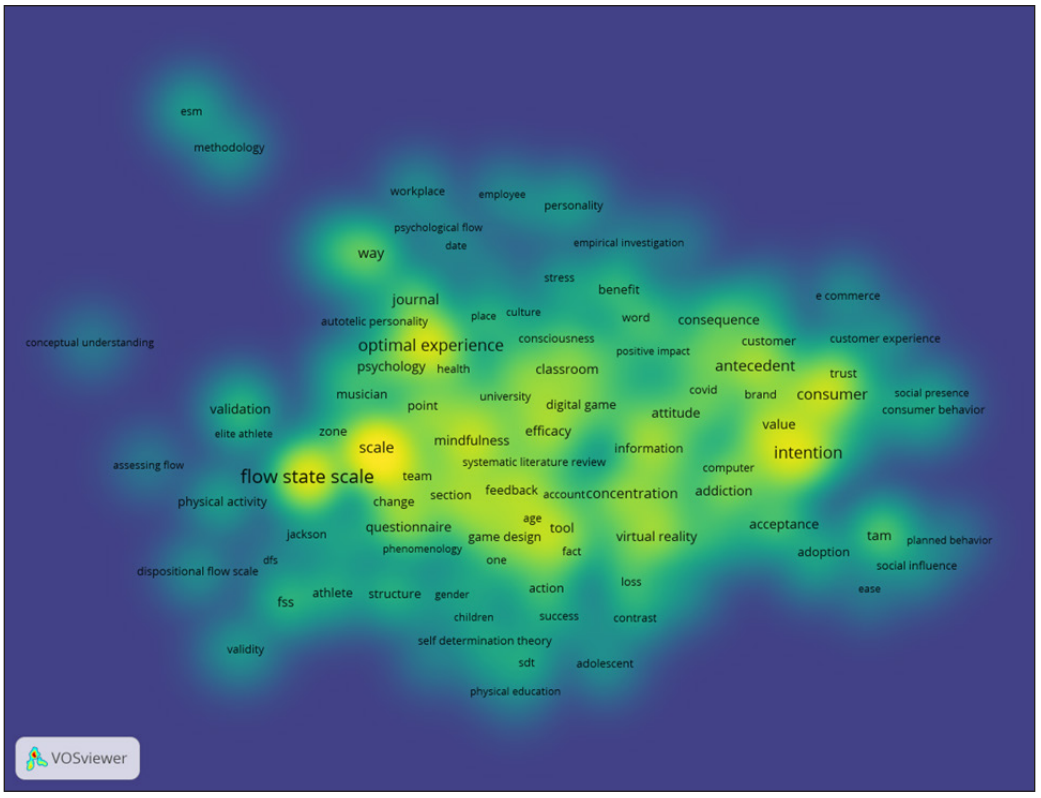



*Figure 6.* Keyword density map for flow

## DISCUSSION

Interpreting bibliometric data requires a rigorous analysis that goes beyond mere description. By addressing the five initial research questions (RQs) and situating the findings within the broader academic discourse. This section elucidates the structural transformation of the flow study based on the previously summarised analytical results in Table 8.

### The Trajectory of Flow: From Psychological Construct to Digital Metric (RQ1)

The first research question (RQ1) sought to identify current trends in flow experience studies. Our longitudinal analysis reveals a non-linear growth trajectory characterised by three distinct phases: foundational application (2000-2010), technological integration (2011-2019), and immersive acceleration (2020-2024).

The data indicate that while flow theory was first formulated in the 1970s by Csikszentmihalyi as a purely psychological framework for autotelic activity, its explosive growth in the 21st century is inextricably linked to the digitisation of daily life. The stable but moderate results observed between 2000 and 2010 reflect a period of theoretical transition, as scholars attempted to operationalise "optimal experience" as

Table 8
*Summary of key research findings*

| Dimension | Key findings (2000-2024) | Theoretical implication & discussion |
|---|---|---|
| Research Trends | Exponential Growth (2020-2024): A massive surge in publications post-pandemic, driven by digital learning and immersive tech requirements. | Flow has evolved from a descriptive state to a prescriptive design goal. It is now a key element for digital systems, validating the technologisation of flow hypothesis. |
| Journal Distribution | Volume vs. impact divergence: Frontiers in Psychology leads in volume, but Computers in Human Behaviour leads in impact (average number of citations over 200). | The centre of gravity for flow research has shifted from Psychology ➔ HCI. Applied utility in technology adoption (TAM) drives citation impact more than theoretical refinement. |
| Publisher Landscape | High fragmentation: The top 10 journals account for less than 8% of total publication volume. | Flow is a “boundary object” used across diverse disciplines, but this fragmentation risks conceptual drift and measurement inconsistency across fields. |
| Influential Works | The application turn: While Czikszentmihalyi (1990) is foundational, Novak et al. (2000) and Kiili (2005) drive modern citations. | The most influential works are those that operationalise flow (measuring it in web use or games). Methodological papers that provide scales or models are the primary drivers of the field's evolution. |
| Evolution Drivers | TAM integration: Koufaris (2002), Moon and Kim (2001) successfully grafted flow onto the Technology Acceptance Model. | This integration has legitimised the flow in business and information systems research, transforming it from an aesthetic experience into a determinant of commercial success (purchase intention). |

a variable in online consumer behaviour. This is an important transition period to consider when systematically compiling future literature, as the flow shifts from the arts and sports environment to the digital environment.

However, a pivotal inflection point occurred post-2014, followed by a dramatic surge in 2022 and 2023. This recent acceleration, which accounts for a significant portion of the total analysed volume, cannot be explained solely by academic interests. It is strongly correlated with two exogenous global factors. First, the rapid maturation of immersive technologies has necessitated a new metric for user engagement that goes beyond mere "satisfaction.” In these environments, flow is a prerequisite for their presence. Second, the COVID-19 pandemic forced a global migration to remote learning and work, prompting a surge in studies investigating how flow states could mitigate “Zoom fatigue” and sustain engagement in digital classrooms.

Critically, the discrepancy between our two data extraction approaches—where the broader keyword search (Method 2) yielded nearly twice as many documents

as the title-specific search (Method 1)—suggests a "diffusion effect". Flow is increasingly treated not as the sole subject of investigation but as a mediating variable in broader models of User Experience (UX) and educational psychology. This confirms that flow has successfully transitioned from a niche psychological theory to a ubiquitous construct in social science research.

**Disciplinary Migration and Publication Venues (RQ2)**

The analysis of journal and publisher distribution (RQ2) provides compelling evidence of a disciplinary migration. While flow originated in positive psychology, our findings show that the most influential conversations are now occurring in the domain of Human-Computer Interaction (HCI) and Educational Technology.

As explained in the results, the journal with the most published articles is indeed Frontiers in Psychology, indicating ongoing theoretical interest in the cognitive processes underlying the state of flow. Nevertheless, if one looks at the citation impact measured by TC/TP, the situation becomes somewhat reversed. Computers in Human Behaviour and Computers & Education show the highest citation impact, above 200 per paper. This signals a precise valuation by the academic community: research that applies flow to solve technological or pedagogical problems is currently more valued than research that merely describes it.

The publisher landscape further supports this shift. The dominance of Elsevier, Springer, and Taylor & Francis underscores the consolidation of flow research among major commercial publishers specialising in applied sciences. However, the findings summarised in Table 8 show that flow research remains a highly fragmented field. Flow research is beginning to emerge in journals such as Sustainability and the Journal of Retailing, indicating the breadth and, possibly, the fragmentation of the concept. In the absence of an umbrella journal that would oversee the dissemination of research on flow across various fields, the concept could develop multiple definitions, none of which overlap. This would create an irony in which researchers and psychologists would refer to the same phenomenon.

**The Intellectual Base: Foundational Works and Field Evolution (RQ3)**

Addressing RQ3, the citation analysis reveals that the field's evolution has been shaped more by methodological operationalisation than by new theoretical discoveries. While Mihaly Csikszentmihalyi remains the spiritual figurehead of the movement, the engine room of modern flow research comprises authors who have adapted his theory for the digital age.

The enduring dominance of Novak et al. (2000) cannot be overstated. By developing a structural equation model to measure online customer experience, they provided a methodological toolkit that enabled thousands of subsequent studies to quantify flow. This publication effectively unlocked the construct for quantitative social science, moving it beyond qualitative interviews with artists and rock climbers. Similarly, the

high citation count for Kiili (2005) marks the formal entry of flow into the serious game's movement. Kiili's experiential gaming model provided the theoretical justification for gamification in education, arguing that the "challenge-skill balance" is synonymous with the "zone of proximal development" in pedagogy.

It is important to note that while these works have shaped the field's development, they have also constrained it. The overreliance on early web-based models and Jackson and Eklund's scales means that much of the field is still using measurement tools designed for the "Web 1.0 era to study Web 3.0" phenomena. This reliance on older tools can limit the ability to capture the nuances of flow in highly immersive, multisensory environments like the Metaverse, where "telepresence" and "embodiment" play a larger role than in early web navigation.

**Thematic Clusters and Comparative Analysis (RQ4)**

The keyword co-occurrence analysis (RQ4) identified five distinct clusters: (1) User-Technology Interaction, (2) Education & Gamification, (3) Measurement, (4) Gaming, and (5) Psychology & Outcomes. To rigorously contextualise these themes, Tables 8 and 9 provide a comparative analysis with major prior reviews.

As illustrated in Table 9, this study diverges from niche reviews such as Tan and Sin (2019) and deMatos et al. (2021) by identifying "Gamification" and "User-Tech Interaction" as the central nervous system of modern flow research, rather than merely peripheral applications. Furthermore, the identification of the "Psychology & Outcomes" cluster (Gold) provides a critical counter-narrative often missed in purely technocentric reviews: the link between flow, anxiety, and digital addiction. Zhang et al. (2024) identifies "Gaming" and "Education" as central themes. However, they miss the nuance of the "Dark Side" (Gold Cluster - Anxiety/Addiction) that our Google Scholar data highlights.

**Future Research Directions (RQ5)**

The persistence of the "measurement" cluster highlights the limitations of questionnaires. As indicated by recent work on snippets, the future lies in objective flow detection. Current scales only measure flow at a moment. Researchers have increasingly called for the use of neuroimaging and heart rate sensors to capture the onset of flow in real time. However, this is not appropriate for research on digitising user experiences, as it may compromise research ethics in fast-paced business environments. This "physio-flow" approach addresses the paradox that stopping a user from asking "are you in flow?" destroys the flow state.

The "dark side" cluster suggests an urgent need to study the ethics of flow. With algorithms explicitly designed to induce and sustain flow to maximise ad revenue, social scientists must investigate the weaponisation of flow. Future studies should explore the boundary between healthy immersion and pathological dissociation and develop "digital wellness" frameworks that help users regulate their flow.

Table 9
*Comparative analysis of bibliometric reviews on flow experience*

| Feature | Current Study | Zhang et al. (2024) | Tan and Sin (2019) | deMatos et al. (2021) |
|---|---|---|---|---|
| Timeframe | 2000-2024 (Most current) | 1982-2021 | 1975-2019 | Up to 2021 |
| Data source | Google Scholar (3,777 docs) | Scopus (2,622 docs) | Multiple sources (95 selected docs) | Multiple sources (185 selected docs) |
| Scope | Broad Social Sciences (Comprehensive) | Multidisciplinary (Scopus indexed only) | Niche: Music Context | Niche: Tourism & Hospitality |
| Primary method | VOSviewer, Dual Strategy | CiteSpace, VOSviewer | Systematic review, Content analysis | Systematic review, Theory extension |
| Dominant themes | 1. User-Tech Interaction<br>2. Education, Gamification<br>3. Measurement (Scales)<br>4. Cognitive Experience<br>5. Anxiety | 1. Technology<br>2. Games<br>3. Sports<br>4. Creativity<br>5. Education<br>6. Mechanism<br>7. Positivity<br>8. Health | 1. Performance anxiety vs. Flow<br>2. Psychophysiology<br>3. Group flow<br>4. Music education | 1. Experiences capes<br>2. Immersion<br>3. Visitor satisfaction<br>4. Behavioural intention |
| Findings on "Tech" | Central driver of research (TAM integration). | Identified as a supreme theme alongside gaming. | Not a primary focuss; focussed on audio/performance. | Focuss on VR and smart tourism as facilitators. |
| Unique contribution | Captures post-COVID surge (2022-2024); validates use of Google Scholar for broader social science coverage. | Long-term historical view (40 years); robust national/regional collaboration analysis. | Deep dive into auditory and performance aspects of flow; distinguishes flow from mere pleasure. | Extends flow theory into Service Dominant Logic and destination management. |
| Noted limitations | Google Scholar data may contain noise or lower quality citations. | Scopus excludes many social science books and niche journals. | Limited to music; small sample size. | Limited to tourism; qualitative focuss. |

Most research focusses on individuals (solitary flow). Future research should expand on Tan and Sin's, "group flow" concepts but apply them to remote teams and digital collaborations. How does a distributed team experience synchrony and flow in a Zoom meeting or collaborative coding environment?

## CONCLUSION

This bibliometric analysis of 3,777 documents represents one of the most exhaustive reviews of flow experience research in social sciences to date. Our findings confirm that flow has evolved from a niche psychological concept into a foundational pillar of the digital experience

economy. The technologisation of flow is the defining trend of the last two decades, with the field migrating from the study of artists and athletes to the analysis of gamers, learners, and online consumers.

This study contributes to the literature by identifying the specific mechanisms of this evolution: integration with the Technology Acceptance Model (TAM), the rise of gamification in education, and the recent pivot toward immersive metaverse environments. We have demonstrated that while the theoretical core of flow (the challenge-skill balance) remains stable, its application has become highly fragmented across diverse disciplines.

Theoretically, this study challenges the reliance on legacy measurement scales and advocates a shift toward psychophysiological and behavioural metrics that match the speed of modern digital interaction. Practically, the results suggest that educators and designers must move beyond "gamification" (adding points/badges) to "flow design" (balancing cognitive load and skill) to achieve genuine engagement.

In conclusion, the future of flow research lies not in simply replicating Csikszentmihalyi's findings in new contexts but in fundamentally reimagining the construct for a sustainable, algorithmic, and neuroconnected world. The question is no longer "what is flow?" but "how do we design flow that enhances, rather than consumes, human attention?"

### Limitations and Future Research

With the initial research goal of answering five basic research questions to shape research trends on flow in the new context, following the suggestions of Zhang et al. (2024), we used Google Scholar rather than other databases. The data source, collected from 2000 to 2024, is based on the emergence of many studies on online flow experiences during this period. The research results also show that the technological context aligns with the trend of flow experiences; however, other aspects grounded in Csikszentmihalyi's foundation continue to be explored over 25 years of observation. This study provides a relatively unique approach to the collected database system. We have provided two methods, or more precisely, two data approaches, from which to offer perspectives different from those in other studies. Although comprehensive, publications collected on Google Scholar are less reliable than those in Scopus and WoS.

Moreover, collecting data from these two platforms will provide a more comprehensive set of criteria for conducting in-depth analyses, such as co-citation and bibliographic coupling analyses. Regarding the data approach, future studies should either merge databases from the two platforms, Scopus and WOS, or implement a more effective document filtering system to identify reputable documents in Google Scholar. The content of flow experience can also focuss on narrower aspects, such as the online flow experience, in the context of technology, such as human-computer interaction.

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# What Indonesian Teachers' Happiness is and How it Manifests at Work in Adopting Technology-based Teaching in the Digital Era: A Pilot Study

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## ABSTRACT

This study explored the characteristics and factors influencing Indonesian teachers' work satisfaction when utilising ICT (Information and Communication Technology) in the digital era. The findings could serve as a foundation for optimising teachers' happiness at work in the face of technological transformation. The research method employed was an exploratory case study with the indigenous psychology approach. The participants were 550 teachers. Data collection involved open-ended questionnaires, which were analysed using content analysis. Four main categories emerged as characteristics of Indonesian teachers' happiness at work in the digital era: positive emotion, work contribution, positive working relationship, and meaning at work. Factors contributing to Indonesian teachers' happiness at work when using ICT stemmed from both personal and organisational sources. The personal factor included personality traits, while the organisational factors encompassed co-worker support, school principal, appreciation of work performance, teacher development programmeme, and school facilities. This research recommends optimising teachers' work happiness by understanding these characteristics and developing programmes that enhance work happiness based on personal and organisational factors, thus preparing teachers to teach effectively with ICT in the digital era.

*Keywords:* Happiness at work, Indonesian teacher, organisational, psychology, technology

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## INTRODUCTION

The integration of technology to improve education quality has been implemented in Western countries (Kun & Gadanecz, 2022).



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In Indonesia the urgency of ICT-based teaching skills increased significantly during the COVID-19 pandemic (Kraiwanit et al., 2023). Before the pandemic schools mainly relied on traditional methods (Herawati et al., 2022; Prasetyo et al., 2021). The pandemic emphasised the need to incorporate ICT into the curriculum. Teachers are now required to use technological applications in learning management, administration, and attendance systems (Prasetyo et al., 2024). This situation demands that Indonesian teachers move from conventional to ICT-based teaching approaches.

Teachers face difficulties in adapting to ICT requirements. Many find it challenging to master diverse applications and prefer conventional methods (Herawati et al., 2022; Prasetyo et al., 2024). These difficulties increase stress levels and reduce teachers' happiness (Prasetyo et al., 2024). Positive personal resources are essential in this process (Ho et al., 2023). Since teaching involves emotional labour, happiness at work becomes an important psychological factor for teachers in responding to technological change (Bangun et al., 2021).

Happiness at work is defined as pleasant experiences and behaviours that allow individuals to contribute effectively (Salas-Vallina & Alegre, 2021). This concept is very important in school organisations because it helps maintain stability. Teachers with higher happiness levels show better performance and more innovative behaviour (Mertoğlu, 2018). Happiness at work also encourages teachers to improve their competence with technology (Moreira-Fontán et al., 2019).

Most studies on happiness in organisational psychology have been developed in Western contexts (Prasetyo et al., 2022). Western cultures emphasise personal achievement, while Asian cultures such as Indonesia prioritse interpersonal relationships (Atan, 2023). For this reason, this study applies an indigenous psychology approach that examines behaviour and mental processes according to the characteristics of local communities (Sundararajan, 2019).

A preliminary study through a systematic review of 23 articles (2010–2021) (Prasetyo et al., 2022), consists of 17 research articles on teachers in Western countries and 6 articles on Asian countries, showed that teachers' happiness at work had a positive effect on classroom management, student satisfaction and achievement, health, work engagement, affective commitment, and innovative behaviour. Factors that affect happiness are divided into individual dimensions (e.g., work stress, personality, job satisfaction, quality of work life, spirituality) and organisational dimensions (e.g., transformational leadership and distribution, school climate). Research that reviews teachers' happiness at work in the context of the digital era is still very limited, there is only one study in Western countries.

Based on the systematic review (Prasetyo et al., 2022), most of the research is still conducted in the Western context, while studies in Asia, particularly Indonesia, are very few. The cultural values of collectivism inherent in Asia are believed to influence the dynamics of teachers' happiness (Benevene et al., 2018; Wesarat et al., 2015). Previous

research in Indonesia has not identified the causative factors, characteristics, or perspectives of teachers' happiness at work that are in accordance with local culture and digital technology-based educational transformation (Prasetyo et al., 2022). Therefore, this research is important to provide a new perspective on the happiness of Indonesian teachers, especially in the digital era.

From the background, several conclusions emerge. First, technological transformation in education is advancing globally (Anwar & Jain, 2025; Pathiranage & Karunaratne, 2023), requiring Indonesian teachers to adapt and innovate through ICT. Such innovation depends on positive mental conditions supported by happiness at work. Second, happiness at work is a crucial variable for teachers, yet studies in Indonesia remain limited. Third, contextual differences show variations between Western and Asian perspectives on teachers' happiness.

Based on the conclusion above, this study aims to examine the characteristics and factors that shape Indonesian teachers' happiness at work in using technology. Using the indigenous psychology framework of U. Kim and J. Kim (2023), it focusses on two main questions: (1) what the characteristics of teachers are, who experience happiness at work with technology, and (2) what factors enhance their happiness in this context. The findings are expected to provide a foundation for developing culturally relevant psychological interventions and measurement instruments.

## LITERATURE REVIEW

### Happiness at Work

The theory of happiness at work originates from the broader concept of happiness. Aristotle introduced "eudaimonia," describing happiness as living by cultivating virtues (Seligman, 2019). In the work context, Fisher (2010) defined happiness at work as positive attitudes and feelings in the workplace, while Salas-Vallina and Alegre (2021) emphasised positive emotions toward the work environment.

According to Kun and Gadanecz (2022), teachers' happiness at work can be identified through four main categories, namely positive emotions, work contributions, social relationships, and work meaning, which reflect pleasant affective experiences, sense of impact, quality of social interaction, and meaningful feelings at work. Meanwhile, Bhatia and Mohsin (2020) emphasised the factors that affect teachers' happiness, namely intrinsic motivation, workload, and student behaviour, which shows that both internal and contextual aspects interact with each other in shaping teachers' happiness at work. A comparison of these two studies helps to understand the difference in perspective between the Western context and the findings of teacher characteristics in different cultures.

### Happiness at Work and Human Resource Development in Teachers

Schools are organisations that continuously encounter changes and require effective Human Resource Management (Zhang et al., 2023). A crucial aspect of HRM in

school management is teacher development. There are two types of HRM strategies for teachers: macro and micro strategies. The macro strategy includes three components: educational objectives, the basic principles of education forming the curriculum basis, and educational methods. White and Kern (2018) state that one aspect of micro strategies for developing human teaching resources is promoting happiness at work. Happy teachers are in a positive psychological state, which fosters positive HRM patterns that enhance performance quality, work engagement, innovative work behaviour, teacher and student relationship.

## METHODS

### Research Design

This research employed an exploratory case study design with the indigenous psychology approach. An exploratory case study serves as preliminary research to gain a deeper understanding of a research topic (Yin, 2018). Correspondingly, the present study aimed to uncover the characteristics and factors contributing to happiness at work from the perspective of Indonesian teachers in the digital era. The indigenous psychology approach used in this research involved a comparative analysis of the identified characteristics and factors of Indonesian teachers' happiness at work. This analysis strived to determine whether these findings aligned with or differed from the concept of teachers' happiness at work within a Western cultural context.

### Participants

Despite Indonesia's ethnic and regional diversity, national identity is unified through the Indonesian language and a standardised curriculum by the Ministry of Education and Culture. This study focussed on five regions: four provincial capitals in Java—Semarang (Central Java), Bandung (West Java), Central Jakarta (DKI Jakarta), and Surabaya (East Java)—and Padang (West Sumatra) as a representative area outside Java, chosen for their high teacher concentrations.

Purposive sampling was used to select schools that had integrated technology into teaching, such as computers, internet, mobile devices, social media, and educational software. The study covered elementary, junior, and senior high schools, with one school per level in each region. Teacher participants met the criteria of permanent employment and at least one year of tenure.

This research has obtained a research permit from the Faculty of Psychology, Universitas Diponegoro. A total of 550 teachers (110 teachers for each study area) agreed to participate in the study. The participants included both male and female teachers from elementary, junior high schools, and senior high schools, categorised by work tenure. Table 1 represents the teacher demographic data.

### Instruments and Data Collection

Data were collected through an open-ended questionnaire (Google Forms) to explore factors and characteristics of teachers' happiness at work with ICT. Access was

Table 1
*Teacher demographic data*

| Gender | | | Work Tenure | | | Total |
|---|---|---|---|---|---|---|
| | | | Early (1-5 years) | Middle (6-10 years) | Long (>11 years) | |
| Male | School | Elementary school | 25 | 37 | 10 | 72 |
| | | Junior high school | 37 | 41 | 6 | 84 |
| | | Senior high school | 32 | 30 | 12 | 74 |
| | Total of male teachers | | 94 | 108 | 28 | 230 |
| Female | School | Elementary school | 40 | 44 | 8 | 92 |
| | | Junior high school | 46 | 50 | 14 | 110 |
| | | Senior high school | 53 | 45 | 20 | 118 |
| | Total of female teachers | | 139 | 139 | 42 | 320 |

*Note*. The numbers in the table represent the number of teachers

restricted to respondents who met purposive sampling criteria and was distributed through official school and teacher networks, with screening questions ensuring only eligible teachers participated. To ensure validity, the same set of guiding questions was used in a Focus Group Discussion (FGD) with the same participants. The FGD served to check response consistency and validate findings, and its results were integrated into the content analysis. This combined method aligns with Yaakop (2023), emphasising the importance of multiple approaches in exploratory research.

The open-ended questions in this study were created based on indigenous psychology guidelines (U. Kim & J. Kim, 2023), focussing on what (characteristics) and how (factors) to formulate concepts or theories that align with the culture or country under study. Following these guidelines, this research aimed to identify the characteristics and factors of happiness at work from the perspective of teachers in Indonesia in the digital era. Table 2 shows the open-ended questionnaire provided in this research.

## Data Analysis

The data analysis of this study follows the content analysis technique from Yaakop (2023) through the process of data interpretation, coding, and evaluation. The main categories are derived by comparing previous literature and empirical findings. The study by Kun and Gadanecz (2022) is an initial reference with the dimensions of teacher happiness in the form of positive emotions, work contributions, social relationships, and the meaning of work. The analysis of this study is also sharpened through comparison with the study of Bhatia and Mohsin (2020) in the Netherlands which emphasises intrinsic motivation, workload, and student behaviour. This comparison shows that the happiness at

Table 2
*Open-ended questionnaire*

| No. | Questions |
|---|---|
| 1 | The Indonesian government requires teachers to use and improve their technological competence in teaching. Based on your experience, whether personal or observations of coworkers' performance, what are the characteristics of happy teachers when using technology? (You may provide more than one answer and explain the meaning of each answer). |
| 2 | Based on your experience, whether personal or from observations of coworkers' performance, what factors influence teachers' happiness at work when using technology? The answer may be one or more, and please explain the meaning of your answer. |

Table 3
*Example of content analysis*

| Teachers | Responses data | Sub-categories (coder 1) | Sub-categories (coder 2) | Agreement of Sub-categories | Agreement of Main categories |
|---|---|---|---|---|---|
| T491 | Although I have been accustomed to conventional methods, I am sure that I can teach according to the changes of the digital era. | Positive beliefs, confidence | Feeling optimistic | Optimism | Positive emotion |
| T0152 | Being able to create teaching materials with *PowerPoint* and online quizzes that students like, such as *Quizizz*, *Kahoot, Wordwall*, and *Quizlet*. | Productive, innovation | Progressive, progress working | Innovation | Work contribution |

work of Indonesian teachers in the digital era has similarities with global themes, but also displays local peculiarities, for example in the aspect of technological adaptation. Thus, the categories produced for the determinants and factors of Indonesian teachers' happiness at work in the context of technology reflect the continuity with the literature while showing typical contextual differences.

The validity of the research data was ensured through an agreement process between two coders who determined the sub-categories and main categories of the participants' responses (Table 3). These main categories were based on the closest definitions of clusters. The stages of the content analysis in this research are detailed below:

Responses tabulation: The researchers recorded the teachers' responses and assigned a numbering code to each line of their answers.

Independent content analysis: Two coders independently interpreted the responses to determine the units of analysis (sub-categories) within each teacher's answer.

Validation of sub-categories: Each coder submitted their identified sub-categories, and then both coders collaboratively validated these sub-categories.

Main categories grouping: The two coders jointly discussed and grouped the sub-categories into main categories based on the closeness of their definitions or meanings.

Table 4 shows coder agreement on 16 data units across four categories: positive emotions, work contributions, positive work relationships, and work meaning. It presents units of agreement and disagreement, forming the basis for calculating observed agreement and Cohen's kappa (Table 5) to assess reliability and validity.

Table 4 shows varying coder agreement across categories. Full agreement was reached in positive emotions (5 units) and work meaning (3 units), while work contribution had 4 agreed units, and positive work relationships had 3 agreements with 1 discrepancy. Overall, 13 of 16 units matched (81.25%). Cohen's kappa of 0.75 ($p < 0.05$) indicates substantial inter-coder reliability, supporting the validity of findings (Table 5).

## RESULTS

### Characteristics of Teachers' Happiness at Work

Table 6 below presents the detailed results of content analysis, including the number of responses regarding the characteristics of teachers' happiness at work when using technology.

The data reveals that the characteristics of happy teachers in the digital era included having responsibility at work, self-control,

Table 4
*Inter-coder agreement matrix for data categories*

| Coder 1\Coder 2 | Positive emotions | Work contributions | Positive work relationship | Meaning of work | Quantity |
|---|---|---|---|---|---|
| Positive emotions | 5 | 0 | 0 | 0 | 5 |
| Work contributions | 0 | 4 | 0 | 0 | 4 |
| Positive work relationship | 0 | 1 | 3 | 0 | 4 |
| Meaning of work | 0 | 0 | 0 | 3 | 3 |
| Number (column) | 5 | 5 | 3 | 3 | 16 |

Table 5
*Inter-coder reliability based on Cohen's Kappa*

| Reliability statistics | Value |
|---|---|
| Number of units (*n*) | 16 |
| *Observed agreement* (Po) | 13/16 (0.8125 or 81.25% |
| *Expected agreement* (Pe) | 0.2578 |
| Cohen's kappa (κ) | 0.75 |
| Interpretation (Landis & Koch, 1977) substantial agreement | |

Table 6

*Characteristics of teachers' happiness at work*

| Sub-categories | Total | % |
|---|---|---|
| Responsibility at work | 427 | 77.64 |
| Self-control | 354 | 64.36 |
| Optimism | 331 | 60.18 |
| Cheerfulness | 310 | 56.36 |
| Friendliness | 289 | 52.54 |
| Sincerity | 276 | 50.18 |
| Enjoyment at work | 265 | 48.18 |
| Ease in helping others | 255 | 46.36 |
| Innovativeness | 238 | 43.27 |
| Loyalty | 210 | 38.18 |

optimism, cheerfulness, friendliness, sincerity, enjoyment at work, ease in helping others, innovativeness, and loyalty. The sub-categories of participants' responses in Table 4 were grouped into main categories (Table 7).

Table 7 portrays four main categories of characteristics contributing to Indonesian teachers' happiness at work in teaching using ICT in the digital era: positive emotion, work contribution, positive working relationship, and meaning at work. Below is an explanation of each main category and examples of response answers.

### *Positive Emotion*

According to the teachers involved in this study, teachers must maintain positive emotions when dealing with any tasks and situations concerning the use of technology in teaching. The teachers described positive emotions as stable, positive feelings that enable them to teach with technology pleasantly. The sub-categories of positive emotions identified were optimism, cheerfulness, and enjoyment at work.

### *Optimism*

Optimistic teachers are those who strongly believe they can overcome obstacles related to mastering technological skills for teaching. These teachers view the challenges of using technology in teaching as opportunities to improve the quality of education in line with contemporary standards.

> "Being able to overcome all obstacles and challenges calmly and positively when I have to teach with a variety of digital media." (T046)

> "In my opinion, a happy teacher is one who always believes that the difficulties of teaching with technology can be overcome well, leading to an improvement in the quality of ICT-based learning." (T180)

Table 7
*Main categories of characteristics of teachers' happiness at work*

| Main categories | Sub-categories |
|---|---|
| Positive emotion | Optimism |
| | Cheerfulness |
| | Enjoyment at work |
| Work contribution | Responsibility at work |
| | Innovativeness |
| | Loyalty |
| Positive working relationship | Ease in helping others |
| | Friendliness |
| Meaning at work | Sincerity |
| | Self-control |

### *Cheerfulness*

Cheerfulness refers to a sense of joy and enthusiasm when teaching with ICT, enabling teachers to achieve maximum performance. Cheerful teachers reflect their positive emotions while teaching, often delivering material with a smile and a sense of fun. Their teaching materials also embody cheerfulness through the use of colorful and engaging ICT media, such as videos, animations, games, or quizzes, making learning more interesting and enjoyable for students.

> "Even though the teacher may not have time to create teaching materials with ICT or is just learning to use technology, they must always engage with students in the classroom with pleasure and a smile in any situation, so that students also feel happy." (T334)

> "A teacher who is happy at work is enthusiastic about learning using various types of ICT. When teaching, they can also arouse enthusiasm in students to adapt to using ICT together, delivering it in a fun way so that students are happy with their teacher." (T215)

### *Enjoyment at Work*

Enjoyment at work refers to teachers who feel comfortable and enjoy their job, enabling them to adapt and innovate in teaching with ICT. Teachers who enjoy their work love their profession, leading to pleasant experiences when performing their tasks. When teachers enjoy their work, they do not feel burdened by the need to shift from conventional methods to technology-based teaching and often perceive time to pass quickly. This situation occurs because they view the demands of teaching in the digital era as a process of learning and professional development.

> "I enjoy the changes in the digital era curriculum because, after all, change is something that teachers are used to as

a consequence of educating students to be ready to face any changes." (T021)

"I love my profession, so I enjoy teaching by creating interesting teaching materials with various ICT applications for students." (T221)

**Work Contribution**

The second major category was work contribution. According to the teachers participating in this study, happy teachers not only experience positive emotions but their happiness must also be reflected in their work behaviour. Hence, work contribution refers to teachers' positive attitudes and behaviours that lead to optimal performance and the creation of innovative teaching materials. Work contribution comprised three sub-categories: responsibility at work, loyalty, and innovativeness.

***Loyalty***

Happy Indonesian teachers in the digital era are characterised by high job loyalty. Teachers' loyalty is a form of vocational dedication stemming from a love for the organisation and a sense of belonging to Indonesian schools and education. This loyalty makes them willing to adapt to the changing demands of the digital era or any other changes.

"A happy teacher in the digital era is the one who is ready to support these changes because, with changes in learning methods, education in Indonesia will progress." (T311)

"I am happy with the shift to digital-based learning methods as a form of support, enabling schools in Indonesia to become more advanced and of higher quality." (T120)

**Responsibility at Work**

Responsibility at work involves fully supporting the school's programmeme in developing technology. The teachers explained that responsibility at work is reflected in the positive work behaviour of teachers willing to develop their abilities and expertise to meet the demands or challenges of their era to achieve educational goals.

"Although school facilities are limited to support digital-based learning, I continue to teach and adapt to conditions with digital media that are easier to use." (T227)

"A happy teacher is ready and supports every school's programmeme. Teachers who are happy to teach are those who are always ready to improve their competence by attending ICT training or seminars." (T420)

***Innovativeness***

Happy teachers in the digital era are innovative and able to create digital-based learning media or methods by maximising the ICT facilities and infrastructure at school. The teaching and learning process using ICT becomes more engaging and can improve student learning outcomes.

Students who receive innovative teaching with ICT acquire the skills needed for their era.

> "Being able to create teaching materials with interesting *PowerPoint* slides and online quizzes that students enjoy, such as *Google Forms*, *Quizizz*, *Kahoot! Wordwall*, and *Quizlet*." (T015)

> "Happy teachers are innovative teachers when teaching. Apart from being able to use technology, they are also able to produce teaching creativity that suits the needs of students." (T070)

**Positive Working Relationship**

The third main category of the characteristics of Indonesian teachers' happiness at work in the digital era was a positive working relationship. It is defined as a relationship between a teacher and all school elements, such as fellow teachers, principals, and students. This association is not just passive; it is an activity that fosters more productive and satisfying results, leading to an optimal ICT-based learning process.

***Ease in helping others***

One sub-category of a positive working relationship identified in this study was ease in helping others. According to the findings, teachers who experience happiness in the digital era are those who willingly and joyfully assist each other in realising quality ICT-based learning, both among fellow teachers and students. This collaborative effort helps them advance together in technology skills.

> "Voluntarily help colleagues who have difficulty making teaching materials using technology media." (T150)

> "Collaborate with students, fellow teachers, and communities to learn from each other using digital tools and resources to promote digital education success in Indonesia." (T103)

**Friendliness**

Friendliness is a characteristic of teachers who can make students comfortable with the delivery of ICT-based teaching materials and are communicative in their interactions with students during the teaching and learning process. A teacher's happiness can be displayed in their ability to create a positive classroom atmosphere.

> "Teachers should be able to create technology-based learning processes that are also communicative, such as online discussion forums that allow students to share thoughts and ideas and solve problems together. For example, in a geography lesson, the teacher might organise a collaborative project where students work in groups to create a multimedia presentation about an ethnic group in Indonesia." (T198)

> "Being able to deliver ICT-based teaching materials communicatively so that all students feel curious and participate actively in setting learning goals." (T271)

**Meaning at Work**

Based on the results of this study, meaning at work encompasses a set of positive concepts, values, and beliefs about teaching. It serves as a personal resource in shaping the characteristics of happy teachers. The main category of meaning at work identified in this study consisted of self-control and sincerity.

***Self-control***

Teachers who derive positive meaning from their work tend to have an orientation towards growth and goals, which fosters good self-control. Self-control is crucial in achieving happiness among teachers because it enables them to manage their emotions and behaviour, maintaining positivity in any situation.

> "Maintaining good behaviour at school and in any setting is important because teaching is a noble profession and sets an example for the next generation." (T291)

> "Happy teachers do not easily complain when facing technological changes related to their work because they understand that their behaviour will be an example for students." (T126)

***Sincerity***

A characteristic of happy Indonesian teachers, as revealed by the teachers' responses, is their ability to carry out tasks based on faith and as a form of worship to God, sincerely and gratefully. This sincerity enables them to find happiness in their work and in educating students.

> "Performing teaching duties sincerely as a form of worship towards God makes me grateful to be a teacher because it encourages me always to improve the quality of my teaching and be useful to my students." (T093)

> "Even though I have to adjust to the demands of teaching with the transformation of technology, I feel grateful for the opportunity to improve my teaching skills." (T028)

**Factors of Teachers' Happiness at Work in the Digital Era**

This study also identified the factors that could affect teachers' happiness at work when using technology (Table 8).

Based on Table 8, it can be concluded that the factors affecting the happiness at work of Indonesian teachers when using technology were categorised into personal and organisational.

***Personal Factor***

A key personal factor was the teachers' personalities. Based on the responses to open-ended questions, teachers must possess stable characteristics to process positive emotions and behaviours when adapting to teaching with technology. Participants defined these stable characteristics as aspects of personality.

Table 8
*Factors of teachers' happiness at work*

| Factors | Total | % |
|---|---|---|
| Personality | 472 | 85.81 |
| Co-worker support | 369 | 67.09 |
| School principal | 350 | 63.63 |
| Appreciation of work performance | 325 | 59.09 |
| Teacher development programmeme | 222 | 40.36 |
| School facilities | 218 | 39.63 |

> "I believe that for teachers to experience happiness at work, they must have stable characteristics that enable them to remain content in any work situation." (T197)

> "Teachers must have a personality that is willing to learn anything, including technology, to ensure that the teaching and learning process is always innovative." (T531)

### *Organisational Factors*

The teachers participating in this study highlighted several organisational factors contributing to their happiness at work.

### *Co-worker Support*

Participants elaborated on the importance of positive relationships and mutual support among colleagues. Indonesian teachers, who are required to improve their technology skills, benefit from supportive relationships with colleagues. Teachers proficient in technology should help less skilled colleagues by sharing knowledge and providing training.

> *"*Support from colleagues can make me feel happy when I work. For example, helping each other teach the latest technology applications among teachers.*"* (T252)

> "Teachers who help each other will make the work atmosphere fun. They will also be better prepared to meet the demands of the digital era." (T340)

### *School Principal*

The teachers in this study explained that the successful application of technology in schools in Indonesia heavily depends on the role of the school principal. Principals must manage all organisational resources and collaborate with teachers to educate students and achieve contemporary educational goals. They must create effective school management by mapping teacher competencies in using technology.

> "Principals should routinely check the competency requirements of teachers in teaching technology." (T089)

> "Principals who can direct and attend to the needs of teachers to develop ICT abilities will make teachers feel comfortable and happy at work, leading to increased productivity." (T190)

### *Appreciation of Work Performance*

An essential factor that makes teachers happy at work is the appreciation of their performance. The teachers involved in this study expressed that innovative teaching with technology should be rewarded with incentives and recognition from schools or the government. Appropriate rewards for teacher performance foster happiness and high motivation to enhance professionalism in technology-based learning.

> "However, demands for innovative use of ICT need to be encouraged with performance appreciation so that we as teachers also enjoy working." (T417)

> "The rewards are very meaningful because they make us happy and proud, as we are recognised for our best contributions by the school." (T171)

### *School Facilities*

According to the teachers engaged in this study, complete and adequate school facilities significantly affected their happiness at work. However, the application of technology in Indonesian schools encounters several challenges, including the lack of electricity networks and other supporting facilities such as computers, e-books, interactive videos, and laptops. Adequate facilities can help teachers improve the quality of innovative teaching, making students more creative and imaginative.

> "One thing that can make teachers comfortable and happy when teaching is the completeness of technology facilities for teaching." (T145)

> "Schools have to provide computers, e-books, interactive videos, and laptops." (T458)

### *Teacher Development Programmeme*

Teacher participants in this study emphasised the importance of opportunities to participate in various programmes to improve their competency in using technology. Development programmes can positively affect teachers' psychological conditions, making them feel valued and supported. Teachers feel happy because the school considers their needs. Furthermore, teacher development programmes should include the availability of information and opportunities to participate in self-competence development, such as workshops, seminars, and training. In addition, teachers also need psychological training to help them feel comfortable when facing changes in teaching situations.

> "Because the demands of teaching with technology require teachers to innovate, schools must provide various technology capability development

programmes and other supporting skills so that teachers feel comfortable and ready to teach." (T288)

"Teachers need training in ICT and psychological competencies to cope with the changing demands of teaching and to ensure they remain happy while handling these challenges." (T390)

## DISCUSSION

### Characteristics of Teachers' Happiness at Work

The results of this study explored the characteristics of teachers' happiness at work, which are distinct from other employees or workplaces because teachers face unique job challenges and have different job characteristics. Given this condition, applying the general concept of happiness at work was not appropriate, as described by Fisher (2010) and Pryce-Jones (2010). Erozkan's research (2016) on teachers from western countries used a general measure of happiness, namely the subjective happiness scale, which does not specifically measure happiness at work.

Based on a systematic review by Prasetyo et al. (2022), there is only one study in the West that explicitly discusses teachers' happiness at work, namely Kun and Gadanecz (2022) in Hungary, in a general context without a technological dimension. This research is different because it highlights the happiness at work of Indonesian teachers in relation to technology adoption. Comparisons remain important to see fundamental similarities or differences with concepts in the West, while also adding a new perspective on the role of technology in teachers' happiness at work (Table 9).

The analysis in Table 9 shows how the emerging categories compare to the previous literature. The four main categories, namely positive emotion, work contribution, positive working relationship, and meaning at work partly in line with the findings of Kun and Gadanecz (2022), who also emphasise the importance of positive emotions, work contribution, social relationships, and the meaning of work. However, this study adds different nuances: (1) the *dimension of positive emotion* in Indonesian teachers is more prominent and emerges as the main capital to face technological challenges, not just the result of achievements, (2) *work contribution* is shown through loyalty and innovation, not only through external recognition, (3) *meaning at work* is firmly rooted in spiritual values and sincerity, which are not highlighted much in Western literature. Thus, although the main category is relatively similar to previous studies, the subcategories that appear in the context of Indonesian teachers show cultural distinctiveness, namely the existence of a collective, spiritual orientation, and readiness to adapt to technology as part of professional meaning and devotion.

#### *Positive Working Relationship*

In terms of similarities, both Hungarian and Indonesian teachers emphasise the

Table 9
*Characteristics of teachers' happiness at work*

| Characteristics of teachers' happiness at work in Hungarian teachers (Kun & Gadanecz, 2022) | Characteristics of teachers' happiness at work in Indonesian teachers (based on this study) |
|---|---|
| a. Results and success: Successful outcomes from work, both past, present, and future, characterise a happy teacher who is also considered successful by their environment.<br>b. Assessment of and feedback on the work: such as receiving positive assessments from students, colleagues, parents, and principals.<br>c. Meaningful work: Happy teachers are highly motivated and interested in the teaching process, positively affecting student learning outcomes.<br>d. Social relationships: Having good social relationships with everyone, including family and others. | a. Positive emotion: Stable positive feelings enable teachers to teach with technology pleasantly. The sub-categories include optimism, cheerfulness, and enjoyment at work.<br>b. Work contribution: Positive attitudes and behaviours of teachers lead to optimal performance, resulting in innovative teaching materials. The sub-categories include responsibility at work, loyalty, and innovativeness.<br>c. Positive working relationship: Relationships between teachers and all school elements (fellow teachers, principals, and students) are active and productive, leading to constructive and satisfying results and an optimal ICT-based learning process. The sub-categories include ease in helping others and friendliness.<br>d. Meaning at work: Positive concepts, values, and beliefs about teaching. The sub-categories include self-control and sincerity. |

importance of positive working relationships with peers, principals, and students. This emphasises that harmonious social interaction is the foundation of cross-cultural teacher happiness, although for Indonesian teachers the positive relationship is more directed towards collaboration that supports the creation of ICT-based learning optimally. The importance of a positive working relationship in the happiness of Indonesian teachers aligns with Atan's (2023) explanation, which notes that the orientation of happiness in Eastern or Asian cultures emphasises interpersonal relationships. This similarity is further reinforced by Moreira-Fontán et al. (2019), who explain that teachers in Western countries are happier in their duties when they help each other improve their ability to use technology.

### *Positive Emotion*

The most prominent difference is in positive emotion. In Hungarian teachers, the positive emotional aspect is only implied through the job satisfaction that arises from success and recognition. On the other hand, in Indonesian teachers, positive emotions actually appear as the main characteristic of happiness at work. Indonesian teachers express happiness through optimism, cheerfulness, humour, and joy, which helps them face the challenges of digital

learning and maintain the sustainability of motivation in educating students. In other words, if in Hungary positive emotions are more of a consequence of achievements, in Indonesian teachers' positive emotions are capital as well as strategies to adapt to change. Indonesian teachers are known to be cheerful, humorous, and optimistic, which allows them to manage their feelings well and foster a strong determination to educate students (Nadlifah et al., 2023). Thus, positive emotions are not just the result of achievements, but important capital for Indonesian teachers in facing change, especially in digital learning situations.

### *Work Contribution*

The dimension of work contribution shows interesting cultural differences. In Hungarian teachers, happiness at work is more influenced by measurable achievement and external recognition from students, peers, parents, and principals (Kun & Gadanecz, 2022). In contrast, Indonesian teachers gain happiness at work through dedication, loyalty, responsibility, and innovation in technology-based learning, where seriousness and creativity in developing learning are the main source of their professional satisfaction. These findings are in line with the research of Suyatno et al. (2019), which affirmed that Indonesian teachers have a high service orientation and willingness to work wholeheartedly, so that work contributions for them are more meaningful in terms of process and personal commitment than external recognition.

Thus, if teachers in Hungary are synonymous with *results and recognition*, then in Indonesia work contributions are more related to *dedication and innovation*. This difference confirms that the happiness of Indonesian teachers in the digital era is rooted in the value of moral responsibility and creativity in facing technological challenges, not solely on achievements and appreciation from outsiders.

### *Meaning at Work*

Kun and Gadanecz (2022) explain the meaning of teachers' work in a general context, namely motivation and interest in the teaching profession. Although it does not mention the digital dimension, this concept is still relevant to be compared with Indonesian teachers who are facing technological transformation. This research shows that in addition to professional motivation, Indonesian teachers emphasise spiritual meaning as worship, with the values of sincerity, self-control, and gratitude which are sources of happiness when facing the challenges of digitising education. This finding is in line with Nurtanto et al. (2022) who affirm that religiosity can strengthen the meaning of work and positive behaviour in organisations.

Thus, the general concept found by Kun and Gadanecz (2022) can still be used as a cross-contextual reference, while this study expands understanding by adding religious and spiritual dimensions that are distinctive in Indonesian culture. These differences show that the meaning of teachers' work in Indonesia in the digital era is not only

rooted in professional motivation, but also in transcendental values that give strength in facing technological challenges.

**Factors of Teachers' Happiness at Work**

This part of the discussion also includes a comparison to see if the research findings on teachers' happiness at work in Indonesia are in line with or different from the Western context, especially teachers in the Netherlands (Bhatia & Mohsin, 2020). Although Bhatia & Mohsin's study (2020) addressed teacher happiness in a general context, the findings remain relevant because these general factors can be a framework to assess whether the happiness of Indonesian teachers in the digital era shows a similar pattern or has characteristics according to the socio-cultural context (Table 10).

A comparison of the factors that affect teachers' happiness in the Netherlands and Indonesia (Table 10) shows that there are different perspectives that reflect different cultural contexts and educational practices. According to Bhatia & Mohsin (2020), teachers in the Netherlands feel happiness at work, especially from job demands such as excessive workload, time constraints, student behaviour that supports the learning process, inter-teacher support, and intrinsic motivation. This suggests that the happiness of Dutch teachers tends to be influenced by external factors and interpersonal relationships, with a strong orientation on results and performance.

In contrast, Indonesian teachers assess happiness through a combination of internal and contextual factors at school. Internal factors, especially personality, are the basis for teachers to still be able to work happily when facing the challenges of technology-based learning. Therefore, personality needs to be considered in the recruitment and selection process of teachers, as well as developed through development programmes that foster happiness, for example with strategy coping training (Jansen in de Wal et al., 2020; Baranski et al., 2023; Chiu et al., 2023; Prasetyo et al., 2024). Contextual factors, such as peer support, the role of principals, rewards for performance, teacher development programmes, and school facilities, reinforce the experience of happiness, where peer support is influenced by a collective culture that emphasises teamwork and integration (Khoshroo et al., 2023).

Table 10
*Factors of teachers' happiness at work*

| Factors of teachers' happiness at work in the Netherlands (Bhatia & Mohsin, 2020) | Factors of teachers' happiness at work in Indonesia (based on this study) |
|---|---|
| a. Job demands, including excessive workload and limited time | a. Personality |
| b. Student behaviour that does not support the learning process in class | b. Co-worker support |
| c. Support between fellow teachers | c. School principal |
| d. Motivation about working as a teacher | d. Appreciation of work performance |
| | e. Teacher development programme |
| | f. School facilities |

In addition, effective school leadership encourages innovation and a positive climate during the digital transformation of education (Dursun & Bilgivar, 2022; Tore & Duman-Saka, 2023). Awards, both material and symbolic, as well as competency and digital literacy training, help teachers adapt to the demands of technology (Eryılmaz & Uzun, 2023; Hasanati, 2024; Oad & Niazi, 2021; Oubibi et al., 2022). The availability of adequate facilities, such as a stable internet network and digital platforms, is an important prerequisite for teachers' happiness in the digital era (Akram et al., 2022; Moreira-Fontán et al., 2019).

This difference confirms that cultural and educational contexts greatly influence teachers' experience of happiness. In the Netherlands, the focus is more on results, external evaluation, and direct interaction with students, while in Indonesia, happiness at work is more processional, collaborative, and innovative, emphasising personal contribution, cooperation, and adaptability in the face of technology-based learning transformation. The findings of this study on Indonesian teachers' happiness at work align with recent research in other Asian countries. In Malaysia, the sudden shift to online teaching fostered pedagogic agility but was limited by infrastructure (Annamalai et al., 2022). In the Philippines, teacher readiness was shaped by experience, location, and institutional support (Lapada et al., 2020). In Thailand, generational differences influenced digital tool usage (Thanaittipath & Boonmoh, 2024), while in Vietnam, AI adoption depended on attitudes, ethics-privacy concerns, and systemic support (Van et al., 2025). These studies, like the Indonesian context, indicate that teachers' happiness and success in technology adoption rely on the interplay of personal resources, institutional support, infrastructure, and professional development tailored to local needs.

## CONCLUSION

This research concludes that Indonesian teachers who thrive in the digital era exhibited positive emotions, significant work contributions, positive work relationships, and a sense of meaning at work. Understanding these characteristics could inform the development of a measuring tool to assess teachers' happiness at work in Indonesian. Such a tool is essential for schools to evaluate teachers' happiness at work significantly contributes to optimal teacher performance. Additionally, the research findings identified that the happiness of working with ICT among Indonesian teachers stemmed from both personal and organisational factors. These insights could guide school management in creating development programmes to enhance teachers' happiness at work in the context of increasing technological demands.

## IMPLICATIONS OF THE STUDY

Theoretically, this study expands the understanding of happiness at work by identifying the special characteristics of Indonesian teachers in the digital era, namely

positive emotions, work contributions, positive work relationships, and work meaning. These findings show that teachers' happiness at work is not only influenced by personal and organisational factors but is also reflected in the behavioural traits and values they show in their daily lives. Thus, the concept of happiness at work has evolved from a mere supporting factor to a more comprehensive understanding of how happiness manifests in the real characteristics of teachers during the demands of technological transformation. This fills a theoretical gap while expanding the scope of happiness at work theory to the realm of digital education in the context of collective culture. Practically, the findings highlighted the importance for Indonesian teachers to manage their happiness at work, as it is crucial for adapting to the digital era. For the schools, Indonesian government and psychology practitioners, these results provide a foundation for policymaking to develop a measuring tool to assess teacher happiness at work and enhance teacher management strategies to boost teachers' happiness at work in Indonesia.

### Future Research Suggestions

Future research could involve longitudinal studies to explore further the stability of teachers' happiness at work and the influence of technology-based teaching on their workplace happiness. In addition, further investigations could examine the impact of specific types of technology on teachers' happiness at work and the role of cultural factors in adopting technology.

### Authors' Contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by all authors. The first draft of the manuscript was written by Anggun Resdasari Prasetyo and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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### Declaration of Conflicting Interests

This research has no conflict of interest and is in accordance with research guidelines for psychological research. The basic principle of this research has followed the Declaration of Helsinki, namely by giving respect to participants, the right of participants to self-determination to give consent after receiving an explanation of their involvement in the research. We received research approval from the school and consent forms from all participating teachers.

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# Persuasive Communication in Online Shopping Websites: A Qualitative Content Analysis of Strategies and Ethical Considerations

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## ABSTRACT

Persuasive communication is one of the important aspects of online content. It plays a vital role in online website users' behaviour, decision-making, and engagement. With the rapid growth of digital media, marketers, designers, and content creators understand how persuasive tactics are employed. This tactic is vital because it is employed across all the websites. This study explores how persuasive communication in online shopping strategies influences users on online shopping websites. The researcher used the qualitative content analysis method to identify persuasion techniques. Drawing on the Elaboration Likelihood Model (ELM) and Cialdini's principles of persuasion as analytical lenses, the study systematically analyses persuasive strategies, such as scarcity, urgency, social proof, and personalisation, on user behaviour impacts, and ethical considerations on online shopping websites. Employing qualitative content analysis and NVivo-based clustering techniques, the research identifies recurring patterns and evaluates their ethical implications. Rather than measuring actual consumer behaviour, this study focusses on how persuasive strategies are designed and communicated within e-commerce interfaces. In the digital era, persuasive communication is more significantly utilised. In this era, digital media dominates all information consumption, and social interaction employs persuasive tactics. This study will enhance the literature on online persuasion by offering a structured qualitative understanding of persuasive communication practises in the online shopping context and providing insights into strategies used for their effectiveness and ethical concerns in digital media platforms.

*Keywords:* Cialdini's principles, Elaboration Likelihood Model (ELM), engagement, online shopping websites, persuasive communication

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## INTRODUCTION

The rise in digital media is experienced due to the increased use of persuasive communication on digital media websites. Many websites are being utilised by their users. The social media platform, e-commerce platforms, news platforms, and others come under many websites. Websites are considered crucial tools for the use of persuasive communications by businesses or individuals for influencing the user's actions. The rise in e-commerce platforms has led to a digital world. The digital world has led to a persuasive communication platform that influences the user's purchasing decision. Persuasion is practised by the marketer to convince the user to do the expected act. Persuasive communication tools such as scarcity, social proof indicators, urgency indicators, and personal recommendation tools are some of the platforms practised by the marketer.

The adoption of persuasive strategies had positioned online shopping websites as critical sites for examining persuasion. It is crucial for marketers, designers, and researchers that these online shopping websites use such tactics to improve user experience, conversion rates, and trustworthiness. A study by Kaur (2025), the results for this research show that social influencers and website rewards each have a positive and significant effect. Users have shown a strong trust in social influencers, viewing them as sources of reliable, comprehensive, and unbiased information. This trust adds to the persuasive force of influencers, thereby increasing their recommendations particularly effective in encouraging impulsive purchases. Unlike the traditional advertising formats, persuasive communication in e-commerce is deeply embedded in the design of e-commerce interfaces, from product descriptions to advertising pop-ups, countdown timers, and recommendation systems. While effective in enhancing conversion rates and user experience, these strategies also raise critical ethical questions, such as deceptive practises and data privacy concerns. The research shows that peripheral cues are more effective in persuading user behaviour, particularly on online websites. It utilised some elements, for instance limited-time offer, scarcity, authority, and evidence (Braca & Dondio, 2023).

Theoretical approaches such as the Elaboration Likelihood Model (ELM) have been very helpful in examining the nature of persuasive communication processes and their applications in digital communication. The ELM encapsulates both central route persuasion, which entails careful message analysis, and peripheral route persuasion, which entails appeals through authoritativeness, scarcity, and social validation. In m-commerce settings, the appeal through authoritativeness, among others, is usually highlighted due to their efficacy in attracting immediate notice and early response. To complement the ELM, one can apply the Cialdini's persuasion principles, which offer a simple categorisation system of the prevalent

persuasion strategies, that is, scarcity, social validation, authoritativeness, and reciprocity.

However, the efficacy of persuasive strategies in convincing consumer behaviour has been widely discussed in previous literature, whereas the way these strategies are designed, presented, and combined qualitatively in online shopping websites has received less attention in terms of qualitative content analysis. In the meantime, an upward trend in this regard is linked to several ethical implications regarding transparency, manipulation, and user autonomy because of data-driven personalisation. Personalised persuasive communication may potentially improve relevance and the user experience, but it also forms a different ethical space regarding users who are unaware of how their data has been used to shape persuasive messages.

In response to these gaps, this paper uses a qualitative content analysis approach for exploring persuasive communication strategies embedded in online shopping websites. Instead of measuring the users' behaviour or perceptions directly, this research concentrates on the identification of recurring persuasive features and ascertains, with the aid of established persuasion theories, their potential influence and ethical implications. This, in turn, enhances the research's contribution to the understanding of persuasive communication practises in digital commerce and develops a basis for future empirical investigation into users' responses and ethical governance of persuasive design.

## LITERATURE REVIEW

A key characteristic of persuasive communication in the online shopping environment is the way in which digital interfaces are designed to persuade and convince consumers to take desired actions. In contrast to offline consumer persuasion, those in the online buying environment are embedded in the architecture of the buying environment itself. Previous studies in digital consumer persuasion and human-computer interaction indicate these persuasive architectural components persuade to shape the design of information as opposed to influencing consumer behaviour itself (Kaptein & Eckles, 2014; Sunstein, 2015a).

Despite a vast number of studies related to persuasive outcomes, less effort has been made to explore systematically the strategies used for persuasion and their adoption in the context of web shopping sites through the lens of qualitative content analysis. There is a vast importance to exploring persuasion communication at the design level, which could help clarify both the outcome and the ethical issues associated with it. The strategies of influence of persuasive communication are supported by two (2) theoretical frameworks that are utilised in the digital era. Firstly, the Elaboration Likelihood Model (ELM). This model was developed by Petty and Cacioppo (1986). The ELM theory is widely used in persuasive messages. There are two (2) renowned dual-process theories under the ELM's main routes to persuasion. There are central routes and peripheral routes. The central route involves a thoughtful evaluation

of the message's arguments. The ELM theory is applied to online communication and provides a comprehensive framework to explore how persuasive communication strategies influence users on online shopping websites (Petty & Cacioppo, 1986). In online shopping environments, users are frequently exposed to high volumes of information under conditions of limited time and attention. For example, the elements that always sway users, such as website aesthetics, ease of navigation, or credibility cues such as user reviews and testimonials, result in reliance on the peripheral route of persuasion (Jayathilake, 2024). Nonetheless, not all users are equally influenced by peripheral cues. Based on the ELM theory, users who are highly motivated or possess the capacity to process information more deeply are more likely to take the central route. These cues are designed to facilitate rapid decision-making without requiring extensive cognitive processing. However, ELM suggests that users with higher motivation or involvement may engage in central-route processing, particularly when evaluating the information about the products on online shopping websites, which draws users' attention to seeking reliable and evidence-based information (Pan, 2024).

In the context of this study, the ELM is employed not as a predictive model of user behaviour but as an analytical framework for categorising persuasive cues observed in online shopping websites. Specifically, it guides the identification of whether persuasive strategies are primarily oriented toward central or peripheral processing routes based on their communicative characteristics.

Secondly, Cialdini's principles of influence in digital persuasion. A second factor to consider in relation to digital persuasion tools, therefore, concerns Cialdini's Six Principles of Influence in relation to applying these to design for improved online interaction. Cialdini's Six Principles of Influence can be identified, therefore, to encompass an established concept under broader persuasive communication. Cialdini's Six Principles of Influence were identified to encompass basic ideas of 'reciprocity, commitment, social proof, authority, liking, and scarcity' among others. All these have long been established ideas in relation to persuasive communication. In addition, these six ideas today exemplify how, in their own way, individuals become influenced by diverse options that target their own diverse psychological needs or preferences (Cialdini, 2009). By taking diverse specified acts, in this case, clicking on related links, signing up for newsletters, or proceeding to make payments to purchase products, among others, these influencing ideas have been modified or applied accordingly for improved interaction in online sites. Therefore, sites offering diverse online purchasing options have been applying these influencing ideas in relation to established diverse design features such as 'customer reviews (social proof), expert endorsement (authority), time-limited deals (scarcity), or personalised recommendations (liking and commitment)', among others.

Empirical studies have demonstrated that these principles are particularly effective in digital environments due to their alignment with users' cognitive shortcuts and decision heuristics. For instance, the principle of social proof is employed via user feedback, reviews, and testimonials, which provide evidence of others' positive experiences with a product or service (Ham & Nelson, 2016a). Apart from that, websites also employ scarcity tactics to persuade users, such as flash sales with limited days, limited-time offers, or countdown timers, which create a sense of urgency and encourage immediate action (Mayasari & Salsabila, 2025). Research by Kaptein and Eckles (2014) indicates that social proof mechanisms such as ratings and testimonials serve to legitimise products and reduce perceived risk. However, the application of these principles in online contexts also concerns ethics, particularly when users manipulate or deceive these techniques by using fake feedback, reviews, or creating false scarcity (Sunstein, 2015a). As a summary of Cialdini's principles (Figure 1), these principles provide a robust framework of how persuasive communication strategies influence users on online websites. Although digital ethics are gaining more attention these days, fewer qualitative studies exist in which digital ethically disputable persuasion

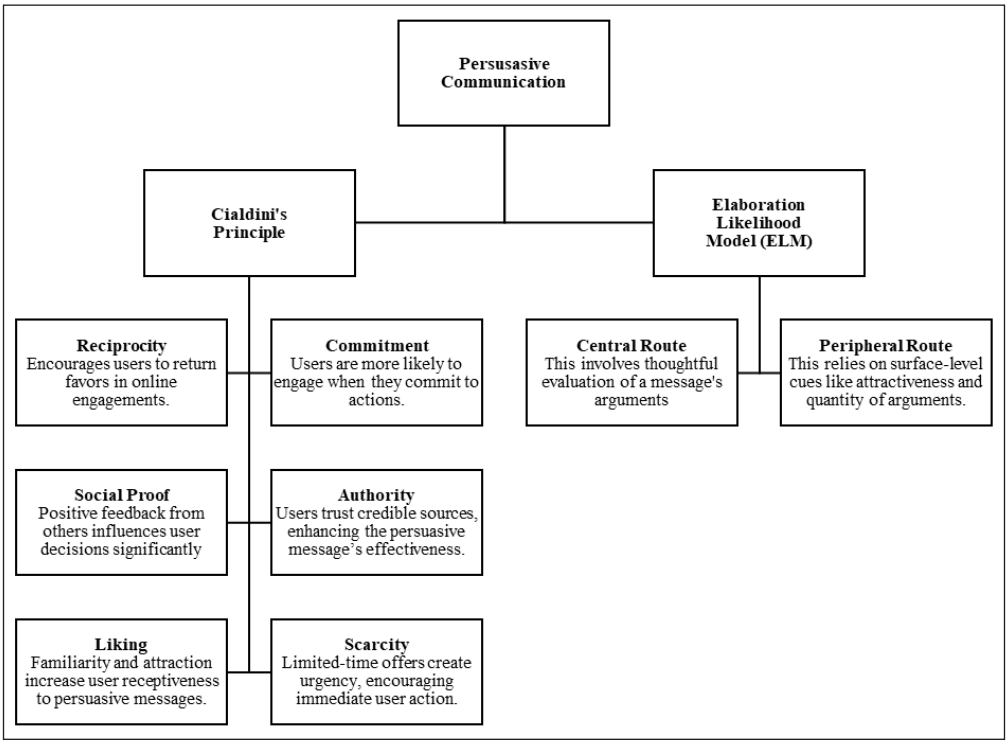



*Figure 1.* Research framework of Cialdini's principal and Elaboration Likelihood Model (ELM)
*Source:* Authors' own work

tactics are explored within online shopping sites.

Although the effectiveness of the ELM and Cialdini's principles is well proven, the existing research tends to investigate the outcomes of behaviour by means of experimental and survey research. Little research was conducted on the investigation of the qualitative aspects of persuasive communication as practised on actual e-commerce systems about ethical viewpoints. The existing research will fill the research gap by making use of qualitative content analysis with the aim of analysing the online shopping websites regarding the incorporation of persuasive communication techniques. By integrating the ELM and Cialdini's principles as analytical lenses, the study focusses on identifying recurring persuasive cues, interpreting their communicative functions, and discussing their ethical implications. Rather than claiming direct behavioural effects, the research contributes a design-oriented and ethically informed perspective on persuasive communication in digital commerce.

### Research Questions

1. What are the persuasive communication strategies embedded on online shopping websites?
2. How are the persuasive communication strategies (e.g., scarcity, urgency, social proof, and personalisation) communicated through website features?
3. How do users perceive the ethical boundaries of the persuasive communication strategies?

### Research Objectives

1. To identify the persuasive communication strategies embedded on online shopping websites.
2. To analyse the persuasive communication strategies through website design using the ELM and Cialdini's principles as analytical frameworks.
3. To evaluate the ethical considerations associated with the use of persuasive techniques.

## METHODOLOGY

This research utilises qualitative content analysis to investigate persuasive communication strategies embedded on online shopping websites. It examines to analyse and classify the recurrent persuasion signals and their possible communication and ethical implications. Based on the analytical framework of the Elaboration Likelihood Model (ELM) and the persuasion principles of Cialdini, the research aims to scrutinise the design of the persuasion strategy in the online content and interface, not the actual communication behaviour of the users. NVivo 11 is software that utilised for clustering and thematic analysis, allowing for detailed exploration of the identified persuasive elements and their implications.

**Data Collection**

A purposive sampling method will be employed to select a diverse range of online shopping websites from different industries, such as e-commerce platforms, fashion, electronics, and groceries. These websites will represent varying levels of user engagement and employ different persuasive strategies. There are three (3) criterias for selecting online websites. First, persuasive communication strategies such as scarcity, social proof, urgency, and personalisation are used on online shopping websites. Next, the availability of publicly accessible website content suitable for analysis. For example, landing pages, product descriptions, and advertisements. The sources were also collected from user interface elements such as banners and pop-ups. Thirdly, ethical considerations are associated with the use of persuasive techniques, such as personalised recommendations, countdown timers, and data from user reviews and testimonials. The data sources were collected from publicly available online website content. The structured content analysis technique is a systematic data collection method where various predetermined questions with a structural nature were collected during an exploration of the online websites. This study gave me an understanding of the designing and use of persuasion elements and enabled me to code the patterns in a systematic way. There were no direct user observations, surveys, or interviews carried out, and this study certainly does not aim to measure any real behaviours or user perceptions. All the websites that were chosen were publicly accessible, and no data was extracted that was not of design elements or content publicly available on these sites. There was no extraction of any private user data. It is ensured that the study meets the ethical standards for any study involving publicly available digital content. Also, all the data was shared with the programme NVivo for systematic coding. Coding was done after several iterations of readings of data for accurate classification of persuasion elements. The final step was interpreting the themes in the context of persuasion theory. These elements of persuasion were matched against the principles of influence of Cialdini theory and the ELM models for understanding their behaviours.

**Data Analysis**

This study conducted QCA to systematically study persuasive communication strategies implemented on online shopping sites and to understand the ways these strategies influence users' behaviour and decision-making processes. QCA is selected because, through it, one can draw a theoretically informed yet structured interpretation of textual and visual content while maintaining contextual meaning. The approach of the analysis followed the method of directed qualitative content analysis guided by prevailing persuasion theories; Cialdini's principles of influence and the Elaboration Likelihood Model (ELM). Thematic analysis in NVivo identifies persuasive cues, aligning them with theoretical frameworks like the Elaboration Likelihood Model (ELM), which was systematically examined

for central-route and peripheral-route cues and for examples of six Cialdini's principles of influence. Classifying patterns, themes, and persuasive techniques, in turn, was organised in relation to theory or concepts, for instance, scarcity indications, urgency calls, social proof signs, authority endorsements, and recommended indicators. Ethical consideration and examples of potentially deceptive, questionable, and misleading techniques (e.g., artificial scarcity, ambiguous recommendations, misleading reviews) were considered and addressed. The emerging themes and the corresponding questions, presented in the order of data collection, are outlined in Table 1.

## RESULTS AND DISCUSSION

### Identification of Persuasive Strategies

The qualitative content analysis identified recurring persuasive strategies across the sampled online shopping websites. The strategies were categorised according to the ELM (central vs peripheral cues) and Cialdini's principles of persuasion.

#### *Scarcity*

The analysis revealed several recurring persuasive strategies across the selected online shopping websites. The most prevalent strategy included scarcity and urgency tactics, such as limited time offers and countdown timers. These limited time offers, which were commonly displayed on landing pages and product descriptions, encouraged immediate purchases. For example, an online website that promotes its product via a live method. There is a nudge to consumers. Marketers create a sense of urgency to grab products with countdown timers or limited time are frequently displayed on landing pages with a banner stating, "Offer ends in 1 hour" or "Only 1 left in stock". These are some scarcity sentences that create urgency. Based on the output word cloud (Figure 2), there is an "immediate". It is made available as soon as possible to grab the offers within the countdown timers. These design features instil a sense of urgency in the viewer and cause the viewer to focus on the present moment, as in the peripheral route of persuasion in the ELM model, which emphasises the heuristic processing that makes judgments based on simple features such as quantity versus quality rather than evaluating the information. Under the Cialdini theoretical model for influence, the designer's tactics represent the application of the "Scarcity" principle. As per results from the text search query (Figure 3*)*, scarcity leads to immediate action, such as creating urgency. This may lead them to fear of missing out, known as FOMO. This FOMO reaction makes a consumer feel worried because they may miss a good opportunity, especially when caused by things that are advertised on social media for purchase. The intense penetration of social media into people's lives has had a very serious impact on people. With increasing shares, social media addiction has caused users to worry about sharing and missing information. This situation has led to the formation of

Table 1
*Themes and questions of the research*

| Variable | Question asked |
|---|---|
| Preparatory questions regarding general online shopping websites | |
| Theoretical alignment | 1. Categorisation of persuasive elements according to the ELM (central vs peripheral route) and Cialdini's principles (General) |
| Persuasive communication strategies | 1. How do different persuasive strategies (e.g., scarcity, urgency, social proof, and personalisation) (General) |
| | 2. How does the phrasing of scarcity messages (e.g., "limited stock" vs. "only 2 left") (Content) |
| | 3. How do countdown timers influence the urgency of consumers' (Content) |
| | 4. How does social proof influence consumer reviews and ratings affect first-time visitors' trust in the website? (Content) |
| The ethical boundaries | 1. How do users perceive the ethical boundaries of strategies? (General) |
| | 2. Discover that a fake review or rating system has been manipulated? (Content) |




*Figure 2.* Result of NVivo word cloud analysis

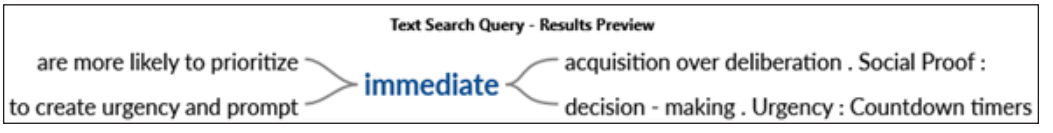



*Figure 3.* NVivo text search query of scarcity

FOMO, especially in users of the post-90s generation (Tanhan et al., 2022; Wang et al., 2021). Marketers well utilised this scarcity strategy concept to attract people's attention to purchase items on social media. As per the ELM model concepts, which are stored under peripheral route elements. To avoid this immediate action or scarcity, consumers do not experience FOMO. These immediate actions from the consumers may result in unnecessary purchases multiple times.

### *Social Proof*

After that, social proof such as user reviews, star ratings, and testimonials prominently influenced user trust and perceived credibility. For instance, most websites now feature "verified purchase" labels and "best seller" tags. These features provide trust and credibility to consumers, influencing user decisions by providing external validation. This social proof technique increased trust among consumers in online purchases. Research by Amblee and Bui (2011) found that electronic word-of-mouth (eWOM) is one of the effective indicators of product reputation for consumers. For consumers who lack prior purchasing experiences, eWOM helps them to identify the best products within social communities, including online ratings and reviews. Apart from that, a research result by Talib and Saat (2017) indicated that the high number of followers and recommendations from social communities influences buyers' intention in online purchasing through social proof strategies. These online ratings and reviews serve as valuable indicators to consumers. Based on the word cloud output (Figure 2), such as trust, reviews, and proofs shared by consumers once they have completed their online process, makes them too confident to move forward with online purchasing. As per results from the text search query (Figure 4), user reviews play a vital role in persuading consumer behaviour. Social proof was consistently embedded in product pages and recommendation sections. Moreover, these social proof strategies can be included under peripheral route elements in the ELM model. The "positive" recommendation by online consumers led to an enhanced favourable attitude towards unfamiliar products and sellers (Talib & Saat, 2017). These strategies effectively influence consumers' purchasing intentions. Therefore, there is an option for sellers, either to increase follower counts or to enhance community recommendations. So, consumers wisely use this strategy when purchasing online.




*Figure 4.* NVivo text search query of social proof

### *Urgency*

Based on the study, Febrilia et al. (2024) represent the stimulus through website personality, product attributes, and motivational activities employed by retailers. The rationale for incorporating website personality as a stimulus lies in the fact that a website's design, functionality, and overall personality constitute the primary stimuli encountered by consumers in their online interactions. The personality of a website affects users' perceptions, emotional reactions, and levels of engagement (Febrilia et al., 2024; Rejikumar & Asokan-Ajitha, 2021). Product attributes encompass the characteristics of a product, such as quality, features, and pricing, which serve as stimuli influencing consumers' perceptions, preferences, and attitudes. The attributes affect the assessment of a product's utility and value (Chiu et al., 2014; Febrilia et al., 2024). Promotional activities, discounts, and incentives employed by marketers act as external stimuli that affect consumer motivations and emotions. These activities generate urgency, excitement, and perceived value, influencing consumer responses (Darke et al., 2003; Febrilia et al., 2024). As per results from the text search query (Figure 5), "offer" strategies are needed to create an urgency for consumers to purchase online. Offers such as limited stock available and offers that end in X hours persuade consumers. Consumers are persuaded by these kinds of urgency strategies by marketers. In the ELM terms, urgency cues function as peripheral-route stimuli, attracting attention, and prioritising rapid decision-making. Cialdini's scarcity and reciprocity principles also inform these strategies, as marketers create a sense of limited opportunity and prompt immediate engagement. These social urgency strategies depend on surface-level cues such as promotional activities, discounts, and incentives employed by marketers, and the arguments presented by social media sellers and consumers. Based on the output word cloud, there is an "immediate" output push that pushes consumers to the urgency factors.

### *Personalisation*

Lastly, personalisation. The websites' tailored content and product recommendations are based on browsing history and demographic data, creating a sense of relevance for users. Convenience and personalisation strategies (CPSs) have emerged as effective strategic levers for acquiring consumers and eliciting "positive" responses from them. (Anshu et al., 2022; Rodríguez-Ardura et al., 2025) report that convenience strategies enhance consumer attitudes and intentions to

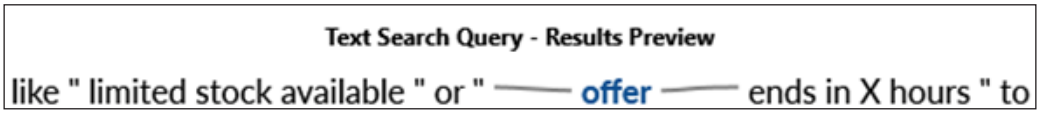



*Figure 5.* NVivo text search query of urgency

repurchase by engaging them in co-creation activities. e-retailers implement convenience strategies to address consumers' limited shopping time and energy by efficiently providing goods and services, minimising the time and effort needed to amend orders, and ensuring prompt delivery (Duarte et al., 2018; Rodríguez-Ardura et el., 2025). Alimamy and Gnoth (2022) and Lalicic and Weismayer (2021) identified comparable impacts on consumers' co-creation intentions through personalisation strategies, whereby e-retailers engage with consumers in a supportive and enriching manner, addressing their individual preferences (Zhang et al., 2019). However, while there is a potential nexus between CPSs and consumers perceived opportunities to co-create value, previous studies do not elucidate the mechanisms by which these processes contribute to value creation for the company. This outcome is surprising given the fundamental assumption of reciprocity and bidirectionality in value cocreation. As per the results from the text search query (Figure 6), “positive” responses from consumers, such as credibility, reducing uncertainty about product quality, visuals, recommendations, and social conversion, persuade them. The personalisation strategy can be included under central route elements. Contrary to the concepts of scarcity and urgency, personalisation has the potential to include central-route features because people can get engaged at a more meaningful level with the information that is of interest to them. From a Cialdini point of view, the principle of liking is satisfied in the case of personalisation because it increases people’s engagement with the information. The quality of arguments presented by social media sellers and consumers. Based on the output word cloud, there is a “positive” output push that persuades consumers of the personalisation factors. Personalisation aligns with the trend of leveraging data-driven technologies to enhance relevance and user experience.

## Ethical Implications of Persuasive Strategies

The study mentioned ethical issues surrounding the use of persuasive techniques such as deception and manipulative personalisation. Deception techniques include fake reviews and scarcity that has been artificially generated. For example, "only 1 left." Manipulative personalisation refers to a situation where individuals feel ‘tracked’ or influenced by highly targeted advertisements. Ethical considerations align with Sunstein's (2015b) critique of manipulative practises, emphasising the need for transparency and user consent.




*Figure 6.* NVivo text search query of personalisation

Striking a balance between effective persuasion and ethical responsibility remains a critical challenge for marketers and designers. Transparency in personalised content was identified as a mitigating factor for ethical concerns. Websites that disclosed how personalisation worked. For example, "Recommended for you based on your browsing history" was perceived as more trustworthy. This study defines that consumers perceive the ethical boundaries of strategies such as scarcity, fake reviews, or misleading personalisation. These ethical considerations are associated with the use of persuasive techniques. The study's findings address the ethical considerations underlying the targeted persuasive techniques employed by marketers. The ethical responsibility of being aware of the ethical implications of targets. For example, in the study by a researcher, Pilaj (2017), for the well-being of individuals or society at large, intentions must be explicit and evaluated against ethical standards, including the autonomy of investors, such as individual autonomy. Consequently, in the implementation of persuasive measures, designers must critically examine their intentions within the framework of ethical boundaries (Benner et al., 2022; Pilaj, 2017). As per the text search query outputs (Figure 7), the ethical consideration depends on individual autonomy, as said by researcher Pilaj (2017). Thus, the findings support the validity and relevance of applying the model in theorising consumers' responses, aligning them with theoretical frameworks like the Elaboration Likelihood Model (ELM) and Cialdini's principles of influence. This process includes coding for peripheral and central route elements and assessing their impact on user behaviour in terms of ethical considerations.

## CONCLUSION

This study underscores the critical role of persuasive communication in shaping user behaviour, engagement, and decision-making on online shopping websites. Strategies such as scarcity, urgency, social proof, and personalisation have proven effective in enhancing user experience and driving conversions. The use of theoretical models such as the Elaboration Likelihood Model (ELM) and Cialdini's principles allows for a comprehensive approach when evaluating the interplay between cognitive processing and persuasive techniques. Central route persuasion is more appealing to consumers seeking trustworthy data, while peripheral techniques are optimal for




*Figure 7.* NVivo text search query of ethical implications

time-strapped and less motivated consumers. Ethical concerns were identified as a vital consideration when applying persuasive techniques. Greater openness regarding personalisation techniques, as well as responsible use of both the scarcity and social proof principles, can help alleviate concerns and create trust. A balance is necessary, therefore, that balances the effective use of persuasive message techniques for successful business outcomes, along with upholding worthwhile, high-quality ethics for the long-term purpose of winning the loyalty of consumers on the web. Future studies must focus on the gaps outlined and include future perspectives based on user attitudes, a range of sectors, and multiple cultural and temporal consideration analyses, given the ever-evolving nature of the digital world on online shopping websites.

## Implications of the Study

This study presents various implications for marketers, website designers, policymakers, and researchers within the realm of digital communication.

### Implications for Marketers and Website Designers.

The understanding of the effectiveness of motivational persuasion techniques like scarcity, urgency, and personalisation can enable the marketer to improve user engagement as well as conversion rates. Peripheral route persuasion techniques such as scarcity/urgency indicators, countdown timers, and limited stock indicators are mainly employed based on the Elaboration Likelihood Model (ELM). Social proofs such as customer testimonials, customer ratings, and "verified labels" are also commonly employed for improving credibility. Personalisation strategies, such as content suggestions, contain elements of central route persuasion when the content strongly favours their interests. Certain ethical issues arise regarding overemphasis on scarcity, lack of clarity regarding personalisation, and customer feedback, which call for ethical marketing practises. The integration of principles of the ELM theory and Cialdini's principles would enable this research study to present a sound framework for understanding the working of persuasion design elements on e-commerce websites. Though this research study would not aim at measuring user behaviour, it would also present some useful insights on design trends and ethical considerations, which would help future research work.

## Limitations and Recommendations for Future

Future research should explore user perspectives through surveys or interviews to complement the content analysis. As a future researcher, explore the nuanced digital platforms that continuously evolve in applications and implication strategies, especially in terms of ethical boundaries. Apart from that, cross-cultural research can be explored by future research. Investigate cultural variations in the perception and efficacy of persuasive techniques to identify culturally specific strategies. Other than that,

Artificial Intelligence and personalisation can be explored and examined to understand the influence of artificial intelligence on the development of hyper-personalised user experiences, with particular attention to ethical considerations and the establishment of user trust. Addressing these limitations and expanding the research scope will enable future studies to develop a more thorough understanding of persuasive communication in the digital era.

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# Pragmatic Small Talk in the Osing Community of Banyuwangi: An Ethnographic Communication Study

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## ABSTRACT

This study aims to describe the variety, function, and dynamics of small talk in the communication of the Osing community in Banyuwangi. This study uses a qualitative approach with a communication ethnography framework. The results show that small talk in the communication of the Osing community in Banyuwangi has various forms of patterned speech and is bound by social context, including differences in interaction backgrounds, interlocutors, and communication situations. Small talk appears consistently in daily interactions, both in public and domestic spaces. Small talk serves as a means of opening and maintaining interaction, maintaining harmonious social relations, and expressing empathy, humility, and concern through phatic and expressive speech acts. The practice of small talk shows a shift in form along with generational differences and the development of digital media, especially through the use of short messages, emojis, and visual symbols, without eliminating its basic sociocultural function. These findings indicate that small talk is not just a conversation filler speech, but a communication practice that is pragmatically and culturally meaningful. Small talk functions as a mechanism for maintaining social cohesion, a medium for transmitting local cultural values, and a marker of the collective identity of the Osing community that is adaptive to social and technological changes. These findings are significant in expanding the study of pragmatics and cultural communication by showing that small talk is a strategic communicative practice to maintain social cohesion, reproducing local cultural values, and ensuring the sustainability of the Osing community identity amidst social and digital changes.

*Keywords:* Digital communication transformation, interactional politeness strategies, phatic speech acts, small talk practices, transmission of local cultural values

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## INTRODUCTION

In pragmatic studies, small talk is a universal communication practise present in various ethnic cultures as a means of building social relations, negotiating politeness, and maintaining harmony in daily interactions (Holmes & Wilson, 2022; Malinowski & Redfield, 1992). However, the development of digital technology and text-based communication has shifted face-to-face interactions towards fast and minimal context, so that politeness strategies and pragmatic sensitivity are increasingly reduced, especially among the younger generation (P. Brown & Levinson, 1987). Several studies have shown that this change has an impact on weakening the social function of small talk as a community glue and a marker of local cultural values. Amidst these tendencies, the Osing Community of Banyuwangi offers a unique local context because small talk still functions as a communication practice based on solidarity, social hierarchy, and the values of oral wisdom that live in daily interactions (Geertz, 2009; Hymes, 2010).

The Osing community is a social ethnic group that resides in Banyuwangi Regency, a geographical area located at the eastern end of Java Island, Indonesia. This ethnic group, also referred to as the indigenous community of Banyuwangi, practice a cultural tradition, characterised by the adoption of a unique language used in daily communication. As a traditional society, the people are hospitable and care for fellow members as well as foreigners. This attitude led to the development of oral tradition in the community communication known as small talk, which plays a role in maintaining social cohesion and cultural sustainability. Additionally, small talk tradition is a verbal interaction that functions as casual conversation and a reflection of politeness, social hierarchy, including harmonious relationships. Based on shared norms and values, the small talk tradition is a symbolic act of respect, empathy, and solidarity (Geertz, 2009; Hymes, 2010).

Oral traditions within the Osing community have shifted with the penetration of globalisation and digital communication technology. The younger generation increasingly relies on fast and direct text-based communication, thus marginalising face-to-face interactions, which are rich in social and cultural context. This shift in communication patterns has resulted in the decline of small talk as part of everyday informal interactions.

From a linguistic anthropology perspective, small talk serves not only as a conversation starter but also as a verbal art form that embodies values of politeness, managing social distance, and strengthening community ties (Finnegan, 1992). Through positive and negative politeness strategies (J. Brown et al., 2007), small talk in the Osing community plays a crucial role in maintaining social harmony, negotiating roles, and indirectly avoiding conflict. However, lifestyle transformations and external cultural influences have led to this interaction pattern being increasingly marginalised.

This weakening of oral communication practices not only marks a change in communication medium but also indicates

the potential loss of intangible cultural heritage and the community's collective identity. When the sociolinguistic context and cultural meaning of speech are no longer practiced, the function of communication as a means of social cohesion and informal community governance is also reduced. Therefore, in line with UNESCO's, (2013) affirmation of the importance of protecting communication traditions as part of cultural heritage, scientific studies on small talk in the Osing community are crucial as an effort to document, analyse, and revitalise endangered linguistic practices.

Previous research on linguistic politeness has generally focussed on formal, dominant speech contexts, and Western or urban settings (Holmes & Wilson, 2022). As a result, politeness practices in informal, community-based and indigenous communication, such as small talk, have received little systematic study and often neglect their local sociocultural logic. Existing pragmatic frameworks tend not to fully accommodate non-Western linguistic ecologies, necessitating the expansion of politeness studies into local community speech contexts.

This study examines this issue by analysing politeness strategies in small talk, particularly their variations, functions, and dynamics of change. This research aims to uncover the forms and functions of politeness in Osing small talk, which are threatened by social and digital change. Methodologically, this study uses a communication ethnography approach (Duranti, 1997; Hymes, 2010), with the SPEAKING framework and P. Brown and Levinson's (1987) politeness theory to examine speech practices within an authentic cultural context.

The main difference between this study and previous studies lies in its focus on small talk as an oral tradition of indigenous communities, rather than solely on formal speech or Western pragmatic frameworks. The novelty of this research lies in the systematic documentation and analysis of Osing small talk as a community-based communicative practice that reveals cultural values, social functions, and the dynamics of politeness amidst the flow of digitalisation, which has until now been rarely studied (Himmelmann, 1998).

In line with the above description, theoretically contributions were made by expanding pragmatic inquiry into localised communication culturals, including critically engaging with the dominance of Euro-American models in politeness theory (Wierzbicka, 2003). Based on the context, the theory reported that a contextualised pragmatic recognised cultural diversity in speech behaviour and outlined the value of ethnographic data in influencing global linguistic discourse. The documentation of small talk led to the formulated model for community-rooted linguistic analysis that informed language preservation and culturally-responsive communication education. This study focussed on cultural significance of small talk as a communicative and identity-forming practice. Furthermore, the need for context-sensitive linguistic models was showed, contributing to the

broader project of decentralising linguistic science by strengthening minoritised voices and communicative systems.

## THEORETICAL FRAMEWORK

Linguistic politeness is a key concept in pragmatic studies that explains how language is used as a social strategy to maintain harmony, manage interpersonal relations, and respect social order in everyday interactions. P. Brown and Levinson's (1987) politeness theory positions politeness as a speaker's effort to protect positive face (the need for social acceptance) and negative face (the need for freedom of action), which is manifested through positive, negative, direct without mitigation (bald on record), and indirect (off record) politeness strategies, taking into account social distance, power relations, and the level of burden of speech (J. Brown et al., 2007). In a cultural context, politeness is not universal, but is bound by the norms, values, and social hierarchies that apply in a speech community (Lakoff, 1973). Linguistic politeness is therefore understood as a cultural practice inherited and reproduced through communication habits, including small talk as a form of phatic speech that functions to build social affiliation, maintain relational balance, and minimise potential conflict (Jeng et al., 2024).

In traditional societies, politeness functions as an adaptation to cultural norms to build solidarity and regulate social distance (Ide, 1989; Lakoff, 1973), and needs to be instilled to shape positive language behaviour (Mayrita et al., 2023). One such politeness strategy is manifested through small talk, which serves to maintain balance in interactions and social cohesion while reflecting cultural symbolic meanings (Geertz, 2009). Small talk also plays a role in opening conversations and creating emotional comfort, primarily building social affiliation rather than exchanging substantive information (Jeng et al., 2024; Malinowski & Redfield, 1992).

The form and function of small talk vary across cultures and reflect prevailing power relations and communication norms (R. Scollon & S. Scollon, 2001; Talukder & Barner-Rasmussen, 2024). In traditional societies, small talk functions as an informal social control mechanism that reproduces collective values through subtle linguistic cues (Finnegan, 1992; Goody, 2007; Gudykunst, 2003). Therefore, small talk is understood as a cultural discourse analysed through Cultural Discourse Studies and Hymes's ethnographic communication model, using the SPEAKING framework (Hymes, 2010). This approach is in line with the view that language is a symbolic resource that reproduces meaning, power, and cultural order (Amerian & Tajabadi, 2020; Blommaert, 2005; Fairclough, 2009).

## METHODS

### Study Design

This study uses a qualitative approach with a communication ethnography framework to examine the practice of small talk in

the socio-cultural context of the Osing community. Referring to (Hymes, 2010), communication ethnography is used to analyse speech events by considering the situational, cultural, and social functions of language. In its application, this study adopts an ethnographic case study, which is understood as an ethnographic research strategy that focusses in-depth study on a particular social case within a clear context. The case studied is the practice of small talk in everyday communication of the Osing community, which is treated as a single ethnographic case to capture traditional norms, intergenerational relations, and pragmatic strategies that develop amidst the process of modernisation. This methodological design integrates Hymes' (2010) communication ethnography, P. Brown and Levinson's (1987) politeness theory, and a pragmatic perspective to produce a comprehensive analysis of language practices as a sociocultural phenomenon.

## Location and Participants

This research was conducted in Gladag Village, Banyuwangi Regency, East Java, where the majority of the population is Osing and actively uses the Osing language in daily life, including small talk practices in markets, community meetings, and families. Participants were selected purposively to represent specific generational groups and communicative roles, including culturally competent adults and elderly figures, the younger generation, as well as cultural figures and informal social actors. A total of 10 participants aged 23-79 years were involved and grouped into three generational categories, with identities maintained through the use of pseudonyms. The three generation categories of the 10 participants are summarised in Table 1.

Table 1
*List of the participants*

| No. | Categories | Initial Name | Male/ Female | Age | Occupation |
|---|---|---|---|---|---|
| 1 | | SU | F | 68 years old | Retired civil servant, native Osing resident |
| 2 | | MND | M | 64 years old | Osing community elder |
| 3 | | AY | F | 67 years old | Osing cultural figure |
| 4 | Elderly | YNR | M | 64 years old | A resource person who conveys personal experience |
| 5 | | SLM | M | 62 years old | RT head, farmer |
| 6 | | KML | M | 79 years old | Housewife, farmer |
| 7 | | MI | M | 58 years old | Banyuwangi dance artist, farmer |
| 8 | Middle | TTK | F | 56 years old | Housewife |
| 9 | | MTW | M | 50 years old | Young Osing figure and teacher |
| 10 | Young | APK | F | 23 years old | Student |

### Data Sources and Instruments

Primary data consisted of naturally occurring speech, semi-structured interviews, and participant observation records. Meanwhile, specific data sources included (1) audio/video recordings of daily small talk during informal activities (e.g., morning markets, traditional ceremonies, household visits), (2) fieldnotes from immersive observations at cultural events and communal interactions, and (3) transcripts of interviews exploring participant interpretations, values, and intentions behind communicative choices. The instruments comprised (1) observation protocol, designed based on Hymes' SPEAKING model (Setting, Participants, Ends, Act sequence, Key, Instrumentalities, Norms, Genre), (2) interview guideline, in line with P. Brown and Levinson's (1987) politeness theory which was adopted to explore face strategies, intentions, and perceptions of social roles, and (3) audio-visual equipment for real-time, in-situ documentation.

### Data Collection Procedure

Data collection was conducted over four months through three stages: pre-field preparation, field immersion, and interviews. The pre-field phase included location mapping, participant selection, and instrument testing, while the field immersion phase involved participant observation of natural interactions. Interviews were conducted individually and in groups, recorded, transcribed, and annotated with contextual information such as location, speaker relationships, and speech purposes to support multi-layered analysis.

### Data Analysis Method

Data were analysed using the interactive analysis model of Miles. Huberman, and Saldana (2020), which includes condensation, presentation, and drawing and verifying conclusions. In the condensation stage, Osing-language small talk data were transcribed verbatim and translated through two stages (Osing-Indonesian-English) literally and contextually, taking into account the function of speech acts and politeness strategies. They were validated through limited back-translation and researcher discussions. The data were then segmented based on speech events, coded using Hymes' SPEAKING model, annotated using P. Brown and Levinson's politeness strategies, and analysed for indexical markers such as lexical choice and speech act types. The results of the analysis were presented in a thematic matrix, intergenerational comparison tables, and narrative vignettes, then verified through triangulation, member checking, and peer debriefing to explain the role of small talk in negotiating social relations and cultural identity.

## FINDINGS

### Various Small Talk in the Daily Communication of the Osing Community

Data on the variety of small talk within the Osing community were obtained through direct observation in natural settings and supported by in-depth interviews with local informants. The findings proved that small talk (phatic communication) played a role

in maintaining social harmony, politeness, and relational intimacy, as shown in Table 2.

Table 2 displays variations in small talk in everyday Osing communication based on context and participants. On public streets and at home, small talk ranges from brief greetings to longer friendly expressions. In the marketplace, it occurs in buying and selling interactions, often through situational questions and humour. At traditional events and in public queues, small talk is used to respond to environmental conditions and shared situations.

Table 2
*Varieties of small talk in Osing daily communication*

| No. | Setting | Participants | Small Talks |
|---|---|---|---|
| 1 | Public road (when meeting neighbours/ relatives) | Neighbours, relatives, old friends | Where are you going, bro?<br>Not stopping by first, huh? |
| 2 | Private house (when welcoming/ receiving guests) | Hosts-guests | It's rare to be home, Miss?<br>Please come in, Sir, sorry the house is messy.<br>I just stopped by for a moment,…<br>I want to meet you, I miss you, it's been a long time since we last met….<br>Come here often, so we can keep in touch….<br>Have you had breakfast yet? |
| 3 | Market/stall (interaction in transactions) | Sellers-buyers | Why are you alone? Who took you where?<br>Why are you shopping so much? Are you going to celebrate?<br>Please, Sir, I'll (eat) first, okay…?<br>I hope you're always healthy, Ma'am… |
| 4 | Traditional events and public queues | Among residents across ages and genders | The air is hot. Why hasn't the event started yet?<br>Wow, the queue is long...?<br>We have to be patient, everyone wants it to finish quickly...! |

Quote 1:

In our village, small talk is essential, it is formal—and maintains relationships. On the street, people ask, Where are you going? If not, it may seem arrogant. Even with an untidy house, people say, Please come in, sorry it is untidy. That is the acceptable way of being polite and humble. [Informant: SU (68), former civil servant, Rogojampi]

SU outlined the social expectations surrounding small talk as a marker of humility and respect in Osing community. It functions as a greeting and social inclusion mechanism.

Quote 2:

Small talk has become a habit with valuable meaning, reflecting care, emotional intelligence, and

attentiveness—including the following values *ngemong*, *ngapurancang*, and *tanggap rasa*. For example, statements such as long time no see rekindles social bonds. [Informant: MI (58), dance artist and farmer, Banyuwangi]

MI introduced the concept of cultural pragmatic, where small talk reflected and reinforced local moral values and relational etiquette unique to Osing traditions.

Quote 3:

Small talk is important, because in the past, children were taught to greet elders or guests using the following phrases Have you eaten yet? Currently, digital communication dominates, but I still teach my grandchildren to show respect through small talk. [Informant: MND (64), community elder]

This view confirmed an intergenerational transmission of politeness norms, reflecting concerns about cultural erosion in the digital age.

**The Function of Small Talk in the Daily Communication of the Osing Community**

To deepen the understanding of the communicative role of small talk among the people, observations and open-ended interviews with cultural figures, local elders, and residents was performed. The data showed that small talk served various pragmatic and sociocultural functions. Meanwhile, selected interview excerpts and synthesised data were reported as follows.

***Interview Excerpts***

Quote 4:

Small talk is like a habit in the community life, when people meet, specifically the elderly or close neighbours, light questions are asked such as Where are you going, Sir? or Have you just come back from the market, Ma'am? It is not just a question, but a sign that the people care and intend to keep the relationship cordial. The atmosphere becomes rigid and feels strange if small talk is omitted. Familiarity is important in this village to help each other and enable living in harmony." [Informant: Mrs. TTK (56), resident of Kemiren Village]

Quote 5:

Speech such as where are you going, Sir? or Please come in, my house is a untidy is phatic expression and contains deep meaning as part of cultural communication strategy. In the Osing tradition that upholds the values of togetherness, harmony, and responsiveness, small talk is a means to convey empathy, politeness, and respect indirectly but effectively. For example, when receiving guests, the people say sorry, the house is untidy, even though it is clean. However, that is not a lie, but an etiquette to show humility." [Informant: AY (67), Osing cultural figure]

Quote 6:

> Supposing my child is going out, I would say, be careful, and do not forget to eat, although in several occasion I am completely aware he has eaten. Personally, it is a form of love. For example, when a sick neighbour is met, people say, 'Get well soon, Mom.' It feels trivial, but fosters a sense of care for each other. [Informant: YNR (64), community elder]

The analysed field data showed several prominent communicative functions of small talk among the people, as in Table 3.

Table 3 shows the seven functions of small talk in Osing communication: building and maintaining social relationships, expressing concern, and maintaining politeness. Small talk also serves to foster intimacy, preserve local values such as friendliness, avoid tension, and build a positive social identity through compliments.

## The Dynamics of Small Talk in the Osing Community

This section presented the findings of interviews conducted with four representatives from the Osing community in Banyuwangi two community leaders (SLM and MTW), a housewife (KML), and youth informant (APK). The analysis showed significant transformation in small talk practices across generations. Thematic patterns were classified into seven major aspects, namely interaction medium, politeness norms, frequency, emotional expression, social appraisal, conversation topics, and communicative function. In this context, the data excerpts were categorised and discussed accordingly.

Table 3
*Function of small talk in the Osing society communication*

| No. | Function | Example Expressions | Description |
|---|---|---|---|
| 1 | Building and maintaining social relations | "Where are you going, Sir?", "Where are you from, Ma'am?" | Opens interaction, preserves social connectedness |
| 2 | Showing concern and empathy | "Have you eaten yet?", "Get well soon." | Verbal expression of care and empathy |
| 3 | Maintaining politeness and social harmony | "Please come in, my house is a mess." | Signals humility and politeness, specifically to guests |
| 4 | Fostering familiarity and warmth | "Wow, you're getting healthier!", "You're looking younger!" | Softens social distance and strengthens emotional bonds |
| 5 | Preserving local traditions and values | "If you pass by my house, stop by." | Reinforces values of communal living, cooperation, and hospitality |
| 6 | Avoiding tension and facilitating neutrality | "The weather is nice, huh?", "The queue is long, huh…" | Manages face-threatening acts, prevents conflict, neutralises interaction |
| 7 | Building positive social identity | "Smart, huh, following in his father's footsteps." | Offers positive affirmation, boosts social pride and recognition |

***Theme 1 Medium of Interaction***

> Traditional: In the past, small talk was face-to-face, people would ask: Where are you going, sir? or Have you eaten yet, ma'am? (SLM, 62)
>
> Contemporary: Currently, people just send messages like Where are you? through WhatsApp or Instagram. Even the use of emojis are enough. (APK, 23)

There is a significant shift from direct interpersonal communication to text-based digital interaction. Although the intention of maintaining social bonds remained, the delivery was briefer and mediated through technology.

***Theme 2 Politeness and Norms of Humility***

> Traditional: People used to say, Please come in, my house is untidy, as a way of showing humility. (KML, 79)
>
> Contemporary: Young people currently say, Just come in, it is my house,—more casual, less self-effacing. (KML, 79)

The shift reflects a transformation from deferential expressions of humility to more egalitarian and practical social etiquette. This is indicative of evolving values favouring comfort and authenticity over formality.

***Theme 3 Frequency of Public Small Talk***

> Traditional: People used to talk to anyone at the market, Where are you from? or Is the weather good? was normal. (MTW, 50)
>
> Contemporary: Presently, people tend to remain silent in public and just look at their phones. (MTW, 50)

Direct interactions in public have declined, signalling a more individualised social orientation, caused by digital absorption and decreased dependency on spontaneous community interaction.

***Theme 4 Emotional Expression***

> Traditional: When someone was missed, both parties would meet and talk at length. (SLM, 62)
>
> Contemporary: Currently, people say Kangen ngobrol through chat, or just use stickers. (APK, 23)

In this context, while the emotional purpose of small talk remains—expressing longing or affection—the medium has become symbolic and minimalist, often relying on visual cues such as emojis.

***Theme 5 Compliments and Social Appraisal***

> Traditional: People complimented one another, by saying You still look young! or You dress well. (MTW, 50)
>
> Contemporary: Currently, the people tend to say You glow differently, or Your style is cool! (APK, 23)

Expressions of social praise are presently more creative, hyperbolic, and

stylised, influenced by global pop customs and digital expression trends.

### *Theme 6 Topics of Conversation*

> Traditional: People talked about the weather, how the kids were doing, or how clean the house was. (KML, 79)
>
> Contemporary: People currently talked about TikTok trends or Instagram posts such as, Your nephew is cute on IG! (APK, 23)

A generational transition in conversational topics reflects a move from domestic and environmental themes to media-driven, trend-oriented discourse, in line with the digitisation of social life.

### *Theme 7 Communicative Function*

> Traditional: Small talk built togetherness and kept neighbours close. (SLM, 62)
>
> Contemporary: Even online chatting keeps friendships intact, just faster and less formal. (APK, 23)

The social function of small talk endures—to maintain bonds and show presence, despite changes in form and medium. However, this function was increasingly abstracted into digital convenience. The change of small talk was summarised in Table 4.

Table 4
*Shifting small talk practices in the Osing community*

| Aspects | Traditional Practices | Contemporary Practices | Description of the Shift |
|---|---|---|---|
| Medium of interaction | Face-to-face greetings in daily contexts | Chatting via digital apps (WA, DM, emojis) | Shift towards fast, technology-mediated interaction |
| Norms of politeness | Humble, self-effacing expressions | Casual, egalitarian phrases | Shift from formal humility to relaxed authenticity |
| Public frequency | Frequent spontaneous encounters in shared spaces | Reduced verbal interaction; increased silence in public | Decline in social spontaneity due to individualism and gadget use |
| Emotional expression | Extended verbal expressions of longing | Short texts or emojis conveying similar sentiment | Compression of affect through symbolic communication |
| Social appraisal | Simple and sincere compliments | Hyperbolic or trend-based compliments | Rise in stylised praise, influenced by online language |
| Conversation topics | Daily life, weather, family | Social media, digital trends | Substitution of intimate content with viral/popular media conversations |
| Communicative function | Deepening intimacy via direct interaction | Maintaining ties via efficient symbolic communication | Continuity in function; transformation in tools and tone |

Table 4 shows the shift in Osing people's small talk practices from face-to-face interactions to digital media. Politeness norms have become more relaxed, public interactions have decreased, and emotional expressions are conveyed concisely through text and emojis, while the function of maintaining social relationships remains.

## DISCUSSION

This study identifies diverse varieties of small talk in the Osing community that are contextually embedded across settings, participants, and interactional situations. Small talk appears in public roads, homes, markets, and ritual spaces, involving neighbours, relatives, elders, and strangers. These varieties are realised through formulaic utterances such as "Where are you going, Sir?", "Please come in," or "Have you eaten yet?" which consistently precede or accompany main conversations. In line with ethnography of communication (Hymes, 2010), these patterned forms demonstrate that Osing small talk is not random but socially organised, showing stable interactional routines that frame everyday communication. Compared to previous studies on phatic expressions in local communities (Holmes & Wilson, 2022b; van Zoonen et al., 2024), this finding confirms that Osing small talk operates as a recurrent communicative practice tied to specific sociocultural contexts.

The findings show that small talk in Osing communication serves multiple pragmatic functions, particularly initiating interaction, maintaining interpersonal relations, and reducing social distance. From a pragmatic perspective, these utterances function as phatic speech acts, where the illocutionary force lies in sustaining social harmony rather than transmitting information (Malinowski & Redfield, 1992; Searle, 1970). Small talk also functions as a politeness strategy, managing face needs and preventing interactional tension, especially in intergenerational or asymmetrical relationships (P. Brown & Levinson, 1987). This aligns with earlier pragmatic studies that emphasise the role of small talk in establishing a conducive interactional climate (Goffman, 1982; R. Scollon & S. Scollon, 2001), while extending them by showing how these functions are realised within Osing-specific norms.

Beyond pragmatic functions, small talk in the Osing community acts as a medium for expressing and transmitting local cultural values such as ngemong (nurturing), ngapurancang (maintaining emotional harmony), responsiveness (empathy), and ngalah (humility). These values are enacted through routine expressions that symbolically encode care, hospitality, and mutual respect. Such findings resonate with Geertz's (2009) view of language as symbolic action and Kaszynska's (2024) notion of values as intersubjectively justified cultural meanings. Compared with previous studies on cultural communication, this research highlights small talk as a micro-level cultural ritual that sustains Osing ethical frameworks in everyday interactions, reinforcing cultural identity through ordinary discourse.

The study further reveals dynamic shifts in small talk practices across generations and communication media. While older speakers predominantly employ face-to-face verbal small talk, younger speakers increasingly use brief messages, emojis, and stickers in digital platforms such as WhatsApp and Instagram. Despite changes in form, the core sociocultural functions—maintaining bonds, expressing concern, and signaling politeness—remain intact. This supports mediation theory (Hjarvard, 2013) and recent studies on digital pragmatics (Gao, 2023; Mutheu, 2023), which argue that digital media reconfigures, rather than replaces, social interaction norms. The Osing case demonstrates a glocalised communicative pattern, where local values persist through globally shared semiotic resources, confirming that small talk remains a resilient marker of social continuity amid technological change.

Overall, this study makes four main contributions: mapping the variety of small talk in various Osing communication contexts, revealing the pragmatic and social functions of small talk in maintaining harmonious interactions, interpreting small talk as a medium for transmitting local cultural values, and analysing the dynamics of small talk in the context of cross-generational digital communication. Unlike previous research, which generally views small talk in general or detached from specific cultural contexts, this study shows that Osing small talk is a patterned communicative practice, has symbolic value, and functions strategically in building social cohesion. The novelty of this research lies in the integration of pragmatics, communication ethnography, and digital cultural dynamics to explain the sustainability of small talk as an adaptive cultural practice. Thus, this research not only enriches studies of pragmatics and social communication but also emphasises the role of language as a marker of identity and local cultural continuity amidst social and technological change.

## CONCLUSION

This section concludes that small talk in Osing society can be understood as a systematic, patterned, and contextual pragmatic-cultural practice, thus broadening the understanding of the functions of phatic and expressive speech acts in the study of pragmatics and ethnography of communication. These findings indicate that small talk functions not only as conversation filler, but as a linguistic mechanism that integrates politeness, emotion, and cultural values in building and maintaining social relations. The findings of this study contribute to strengthening the theoretical framework that views language as a sustainable and culturally oriented social act. The results of this study have implications for language education, particularly in the development of pragmatic competence and cultural awareness through the use of authentic communication practices based on local culture. Furthermore, small talk plays an important role in cultural preservation because local values are continuously reproduced through daily interactions. In the

context of intergenerational communication, small talk has proven to be adaptive and has the potential to become a communicative bridge that maintains the continuity of social relations and cultural identity amidst social change and technological developments.

### Implications of the Study

This study makes important contributions to the fields of pragmatics, communication ethnography, and intercultural linguistics, especially regarding minority communities in the digital age. The significance of the study centered on enlightening how small talk, often considered trivial, played a major role in cultural logic by maintaining social cohesion and transmitting traditional values. This offered a meaningful scholarly contribution to pragmatic, ethnographic communication and intercultural linguistics by showing that language functioned as a medium of exchange and symbolic ritual that sustained cultural identity, particularly within minority and digitally evolving communities.

### Limitations and Recommendations for Future Research

This research is limited to a specific social and regional context within the Osing community, so its findings cannot be broadly generalised. This study only focused on small talk practices in everyday interactions and did not include formal or institutional communication contexts. Furthermore, the analysis of the dynamics of digital small talk has not been conducted longitudinally, so changes in communication practices over time cannot be fully described. Based on these findings and limitations, further research is recommended to expand the scope of locations and social contexts to obtain a more comprehensive picture, including cross-cultural comparisons. Further research should also examine small talk in formal and institutional contexts, such as education and public services, as well as conduct longitudinal studies of digital small talk. Ethnographic approaches can also be combined with conversation analysis or experimental pragmatics to deepen understanding of the relationship between speech forms, contexts, and the social meaning of small talk.

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# AI Banking Adoption in Saudi Arabia: Extending the UTAUT Framework

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## ABSTRACT

With the tremendous recent advances in Artificial Intelligence (AI), many businesses have begun to utilise it to improve their operations and enhance the customer experience. Utilising the unified theory of acceptance and use of technology (UTAUT) as a theoretical framework, the present study examines the behavioural intentions of Saudi customers towards AI-powered banking. The UTAUT model is extended by incorporating trust and perceived risk as additional factors influencing customers' behavioural intentions when using AI-powered banking, alongside perceived performance, perceived effort, and social influence. The participant sample for the study consisted of 323 bank customers. The findings of the structural equation modelling (SEM) analysis indicate that all the factors in the extended model affected customers' intention to use AI-powered banking. Specifically, perceived performance, perceived effort, social influence, and trust had positive effects on the intention to use, whereas perceived risk had a negative effect on this intention. These results underscore the importance of developing more user-friendly and effective AI-powered banking services. Additionally, the results demonstrate the effectiveness of targeting customers through key individuals in their lives to encourage their adoption of AI-powered banking. Finally, gaining customers' trust and lessening their perceived risk both increase their likelihood of using AI-powered banking.

*Keywords:* Artificial intelligence acceptance, perceived risk, trust, UTAUT

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## INTRODUCTION

Artificial intelligence (AI) is changing the way businesses operate and provide services to their customers. With a projected total contribution of USD 15.7 trillion to the global economy (Pavlidis, 2025), AI is expected to remain a key driver of



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business development worldwide. Currently, services are increasingly enhanced with technology. Financial and banking services are key areas witnessing a rise in AI utilisation (Onabowale, 2024). Banks have transitioned from traditional operations and customer service to technology-based services, including ATMs, the internet, mobile banking, and AI-powered banking. Integrating AI into banking services has improved the way that banks operate and serve their customers, including through transaction automation, service personalisation, and financial advising (Sharma et al., 2024).

Although customer acceptance of new banking technologies, such as internet banking and mobile banking, has been extensively studied, the adoption of AI in banking from the customer perspective has not yet been fully explored. Therefore, this study aims to investigate the behavioural intentions of Saudi customers towards AI-powered banking. By shedding light on the adoption of AI-powered banking in a developing country like Saudi Arabia, this study aims to expand our understanding of the factors that enhance its acceptance. Although banks in Saudi Arabia have embraced other sophisticated technologies such as the internet and mobile banking, they remain far from optimally utilising AI in their banking services. Moreover, although AI offers numerous features for customers to utilise, not all opt to use it. Therefore, banks need to determine how customers perceive AI and understand their attitudes and intentions towards its use to increase AI adoption and enable the optimisation of AI-powered services to, which can ultimately enhance customers' banking experience.

Despite the growing integration of artificial intelligence (AI) in the global banking sector, customer adoption of AI-powered services remains low in several regions, including Saudi Arabia. While AI offers promising benefits—such as improved service efficiency, personalised financial recommendations, and cost reduction—many customers remain hesitant to engage with AI technologies. This hesitation is often attributed to concerns over trust, data privacy, usability, and risk perception. Existing research has primarily focussed on technology adoption in general or in Western contexts, with limited attention given to how cultural, social, and technological factors uniquely influence the acceptance of AI in banking across Middle Eastern societies. As a result, a significant knowledge gap exists regarding the drivers of and barriers to AI adoption in the Saudi banking context. Addressing this gap is crucial for informing banks, developers, and policymakers on how to tailor AI services to meet local user expectations and comply with relevant regulatory frameworks.

Moreover, despite the growing body of research applying the unified theory of acceptance and use of technology (UTAUT) and its extensions in digital and mobile banking contexts, limited empirical attention has been given to AI-powered banking services, particularly within emerging economies such as Saudi Arabia.

Unlike conventional digital banking, AI-enabled services rely heavily on automated decision-making, extensive data processing, and algorithmic interactions, which elevate the roles of trust and perceived risk in shaping user acceptance. This study contributes to the literature by empirically examining the relative explanatory power of traditional UTAUT constructs alongside trust and perceived risk in the context of AI-powered banking. By doing so, it provides context-specific evidence on whether trust and risk perceptions outweigh classical technology acceptance drivers in consumers' evaluation of AI-based financial services.

The remainder of this paper is organised as follows. First, the literature on AI banking is reviewed, followed by a discussion of UTAUT. The conceptual model is then presented, and the hypotheses are formulated. The methodology section presents the sample, data collection, data analysis, and results. The last section provides a discussion of the study's results, implications, and limitations.

## LITERATURE REVIEW

### Artificial Intelligence in Banking

AI has brought about a significant shift in multiple aspects of various industries. To remain competitive in today's market, businesses must adopt advanced technologies, such as AI. Considering recent advancements in AI technologies, many businesses have started to utilise them to reduce costs, improve their services, and enhance the customer experience (Pagani & Pardo, 2017; Parise et al., 2016; Ransbotham et al., 2017). In particular, the banking and financial services sector has increasingly adopted AI technologies. Some of AI's advantages include automation, fewer human errors, and the availability of 24/7 services (Ghandour, 2021). Additionally, AI enables banks to achieve their goals of high-speed, error-free services (Noreen et al., 2023) and prevent fraud by effectively predicting the credit risk of clients (Haro et al., 2018).

AI has also been widely used to automate bank operations (Agarwal, 2019) and reduce costs, with the latter stemming from distinct aspects of banking services. For example, the AI automation of customer services saves considerable costs in terms of human resource efforts and training, as chatbots and virtual assistants are more cost-effective options (Pattanayak, 2023). AI integration can also enhance customers' experience and improve their satisfaction (Maseke, 2024). AI enables banks to offer new features for their customers, including chatbots and robo-advisors (Indriasari et al., 2022). According to Misischia et al. (2022), integrating chatbots into banking services improves interaction, entertainment, and problem-solving.

Customers' behaviour towards AI-powered banking has been studied to understand their intention towards its use. In their study of Malaysian customers' adoption of AI banking, Rahman et al. (2023) identified perceived usefulness as the main factor affecting customers' intention to use AI banking, with customers' attitude towards AI banking mediating the effect. They also found

that perceived risk had an adverse effect on the intention to use AI banking, while perceived trust and subjective norms had a positive effect. In a study of customers' usage of chatbots in banking services, Alt et al. (2021) found that perceived usefulness and perceived compatibility positively affect customers' intention to use chatbots. They also found that service awareness directly affects perceived ease of use and perceived privacy risk and indirectly affects use intention.

While AI offers advantages that can enhance customers' banking experiences, customers' adoption of AI is necessary for AI-powered banking services to be successful. Thus, as banks begin to offer such services, they must identify the factors that drive customer adoption and determine which AI characteristics are most important to customers. For example, attitudes towards AI, security, and trust have been found to influence customers' intentions towards using AI-powered banking services (Payne et al., 2018). Another factor that might affect AI adoption is customers' concern regarding the substantial amount of personal information required to provide them with tailored services (Hasan et al., 2023).

## Unified Theory of Acceptance and Use of Technology

Venkatesh et al. (2003) proposed the UTAUT model to explain how users adopt modern technologies. UTAUT integrates eight theories on the adoption and acceptance of technologies by combining and synthesising important variables from each theory into a unified theory. These eight theories are the theory of reasoned action (TRA), theory of planned behaviour (TPB), technology acceptance model (TAM), motivational model (MM), combined theory of planned behaviour/technology acceptance model (C-TPBTAM), model of PC utilisation (MPCU), innovation diffusion theory (IDT), and social cognitive theory (Attuquayefio & Addo, 2014; Williams et al., 2015). The UTAUT model posits that the behavioural intention to accept technology is based on performance expectancy, effort expectancy, social influence, and facilitating conditions. The UTAUT model has been applied in various research areas, including healthcare technologies (Rouidi et al., 2022), food delivery mobile applications (Puriwat & Tripopsakul, 2021), and mobile banking (Yu, 2012). One of the main advantages of UTAUT is its capacity to incorporate other variables in explaining users' acceptance of modern technologies.

## Study Hypotheses

According to the UTAUT model, technology acceptance is determined by four factors: performance expectancy, effort expectancy, social influence, and facilitating conditions. This study focusses exclusively on the first three factors, as research has suggested that facilitating conditions influence actual use, not use intention (Venkatesh et al., 2003). Accordingly, facilitating conditions were excluded to maintain conceptual consistency with the study's focus on behavioural intention rather than actual usage behaviour in the context of

AI-powered banking. Although the proposed hypotheses are grounded in well-established technology acceptance research, their examination in the context of AI-powered banking remains theoretically meaningful. AI-enabled banking differs from earlier digital banking technologies in its reliance on automated decision-making, predictive analytics, and data-driven personalisation, which may alter the relative importance of traditional UTAUT predictors. Accordingly, this study does not aim to propose novel directional hypotheses but, rather, to assess the comparative strength of established relationships within an AI-specific and culturally distinct setting.

### *Performance Expectancy*

Performance expectancy refers to users' perception of the benefits they derive from using a technology (Çalışkan et al., 2023). The effects of performance expectancy on technology acceptance have been consistently confirmed in studies across various industries, including the banking sector (Goswami & Dutta, 2016; Ivanova & Kim, 2022; Lakhal et al., 2013; Utomo et al., 2021). In their study of users' adoption of internet banking, Rahi et al. (2018) found that effort expectancy positively affected users' intention to use internet banking, and several other researchers came to the same conclusion (Dendrinos & Spais, 2024; Knutsen, 2005). Based on these findings, the following hypothesis is proposed:

> H1. Performance expectancy has a positive impact on customers' intention to use AI-powered banking services.

### *Effort Expectancy*

Effort expectancy refers to users' perception of the ease of using a technology. Research has found that the intention to use a technology is higher when it is perceived to be easy to use (Ghalandari, 2012; Yu, 2012). In their study of behavioural intention to adopt digital banking among Vietnamese consumers, Nguyen et al. (2020) found that effort expectancy had a positive effect on consumers' intention to adopt digital banking. Similar findings were reported by other researchers (Foon & Fah, 2011; Hilal & Varela-Neira, 2022). Based on these findings, the following hypothesis is proposed:

> H2. Effort expectancy has a positive impact on customers' intention to use AI-powered banking services.

### *Social Influence*

Social influence refers to the impact of influential individuals on a user's intention to adopt a technology. Yu (2012) found that social influence was the most influential variable in users' intention to adopt mobile banking. However, other studies have not found social influence to be a significant predictor of intention to adopt e-banking (Mhlanga & Langerman, 2024). Based on these findings, the following hypothesis is proposed:

> H3. Social influence has a positive impact on customers' intention to use AI-powered banking services.

### *Trust*

Trust refers to the perceived mutual reliability and dependability between the parties involved in a transaction. Trust is a crucial factor in banking transactions (Skvarciany & Jurevičienė, 2018) and has been found to have a positive impact on the intention to use technology (Merhi et al., 2019). In a study of individuals' intention to adopt chatbots in banking, Yadav et al. (2024) found that trust had a positive effect on their intention. As trust is most important in technology adoption in the case of relatively modern technologies, including AI, the following hypothesis is proposed:

> H4. Trust has a positive impact on customers' intention to use AI-powered banking services.

### *Perceived Risk*

Perceived risk refers to consumers' perception of the potential negative outcome of using a modern technology. Prior research has found that perceived risk negatively affects users' intention to adopt advanced technologies in banking services, such as the internet and mobile banking (Bashir & Madhavaiah, 2015). Thus, the following hypothesis is proposed:

> H5. Perceived risk has a negative impact on customers' intention to use AI-powered banking services.

## METHODOLOGY

The current study used a quantitative method to evaluate the proposed model. The study population consists of Saudi bank customers who were at least 18 years old at the time of the study. Convenience sampling was used to collect survey data from a sample of 350 respondents via a survey shared on social media platforms. The answers of twenty-seven respondents were excluded due to incompleteness. Thus, the final sample consisted of 323 respondents. All respondents gave their consent to participate before completing the online survey.

### Instrument

The first section of the questionnaire asked respondents to provide basic demographic information, such as age, gender, and education. The second section presented the measurement scales of the study variables. Likert-type scales (1 = strongly disagree; 5 = strongly agree) were used for all measurement scales.

All the scales were adapted from the extant literature. Performance expectancy (4 items), effort expectancy (4 items), and social influence (3 items) were measured using scales adopted from Venkatesh et al. (2003). Trust was measured using a 3-item scale adapted from Noh and Lee (2016). Perceived risk was measured using a 3-item scale adapted from Featherman and Pavlou (2003). Use intention was measured using a 3-item scale adapted from Bryson et al. (2015).

The survey was first developed in English, then translated into Arabic, and finally back translated into English. Two marketing academics assessed the face validity of the survey and provided feedback to enhance its quality. The revised survey was pretested with fifteen participants, who

confirmed its appropriateness and clarity. When responding to the questionnaire, participants were instructed to consider common AI-enabled banking services, such as chatbots, virtual assistants, AI-based customer support, automated financial advice, and intelligent transaction services.

### Analysis

SPSS and AMOS were used to evaluate the proposed model of interrelationships between performance expectancy, effort expectancy, social influence, trust, perceived risk, and customers' intention to use AI-powered banking services. Composite reliability (CR) and Cronbach's alpha were used to assess construct reliability. The Fornell-Larcker criterion and heterotrait-monotrait ratio (HTMT) were used to test the discriminant validity of the constructs. Finally, the Comparative Fit Index (CFI), Normed Fit Index (NFI), Root Mean Square Error of Approximation (RMSEA), and $\chi 2$/df were used to evaluate model fit.

## RESULTS

As shown in Table 1, 58% of respondents were female, and 42% were male. Regarding age, 7% of respondents were 18 to 24 years old, 19% were 25 to 34 years old, 20% were 35 to 44 years old, 19% were 45 to 54 years old, 15% were 55 to 64 years old, and 20% were 65 years old or older. In terms of education, most respondents had a bachelor's degree or higher.

Table 1
*Respondents' demographics*

| Demographic | Number of Participants |
|---|---|
| **Gender** | |
| Male | 136 |
| Female | 187 |
| **Age** | |
| 18-24 | 22 |
| 25-34 | 60 |
| 35-44 | 67 |
| 45-54 | 62 |
| 55-64 | 48 |
| 65 and above | 64 |
| **Education** | |
| High school, no diploma | 8 |
| High school | 43 |
| College | 66 |
| Associate's degree | 37 |
| Bachelor's degree | 96 |
| Master's degree | 53 |
| Doctoral or professional degree | 20 |

As shown in Table 2, Cronbach's alpha and CR for all constructs exceeded the recommended value of 0.70. The average variance extracted (AVE), as shown in Table 2, ranged from 0.77 to 0.89, exceeding the recommended value of 0.50, thereby providing evidence of convergent validity. Although some constructs exhibit high AVE values, this reflects strong convergence among items rather than redundancy. All measurement items were adapted from well-established and previously validated scales and were retained in their original form to preserve content validity. Moreover, the evidence from the Fornell-Larcker criterion and HTMT ratios confirms that the constructs remain empirically distinct, indicating that the high AVE values do not compromise discriminant validity. Specifically, the AVE square root of each construct is greater than the correlation of that construct with other constructs. The HTMTs of the constructs were less than 0.90. These findings provide evidence of the constructs' discriminant validity. Although some constructs exhibit high correlations, this pattern is common among theoretically related variables in UTAUT-based models.

Table 2
*Construct reliability and convergent validity*

| Construct | Cronbach's Alpha | Composite reliability | Average Variance Extracted (AVE) |
|---|---|---|---|
| Effort expectancy | 0.930 | 0.931 | 0.772 |
| Performance expectancy | 0.943 | 0.944 | 0.807 |
| Perceived risk | 0.941 | 0.941 | 0.842 |
| Social influence | 0.959 | 0.959 | 0.885 |
| Trust | 0.944 | 0.945 | 0.851 |
| Use intention | 0.959 | 0.960 | 0.888 |

Table 3
*Fornell-Larcker criterion*

| Construct | Effort Expectancy | Performance Expectancy | Perceived Risk | Social Influence | Trust | Use Intention |
|---|---|---|---|---|---|---|
| Effort expectancy | 0.879 | | | | | |
| Performance expectancy | 0.831 | 0.898 | | | | |
| Perceived risk | −0.441 | −0.523 | 0.918 | | | |
| Social influence | 0.713 | 0.792 | −0.645 | 0.941 | | |
| Trust | 0.794 | 0.880 | −0.584 | 0.859 | 0.923 | |
| Use intention | 0.809 | 0.875 | −0.608 | 0.828 | 0.886 | 0.942 |

Multicollinearity concerns were evaluated through discriminant validity assessments using the Fornell-Larcker criterion and HTMT ratios, both of which fell within acceptable thresholds. These results suggest that the constructs remain empirically distinguishable and that multicollinearity is unlikely to bias the structural path estimates. Detailed discriminant validity statistics are reported in Table 3 and 4. In addition, supplementary collinearity diagnostics indicated that variance inflation factor (VIF) values for the structural predictors were within acceptable thresholds, further confirming that multicollinearity does not bias the estimated relationships.

## Model Fit

The results show that the data fit the proposed model adequately. Specifically, $\chi^2/df = 2.06$, meeting the recommended value of < 3; GFI = 0.91, meeting the recommended value of > 0.90; AGFI = 0.88, meeting the recommended value of > 0.80; NFI = 0.961, meeting the recommended value of > 0.90; and RMSEA = 0.058, meeting the recommended value of < 0.08.

## Hypothesis Testing

As summarised in Table 5, all hypothesised relationships were statistically significant and in the expected directions. Performance expectancy was found to have a positive

Table 4
*Heterotrait-monotrait ratio (HTMT)*

| Construct | Effort Expectancy | Performance Expectancy | Perceived Risk | Social Influence | Trust |
|---|---|---|---|---|---|
| Performance expectancy | 0.830 | | | | |
| Perceived risk | 0.439 | 0.517 | | | |
| Social influence | 0.717 | 0.789 | 0.657 | | |
| Trust | 0.792 | 0.881 | 0.593 | 0.857 | |
| Use intention | 0.813 | 0.874 | 0.607 | 0.841 | 0.895 |

Table 5
*Structural model results and hypothesis testing*

| Hypothesis | Path | β | p-value |
|---|---|---|---|
| H1 | Performance expectancy → Use intention | 0.323 | < 0.001 |
| H2 | Effort expectancy → Use intention | 0.215 | < 0.005 |
| H3 | Social influence → Use intention | 0.139 | < 0.05 |
| H4 | Trust → Use intention | 0.335 | < 0.001 |
| H5 | Perceived risk → Use intention | −0.110 | < 0.005 |
| H1 | Performance expectancy → Use intention | 0.323 | < 0.001 |

effect on customers' intention to use AI-powered banking services (β = 0.323, $p < 0.001$), supporting H1. H2, which proposed that effort expectancy has a positive effect on customers' intention to use AI-powered banking services, was also supported, with β = 0.215 ($p < 0.005$). H3 proposed that social influence has a positive effect on customers' intention to use AI-powered banking services, and the results support this hypothesis as well (β = 0.139, $p < 0.05$). H4 proposed that trust has a positive effect on customers' intention to use AI-powered banking services, and the results support this hypothesis, with β = 0.335 ($p < 0.001$). Finally, H5 proposed that perceived risk has an adverse effect on customers' intention to use AI-powered banking services, which the results also support (β = −0.110, $p < 0.005$).

## DISCUSSION

A comparison of the standardised path coefficients provides additional insight into the relative importance of the predictors of AI-powered banking adoption. Trust emerged as the strongest determinant of use intention (β = 0.335), followed closely by performance expectancy (β = 0.323), highlighting the significant role of confidence in AI systems and perceived functional benefits. Effort expectancy exerted a moderate effect (β = 0.215), suggesting that ease of use remains important but secondary to trust and performance considerations. Social influence showed a smaller yet statistically significant effect (β = 0.139), indicating a supportive rather than dominant role. As expected, perceived risk negatively influenced use intention (β = −0.110), reinforcing its role as a barrier to rather than a primary driver of adoption. Regarding perceived risk, the negative effect on use intention suggests that Saudi customers remain sensitive to potential uncertainties associated with AI-powered banking. In the local banking context, such risk perceptions are likely to stem from concerns related to data privacy, cybersecurity, automated decision-making, and the use of personal financial information by intelligent systems. Although perceived risk was modelled as a direct predictor in the current study, it is plausible that trust may partially mitigate these concerns by reducing customers' uncertainty and perceived vulnerability. Exploring the specific dimensions of perceived risk and the potential indirect role of trust represents a promising avenue for future research.

### Theoretical Implications

AI-powered services are increasingly offered by service providers across various sectors, including banking, with many banks adopting AI in their operations and customer service. Despite the revolutionary features introduced by incorporating AI into banking services, the customer acceptance of AI-powered banking remains to be fully explored. To assess users' acceptance of AI in banking, this study used the UTAUT model, proposed by Venkatesh et al. (2003), to explain users' behavioural intention towards AI technologies. The results of the current study indicate that

trust had the most significant effect on customers' intention to use AI-powered banking services, followed by performance expectancy, effort expectancy, and social influence. On the other hand, perceived risk, as hypothesised, had a negative effect on customers' intention to use AI-powered banking services. This result could be attributed to the growing importance of the financial aspect of banking services, as well as increasing customer sensitivity regarding the security of their transactions. The results of the current study align with those of previous studies, including those by Rahi et al. (2018), Nguyen et al. (2020), Yu (2012), and Yadav et al. (2024).

Theoretically, the current study adds to our knowledge by examining the UTAUT model to explain Saudi customers' acceptance of AI-powered banking services. The UTAUT model proved to be appropriate for explaining Saudi customers' intention to adopt these services. Another theoretical contribution of the current study is its expansion of the UTAUT model to include trust and perceived risk as factors affecting customers' intention to use AI-powered banking services. The UTAUT factors of performance expectancy, effort expectancy, and social influence, as well as the additional factors of trust and perceived risk, were found to influence customer acceptance.

Trust emerged as the most influential determinant positively shaping customers' behavioural intentions towards AI-powered banking services. Accordingly, it is essential for financial institutions to proactively disclose their AI usage policies, emphasising transparency, accountability, and ethical data handling to foster customer confidence and credibility. Additionally, targeted educational initiatives are recommended to enhance customers' understanding and perception of AI, which can significantly improve trust and facilitate broader adoption. Performance expectancy was identified as the second most significant predictor of AI banking adoption, underscoring the need for banks to prioritise efficiency, responsiveness, and functionality in their AI applications. This predictor was followed by effort expectancy and social influence, reinforcing the importance of designing AI interfaces that are intuitive, user-friendly, and accessible to a wide demographic. Furthermore, social influence was found to play a supportive role in shaping customers' intentions, suggesting that peer endorsements and social norms can complement, rather than dominate, individual evaluations of AI-powered banking services. The study also revealed that perceived risk exerts a negative impact on customers' intention to adopt AI-enabled banking technologies. Therefore, reducing perceived risk through enhanced cybersecurity measures, robust privacy safeguards, and customer assurance mechanisms is vital for promoting trust and reducing resistance. Overall, these findings underscore the multifaceted nature of technology acceptance in the context of AI banking and suggest a strategic approach for banks seeking to enhance customer adoption rates.

### Practical Implications

The findings of this study yield several practical insights for banking institutions and policymakers aiming to facilitate the adoption of AI-powered services in Saudi Arabia and similar emerging economies. Most notably, the dominant role of trust as a predictor of behavioural intention emphasises the urgent need for banks to establish transparent AI usage policies and to actively communicate their ethical and secure handling of customer data. Practical steps may include publishing clear AI governance frameworks, embedding explainability features into AI systems, and offering customer assurance mechanisms. Furthermore, banks should invest in public education initiatives, such as digital literacy workshops, instructional videos, and in-app tutorials, which help demystify AI technologies and foster greater user confidence. These initiatives not only reduce psychological barriers but also strengthen user engagement and acceptance.

Additionally, enhancing the perceived performance of AI systems is crucial. Banks should focus on delivering services that are not only fast and dependable but also personalised and contextually relevant, reinforcing customers' perception that AI enhances service quality and convenience. Simplifying system interfaces to reduce cognitive load will help address concerns about effort expectancy, particularly for users with limited technological experience. The findings also suggest that social influence plays a non-trivial role in shaping customer decisions. Therefore, banks may benefit from strategies such as influencer engagement, referral programs, or testimonials that leverage trusted social networks to encourage adoption.

Finally, the negative impact of perceived risk on adoption intention highlights the importance of proactively addressing security concerns. Visible cybersecurity features, third-party certifications, and transparent privacy policies can help mitigate user concerns. In sum, a multi-faceted implementation strategy that prioritises trust, usability, social influence, and risk reduction is crucial for banks seeking to integrate AI technologies into mainstream financial services successfully. These practical implications can inform managerial decisions and policy design in the broader context of digital transformation and financial inclusion.

## CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH

This study examined the factors that affect customers' intention to use AI-powered banking. Using UTAUT, the results show that trust, performance expectancy, effort expectancy, and social influence had positive effects, while perceived risk had a negative effect, on AI-powered banking use intention. Understanding the factors that affect AI-powered banking use intention can help banks develop their AI-powered banking services in a way that appeals to customers.

Although the current study sheds light on customers' acceptance of AI-powered banking services, the results apply only to Saudi customers.

Thus, future research should replicate this study in other countries. The use of convenience sampling through online platforms may also limit the generalisability of the findings beyond the sampled respondents; future studies could employ probability-based or mixed sampling approaches to enhance external validity. In addition, the current study expanded the UTAUT model by incorporating trust and perceived risk as factors influencing customers' intention to use AI-powered banking services. Future studies may consider adding other factors, such as innovativeness, to the model to deepen our understanding of customers' intentions regarding the use of AI-powered banking services. In addition, future research could examine potential moderating variables, such as age, digital literacy, and prior experience with AI technologies, and employ alternative research designs, including longitudinal or experimental approaches, to further extend the current findings.

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# Reading Javanese Ethics in Design Practice: A Hermeneutic Analysis of Serat Wulangreh on Humanity, Empathy, and Tolerance

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## ABSTRACT

Ethical issues in contemporary visual communication design practice increasingly demand a reflective approach that goes beyond the procedural guidelines and rhetoric of human-centred design. While empathy and inclusivity are often considered the foundations of design ethics, the cultural assumptions and interpretive limits of these concepts are usually under-examined. This study aims to explore how ethical reflection in design practice can be enriched through dialogue with culturally rooted moral traditions by examining Serat Wulangreh, a 19th-century Javanese literary manuscript. This study uses a hermeneutic approach to selected verses to identify the ethical orientations expressed in *Serat Wulangreh*'s moral teachings. The analysis is supported by consultations with a Javanese cultural expert and a Javanese literary academic to maintain the accuracy of the historical and cultural context. The results reveal three dominant ethical orientations: humanity, empathy, and tolerance, understood as ethical dispositions based on inner discipline, relational awareness, and moral restraint in the context of Javanese court culture. Rather than offering a normative ethical transference, this study positions Serat Wulangreh as a contextual ethical interlocutor that complements contemporary design ethics discourse by emphasising intention, power awareness, and self-restraint. This study contributes to the study of communication and design ethics by demonstrating how non-Western moral texts can enrich ethical reflection through a dialogical approach sensitive to cultural context.

*Keywords:* Cultural communication, empathy and tolerance in visual communication, ethical meaning-making, *serat wulangreh*, visual communication ethics

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## INTRODUCTION

Ethical issues in contemporary visual communication design have become increasingly visible as design practices play a decisive role in shaping meaning, emotion, and public behaviour through persuasive and symbolic strategies. Design is no longer understood merely as an aesthetic or technical activity but as a social practice embedded in moral intention, power relations, and social consequences (Auxtova et al., 2021; Aylsworth, 2022; Kane, 2010; Parsons, 2015). Empirical studies in advertising and digital communication further demonstrate that manipulative visual strategies, hyperbolic claims, and affective persuasion may undermine audience autonomy, marginalise vulnerable groups, and provoke public controversy despite regulatory oversight (Akmal et al., 2024; Ferrucci & Schauster, 2024; Kim et al., 2021; Paradis et al., 2020). These recurring cases suggest that ethical problems in visual communication design cannot be resolved solely through regulation, technological intervention, or procedural compliance.

In response to such challenges, human-centred design and design thinking have been widely promoted as ethical and operational frameworks that emphasise empathy, inclusivity, and social responsibility (Foster, 2021; Liedtka & Locatelli, 2023; Thomas et al., 2020). These approaches have contributed to greater sensitivity towards user needs and participatory processes in design practice. However, critical scholarship points out that empathy and tolerance within these frameworks are often treated as methodological tools, assumed to be universal, ahistorical, and culturally neutral, thereby obscuring power relations, moral intention, and symbolic authority embedded in design practices (Horton, 2021; Leary et al., 2022; Li & Hölttä-Otto, 2022). As a result, ethical reflection risks remaining procedural rather than interrogating how designers position themselves ethically within complex social contexts.

This limitation has prompted scholars to seek alternative ethical perspectives that can enrich design ethics without imposing prescriptive norms. Rather than proposing universal ethical principles, recent work in design ethics and cultural studies emphasises the value of contextual and culturally situated moral traditions as dialogical partners in ethical reflection (Parsons, 2015; Pata, 2021). Within this context, *Serat Wulangreh*, a 19$^{th}$-century Javanese didactic manuscript composed by Pakubuwono IV in *macapat* poetic form, presents a compelling yet underexplored site of inquiry. The text articulates ethical orientations through metaphor, symbolic language, and disciplined inner conduct within the moral and political structure of the Javanese court. Previous studies have predominantly examined *Wulangreh* in relation to character education, leadership, moral philosophy, and Javanese cultural values (Ismawati et al., 2022; Ismawati & Anindita, 2020; Panani, 2019;

Zuhri, 2017). while its potential contribution to contemporary discussions on design ethics and visual communication remains largely unexplored.

Importantly, this absence does not imply that *Serat Wulangreh* offers ready-made ethical solutions for modern design practice. Instead, it raises a critical question: what happens when an eighteenth to nineteenth-century Javanese moral text encounters contemporary ethical concerns in the design of visual communication? Addressing this question requires moving beyond validation or moral alignment and towards a dialogical engagement between distinct ethical worlds. Accordingly, this study positions *Serat Wulangreh* not as a normative guide for design practice, but as an ethical interlocutor that enables reflective dialogue with contemporary design ethics discourse.

Using a contextual hermeneutic approach, this study examines how orientations towards humanity, empathy, and tolerance are articulated in selected *pupuh* (stanza) of *Serat Wulangreh* and reflects on their relevance for understanding ethics in visual communication design as a practice grounded in self-discipline, relational awareness, and moral restraint. Rather than assuming harmony between Javanese moral philosophy and modern design frameworks, this study explores points of resonance and tension, thereby contributing to communication and design ethics scholarship through a culturally sensitive, historically grounded perspective.

## LITERATURE REVIEW

### Design Ethics, Persuasion, and Moral Responsibility in Visual Communication

Research on design ethics and visual communication has consistently emphased that design practices are not value-neutral but actively shape meaning, perception, and social behaviour through persuasive and symbolic strategies. Scholars argue that ethical problems in design often arise from asymmetrical power relations and the capacity of visual communication to influence audiences beyond conscious awareness (Kane, 2010; Parsons, 2015). Studies in advertising and digital media further demonstrate how affective persuasion, emotional manipulation, and commercial imperatives can undermine audience autonomy and reproduce social inequalities, even when designs comply with professional regulations (Akmal et al., 2024; Auxtova et al., 2021; Aylsworth, 2022; Ferrucci & Schauster, 2024). These findings suggest that ethical concerns in visual communication design extend beyond technical execution and require deeper reflection on moral intention and symbolic authority.

In response, ethical frameworks within design studies increasingly foreground responsibility, accountability, and social impact. Design ethics scholarship emphasises the need for reflective judgment rather than procedural compliance, particularly in contexts involving vulnerable audiences and persuasive communication (Devon & Van de Poel, 2004; Hoffenson et al., 2013).

However, while these frameworks identify ethical risks, they often remain abstract and lack culturally grounded perspectives that address how moral orientation is formed within specific social traditions.

## Empathy, Human-centred Design and their Limitations

Human-centred design and design thinking have emerged as influential approaches that operationalise ethics through empathy, participation, and user-oriented problem-solving (Foster, 2021; Liedtka & Locatelli, 2023; Thomas et al., 2020). These approaches posit empathy as a moral capacity that enables designers to understand user needs and mitigate harm. Empirical studies suggest that participatory methods can enhance social sensitivity and inclusivity in design practice. Nevertheless, critical scholarship cautions that empathy within these frameworks is frequently instrumentalised as a methodological step rather than examined as an ethical disposition.

Several studies argue that empathy in design is often treated as universal, psychologically oriented, and culturally neutral, thereby masking power relations and privileging the designer's interpretive authority (Leary et al., 2022; Li & Hölttä-Otto, 2022). Horton (2021) further contends that tolerance and inclusivity in design discourse are frequently framed as normative ideals, with insufficient attention to conflict, moral restraint, or social consequences. These critiques highlight the need to reconsider empathy and tolerance as context-dependent ethical orientations rather than transferable techniques.

## Contextual Ethics and Culturally Situated Moral Traditions

Recent scholarship in design ethics and cultural studies has called for greater engagement with culturally situated moral traditions to enrich ethical reflection in design practice. Rather than seeking universal ethical principles, scholars emphasise dialogical approaches that recognise ethical reasoning as historically and culturally embedded (Parsons, 2015; Pata, 2021). Social design studies further underscore that ethical judgment emerges through relational awareness, power negotiation, and sensitivity to local values (Gutiérrez & Jurow, 2016; Shinohara, 2012). Within this perspective, ethical reflection is understood as a situated practice shaped by moral traditions rather than abstract rules.

In Southeast Asian and Indonesian scholarship, *Serat Wulangreh* has been examined primarily as a moral and educational text within Javanese court culture. Studies highlight its role in character formation, leadership ethics, self-discipline, and social harmony through symbolic and poetic instruction (Ismawati et al., 2022; Ismawati & Anindita, 2020; Panani, 2019; Zuhri, 2017). However, these studies rarely engage *Wulangreh* in dialogue with contemporary design ethics or visual communication, leaving its potential relevance for modern ethical debates largely unexplored.

### Positioning *Serat Wulangreh* as an Ethical Interlocutor

Building on these gaps, recent interdisciplinary work suggests that traditional moral texts need not function as normative guides to be relevant for contemporary ethical reflection. Instead, they can serve as ethical interlocutors that introduce alternative ways of thinking about humanity, empathy, and restraint (Parsons, 2015; Pata, 2021). This study adopts this position by engaging *Serat Wulangreh* not as a source of design principles, but as a dialogical partner that complicates, questions, and enriches dominant ethical assumptions in visual communication design.

By situating *Wulangreh* alongside design ethics literature, this research responds directly to calls for culturally grounded, reflective, and non-prescriptive approaches to ethics in design. The literature thus points to the need for a hermeneutic engagement that allows ethical tension, historical difference, and cultural specificity to remain productive rather than be prematurely resolved.

## METHODS

This research focusses on the interpretation of ethical orientation in *Serat Wulangreh* and its relevance for the ethics of visual communication design. The material object of the study is *Serat Wulangreh*, which contains moral teachings in the form of 13 Javanese *macapat* songs: *Dhandanggula, Kinanthi, Gambuh, Pangkur, Maskumambang, Megatruh, Durma, Wirangrong, Pucung, Mijil, Asamaradana, Sinom, and Girisa*. The unit of analysis for this research is selected stanzas that explicitly articulate moral values, represented through ethical terms and metaphors in Javanese. The analysis focusses on the relationship between ethical expressions in the text, the cultural-historical context of the Javanese palace, and its implications for ethical reflection in contemporary visual communication design practices.

This research was designed as an interpretive qualitative study with a hermeneutic approach. This type of qualitative research was chosen because the research objective was not to measure or test the relationship between variables, but rather to understand the ethical meaning contained in the text and its relevance to the context of visual communication design. The hermeneutic approach was used to interpret *Serat Wulangreh* as a moral text whose meaning is shaped by the relationships among language, historical-cultural context, and the interpreter's horizon (Parsons, 2015; Pata, 2021). This approach allows for a reflective reading that is not normative but dialogical, positioning *Serat Wulangreh* as an ethical interlocutor that enriches understanding of design ethics in the context of visual communication (Foster, 2021; Leary et al., 2022).

The data types in this study consist of primary and secondary data. Primary data is the Serat Wulangreh text, analysed through selected stanzas that contain ethical teachings, particularly the values of humanity, empathy, and tolerance. This

data was obtained from the manuscript and the transliterated edition of *Serat Wulangreh*, which were consistently used as the primary references for the study. Secondary data includes literature on design ethics and visual communication, hermeneutic studies, and previous research on *Serat Wulangreh* and Javanese literature. In addition, supporting data were obtained through in-depth interviews with a Javanese cultural expert (expert 1) and a Javanese literary academic (expert 2), who served as interpretive sources to strengthen the understanding of the cultural context and limit the subjectivity of interpretation.

This research's analytical model employs hermeneutic analysis, integrating textual reading, contextual interpretation, and conceptual dialogue with design ethics. The analysis begins with a close reading of selected poems from *Serat Wulangreh* to identify the terms and structures of ethical teachings in Javanese. This stage is followed by a contextual interpretation that links the text to its Javanese cultural and moral background through the hermeneutic circle, namely, the iterative dialogue among textual parts, the overall meaning, and the interpreter's horizon (Boell & Cecez-Kecmanovic, 2014; Parsons, 2015). Next, the identified ethical orientations are placed in reflective dialogue with design and visual communication literature to assess conceptual resonance (Foster, 2021; Kane, 2010; Leary et al., 2022; Pata, 2021). Validity is strengthened through interpretive triangulation with expert perspectives as a cultural context control.

## RESULTS AND DISCUSSION

### Humanity as Inner Discipline and Ethical Orientation of Action

The analysis shows that *Serat Wulangreh* positions humanity as an inner discipline that precedes social action, as summarised in Table 1. *Kinanthi* stanza 1 and *Durma* stanza 1 state that ethics are not taught through normative rules or explicit prohibitions, but rather through the formation of self-control practices (*ngendhaleni hawa nepsu*), so that humans do not live according to instinctive urges that are analogous to those of stupid animals (*kebo*). This perspective views humanity in *Wulangreh* as an internal moral readiness that shapes how a person acts, speaks, and positions themselves in social relations.

*Wulangreh* emphasises that arrogance stemming from physical strength, power, and intelligence (*adigang, adigung, adiguna*) is the primary source of ethical failure. At the same time, humility (*andhap asor*) is positioned as a moral buffer that maintains the balance of relationships (*Gambuh* stanzas 4-6). Humanitarian values are also manifested through the concept of devotion, namely the awareness of preserving social relations responsibly, where violations of these relations are understood as ethical failures, not merely personal mistakes (*Maskumambang* stanzas 5; 7-9; 18). These findings show that humanity in *Wulangreh* is always tied to social structures and positional awareness, as summarised in Table 1.

This interpretation is supported by the views of experts who assert that *Wulangreh*

Table 1
*Human values as inner discipline in Serat Wulangreh*

| Interpretation of Songs and Stanzas | Design Ethics | Expert 1 | Expert 2 |
|---|---|---|---|
| Ethics is taught as inner control (*ngendhaleni hawa nepsu*) so that humans do not live following instincts (*kebo*) (*Kinanthi* stanza 1; *Durma* stanza 1). | Ethics precedes the act of design as a reflection of intention, not simply procedure (Foster, 2021; Leary et al., 2022). | *Wulangreh* teaches a sense of self-control and knowing limits, not rules of dos and don'ts. | *Wulangreh* ethics are reflective and symbolic, not legalistic. |
| Arrogance (*adigang, adigung, adiguna*) is positioned as a source of moral destruction; humility (andhap asor) becomes an ethical buffer (*Gambuh* stanzas 4-6). | Humility corrects the dominance of designer authority in human-centred design (Liedtka & Locatelli, 2023; Thomas et al., 2020). | Javanese ethics assess maturity from the ability to restrain oneself and be humble. | *Andhap asor* is the axis of Javanese personal ethics, grounded in self-mastery. |
| Humanity is manifested through devotion to others; the violation of this relationship is seen as an ethical failure (*Maskumambang*, stanzas 5, 7-9, 18). | Design responsibility is understood as moral accountability (Devon & Van de Poel, 2004; Hoffenson et al., 2013). | *Wulangreh* ethics maintain order through awareness of social position. | Personal ethics are always intertwined with the palace's power structure. |

does not teach morality as a set of rules on what is permissible or not, but rather forms character so that a person "knows himself and knows his limits" (expert 1). Ethics is understood as a reflective and symbolic practice that works from within to maintain social order within the palace's hierarchical order (expert 2). In dialogue with the design ethics literature, this interpretation of humanity as an inner discipline resonates with criticisms of design ethics approaches that are overly procedural and fail to adequately examine the designer's intentions and moral orientation (Foster, 2021; Kane, 2010; Parsons, 2015). Thus, *Wulangreh* enriches the ethics of visual communication design by positioning humanity as a reflective orientation before any persuasive action is taken.

## Empathy as Moral Vigilance and Control of Power Relations

As summarised in Table 2, research shows that empathy in *Serat Wulangreh* is not interpreted as emotional or affective empathy, but rather as moral awareness of the impact of actions and power relations. The teachings of *tepa sarira* emphasise the importance of weighing one's actions against oneself to avoid harming others (*Asmaradana* stanza 11). Empathy is primarily directed towards those in power through the prohibition against burdening commoners and the encouragement to yield for the sake of a sustainable communal life (*Asmaradana* stanzas 23-24). Within this framework, empathy functions as an ethical mechanism to restrain domination and prevent arbitrariness.

Table 2
*The value of empathy as moral awareness and power awareness in Serat Wulangreh*

| Interpretation of Songs and Stanzas | Design Ethics | Expert 1 | Expert 2 |
|---|---|---|---|
| Empathy is taught as tepa sarira, namely measuring actions with oneself and avoiding hurting others (*Asmaradana* stanza 11). | Empathy is understood as an ethical awareness of the relational impacts of design, not simply an emotional understanding of users (Kamińska et al., 2023; Li & Hölttä-Otto, 2022). | *Tepa sarira* means thinking about the impact on others before acting, not getting carried away by feelings. | Javanese empathy is closer to moral reflexivity than modern psychological empathy. |
| A leader's empathy is demonstrated by prohibiting the burdening of commoners and by recommending prioritising others for the sake of the people's continued lives (*Asmaradana*, stanzas 23-24). | Strengthening criticism of designs that ignore power inequalities and social burdens on vulnerable groups (Gutiérrez & Jurow, 2016). | Empathy in *Wulangreh* primarily targets those in power to prevent them from acting arbitrarily. | Empathy serves as an ethical brake in hierarchical power relations. |
| Collective empathy is manifested *through golong-gilig* (*rukun lan manunggal pamikir*), emphasising togetherness and mutual support (Pucung stanza 4-5). | Affirming empathy as relational awareness in social and community design practices (Gutiérrez & Jurow, 2016). | Harmony makes the burdens of life feel lighter because they are carried together. | Javanese relational ethics places togetherness above individual expression. |
| Abuse of power is prohibited through the teachings of *aja dumeh* and careful language (gemi ing lathi) (*Wirangrong* stanza 6). | Empathy is associated with awareness of the designer's position and responsibility in power relations (Shinohara, 2012). | *Aja dumeh* is a stern warning for those in power not to belittle others. | *Aja dumeh* functions as a mechanism for controlling symbolic and social domination. |

The collective dimension of empathy is also manifested through the principle of *golong-gilig*, which emphasises togetherness and unity of thought in facing life's burdens together (*Pucung* stanzas 4-5). In addition, the teachings of aja dumeh and careful language (*gemi ing lathi*) function as a control over symbolic power so that it is not used to demean or harm others (*Wirangrong* stanza 6). All of these empathetic orientations show that empathy in *Wulangreh* is reflective and preventative.

Experts' perspectives reinforce this interpretation by asserting that Javanese empathy is closer to moral reflexivity than modern psychological empathy. *Tepa sarira* is understood as the habit of thinking about social impact before acting, especially for those in dominant positions (expert 1). The teaching of *aja dumeh* is seen as a mechanism for controlling symbolic domination in hierarchical relations (expert 2). This interpretation of empathy deepens the critique of empathy in human-centred

Table 3
*The value of tolerance as a strategy for social harmony in Serat Wulangreh*

| Interpretation of Songs and Stanzas | Design Ethics | Expert 1 | Expert 2 |
|---|---|---|---|
| Tolerance is described as a broad mind (*jembar ing ati*) which is able to accommodate differences without excessive emotional reactions (*pindha segara*) (*Pucung* stanza 12). | Tolerance is understood as the control of judgment and emotions in responding to the diversity of design audiences (Horton, 2021; Sandman et al., 2022). | Javanese tolerance emphasises patience to prevent conflicts from escalating, but it does not mean agreeing with everything. | Tolerance functions as a strategy to maintain harmony, not solely because of rights. |
| The prohibition against criticising or belittling others (*aja mamaoni*) emphasises refraining from open moral judgment (*Durma* stanzas 5-7). | Avoiding design practices that are judgmental or reinforce social stigma (Hoffenson et al., 2013). | Criticism is easy to do, but it damages social relationships. | Withholding judgment is an ethical mechanism for maintaining social stability. |
| Careful language (*gemi ing lathi*) is positioned as a form of tolerance in social interactions (*Wirangrong* stanza 6). | Relevant to the ethics of design communication that avoids symbolic violence and language exclusion (Shinohara, 2012). | Holding back opinions is vital to avoid hurting other people's feelings. | Language functions as a medium of power that must be controlled ethically. |
| The suggestion to hide intelligence (*pintere den alingi*) functions to protect feelings and prevent symbolic domination (*Sinom* stanza 1). | Reminding designers to refrain from symbolic superiority and professional expertise (Pata, 2021). | Intelligent people should not show off to maintain a harmonious atmosphere. | This ethical strategy suppresses symbolic hierarchies in social relations. |

design, which is often instrumental and risks reproducing the designer's perspective (Horton, 2021; Kamińska et al., 2023; Li & Hölttä-Otto, 2022). Thus, Wulangreh offers an empathetic orientation that emphasises the limitations of power and relational responsibility in the practice of visual communication design.

## Tolerance as an Ethical Strategy to Maintain Social Harmony

Tolerance in *Serat Wulangreh*, as presented in Table 3, is positioned as an ethical strategy for maintaining social harmony through self-control and restraint of judgment. Tolerance is described as an inner spaciousness (*jembar ing ati*) that can accommodate differences without excessive emotional reactions, analogous to the vastness of the ocean (*pindha segara*) (*Pucung* stanza 12). This interpretation indicates that tolerance does not function as a normative affirmation of all differences, but rather as a practice of self-restraint to prevent open conflict.

The prohibition against criticising or belittling others (*aja mamaoni*) emphasises

the importance of withholding open moral judgment to maintain social relations (*Durma* stanzas 5-7). Careful language (*gemi ing lathi*) is positioned as a symbolic practice of tolerance that prevents social injury in everyday interactions (*Wirangrong* stanza 6). The recommendation to *pintere den alingi* emphasises concealing one's intelligence as an ethical strategy to avoid symbolic domination and protect the feelings of others (*Sinom* stanza 1). These overall orientations emphasise tolerance as a mechanism for stabilising social relations, as summarised in Table 3.

Experts interpret Javanese tolerance as an effort to maintain social harmony and stability within a hierarchical order. Patience and openness of mind are seen as more important than overt expressions of judgment (expert 1). At the same time, concealing intelligence is understood as a way to suppress symbolic hierarchies to maintain social balance (expert 2). This perspective resonates with criticisms in the design literature that highlight the tendency to treat tolerance abstractly and ahistorically, without considering power relations and the risk of stigma (Hoffenson et al., 2013; Sandman et al., 2022). Tolerance in *Wulangreh* enriches design ethics by emphasising moderation, symbolic prudence, and the sustainability of social relations.

The results of this study indicate that humanity, empathy, and tolerance in *Serat Wulangreh* function as ethical orientations rooted in inner discipline, relational awareness, and self-control. These values do not exist as ready-to-apply normative principles, but rather as reflective lenses for understanding intention, power, and the social consequences of actions. In dialogue with the design ethics literature, *Wulangreh* complements the human-centred design and design thinking frameworks with a reflective dimension that emphasises moral intention, power limitation, and self-restraint as the ethical foundations of visual communication design practice (Foster, 2021; Parsons, 2015; Pata, 2021).

In relation to design, *Serat Wulangreh* constructs an ethical framework that serves as a reflective orientation before action, rather than as a set of normative rules ready to be implemented. Humanity is positioned as an inner discipline that cultivates intention and self-control before taking persuasive action. Empathy is understood as moral awareness of power relations and social impacts, while tolerance functions as a symbolic control strategy to maintain harmony and stability in social relations.

This orientation forms an ethics that works preventively and reflectively, in line with criticisms in the design ethics literature against approaches that are too procedural and solution-oriented. In the context of visual communication design, *Wulangreh* serves as an ethical interlocutor, enriching human-centred design and design thinking with dimensions of awareness of intention, power limitation, and self-restraint. The primary significance of this research lies in its contribution to expanding design ethics in a more contextual, cultural, and reflective direction, without shifting design practice, but rather complementing it through dialogue across moral traditions.

## CONCLUSION

### Findings

This research shows that *Serat Wulangreh* can be read productively as a source of contextual ethical reflection that enriches the ethical discourse in contemporary visual communication design practice. Through a contextual hermeneutic approach, this research reveals that the values of humanity, empathy, and tolerance in *Serat Wulangreh* do not appear as normative moral principles or universal rules of behaviour, but rather as ethical orientations rooted in inner discipline, relational awareness, and self-control in the Javanese socio-cultural order. This finding confirms that ethics in the Javanese teachings tradition operates through the formation of character and inner behaviour, rather than through the formulation of explicit prohibitions or obligations.

The value of humanity in *Serat Wulangreh* is understood as an ethical inner discipline that precedes social action. Teachings such as ngendhaleni hawa nepsu and andhap asor place moral maturity in the ability to control oneself, recognise boundaries, and understand social position. In this context, humanity is not separate from the palace's hierarchical structure; rather, it manifests through role awareness, moral responsibility, and appropriate behaviour. This perspective provides a critical lens on contemporary design ethics, which often emphasise procedures, compliance, or professional standards without in-depth reflection on the designer's intentions and moral orientation.

Empathy in *Serat Wulangreh* is interpreted not as emotional or affective empathy as commonly understood within the framework of human-centred design, but rather as moral vigilance and awareness of power relations. The teachings of *eling lan waspada* and *aja dumeh* emphasise the importance of caution in action and speech, especially for those in power or dominant positions. Empathy, in this sense, functions as a self-control mechanism and an ethical brake against potential abuse of power, not simply the ability to understand another party's feelings. This finding enriches the critique of empathy in design, which is often instrumental and psychological, and risks reproducing the designer's perspective as the centre of interpretation.

Tolerance in Serat Wulangreh is presented as an ethical strategy to maintain social harmony and stability, rather than as normative pluralism grounded in the recognition of individual rights. Concepts such as jembar ing ati, the prohibition of criticising, careful language, and the recommendation to conceal intelligence demonstrate that tolerance works through withholding judgment, controlling emotions, and reducing symbolic domination. Tolerance is understood as the practice of self-restraint for the sake of harmony, situated and contextual, oriented Towards the sustainability of social relations. This understanding challenges the approach to tolerance in design ethics, which is often treated abstractly and universally without considering the social tensions and power relations that underlie it.

This research confirms that *Serat Wulangreh* is better positioned as an ethical interlocutor than as a source of applicable ethical guidelines for visual communication design practices. Hermeneutic dialogue with this text is not intended to transfer moral values directly, but rather to enrich ethical reflection with a cultural perspective that emphasises intention, self-awareness, power management, and self-restraint. Thus, this research contributes to the study of design and communication ethics by demonstrating that non-Western moral texts can broaden the horizon of ethical meaning in a dialogical and contextual manner, while avoiding ahistorical and culturally universalist ethical claims. These findings open up space for a more reflective approach to design ethics, sensitive to cultural context, and aware of power relations in contemporary visual communication practices.

**Implications of the Study**

This research has several important implications for the development of studies on the ethics of visual communication design, cultural communication studies, and interdisciplinary approaches between design and the humanities. The primary significance lies in expanding the conceptual framework of design ethics, which has tended to be dominated by normative and universally oriented approaches, towards an understanding of ethics as a contextual, reflective practice rooted in cultural moral traditions.

Theoretically, the findings of this study strengthen the argument that design ethics cannot be reduced to a set of ahistorical, cross-cultural principles or operational guidelines. By positioning *Serat Wulangreh* as an ethical interlocutor, this study shows that traditional moral texts can serve as conceptual dialogue partners that enrich ethical reflection without being used as sources of normative legitimacy. This implication is essential to the study of design ethics because it offers an alternative perspective on key concepts such as humanity, empathy, and tolerance, which have often been treated as universal and culturally neutral. This approach encourages a shift from compliance-based ethics to an ethics grounded in inner orientation, intention, and relational awareness.

Another conceptual implication relates to the critique of the use of empathy and tolerance in the discourse of human-centred design and design thinking. The findings of this study suggest that empathy need not always be understood as an affective or psychological capacity, but rather as a moral awareness of power relations and the social impact of communication actions. Similarly, tolerance does not merely function as a normative affirmation of diversity, but can be understood as an ethical strategy for managing tensions and preventing symbolic domination. These implications enrich the discourse on design ethics by offering a more reflective lens sensitive to cultural and historical contexts.

From a methodological perspective, this study underscores the potential of a contextual hermeneutic approach as a relevant method in the study of design ethics

and visual communication. This approach allows researchers to read design texts, practices, and artifacts as spaces for the production of ethical meaning, inseparable from language, culture, and power relations. The methodological implications of this study encourage the use of a more reflective interpretive approach in design studies, especially when dealing with complex ethical issues that cannot be resolved through measurement or generalisation alone.

This research has implications for cultural communication and humanities studies by demonstrating that literary texts and traditional teachings are not only relevant as objects of historical study or character education, but also as sources of interdisciplinary ethical reflection. A dialogical reading of *Serat Wulangreh* opens new possibilities for using non-western moral texts in contemporary discourse without subjecting them to Western epistemological frameworks or treating them as static tools of moral legitimacy. This implication strengthens the position of literary and cultural studies as active contributors to modern ethical debates.

Overall, the implications of this research underscore the importance of a more reflective, contextual, and culturally conscious approach to design ethics. By bringing together visual communication design ethics and Javanese moral traditions through hermeneutic dialogue, this research not only enriches conceptual understanding of ethics but also opens up space for the development of a design ethics framework that is more epistemologically inclusive and sensitive to the diversity of social and cultural experiences.

## Limitations and Recommendations for Future Research

This study has limitations primarily related to the interpretive nature of the contextual hermeneutic approach used. The interpretation of *Serat Wulangreh* in this study is not intended to produce a reading that represents the entire Javanese ethical tradition. Although the validity of the interpretation is strengthened through triangulation with Javanese literary scholars and cultural experts, the study's results are still influenced by the interpreter's horizon, the purpose of the conceptual dialogue, and the context of contemporary design ethics, which serves as the meeting point of the analysis. Therefore, the findings of this study cannot be generalised as a universal representation of Javanese ethics, but must be understood as a situational construction of meaning.

The second limitation concerns the scope of the text and the unit of analysis. This study consciously focuses on selected stanzas in *Serat Wulangreh* that explicitly express the values of humanity, empathy, and tolerance. Consequently, other significant ethical dimensions in *Wulangreh*, such as religiosity, asceticism, and Javanese metaphysics, are not analysed in depth. This limitation is intended to maintain focus and depth of analysis, but it also limits the breadth of the Javanese ethics that can be uncovered. Thus, the results of this study

represent a portion of *Wulangreh's* ethical orientation, not the entire moral framework contained in the text.

A further limitation lies in the conceptual and reflective nature of the dialogue between *Serat Wulangreh* and the ethics of visual communication design. This research was not intended to examine the application of *Wulangreh* values in concrete design practices through case studies, field observations, or analysis of visual communication artifacts. Therefore, the resulting implications are theoretical and interpretive, rather than empirical and applicable. This research does not claim that the identified ethical orientations directly influence contemporary design practice, but instead offers a reflective framework that can enrich the meaning of design ethics. This limitation needs to be noted so that the research findings are not read as normative guidelines or practical recommendations.

Based on these limitations, further research is recommended to broaden and deepen the dialogue between design ethics and cultural moral traditions. Comparative studies with other Javanese teaching texts or non-Western ethical traditions from different cultural contexts can enrich understanding of the diversity of ethical orientations. Future research could combine a hermeneutic approach with qualitative empirical methods, such as interviews with design practitioners or analysis of specific design projects, to explore the reflective resonance of these values in real-life practice. Further studies could also examine their pedagogical implications in design education as a contextually and dialogically grounded source of ethical reflection.

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# Predictors of Flourishing among Filipino College Students in Rural Areas

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## ABSTRACT

Access to necessary resources is sometimes limited for college students in rural areas. With these limitations, this study focussed on self-adjustment, factors related to academic persistence, health-promoting behaviours, satisfaction with life, and external social support as predictors of the flourishing of college students in rural areas. Specifically, flourishing is operationally defined in this study as the promotion of social and psychological well-being (Diener, 2010). There were 217 college students enrolled in rural-based schools in the Philippines as respondents in the study. The multiple regression analysis results showed that academic buoyancy, academic self-efficacy, regularly eating breakfast, social support from friends, and life satisfaction significantly predicted the flourishing of college students. The discussion delved into the far-reaching implications of preventive and responsive student support services programmes.

*Keywords:* Flourishing, health-promoting behaviours, programme development, rural areas, scholastic persistence, social support, university students

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## INTRODUCTION

In rural areas, residents' living standards are usually less advanced than those in urban areas. Access to a stable and high-speed internet connection, quality technological equipment for learning (Dasinger & Gibson, 2022), poverty, and unemployment of family members (Liu et al., 2023) are just some of the common challenges faced by college students in these contexts. Sometimes, because of these dire circumstances, students in rural areas were observed to have lower grades and lower aspirations compared to their urban counterparts (Miranda & Rodriguez, 2022).

Relevant scholarly literature indicates that personal characteristics like resilience and coping strategies, positive relationships with classmates, professors, and school staff (Erck & Sriram, 2022), and a positive school environment (Jones et al., 2023) are key factors for flourishing in college students. However, the plethora of available research has mostly reported flourishing among college students residing and enrolled in urban-based colleges or universities (Miranda & Rodriguez, 2022).

Flourishing, as operationalised in this study, refers to the promotion of social and psychological well-being, as explained by Diener et al., (2010). In rural areas, the flourishing of college students was observed to experience the following challenges: primary is the economic context of the student's family. Studies observed that since viable work opportunities in the provinces are not as readily available compared to urban areas, families usually find themselves relocating to the cities where work with higher pay is offered (Miranda & Rodriguez, 2022); this, in turn, results in students dropping out of school because their families had to transfer to work in the city (Guzmán et al., 2022). In retrospect, studies recorded that during the COVID-19 pandemic, students in rural areas experienced relatively more stress and anxiety as they coped with digital/online lessons and activities in school (Dasinger & Gibson, 2022). On the other hand, studies in other Asian countries such as in remote rural China, reported limited school facilities, inexperienced teachers handling subjects, and poor student life on campus (Gunawardena et al., 2020).

In a qualitative study conducted in the Philippines, particularly in the Bicol Region, students expressed financial limitations because of which they have to skip meals to spare some amount for transportation and printing papers to be submitted for class (Uclaray, 2023). In light of these difficulties, students depend on their families for support as a key method of coping (Asiones, 2023).

Given the unique circumstances of students in rural areas, the present study would contribute to the literature by confirming whether or not personal adjustments like scholastic persistence (i.e., academic buoyancy, general academic self-efficacy), satisfaction with life, family monthly income, health-promoting behaviours (i.e., breakfast frequency, exercise frequency, sleep average), and external sources of support (i.e., social support from family, social support from

friends, social support from significant others) would be significant in predicting flourishing among college students in the rural context.

## LITERATURE REVIEW

Flourishing is an interesting construct, often associated with success (Bakracheva, 2020). It is described as the "pinnacle of good mental health" and a representation that one has achieved a balanced life (Keyes, 2016, p. 100). It is a state of human excellence, associated with self-care behaviours, social support, and positive affect (Lomas et al., 2023). While the conceptualisation of flourishing varies in the professional literature (Diener, 2010; Keyes, 2016; Butler & Kern, 2016), this paper will focus on flourishing as forwarded by Diener (2010), which underscores the social and psychological well-being of individuals (Rule et al., 2024).

Furthermore, the possible predictors of flourishing were analysed, with specific consideration given to college students in rural areas. Consequently, since the context of the study is flourishing in college, factors related to scholastic persistence, like academic buoyancy and academic self-efficacy were deemed important in determining well-being among this group. Including these factors acknowledges the unique circumstances of college students trying to thrive in the world of the academe. In addition, social support from family, friends, and significant others were considered because of its ability to protect against negative mental health outcomes (Guzman Villegas-Frei et al., 2024) and the fact that social support is a known and crucial resource for thriving in the academe (Hou et al., 2024b). Moreover, including monthly income as a possible predictor recognises the study's rural context. One of the marked characteristics of living in a rural community is the relatively lower income strata of its members compared to those who reside and work in an urban setting (Liu et al., 2023). Other unique contexts of students in rural areas include the distance between home and school, lack of qualified teachers, an unstable internet connection, and poverty (Hassan et al., 2023). Satisfaction with life is therefore also included in recognition of the crucial role that cognitive perception plays in flourishing (Rule et al., 2024). Given these circumstances, this research question is forwarded, whether or not internal adjustments such as scholastic persistence, health-promoting behaviours, life satisfaction, and relationship support such as support from family, friends, and significant others, and monthly income would be significant predictors of the flourishing of college students in rural areas.

### Scholastic Persistence

Scholastic persistence refers to one's disposition to achieve specific goals related to students' academic achievement despite challenges and difficulties (Leonard et al., 2021). While it is related to grit, scholastic persistence is a general term used in this paper to encapsulate the constructs of academic buoyancy and academic self-efficacy. Grit is not given focus because

of reported limitations in theory and measurement (Datu, 2021; Hou et al., 2024a). Instead, academic buoyancy, which is about overcoming daily challenges in school (Putwain et al., 2023), and academic self-efficacy, which is the belief in one's ability to perform academic tasks successfully (Ribeiro & Fernandes, 2020) are considered because of their robust support from the literature and reports positively correlating them with academic resilience and well-being (Mao et al., 2023).

According to Martin and Marsh (2008), academic buoyancy promotes resilience and can buffer students from the anxiety of performing well in examinations despite setbacks. In addition, academic self-efficacy, or the belief in their capacity to overcome academic challenges, was also seen to partially explain reports of well-being (Ansong et al., 2019). Common to academic buoyancy and academic self-efficacy is their ability to be developed and sustained despite limitations in economic and other relevant resources (Kingsford-Smith et al., 2024).

**Health-promoting Behaviours**

Health-promoting behaviours like exercise, sleep, food, and nutrition were seen to also contribute to flourishing as these factors can improve mood and the overall mental well-being of individuals (Wickham & Amarasekara, 2020).

Eating breakfast, for instance, is generally associated with better mental health (Kaiwai et al., 2022), while fruit and vegetable consumption is linked to higher levels of happiness (De Leon et al., 2022). Improved mental health is likewise linked to exercise frequency (Wang et al., 2022) and sleep (Scott et al., 2021). Unfortunately, access to healthy and sufficient meals, time and space for exercise, and adequate sleep are sometimes heavily influenced by socioeconomic status (Kopels & Roulette, 2023). Some students in rural areas can resonate with the experience of being disadvantaged as limited access to relevant facilities can be a barrier to pursuing health-promoting behaviours (Houghton et al., 2023).

**Social Support**

Studies report that social support and social skills tend to predict flourishing in college students (Holliman et al., 2021). Increased resilience and self-compassion (Yıldırım & Tanrıverdi, 2020) are said to explain this relationship. Resilience from social support tends to encourage a necessary perseverance to overcome challenges, while self-compassion generates a more self-forgiving stance. In other studies, social support from family, friends, and significant others (Qureshi et al., 2023; Whitaker et al., 2022) were also seen to be associated with flourishing as it fosters trust (Heyman et al., 2020), accelerates recovery, enhances coping behaviours, reduces stress, and diminishes physiological responses to stress (Lauzier-Jobin & Houle, 2022; Li et al., 2020). However, its effectiveness may vary among different groups. Specifically, among rural students, social support from friends and classmates can help ease the observed divide and discomfort when befriending

or interacting with someone above one's social class (Álvarez-Rivadulla et al., 2023). Social support from family, friends, and significant others can also buffer against the negative effects of stress and anxiety regardless of socioeconomic status (Shin & Gyeong, 2023).

### Life Satisfaction

Another facet that is examined in most studies on flourishing is satisfaction with life, which is a cognitive evaluation of one's well-being (Bee Seok et al., 2020). Life satisfaction has been observed to influence emotional intelligence (Qin et al., 2023), health quality (Durand-Sanchez et al., 2023), and perceived distress levels (Johnson et al., 2023). Further, studies suggest that low socioeconomic status (SES) can result in low life satisfaction (Álvarez-Rivadulla et al., 2023). Interestingly, in the Philippines, the concept of the 'happy poor' finds empirical evidence in the study of Palanca-Tan (2021), citing that Filipinos, despite high poverty incidence, evaluate themselves as generally content and happy.

### Monthly Income

In the rural areas of the Philippines, monthly income is less competitive than in metropolises (e.g., Metro Manila). In one study (Miranda & Rodriguez, 2022), given the same job position and job qualification, workers in the rural provinces are paid less than their urban counterparts. Including monthly income as one of the possible predictors of flourishing among rural college students finds a basis in professional literature, which shows evidence that income contributes to flourishing and to a decrease in symptoms of depression (Lomas, 2024). Some studies would even peg a threshold that when the amount is met, facilitate flourishing (Killingsworth et al., 2023). While some would assert that the positive association between the two would only be true up until a certain income level, when the income surpasses the threshold, the effect of income on flourishing ceases (Killingsworth et al., 2023; Palanca-Tan, 2021). Thus, the inclusion of monthly income as one of the possible predictors in this study would verify reported claims on the association between income and flourishing.

Considering all the reasons mentioned above, this research investigates how flourishing among university students in rural areas is predicted by scholastic persistence (i.e., academic buoyancy and general academic self-efficacy), health-promoting behaviours (i.e., breakfast frequency, exercise frequency, and average sleep), satisfaction with life, social support (i.e., friend, family, and significant others' support), and monthly income.

## METHODS

### Research Design

The study utilised a cross-sectional research design that is quantitative in approach, using predictive correlation (Sharmila et al., 2022) to analyse data. This research model may guide mental health professionals in making clinical decisions based on proven relationships between multiple dependent variables and an independent variable (Yang et al., 2022).

## Research Participants

The participants of this study were undergraduate students from various disciplines at universities in the Bicol and Northern Mindanao Regions, Philippines. These regions have more rural areas and are comparatively less progressive when compared with the highly urbanised context of Metro Manila. A purposive sampling method was employed to gather 217 respondents who were specifically selected from students enrolled in universities from the specified areas, thus ensuring the sample aligns with the research context. While useful for focussing on a specific study population, the non-probability nature of this method essentially limits the generalisability of the findings to college students in highly urbanised or otherwise diverse regions.

To facilitate survey administration, an online form was created and posted on the social media platform Facebook and the websites of the target universities. Table 1 presents the demographic profile of student participants, based on the data culled from the researcher-made questionnaire.

Table 1 shows that the majority of the respondents are female (64.98%), aged 18-19 years old (80.64%), in their freshman year (86.2%), with monthly family income ranging from 10,000 to 50,000 pesos (48.85%), eat breakfast in 'some days' (47.22%), engage in exercise ranging at least 1-4 days (64.98%) and have a sleep duration of 5-8 hours (89.40%).

In terms of income, while it is true that families in rural areas are comparatively less advantaged (in terms of income and opportunities) than those in the urban context (Luo & Hu, 2024), the income spread of the participants in this study is consistent with research that posits that higher education is less pursued by individuals from low-income backgrounds (Voss et al., 2024).

## Research Instruments

Data for this study was collected using a combination of a researcher-developed questionnaire and five established psychometric scales. These measures were designed to assess key psychological constructs, demographic variables, and behavioural indicators among Filipino college students in rural areas.

### *Researcher-made Questionnaire*

Items in a Likert-scale form were utilised to elicit responses concerning college students' monthly income and health-promoting behaviours (e.g., breakfast frequency, exercise frequency, and sleep duration). Specifically, the questions used were: "In your estimate, what is the total monthly income in your family?" "How often do you eat breakfast in a week?;" "How many days in a week do you engage in at least 30 minutes of exercise?;" and "On average, how many hours of sleep do you get per night?" The answers to these questions are presented in a multiple-choice format, giving the respondents the option to choose specific answers that best resonate with their experience. Expert feedback and pilot testing of these questions were done to ensure ease of administration too and comprehension by the participants.

Table 1
*Demographic characteristics of the participants of the study (N=217)*

| Variables | Frequency | Percentage |
|---|---|---|
| **Sex at Birth** | | |
| Male | 76 | 35.02 |
| Female | 141 | 64.98 |
| **Age** | | |
| 16-17 years old | 12 | 5.53 |
| 18-19 years old | 175 | 80.64 |
| 20-21 years old | 19 | 8.76 |
| 22-28 years old | 11 | 5.07 |
| **Year in College** | | |
| 1st year | 187 | 86.2 |
| 2nd year | 8 | 3.70 |
| 3rd year | 15 | 6.90 |
| 4th year | 7 | 3.20 |
| **Family's Monthly Income** | | |
| Prefer not to disclose | 37 | 17.10 |
| Less than PhP10,000 | 25 | 11.50 |
| PhP10,001-PhP50,000 | 106 | 48.85 |
| PhP50,001-PhP90,000 | 31 | 14.29 |
| PhP90,001 and above | 18 | 8.30 |
| **Breakfast Frequency** | | |
| Everyday | 92 | 42.40 |
| Some days | 95 | 47.22 |
| Rarely to Never | 30 | 13.82 |
| **Exercise Frequency** | | |
| None | 53 | 24.42 |
| 1-4 days | 141 | 64.98 |
| 5-7 days | 23 | 10.60 |
| **Sleep Duration** | | |
| Less than 5 hours | 17 | 7.83 |
| 5-8 hours | 194 | 89.40 |
| More than 8 hours | 6 | 2.76 |

### *Flourishing Scale*

It is an eight-item self-report scale that measures perceived success in relationships, self-esteem, purpose, and optimism. Responses were provided on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree) (Diener et al., 2010). The scale demonstrates strong internal consistency (Cronbach's alpha typically > 0.800), construct validity through correlations with well-being indicators, and a unidimensional factor structure (Diener et al., 2010). Test-retest reliability is moderate to high over weeks to months. The scale's cross-cultural applicability is supported by its translation and validation in diverse contexts (Rule et al., 2024). The value of Cronbach's alpha in the sample of Filipino college students is at $\alpha = 0.950$.

### *General Academic Self-efficacy (GASE)*

This five-item scale assesses participants' beliefs in their ability to perform well academically (Nielsen et al., 2018). Responses were provided on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Recent reports on the internal consistency of GASE are at .81 Cronbach Alpha (Akanni & Oduaran, 2018). The value of Cronbach's alpha in the sample of Filipino college students is $\alpha = 0.855$.

### *Academic Buoyancy Scale*

This four-item scale evaluates students' ability to cope with everyday challenges in school. Responses are on a seven-point Likert scale, ranging from Strongly Disagree to Strongly Agree. Internal consistency of .80 Cronbach Alpha was observed (Martin & Marsh, 2008). Some studies suggest that the Academic Buoyancy Scale is reliable (Kumar & Singh, 2021) and can positively influence performance in exams (Putwain et al., 2023). The value of Cronbach's alpha in the sample of Filipino college students is at $\alpha = .900$.

### *Satisfaction with Life Scale*

This five-item scale measures an individual's cognitive evaluation of their satisfaction with life. Responses are on a seven-point Likert scale, ranging from strongly disagree to strongly agree (Diener et al., 2010). Satisfaction with life has been reported to correlate with self-efficacy (Çelik et al., 2020) and self-esteem (Szcześniak et al., 2021). Internal consistency ranges between 0.790 to 0.890 Cronbach alpha (Sachs, 2003). The value of Cronbach's alpha in the sample of Filipino college students is at $\alpha = .895$.

### *Multidimensional Scale of Perceived Social Support*

The scale includes 12 items that measure perceived support from family, friends, and significant others. Responses were provided on a seven-point Likert scale, ranging from 1 (very strongly disagree) to 7 (very strongly agree). Internal consistency would range from 0.800 to 0.950, indicating that the items measure the construct of perceived social support (Zimet et al., 1990). Studies also suggest that the Multidimensional Scale of Perceived Social Support (MSPSS) has good internal reliability and strong factorial validity (Wittenborn et al., 2020) and is useful for measuring perceived social support across various contexts and populations (Dambi et al., 2018). The value of Cronbach's alpha in the sample of Filipino college students is $\alpha = 0.923$.

From these scales, results show that one out of three college students tends to have high academic buoyancy (39.17%) and life satisfaction (37.33%), and the majority (65.90%) has a high level of flourishing, perceived general academic self-efficacy (89.40%), and perceived social support from friends (60.83%), significant others (53.45%), and family (44.70%).

## Data Analysis

Computations were done using SPSS Version 29. Multiple regression analysis

(Baždarić et al., 2021) was performed in this research. Multiple regression analysis enables the analysis of more than one variable and it is said to optimise precision in prediction (Maulud & Abdulazeez, 2020).

### Ethical Consideration

Participants were assured of the confidentiality and anonymity of their responses. They were also asked to fill out an online informed consent form before proceeding with the main part of the survey questionnaire. Data will only be used for research purposes and will be stored for no more than five years in compliance with the Data Privacy Act of 2012 (Flores-Román, 2021).

## RESULTS AND DISCUSSION

This study conducted a survey (N=217) to investigate the determinants of flourishing among college students in Bicol and Cagayan de Oro, Philippines. Specifically, variables related to scholastic persistence (i.e., academic buoyancy and academic self-efficacy), health-promoting behaviours (i.e., breakfast frequency, exercise frequency, and average sleep), social support from family, friends, significant others, monthly income, and satisfaction with life were measured.

Once data gathering was completed, the data were uploaded to SPSS Version 29, where a multiple regression analysis was performed. This analysis, as summarised in Table 2, generated the model identifying research variables that predict flourishing among college students in rural areas.

Table 2 shows the impact of flourishing by academic buoyancy, general academic self-efficacy, breakfast frequency, exercise frequency, average sleep, family, friends, and significant others' support, satisfaction with life, and monthly income. A Pearson correlation coefficient was calculated to examine the relationship between the predictors to ensure no multicollinearity. The correlation coefficients, tolerance, and variance inflation factor (VIF) are indicative of no multicollinearity. Durbin-Watson was also calculated to assess the assumption that the values of the residuals are independent, which suggests that this assumption was not violated (DW = 2.161).

The results revealed an $R^2$ value of 0.514, which suggests that the predictors explained 51.4% of the variance in the outcome variable with $F(10, 206) = 21.803$, $p < 0.001$. The $R^2$ value of .514 is acceptable in social science research (Ozili, 2023). The findings also indicated that the following predictors significantly projected flourishing: academic buoyancy ($\beta = .53$, $p < 0.050$), general academic self-efficacy ($\beta = .19$, $p \leq 0.001$), breakfast frequency ($\beta = 1.010$, $p < 0.050$), satisfaction with life ($\beta = .525$, $p < 0.001$), and friend support ($\beta = 1.634$, $p \leq 0.001$).

These results support the following: scholastic persistence such as academic buoyancy and general academic self-efficacy remains a robust predictor of flourishing even among college students in rural areas. Consistent with professional literature, academic buoyancy is linked with flourishing in the forms of increased engagement and adjustment (Thomas & Allen, 2021), and improved academic

Table 2
*Determinants of flourishing among college students in rural areas*

| Variables | β | SE | t | p | 95%CI | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | | | | | | Tolerance | VIF |
| Academic Buoyancy | 0.337 | 0.111 | 3.025 | 0.003* | [0.117, 0.557] | 0.614 | 1.629 |
| General Academic Self-efficacy | 0.533 | 0.165 | 3.235 | 0.001** | [0.208, 0.858] | 0.681 | 1.468 |
| Breakfast Frequency | 1.010 | 0.411 | 2.454 | 0.015* | [0.198, 1.821] | 0.883 | 1.132 |
| Exercise Frequency | 0.537 | 0.462 | 1.163 | 0.246 | [-0.373, 1.448] | 0.834 | 1.199 |
| Sleep Average | -0.740 | 0.493 | -1.501 | 0.135 | [-1.713, 0.232] | 0.905 | 1.105 |
| Social Support from Family | 0.332 | 0.503 | .046 | 0.510 | [-0.660, 1.325] | 0.481 | 2.078 |
| Social Support from Friends | 1.634 | 0.488 | 3.350 | <0.001** | [0.672, 2.595] | 0.598 | 1.672 |
| Social Support from Significant Others | 0.232 | 0.362 | .640 | 0.523 | [-0.482, 0.945] | 0.690 | 1.450 |
| Satisfaction with Life | 0.525 | 0.091 | 5.753 | <0.001** | [0.345, 0.704] | 0.620 | 1.613 |
| Monthly Income | -0.231 | 0.150 | -1.537 | 0.126 | [-0.527, 0.065] | 0.986 | 1.015 |
| $R^2$ = .514 | | | | | | | |

*Note.* CI = Confidence interval, *p ≤ .05, **p ≤ .001

performance (Katalbas et al., 2023). Moreover, research also lends proof that it is correlated with reduced academic adversity (Martin & Marsh, 2008), while offering protection against minor adversities and test anxiety (Putwain et al., 2023).

In addition, evidence of academic self-efficacy contributing to positive outcomes among college students is strengthened. Specifically, studies suggest that self-efficacy contributes to greater learning engagement, improved academic performance, and better mental health among college students (Mao et al., 2023). Research that suggests otherwise (i.e., contending no relationship between self-efficacy and academic achievement) is limited, and the samples gathered do not represent the Philippine population (Pratiwi et al., 2021).

On the other hand, the frequency of eating breakfast can support positive health-related outcomes and efforts to promote optimum mental health (Kaiwai et al., 2022). Past research demonstrates that eating breakfast correlates with improved cognitive performance, academic achievement, well-being, and reduced morbidity risk factors (Hanawi et al., 2020). These studies lend credence to the present result of breakfast frequency as one of the significant predictors of flourishing.

In addition, satisfaction with life remains a robust predictor of flourishing even in the rural context. In rural areas, even with the limits to economic resources and opportunities, the abundance of nature (e.g., its fresh air, greens and blues, the availability of affordable but healthy food) the absence

of traffic jams, the no-rush ambience usually associated with these areas can buffer against the negative effects of stress (Counted et al., 2024). Furthermore, the results support previous studies establishing the association of life satisfaction with positive mental health outcomes (e.g., emotional intelligence, health quality, perseverance of effort, lower stress levels) (Durand-Sanchez et al., 2023; Johnson et al., 2023; Qin et al., 2023).

Among college students, social support from friends can explain flourishing better than social support from family and significant others. This result supports studies that suggest that perceived social support from friends may have a greater impact on college students in general as it contributes to their well-being, mental health, life satisfaction, sense of belonging, college success and adjustment, and it helps reduce stress, anxiety, social isolation, and negative affect (McCabe, 2023; Jie et al., 2023).

Moreover, friends are found to provide more emotional support and companionship support that reduces social isolation when in college (McCabe, 2023), especially during college transitions. On the other hand, family support contributes to both positive and negative outcomes (Arroyo et al., 2022). Support from significant others matters during college, however, in the present study, this was not a significant predictor of flourishing. A possible reason for this is that most of the participants were in their first year of college. The transition from high school to college and the change in context, place, and people may find them in a period of adjustment that may be early enough for some to be in a serious romantic relationship (Shin et al., 2022).

Exercise frequency in this study is not a significant predictor of flourishing ($p = 0.246$). Although the result goes against research that suggests that physical exercise can improve subjective well-being (Wang et al., 2022), it supports literature that indicates that there is a significant decrease in exercise during college years (Alkhateeb et al., 2019). At this point, passing exams and submitting requirements may be pressing. The higher the course load, the longer the time spent studying, and the less vigorous the physical activity one engages in (Wei et al., 2022). Hence, it can be deduced that college students, especially those who spend more time on schoolwork, may find it challenging to engage in regular physical exercise, explaining the non-significant role of exercise frequency on flourishing.

Moreover, the result that sleep duration is not a significant predictor of flourishing among college students is not the same as research on children which establishes a sufficient amount of sleep as a good predictor of flourishing (Okorie & Weber, 2024). Among college students, the non-association is probably because sleep duration does not guarantee sleep quality. Probable insomnia was noted in some to be related to gadget use (King et al., 2023), and sleeping during the daytime to compensate for lack of sleep during the previous night

alters the body's circadian rhythm, which does not provide the same levels of rest and rejuvenation as regular night time sleep (Jagota, 2023).

Finally, monthly income was not a significant predictor of flourishing. This result has to be approached with care because about 17.1% of this paper's respondents refused to disclose their monthly family income, limiting the reliability of this result. Although professional literature asserts that levels of flourishing increase as income increases, nuances in the results include the observation that regardless of income levels, having more education is associated with better life satisfaction (Lomas, 2024). In a local study in Koronadal, a remote low-income locality in Mindanao, Philippines, income was found to be associated with life satisfaction, however, the strength of the association is very marginal, and the incremental increase in perceived happiness is only 0.016 for every PhP1,000 increase in monthly income. Correspondingly, when a threshold is met (in Koronadal's case, PhP20,000), increase in income ceases to impact life satisfaction (Palanca-Tan, 2021). All these suggest that although there is robust evidence supporting income with well-being outcomes, the unique context of individuals and groups should still be considered to determine nuances in the relationship.

## CONCLUSION

This paper sought to determine whether scholastic persistence (i.e., academic buoyancy and academic self-efficacy), health-promoting behaviours (i.e., breakfast frequency, exercise frequency, sleep duration), social support (i.e., social support from family, friends, or significant others), life satisfaction, and monthly family income are predictors of flourishing. The results suggest that scholastic persistence including academic buoyancy and academic self-efficacy, health-promoting behaviour like breakfast frequency (but not exercise frequency and sleep duration), social support from friends (but not social support from family and significant others), and life satisfaction (but not monthly income) significantly predict flourishing among college students in rural areas.

Overall, the key findings of this study provide valuable insights that lead to actionable and practical contributions for educational settings, specifically in the implementation of programs that enhance student flourishing. Furthermore, the theoretical implications strengthen the extant literature by substantiating that psychological factors (academic buoyancy and self-efficacy), alongside life satisfaction and specific behaviour (breakfast frequency), are crucial predictors of flourishing among students in the rural college context.

## IMPLICATIONS OF THE STUDY

### Programme Development

Practical implications include the following: First, activities and initiatives that build academic buoyancy and self-efficacy can be encouraged. According to Martin and Marsh (2008), building confidence, reducing anxiety, and creating positive teacher-student

relationships can contribute to academic buoyancy. Incidentally, specific activities that support these also boost academic self-efficacy. These include but are not limited to the following: recognising students' strengths in class to help build confidence, teaching mindfulness, meditation, or yoga to help reduce anxiety among students, and counselors coaching faculty members on how to create and sustain positive relationships with students and suggesting reading resources that speak about these may make a significant difference in the students' belief and ability to cope with everyday challenges.

Second, acknowledging the importance of breakfast frequency in predicting flourishing underscores the necessity of advocating for healthy eating habits. However, a proper and nutritious meal usually means an added expense. To address issues of limited finances, collaborative efforts can be explored with governments and non-governmental organisations on how they can help with enabling policies, programs, or projects to capacitate and address concerns related to these. In the school setting, universities, depending on available resources, may consider offering financial subsidies or meal sponsors to cover the breakfast of financially challenged scholars or students.

Third, regarding the social support of friends as a significant predictor of flourishing, colleges can organise Peer Mentoring programmes, and other social activities that can encourage meaningful connections. These activities can address gaps in interactions between students from low socioeconomic backgrounds and those coming from affluent families. Social interactions can nurture students' sense of belonging which is also known to contribute to overall flourishing.

Fourth, the connection between life satisfaction and flourishing supports the importance of cognitive judgment of one's overall life circumstances. Colleges can provide learning materials that teach the cultivation of these constructions. For instance, activities that encourage gratitude despite life's adversities and challenges can promote life satisfaction, which can later lead to flourishing.

Fifth, while exercise frequency, sleep duration, monthly income, and social support from family, and significant others were not found to significantly predict flourishing, these results highlight the complex nature of the construct. Further research can be done to investigate nuances in contexts to validate their association with flourishing.

Sixth, analyses can be done to determine whether certain groups of students might benefit more from interventions targeting specific predictors. For example, programmes on academic self-efficacy could benefit students under academic probation, transferees, and readmitted students while programs on academic buoyancy can benefit those who are highly anxious about grades and performance. On the other hand, programmes promoting healthy eating, adequate sleep, and exercise

can benefit those who complain of feeling constantly lethargic or physically unhealthy.

In terms of responsive services, counseling interventions can include psycho-education inputs on the importance of these constructs and how to build and sustain them. Specifically, underscoring the values of setting achievable goals, belief in one's ability, health-promoting behaviours, life skills inputs on how to have a growth mindset, and how to create and sustain meaningful connections with peers can aid counseling interventions for a vast array of mental health concerns. Further, counseling techniques such as cognitive behaviour therapy can aid in overcoming negative self-belief, and mindfulness exercises can facilitate keeping a calm but focussed disposition amidst adversities and temporary setbacks.

### Limitations and Recommendations for Future Research

Finally, the measurement of flourishing in this study is limited to social and psychological flourishing as conceptualised by Diener (2010). Future research can explore using other conceptualisations (i.e., eudaimonic and hedonic well-being, PERMA) (Rule et al., 2024) to investigate and verify the impact of these predictors on flourishing. Another limitation of the study is the specific context of the research setting, which focussed on college students from rural areas in Bicol and Northern Mindanao, Philippines. While the study provided valuable insights into this specific demographic, future investigations should increase the geographical scope and include students from various rural regions to enhance the generalisability of the findings. Moreover, the results of this study do not indicate causal relationships between predictors and flourishing, hence future research that focusses on controlled trials or longitudinal studies can be considered to address this gap. This can help researchers better understand the efficacy of targeted interventions related to specific predictors and the stability of their effects over time. The results can be used to tailor-fit interventions to diverse student populations to ensure a greater impact on flourishing.

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# The Interplay of Religion, Ethnicity, and Politics: The Power Contestation between Old and New Informal Actors in Madura, Indonesia

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## ABSTRACT

The presence of informal leaders, especially *ulama*, remains influentialin the current regional election in Indonesia. Through their religious authority, they shape voter preferences and provide legitimacy to political candidates. Consequently, they occupy a strategic position that bridges elite and public interests. This creates a unique opportunity to understand informal leaders as brokers who persuade voters. Some studies have suggested that the role of ulama is widely recognised due to their religious and charismatic authority. However, this is inadequate to capture the current local political configurations as new actors emerge to replace the established ones. Ultimately, this led to a change in allegiance, with the emergence of new informal figures such as *Gus* (a young ulama) and *Nyai* (wife or daughter of ulama) in the local public space. The findings of the study show that struggles over socio-cultural patronage exist between old and new patrons. It has resulted in heated tensions in society. While old local patrons represented by ulama tend to maintain their influence over society, it faced new challenges from other actors who aspired to be new patrons particularly during local elections.

*Keywords:* Ethnicity, informal Leaders, Madura. politics, religion

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## INTRODUCTION

Electoral contestation in local elections in Indonesia is generally different from



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presidential or legislative elections. While the latter two rely on massive campaigns, regional elections tend to rely on informal approaches to connect with voters. The emergence of religious figures as informal leaders is significant. They served as bridges between candidates and voters. This indicates how Indonesian electoral politics operate along hierarchical lines rather than debates over ideas, as commonly shown in Western context (Fionna & Tomsa, 2020; Sobari, 2017; Van Klinken, 2009). In this regard, the longer the hierarchical chain, the more intermediaries are needed to reach voters, as candidates are often uncertain about how to identify or map their potential supporters.

It has been widely discussed in the literature that regional elections are more competitive and fiercer than national elections (Buehler et al., 2021; Toha, 2017). The shared identity similarity between candidates and voters, the role of middlemen, and potential violence are those factors that have made local elections particularly heated in Indonesia. Among these factors, the role of middlemen, performed by informal leaders, is the focus of further discussion here. In a paternalistic society, protection, the possession of knowledge, and the distribution of resources are vital factors that made foster voters' attachment to informal leaders. This illustrates how economic dependency shapes emotional relationships in the public sphere.

As the regional elections relied on the emotions due to the identity and kinship closeness, this makes the position of informal leaders important as sources of local voters' preferences. At the same time, candidates need symbolic legitimation from the local powers in order to enhance their electability (Berenschot, 2019). This eventually leads candidates to reach out to informal leaders to seek legitimation. In this regard, informal grassroots leaders serve as a nexus between parties/candidates and voters. This nexus is examined in detail in this article.

In line with the above discussion, Madura offers an interesting case to show how political nexuses operate working out in electoral campaign. As mentioned earlier, the reliance on informal leaders has made informal leaders influential figures. *Ulama* is not solely the main actors, but there are other informal leaders who shared paternalistic power in society (Jati et al., 2025). This creates a unique case to understand the complexity of informal actors to gain political advantages as a nexus between parties/candidates and voters. Previous studies have shown *ulama* and *blater* together form a power channel that connects aspects of piety and violence (Pribadi, 2013, 2018).They not only mobilise votes but also play a strategic role in the formation of local power networks, which have implications for tensions between religious moral authority and the use of coercive force. This ultimately led to the rise of local oligarchs seeking to control the centralised distribution of resources, which fostered existing patronage networks (Rozaki, 2021a).

In alignment with earlier claims, the authority of original patrons largely rests

on established forms of veneration and coercion. In this context, reverence for ulama is influenced by both ancestral ties and the organisational affiliations that legitimise individuals as patrons within religious networks (Pribadi, 2025). Meanwhile, coercion employed by *blater* is less visibly exercised due to legal and religious sensitivities (Sila, 2019; Pribadi, 2023). Building on this argument, it is compelling to examine the familial ties that underpin the hereditary positioning of *ulama*. Presently, existing studies have paid limited attention to *Gus* (young *ulama*) and *Nyai* (wives or daughters of *ulama*). This study seeks to address this gap by examining their roles within contemporary patronage and electoral networks.

## METHODS

The primary method employed in this study is ethnography. This approach enables the researcher to comprehend complex contexts of specific social phenomena and to analyse relationships among actors and their interests (Ploder & Hamann, 2021; Xiaochen & Li, 2024). The data collection strategy included in-depth interviews with various actors, such as academics, media practitioners, and *ulama*. Once the primary data had been compiled, it was cross-referenced and validated with documentary analysis to verify its credibility and consistency (Emerson et al., 2011; Hammersley & Atkinson, 2019). The findings were subsequently synthesised into a coherent analytical framework.

Earlier research included ethnographic studies, but these primarily examined existing informal actors but did not investigate their long-standing networks and hereditary lineages of these actors, especially within recent generations. This study contributes by offering a detailed examination about the new patrons, *Gus* and *Nyai*, who represent the emerging generation of religious patrons.

To achieve this, this study conducted fieldwork research on Madura Island, particularly in Bangkalan, Sampang, and Pamekasan Regencies in June 2024. In-depth interviews were conducted with selected respondents representing ulama, academics, community members, and media practitioners. Documentary analysis was also conducted to strengthen the fieldwork data. All the data were compiled and then selected based on the findings and their relevance with the fieldwork context. After that, the data were then synthesised into a manuscript that underwent internal review.

Madura was chosen due to the complex role of informal actors in local elections. More specifically, its political nexus has generated heightened tensions, particularly during the electoral campaign period. These tensions remain understudied in the recent studies on Madurese politics. While most studies have focussed primarily on religious power as reflected in recent publications, studies focussing on these tensions remain limited. This represents the novelty of the present study to examine whether the intersection of local power structures influences electoral outcomes. Otherwise, each informal leader has their own voter base market to convince. Therefore, competition

among informal leaders becomes a key determinant in electoral success.

## THEORITICAL FRAMEWORK

### The Emergence of Informal Leaders as Authoritarian Populism Expression

In general, informal leaders are individuals or groups that can maintain an influential presence in society. Informal leaders, also understood as individuals who have a significant impact on policy and decision-making processes, operate outside the constraints of formal political roles and titles. Their influence stems from a combination of strong personal relationships, deep expertise and networking in their field, and a well-established reputation, allowing them to shape opinions and actions primarily outside of conventional political structures and processes even without the formal authority of elected office or appointment, informal leaders demonstrate considerable power and play a significant role in determining the course of political events. Therefore, informal leaders themselves can, to some extent, rival the influence of the state apparatus.

The emergence of informal leaders especially in the decentralised Indonesia signals the persistence of local strongmen. Joel Migdal's classical theory argues that strongmen are non-state actors that undermine state capacity through their infiltration of formal state institutions (Migdal, 1988). Strongmen themselves are recognised for their power and charisma, which enable them to act as patrons offering protection. This argument has been used in many studies especially Southeast Asian studies. More specifically, the emergence of strongmen is often associated with declining democratic performance as governments face limitations in delivering public goods.

While the system has been declining due to strongmen' pervasive infiltration, this results in the strengthening capacity of informal leaders as strongmen. Specifically, their capacity exploits the void between state and society, thus making them the broker. This new kind of legitimacy is a fundamental response to the era of democracy which is still in an immature condition in Indonesia. More importantly, this enables strongmen and their networking to use their existing influence to gain electoral support to become elected democratic leaders. This differs to previous strongmen who used violence as the primary source of power.

Since the influence of strongmen fade away, their influence has been passed down to the informal leaders. It is important to note that the current informal leaders may share blood ties with the strongmen since the informal leaders often used strongmen symbols to obtain public acknowledgment. The involvement of informal leaders into local election indicates how populist campaign is deemed as political strategy. As the informal leaders have authority over society, it is a response to the failures of democracy to deliver equal prosperity and justice for all people (Rakhmani & Saraswati, 2021). This condition eventually forces people to turn their backs on informal leaders as a method of speaking up within the policymaking process (Foa & Mounk,

2017). In this sense, the implementation of democracy that practically has been election, it nurtures the transactional exchange between candidate and informal leaders as brokers.

The brokers provide backups based on voters' mobilisation, whereas the candidate offers money politics or club goods to brokers. This mechanism has been pervasively ingrained within electoral campaign in Indonesia. Especially informal leaders, this strengthens their position as the informal actors that should be most wanted figure during the election. Obviously, the authoritarianism populism expression is the umbrella term to find out how informal leaders cultivate patronage power for their interests. As the populist figures, they can be able to mobilise people to aspire for certain purpose (Jati, 2024). At the same time, as an authoritarian figure, they can bind people with their knowledge and strength. These two capitals made the informal leaders served to be informal political actors.

## The Politics Identity Constellations in Madura

Madura as a region with rich and diverse socio-political dynamics, where education, religious identity, and informal leadership play a major role in shaping political direction and social stability. Outsiders often view Madurese society as homogeneous, with stereotypes that all Madurese are uniform in their beliefs, habits, and political affiliations. Madurese society is much more diverse and complex, especially in terms of political identity and religious affiliation. In brief, Madura shapes its own structure and actors that eventually ingrained in society level.

Most Madurese do identify themselves as part of Nahdlatul Ulama (NU), but this does not mean that they are automatically loyal to a particular political party such as PKB or follow the policy lines of PBNU. This made an interesting position that the Party ID is weak in the grass-root levels. Instead, the locals tend to in line with their preferred informal actors. There is also fragmentation in political affiliation, indicating that loyalty to a religious organisation does not always mean parties political loyalty (Jati & Supriatma, 2024). From these two factors, it shows significant differences between Madurese people who live in cities and villages. Ulama are still highly respected political advisors in villages. In contrast, cities have seen a weakening of ulama's power, which can be attributed to greater access to formal education and a more open approach to modern political advancements. Politics in urban areas are viewed more critically and independently.

Religious and cultural teachings are key in the village. In cities, however, formal education plays a more significant role, leading to increased political literacy and independent political choices. Rural and urban areas hold contrasting political perspectives, partly due to this. In recent decades, formal education in Madura has fostered greater political awareness and religious tolerance. Even though NU remains dominant, a new understanding

and acceptance of diversity, including other religions, has emerged (Jati et al., 2024). For example, the *ulama's* intervention in preventing interreligious conflict shows the important role of the *ulama* as mediators and peacekeepers.

## FINDINGS AND DISCUSSION

### The Intersection of Informal Actors within Local Politics in Madura

Situated in the northeastern part of East Java, Madura Island is renowned for its distinctive social structures and cultural traditions, which set it apart from neighbouring Java Island. From a sociological perspective, the social structure of Madurese communities is characterised by a robust emphasis on tradition, religious observance, and the importance of kinship ties. These elements resulted complex structures that headed by different informal actors. Religious figures, such as the ulama, and community leaders, who are considered informal actors, exert considerable sway in melding the political leanings of individuals within their communities. Their influence extends beyond the formal political structures, shaping both individual and collective political decisions through various channels such as social networks, religious studies, and religious gatherings (Jati, 2021).

The island of Madura is conveniently located near the island of Java in terms of geography. The historical context of Javanese culture, particularly the influence of the Hindu-Buddhist Kingdom until Islamic sultanate, has significantly shaped and continues to ongoing impact the relational structures and belief systems of the Javanese people, making this situation a product of that long history. It is important to note, however, that Madura's cultural identity is distinctive, and its people are known for their courageous display of cultural treasures, setting it apart from Java Island (Syamsuddin, 2019).

In its socio-religious construction, Madurese society prioritises religious values in every aspect of life and highly values the figure of ulama/*ulama*. For Madurese society, ulama is not only considered a religious leader but also a reference and role model that covers all aspects of life (Suswanta, 2018). *Ulama* Madura plays a social, cultural, political, educational and even economic role. This shows the central position of the ulama, because the ulama is considered not only as a subject who is able to teach religious values but also has the power of blessings (Asmawati et al., 2021).

In the context of the 2024 Election, the power of informal actors in Madura remains influential because of cultural ties to local authority figures (Jati, 2025). These actors not only mobilise political support through da'wah and moral messages but are also able to act as mediators between politicians and the community, so that political preferences are often linked to emotional and religious closeness.

There are two informal actors in Madura that are generally referred to as *ulama* and *blater* (Rozaki, 2021a). The role of ulama in Madura is not only in religious aspects but also in politics. They are respected as spiritual leaders who can move and influence

society, especially in the election context. The charisma and moral legitimacy of ulama are often used by aspiring politicians to build political support and public trust.

On the other hand, *blater* - a figure who is known to have a strong influence both physically and socially, plays a role as a figure who is able to organise groups and support political candidates with methods that are more based on strength and informal networks.(Rozaki, 2009) The tradition of the blater as a "champion" adds a complex layer to power relations in Madura, because it combines personal loyalty and loyalty to the prospective leaders they support (Rozaki, 2021b).

*Ulama* and *blater* together form a power channel that connects aspects of piety and violence. Their vote mobilisation and strategic power building impact the tension between religious morality and force. Madura's carok tradition uses physical fights to resolve conflicts of honor. *Carok* is carried out as a form of fighting between two people, which is triggered by issues of honor, family disputes or insults. Despite declining rates of *carok*, it remains a significant aspect of Madurese identity and social dynamics. The proverb "better dead than ashamed" encapsulates the cultural justification for carok actions among the Madurese (Pribadi, 2018). *Ulama and blater* play an important role in mediating conflicts with the aim of preventing violence (Sila, 2019). But over time, the influence of modernisation and law enforcement, the practice of carok has decreased. Now, *ulama and blater* focus more on resolving problems peacefully with a more rational approach, although this tradition remains embedded in local culture.

Based on fieldwork findings, it turns out that there are 2 informal actors besides ulama and blater who have influence in local politics, namely: the role of *gus* (son of ulama) and *nyai* (wife or daughter of ulama). Both have an important role in bridging the influence of the two main actors, ulama and blater. *Gus* and *Nyai* often act as mediators who can connect the spiritual world and social power with the wider community.

*Gus*, a modern ulama, represents the next generation. They adapt better to young groups and changing times, subtly blending religious and political strategies. *Nyai* empowers women's communities and socio-religious activities. They inspire community participation, mobilising female followers. *Gus* and *Nyai* strategically combined religious and secular power. *Gus* and *Nyai's* networks bridge influence and power for stable grassroots support. In Madura, *Gus* and *Nyai* are key influencers, bridging socio-political divides. These two actors help maintain harmony between the religious morality brought by the ulama and the social control carried out by the *blater*, creating a balance in the unique local political dynamics in Madura. In addition to being a balance between religious and social power, it also connects public belief in religion with cultural aspects and local political pragmatism.

*Nyai* or female clerics, although often positioned under the patronage of *ulama* in patriarchal culture, apparently have a strong role in managing Islamic boarding schools

and religious activities. They are often the driving force in community activities, providing teaching and preaching through Islamic poetry which influences the social life of the community. For example, *Nyai* Fatmah Mawardi from Prenduan, Sumenep, shows an active role in the fields of education and economics, and uses the art of poetry as a medium for da'wah. Including gus - the ulama's children and grandchildren who are often involved in various social and political activities to facilitate communication and unite the influence of *ulama* and *blater*.

## The Heated Tension between Old and New Informal Actors in Shaping Voting Preferences

### *Gus and Nyai versus Old Informal Actors in Madura*

Gus and Nyai are typically members of Madura's long-standing traditional ruling class. Being from a family of religious scholars, gus and nyai are definitely highly respected in the community because of their family history. Furthermore, the public also perceived that Gus and Nyai would succeed the existing ulama capacity. This ultimately resulted in Gus and Nyai amassing a substantial following within various *pengajian* groups.

As previously stated, some of the gus and nyai have received modern or secular higher education and tend to have a more contemporary perspective, thus enabling them to successfully engage with younger generations. Their adaptability in mediating between the religious community and political power renders them influential mediators. This capability has caused disputes among the old and *gus/nyai* who sought to preserve patronage influence within society.

In this respect, the emergence of *gus* and *nyai* as new informal actors fundamentally addressed the generational transition within the Madurese political and social sphere. By challenging conventional power dynamics and introducing innovative concepts to the political landscape, younger generations, who tend to possess more contemporary perspectives and various approaches to political involvement, are making an impact. Political priorities and alliances could be redefined by this change in generations as time passes.

As mentioned, Gus and Nyai certainly challenged the current patrons. Because of their standing as an ulama family, they do not directly engage in physical confrontations, contrasting with the Madurese tradition of *carok*, a knife fight used to settle disputes. Instead, they seek to amass a larger following that defies the established patron's supporters. Gus and Nyai slowly become well-known in society via religious gatherings, and in the end, they become new informal actors. It may be effective in shaping public opinion, specifically in relation to how people voted in the recent elections.

*Gus* and *nyai* helped Khofifah Indra Parawansa win the most recent East Java local election as part of her coalition. The "Khofifah Effect" highlights the considerable impact of Khofifah Indar Parawansa on East Java's political landscape, especially

concerning the 2024 presidential election. Her public endorsement of the Prabowo-Gibran ticket has considerably boosted their chances of winning in the province, as support for other candidates, including Ganjar Pranowo and Anies Baswedan, has fallen. Khofifah is thought to be very good at getting political support from Nahdliyin (NU followers), which may be key to the Prabowo-Gibran ticket winning in East Java, where votes from NU members were very important, thanks to a strong network of nyai (women's wives). Khofifah's impact, combined with backing from various factions within NU, illustrates how she can rally a wide political network and shape political trends at both local and national scales.

### *Ulama, Village Heads, and Thug Bosses as Brokers*

In line with above explanations, the existence of old informal leaders has shaped the social relationship. They have their own traditional authority over society through violence control and socio-religious patronage. These two source of power often to be political brokerage during electoral campaign period. It is important to note that current brokerage power is the legacy of past similar power.

At the grassroot level, old informal leaders have played a significant role for centuries. Previously, this large number of leaders were head of their respective polity before surrendering their authority to the national government after the independence proclamation in 1945. These processes took gradual progress since the local leaders retained traditional authority as part of formal power sovereignty transfer to the national government. In some places specially Bali, Papua, Maluku, Aceh, and Madura, those informal leaders continue to exist in the meantime (Tyson, 2010).

Although they have lost their formal political authority, they remain influential at the grassroots due to their alluring charisma. In other words, these leaders still possess some level of political capital. Another informal figure is called *Tojing*, which in the Madurese cultural context refers to individuals or groups who act as intermediaries or political liaisons between candidates or parties and voters. The role of *tojing* is often considered as a "vote broker" who can mobilise support in elections through their personal or social networks. They have strong relationships with local communities, and their influence can be based on social, economic, or family power.

*Tojing* coordinates grassroots campaigns, candidate-voter communication, and positive candidate image events. They sway voters through personal or group persuasion. This role involves mobilising large groups, sometimes using incentives. *Tojing* relies on community trust. Madura's patron-client system relies on them to connect elites and voters. Their influence on local politics is significant, despite lacking formal regulation. Tojing and Blater's societal impacts differ in scale and breadth. *Blaters* strongly influence local communities socially and politically. Respected figures, they wield considerable electoral power. Blatters bridge the gap between elites

and communities. They informally sway citizens' political decisions despite lacking formal election roles. *Tojing* act as local intermediaries. Despite smaller networks, they still link politicians and voters. *Tojing emphasise personal communication with voters.* While less influential than *blater, tojing* builds trust and better connects local communities politically.

*Blater* is more often seen as a more dominant figure on a large scale, with a wider social network and stronger influence, while perhaps operating at a more micro level and relying more on personal relationships. Both play a role in mobilising votes for certain political interests, but in different ways and with different influences. In the context of local elections, *blater* can be considered as an actor who plays a more macro role (district/city), while tojing focusses more on the micro (sub-district/village), but both play an important role as vote brokers in the Madurese political system.

Such old informal leaders include Islamic religious leaders or *ulama*, village heads and thug (*preman*) bosses. These three figures has been extensively discussed in literatures (Mudhoffir, 2017, 2022). Some have described them as "strongmen" due to their significant influence over people (Young, 2021). Meanwhile, others have proposed that they are local patrons, owing to their immense power to confer protection in exchange for tributes from people (Sidel, 2005, 2012).

Among those informal local leaders, the ulama would be the preferred informal local leaders for both candidates and voters. The possession of religious knowledge can dogmatically affect people. For voters itself, ulama's suggestions might be the best for life including political decision making. Meanwhile, the candidates considered the ulamas' endorsement can be powerful to attract voters. These two factors made ulama to be influential actors in the current *Pilkada* campaign.

Given their considerable influence and ability to enforce decisions, Gus and Nyai typically do not directly engage with those informal leaders. In this situation, Gus and Nyai prefer connecting with the younger generation because of shared generational interests, possibly using soft power instead of force.

### *Village Chiefs as New Brokers*

The role of village heads in local political influence tends to be significant, especially in the distribution of power at the village level. This reflects the fact that village heads are often a channel for mobilising political support, especially because they have direct access to village communities. In the *Imabra* region (possibly referring to a part of Madura or a particular area), village heads have a stronger influence, although this strategy is not always effective, especially if they only rely on village assistance.

Given that the strategic position of village heads in local Madurese politics, political parties often try to control village heads to support their political agendas. However, this practice shows limited effectiveness because the influence of village heads does not always guarantee campaign success or full support. On the

contrary, there is a tendency that politicians who try to approach the community through village heads are those who do not have a strong power base or wider political access.

During elections, village heads strategically coordinate logistics, mediate citizen needs, and connect elites with communities. Village heads' political activity shapes Madura's elections. Village heads control local politics, including polling places. Village heads sometimes rig elections, causing tensions like the protests in Grampes. In Madura, political success hinges on a strong power base, despite the influence of informal actors like village heads.

Regarding this, the village heads appear to have a cordial relationship with Gus and Nyai, given their frequent attendance at religious meetings. Moreover, village heads aim to partner with gus and nyai in terms of local informal stability, instead of other actors who might operate independently. At the same time, Gus and Nyai are also seeking protection from the village heads, who have the authority to secure villagers and negotiate with other informal actors.

### *The Contested Position of Ulama as The Political Patron*

In Madura, the Ulamas, as long-standing local figures, may serve as active informal leaders who can propose their own candidacy or endorse their preferred candidates for the regency. They could mobilise their students *(santri)* and even the *pesantren* (boarding schools) alumni to vote for them or their preferred candidates. The presence of such alumni networking is a main factor that contributes to why *ulamas* and their *pesantrens* still continue to exist in Madura. Many of the *pesantren* alumni have even become public figures such as politicians. It is worth noting that some Madurese politicians nominated as regents or lawmakers are usually *pesantren* alumni, for example: Mahfud MD, Achmad Baidowi, and Hasani Bin Zuber. They still maintain connections with their alumni and *ulamas* for their electability because of their strong communal bonding. Therefore, this network can be relied on by candidates to secure *pesantren* votes.

The above condition also applies to *ulamas*. As they have spiritual and religion authority, most of Madura people still have great admirations toward *ulamas* and families. *Ulamas* can be great endorsers for those whom candidates win over Madura people. Ulama also have large assets possession that surrounded people still used it. this resulted in dependent relations between ulama and people that turned to be great votes sources.

*Ulama* remain important figures in the social, cultural, and economic life of Madurese society. However, their influence in politics is not entirely uniform or universal. There are differences in the way their influence is practiced in different regions and among different ulama. Although they can play a significant role in shaping opinion and mobilising society, not all ulama have the same strong influence in every region. In this regard, Gus's potential elevation to the status of ulama is likely,

as the pilgrimage to Mecca has become a significant factor in determining ulama status, with many aspiring to the title of *Kiai Haji*. Likewise, *Nyai* can also elevate to be *Nyai Haji* if she conducted pilgrimage to Mecca as well.

Madura's political landscape is often fractured, with ulama aligning with various parties, including the PPP and Golkar. This demonstrates that people's political loyalties are fluid and influenced by factors beyond a single ideology or group, such as family and background. While some ulama may hold significant sway in parts of Sumenep, their influence doesn't extend to the whole of Madura. In Madura, door-to-door campaigning is generally more effective than other strategies. The lower echelons of society are often underserved by aid and programmes routed through official channels or established forums. Ulama's impact is still significant, however, its political influence isn't absolute; not all ulama can effortlessly rally the masses or dictate political decisions.

A prominent Madurese political family, the Bani Cholils, shaped local politics. One of Madura's most influential political families is this one. Originating with Ulama Cholil of Bangkalan, this family has held considerable sway over local Bangkalan, Madura politics from the New Order to the present day. The family's powerful religious influence lends moral and cultural legitimacy to local leaders who are family members. Bani Cholil's influence extends beyond religious matters, reaching into the political sphere where family members commonly occupy influential positions in local government. The influential Ulama family of Bani Cholil significantly impacted local Madurese politics. This is a politically powerful clan in Madura. Originating with Ulama Cholil of Bangkalan, this influential clan has held a powerful position in Madura's Bangkalan local politics from the New Order era to the present. The family's size and devout faith grant its local leaders considerable moral and cultural influence. The Bani Cholil family's influence is not confined to religion but also significantly impacts local politics, with family members often in powerful governmental roles.

Bani Cholil's political endorsements since the New Order have favoured candidates with familial connections or similar beliefs. Their network of Islamic boarding schools, religious study groups, and other religious communities allows them to garner widespread support and cultivate a loyal following. The political clout of Bani Cholil figures, particularly within religious communities, heavily influences voter support and mass mobilisation. Bani Cholil's strong ties to the central government, cultivated through both formal political parties and informal networks, solidified their influence during the New Order era. Despite shifts in political power following the reformation, the Bani Cholil successfully adapted by mediating between local elites and the community. This created a consistent and sustainable influence in Bangkalan politics. Their role as mediators in social conflicts, leveraging religious authority to mitigate tensions and ensure

political stability, further solidified their influence. Bani Cholil remains a powerful and relevant figure in local politics because of the potent combination of religious charisma, strong social networks, and political savvy.

Fuad Amin is a powerful figure due to his ancestry (a ulama from Bani Cholil), his position as Bangkalan's regent, and his leadership of the blater. This alliance gives him considerable power in Madura. This power extends beyond traditional political borders, enabling total domination of the local political landscape. The 2014 arrest of prominent Bani Cholil figure and former Bangkalan Regent, Fuad Amin Imron, by the Corruption Eradication Commission (KPK) for bribery and corruption severely damaged Bani Cholil's reputation and political standing. Fuad Amin was a highly influential political figure, especially in Madura and Bangkalan. The arrest damaged the reputation of the influential Bani Cholil family, known for their power in religious and political circles.

This arrest jeopardises the family's political standing and public image. The corruption scandal tarnished the family's reputation for integrity and cast doubt on the moral leadership of local politicians. To further complicate matters, his son's involvement increased the family's need to restore public confidence and maintain their strong position in Madura. Bani Cholil remains strong due to its religious ties and historical backing, though this situation necessitates adapting to image concerns and preserving its political and social influence in the post-Suharto reform era. This situation led to a reassessment and strategic shift to stay relevant in a society increasingly intolerant of corruption and opaque politics.

The dominant political forces in Madura tend to draw support from the community's cultural and religious affiliations. The National Awakening Party (PKB) and the United Development Party (PPP) wield considerable influence, largely because of their strong connections to the pesantren community and its influential religious leaders. Support for these parties is bolstered by the backing of religious leaders, including clerics and members of the Bani Cholil family. Major national parties, including the Democratic Party and PDI Perjuangan, also aim to expand their influence in the area by employing locally adapted strategies that cater to the Madurese community's unique characteristics.

## Political Competitions and Struggles in Madura

The varying impacts of local Madurese informal leaders on voter preferences have created tensions across different aspects of the community. As discussed earlier, Maduran politics involves more than just official politicians. Informal leaders like religious figures (ulama) and local strongmen (*blater*) often hold significant sway due to their influence on followers and communities. Madurese politics is a complex interplay of competing power structures constantly negotiating and leveraging their influence, creating a dynamic socio-political environment. Politics plays out in many ways.

### *Religious and Secular Authority*

The central conflict in Madura's politics is the tension between religious and secular authorities. The influence of ulama is substantial, yet it overlaps with the authority of local strongmen (blater) and village leaders. The resulting dynamic fuels competition for influence and domination of political processes. Specifically, young activists frequently act as intermediaries, facilitating communication between village heads and ulama with potentially differing agendas.

### *Traditional Power Structures vs. Modernity*

The struggle between established power structures—represented by figures such as Blatter and influential families like the Bani Cholil—and modernising forces is another key element of the competition. Although traditional networks and relationships are still important, a new generation of activists educated elsewhere and exposed to modern political thought is challenging the status quo. The impact of these young activists signals a possible power shift, introducing new viewpoints and communication methods to politics.

### *Formal and Informal Politics*

In Madura, the political landscape is a complex mix of formal institutions and informal power dynamics. Within this system, *Tojings*—political brokers—exploit their social capital and connections to mobilise support behind chosen candidates or parties. This informal brokerage system can sometimes eclipse formal political processes, leading to concerns about transparency and accountability.

### *Urban-rural Divide*

The data further suggests a growing disparity in political views and power between city and country dwellers. Ulama maintain a strong presence in rural communities; however, their power diminishes in urban areas characterised by higher education levels and exposure to varied political ideologies. This urban-rural divide may result in competing political priorities and preferences, potentially causing fights over resources and representation.

### *Impact of Corruption*

Fuad Amin's corruption case has significantly altered Madura's political scene; Amin is a prominent member of the Bani Cholil family and a former regent. This incident has tarnished the family's reputation and undermined their long-standing political power. This has heightened public awareness of corruption and accountability problems, possibly resulting in increased oversight of political figures and their conduct.

The old informal leaders tend to maintain their influences specially *ulama* through their religious patronages. It faced series of challenges from the incoming new informal leaders in society. This resulted in the dynamic contestation to compete voters. In addition, the contestation also showed the fight for existence remaining influential in Madurese. As the cultural patronage still

saliently important. This made the presence of the informal local leaders will continue in Madura.

## CONCLUSION

The Madurese case have showed how the presence of informal leaders still important in the local democracy building. Concurrently, the rise of *gus* and *nyai* has been met with resistance, as they seek to supplant the established informal leadership. As the quality of democracy specially parties' consolidation has been weakening, the informal leaders are needed to shape voters' preference, even they can also mobilise voters. This revealed how patronage worked out that conducted by those informal leaders through their powers. In this regard, ulama/ *ulama* remains important figures due to his religion knowledge and economic resources that become binding power to control people. As a result, *ulama* has been powerful actors in local politics particularly on his commands that can mobilise voters.

However, *ulama* itself face challenges from various local actors that made patronage is not solely under *ulama* but also it has been decentralised to different actors. They have various powers that also can bind people. This occurred during the electoral campaign, each informal leaders fight for voters through their power networking. While *ulama* remains powerful, their legitimacy gradually eroded as the new actors have engaged with people on daily basis. This study revealed that the informal actors at the same time, are needed to drive political participation, but they can also be actors that erode democracy through their patronage powers.

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# Religious Metaphor in Malaysian Political Speeches After the *1997-1999 Financial Crisis*

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## ABSTRACT

This study examines the use of religious metaphor in Malaysian political speeches delivered in response to the unprecedented 1997-1999 financial Asian crisis, which originated in Thailand and spread to other Southeast Asian countries, including Malaysia. It focuses on how religious metaphors were used to criticise the dogmatic commitment of free market proponents who promoted market liberalism as the sole solution to the crisis, thereby advancing the view that market forces should be balanced by social protection. The data was drawn from thirty-nine political speeches delivered in 2000 by Mahathir Mohamad, former Prime Minister of Malaysia. The study aims to identify the types of religious metaphors selected for inclusion in his speeches and examine how they were used to represent fanaticism among those supporting free-market ideology, taking into account the socio-political context of the speeches and Mahathir's religious beliefs. The analysis draws on Charteris-Black's approach to political rhetoric and Fairclough's (2003) textually oriented discourse analysis. Five speeches were selected for close analysis to illustrate how religious metaphors were used to represent the doctrine of the free market as a "quasi-religion", characterised by dogmatism and resistance to alternative perspectives. The findings show that religious metaphors enabled Mahathir to present a vision of economic independence for Malaysia, while framing his opposition to free-market capitalism within a morally resonant narrative. The study demonstrates how religious metaphor functions as a powerful rhetorical and ideological resource in political discourse, particularly in times of crisis, contributing to critical debates on metaphor, ideology and resistance in political communication.

*Keywords:* Capitalism, economic marginalisation, financial crisis, free market, north-south divide, political speeches, religious metaphor

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## INTRODUCTION

This study examines the use of religious metaphors in the political speeches of Mahathir Mohamad after the 1997-1999 financial Asian crisis, a period that exposed economic vulnerabilities across Southeast Asian economies (Berg, 1999). The crisis, which began in East Asia, was global but the impact was local. Southeast Asian countries faced major challenges and turned to the West for solutions; some took loans from the International Monetary Fund (IMF). Their decisions had an unfortunate impact on the economy and their political lives (Makaruddin, 2002). The impact of the crisis on Malaysia was particularly severe, leading to a sharp contraction in economic growth, a decline in real GDP to 6.7%, a depreciation of the Malaysian ringgit by nearly 50%, and an estimated 60% collapse in the stock market (Ariff & Abu Bakar, 1999). This was Mahathir's most impactful period, and when he showed his true calibre. Following his own path to recovery, Mahathir pulled Malaysia out of the 'global economy', took the Malaysian currency off the world market, "imposing controls on the export of capital and imposing tariffs." (Fairclough, 2006, p. 53). Fairclough (2006) argued that the unexpected success of Mahathir's unprecedented steps and bold policy decisions took many neoliberal experts by surprise.

In his post-crisis speeches, Mahathir articulated a sustained critique of global economic inequality and exploitation, which he identified as underlying causes of structural imbalances within the international economic system. He was especially critical of the International Monetary Fund and the World Bank for imposing an unfair Western-controlled financial system on poorer countries in the Global South in exchange for financial assistance, measures that, he argued, intensified poverty and exacerbated the exploitation of vulnerable populations (Rethel, 2020). Mahathir consistently called for a more equitable global economic order that would allow developing nations to grow and prosper without being subjected to unfair trade practices and systemic disadvantage (Kaplinsky & Kraemer-Mbula, 2022). Against this backdrop of profound economic disruption, this study investigates how religious metaphor functions as a rhetorical resource through which Mahathir communicated his interpretation of the crisis and framed its moral and ideological significance, particularly following the government's success in mitigating its effects on the national economy. In this study, religious metaphor is understood as the metaphorical use of language drawn from religious discourse to construct meaning in non-religious contexts, enabling abstract socio-economic phenomena to be interpreted through shared religious beliefs and moral evaluations.

Mahathir Mohamad was the fourth Prime Minister of Malaysia (1981-2003) and returned in 2018 as the seventh. The significance of Mahathir's speeches derives not only from his institutional authority as head of state, but also from his leadership during the economic crisis of the late 1990s. His speeches delivered in the year 2000

discursively position neoliberalism not as a neutral economic paradigm, but as an ideological project that privileges market liberalisation, minimal state intervention and regulation, and global financial integration. Mahathir articulated a counter-hegemonic discourse in response to the Asian financial crisis, and by rejecting dominant neoliberal prescriptions of liberalising financial markets and the withdrawal of regulatory oversight, he legitimised an alternative model centred on state intervention, capital controls and economic sovereignty. This discursive challenge to neoliberal orthodoxy provoked considerable controversy, while simultaneously positioning Malaysia as a site of resistance to globally dominant economic ideologies. According to Peck et al. (2010), the dominant thinking that neoliberalism is "a sort of theological free-market ideology" (p. 99) explains its resilience and growing capacity to shape the economy and the market, reflected in the way it dominated the thirty years before the 2008 financial crisis. In this regard, we concur with Charteris-Black (2004) that metaphor is "a gateway through which persuasive and emotive ways of thinking about the world mould the language that we use, and through which our thoughts about the world are moulded by language use" (p. 2).

Drawing on Critical Metaphor Analysis (Charteris-Black, 2004; henceforth CMA) and Fairclough's (2003) textually oriented discourse analysis, this article examines the use of religious metaphors in Mahathir's speeches in response to what he perceived as fanaticism in the free-market economic model promoted by major Western economies. Mahathir's position as Prime Minister of a predominantly Muslim nation, his self-identification as a Muslim and close political and economic ties with ASEAN significantly shaped his political rhetoric. Consequently, his religious beliefs informed his worldview and were discursively realised through the strategic deployment of religious metaphors in his speeches, which functioned to construct and legitimise a particular representation of social and economic reality.

## RELIGIOUS METAPHORS IN POLITICAL SPEECHES

Interest in metaphor as an area of academic research increased markedly following Lakoff and Johnson's (1980) *Metaphors We Live By,* which conceptualised metaphor as a fundamental cognitive phenomenon, rather than a purely rhetorical device. They argue that human communication is grounded in an ordinary conceptual system used "in thinking and acting" which is inherently "metaphorical in nature" (p. 1), and that "metaphors play a central role in the construction of social and political reality" (p. 159). In political speeches, communication is intrinsically persuasive, and is realised through linguistic resources, including metaphor to produce effects of authority, legitimacy, and consensus that are central to political practice (Chilton, 2025). Research further demonstrates that metaphor "can guide thought and influence our reasoning about social reality" (Liu &

Chen, 2023, p. 1), functioning as a cognitive tool that can be drawn on to understand a target domain in terms of a seemingly unrelated concept" (p. 2). By structuring one domain of experience (e.g., finance) metaphorically in terms of another (e.g., religion), metaphor constructs reality in particular ways, foregrounding specific interpretations while obscuring others. In this regard, metaphors prompt audiences to use their knowledge of the concrete source concept to make sense of the more abstract target issue (Lakoff & Johnson, 1980).

Cox (2012) argues that political discourse makes strategic use of metaphor to serve the following purposes: first, to simplify abstract political concepts that may not be readily accessible to the general public; second, to influence the mind of the audience by framing issues in ways that suggest a particular course of action; and third, to persuade the audience in support of arguments that serve the interests of the speaker or writer. Empirical support for the first purpose is provided by Imani et al.'s (2021) study, which analyses Mahathir's political speeches, and demonstrates how metaphorical language renders complex economic concepts more accessible and meaningful to his audience. Similarly, Yu et al. (2025) emphasise the centrality of metaphor in political discourse, foregrounding its capacity to convey evaluative ideologies and influence public perception. In line with Lakoff and Johnson's cognitive view of metaphor, Kövecses (2020) further underscores its power as a rhetorical resource for constructing reality, particularly in political contexts where persuasion is paramount (see also Alharbi, 2023).

Lakoff and Johnson's Conceptual Metaphor Theory (CMT) has led to the critical study of metaphor. For example, Charteris-Black's (2017) study on metaphors in different genres has revived interest in how those in power use metaphor as a rhetorical tool *par excellence* in political, media and religious texts. He uses corpus methodology and draws on CMA and Fairclough's (1995) CDA to identify, quantify and discuss metaphors in presidential speeches and political manifestos. The findings show that research on metaphor provides a strong basis for the critical analysis of texts produced by those in power to create meaning to account for their actions. Because of its persuasive nature, metaphor is frequently used by politicians to evoke feelings to influence people's thinking (Arcimavičienė, 2023; Musolff, 2021). When metaphors influence the way we understand and think about things, they may become the commonsensical way of understanding certain aspects of the world, which explains why politicians tend to use metaphors to highlight some aspects of reality while concealing others for ideological purposes (Machin & Mayr, 2013). Metaphor thus provides rich insights into people's ideas, attitudes, and values (Cameron et al., 2009; see, e.g., Patterson, 2022), making it a suitable research object to understand why those in positions of authority act in a particular way affecting the lives of others.

One of the most rhetorically powerful metaphor domains in political speeches

(Charteris-Black, 2004) is arguably the comparatively under-researched 'Religious' domain. Dorst (2021) argues that metaphor and religion are closely intertwined, as religious and spiritual experiences are often highly personal, emotional, and abstract. Drawing on CMA, Polova (2020) investigated the use of religious metaphors in the speeches of Turkish politicians to identify their functions and explain how these metaphors reflected Turkish cultural values and shaped public perceptions of reality. In contrast to more established metaphor domains such as 'Journey, Building, and War', 'Religious' metaphors tended to be more selectively deployed, often associated with political actors and specific genres. For example, studies have shown that the speeches of US presidents are noticeably richer in religious metaphors than those found in British political speeches (Hughes, 2019; Ivanovic, 2017). Similarly, an analysis of David Cameron's campaign speeches demonstrates how religious language was strategically used to appeal to Christian voters in England, highlighting the persuasive power of religious metaphor in electoral contexts (Williams, 2018).

In American political speeches, 'religious' metaphors were associated with different ideological perspectives. George W. Bush, for example, used 'Religious' metaphors as a strategy to validate and legitimate war against Iraq (Biria & Mohammadi, 2012). Daughton (1993) asserted that the 'Holy War' metaphor in Roosevelt's inaugural speech was an effective strategy to 'unify the audience' and 'rehearse shared values'. What is socially significant about 'Holy War' was the combination of qualities of 'Religious' and 'War' metaphor domains calling for 'unquestioning obedience' and "inspired, committed actions for a morally satisfying victory over evil" which ultimately brings about peace (p. 436). Bush referred to Iran using the metaphor 'Axis of Evil', and Reagan used 'Evil Empire' for the Soviet Union. Likewise, the Iranian government framed the policies of the US government using the 'Great Satan' metaphor, and Osama Bin Laden used the 'Us/Them image-making' strategies to represent the USA as 'the Evil' (Bhatia, 2007). From a religious point of view, as an ontological force, Evil is not to be negotiated with and must be destroyed as a last resort (Biria & Mohammadi, 2012). Van Dijk (2006) refers to this image-building function as 'ideological square' defined as 'emphasising our good things, emphasising their bad things, de-emphasising our bad things, and de-emphasising their good things' which ranges from persuading alliance with Us (Daughton, 1993) to legitimating war against our enemies (Bhatia, 2007).

'Religious' metaphors tend to be strongly polarised ('Us/Them') to justify, for example, the complete eradication of 'them' by waging war against 'them'. This is a common function of 'Religious' metaphors, usually conveyed by Good vs. Evil image-making (Heradstveit & Bonham, 2007) to restructure the political world and unify 'us' against 'them'. Bhatia (2007) reported the use of contrasting metaphors such as

'Evil, Light and Darkness, and Heaven and Hell' as an image-making strategy by George Bush and Osama bin Laden to create a positive self-image versus a negative-other image. This evangelical dualistic perspective of life seems to have no middle ground: you are either with 'us' (the forces of Good) or with 'them' (the forces of Evil). The 'Evil-other' image portrayed by 'Religious' metaphors in the speeches of US presidents appears to be quite forceful and intense, and attributing to their enemies or rivals negative attributes to legitimate war against them (Heradstveit & Bonham, 2007).

## METHODOLOGY

The dataset comprises five political speech transcripts (Table 1) selected from a larger corpus of thirty-nine speeches (see Appendix) delivered by Mahathir at international summits and conferences in 2000. The transcripts were sourced from the Prime Minister's Official Website and the Collection of Mahathir's Speeches (January - December 2000) compiled by Kidam and Hamim (2001). In general, the primary audiences for the five speeches were heads of states from different countries, political leaders, government officials and business leaders.

The selection of the year 2000 as the historical context was significant. It marked a critical turning point in Malaysia's economic and political trajectory, thereby rendering Mahathir's speeches relevant for contemporary audiences despite having been delivered more than two decades earlier.

Table 1
*Details of the five speeches*

| Speech No. | Date of Delivery | Title of Speech/Conference | Source of Speech | Length of Speech in Words | Location of Delivery |
|---|---|---|---|---|---|
| 1 | 11/04/2000 | ASEAN Business Summit 2000/Asia 2000: Moving Forward | Collection of Mahathir's Speeches (Kidam & Hamim, 2001) | 2724 | Kuala Lumpur, Malaysia |
| 2 | 12/04/2000 | The South Summit | Prime Minister's Website | 1460 | Havana, Cuba |
| 3 | 09/06/2000 | The 6th Nikkei Shimbun International Conference on 'the Future of Asia' | Prime Minister's Website | 3145 | Tokyo, Japan |
| 4 | 20/06/2000 | Malaysia's Strategies to Deal with the Financial Crisis as Related to the Impact of Globalisation on Developing Countries | Prime Minister's Website | 3088 | Cairo, Egypt |
| 5 | 11/11/2000 | The Meeting with Muslim Intellectuals and Businessmen | Prime Minister's Website | 2384 | Doha, Qatar |

Malaysia had (1) successfully emerged from the late 1990s economic crisis; (2) begun to orient its foreign policy priorities, shifting from Buy British Last towards the Look East policy; (3) initiated new economic development programmes; and (4) sought to strengthen economic ties with ASEAN and African countries (Jomo, 2003).

The speeches reflect Mahathir's unorthodox approach to managing economic crises. The introduction of regulatory measures, most notably capital controls and foreign investment regulation, was aligned with national priorities and domestic needs. The relative success of these measures renders his speeches particularly significant, as they offer an alternative paradigm that challenges the orthodox neoliberal response to economic instability. In an era marked by recurrent global financial crises, Mahathir's decisive action highlights the enduring relevance of political leadership that prioritises national resilience over an uncritical reliance on free-market forces. His development policies, informed by Islam and a critical stance towards Western economic dominance, further contribute to ongoing debates about sovereignty, economic justice, and governance shaped by local values and priorities.

The use of metaphor was examined in selected extracts from Mahathir's political speeches in which he directly challenged "a particular neoliberal version of free market capitalism" (Fairclough, 2006, p. 11), arguing instead for the need to balance market forces with social protection. The unit of analysis is the lexical item, operationalised either as a single word or a multi-word phrase, and analysed as situated instances of metaphorical language through which Mahathir's ideological positions and critiques of free-market capitalism are discursively constructed. Other linguistic resources and larger units are also examined to show how the speeches were textured by setting up relations between their elements. This is particularly relevant at the level of textual interpretation because "metaphors may extend over longer stretches of text, creating powerful cohesion." (Mautner, 2008, p. 43).

This study adopts the three-stage analytical procedure of Critical Metaphor Analysis: Identification, Interpretation, and Explanation (Charteris-Black, 2004). Metaphor identification involves close reading to identify words or phrases used metaphorically in context. Metaphor interpretation examines the cognitive and pragmatic factors shaping metaphor use and the extent to which metaphor choices construct socially salient representations. Metaphor explanation examines the discourse functions of metaphor, enabling the identification of their ideological and rhetorical motivations.

To minimise subjectivity in metaphor identification, this study adopted the Metaphor Identification Procedure (Pragglejaz Group, 2007) to systematically identify religious metaphors framing the free market as "the religion of free trade". The procedure involved initial familiarisation with the speeches, followed by close analysis to identify candidate expressions,

which were then examined in context to determine metaphorical use before coding. Reliability was enhanced through independent identification by two raters, a PhD candidate in TESL and a researcher in language studies, followed by a final review by an ESL teacher from England pursuing a master's degree in education.

Although Charteris-Black draws on corpus linguistics tools, his approach to metaphor analysis is theoretically independent, and is applied here to selected examples extracted from a corpus. The analysis is grounded in Fairclough's (2003) approach to textual analysis, which examines linguistic features in relation to their socio-cultural contexts to reveal the relationship between language and social change under new capitalism. Rather than examining large datasets, handpicked extracts were analysed to enable close examination of how textual elements construct meaning, specifically in representing a dogmatic form of capitalism, described by Mahathir as "the current financial orthodoxy" which foreclosed alternative views. In this neoliberal discourse, the unquestioning acceptance of the free market as the sole solution to economic problems is framed as a form of religion using religious metaphors, with dissenting voices positioned as "heretics" and "non-believers". This finding aligns with Mavelli's (2020) argument that neoliberalism derives discursive power by invoking religious meanings and signification, thereby creating "an aura of sacredness" while concealing itself behind the appearance of objective, secular rationality.

## ANALYSIS AND RESULTS

Mahathir's most impactful period was in the late 1990s when Malaysia was faced with the 1997-1999 Financial Crisis. His world view and Eastern rhetoric were shaped by Malaysia's post-colonial experience, marked by economic dependency, cultural domination and the lingering influence of Western powers in the region (Hilley, 2001). The Western-controlled financial system was viewed as a continuation of colonial exploitation, keeping former colonies economically dependent.

### Identification Stage

Mahathir's religious metaphors emphasised themes of justice, morality, and collective responsibility grounded in Islamic and "Asian values". He positioned himself as the spokesman for the Third World during the 1997 financial crisis (Soh, 2000), and the leader of the Islamic World in responding to the economic challenges faced by Muslim nations (Ahmedullah, 2004). These metaphors lent moral authority to his critiques of neoliberal policies, which he argued undermined the sovereignty and development of Eastern nations. By framing economic injustice in religious terms, Mahathir challenged Western-centric narratives of globalisation and governance, presenting an ethical alternative to what he perceived as the greed and moral deficit of Western economic practices. This context underscores the significance of religious metaphors in shaping his political discourse during the post-crisis period.

The first level of analysis involved the close reading of 39 speeches, of which five were selected for detailed examination of metaphorical language and Mahathir's use of metaphor to represent his views on trade liberalisation and free-market solutions to the financial crisis. These speeches were selected because they were delivered at international events in African and Asian countries adversely impacted by the crisis and sharing key affinities with Malaysia, including religious (Muslim-majority), regional or cultural and historical contexts. In addition, the speeches addressed comparable themes, including Malaysia's experience of the economic challenges, strategies for survival, and calls for unity and independence from Western influence. Across the five speeches, 54 religiously based metaphorical expressions were identified and grouped by key lexical items, frequency and patterns of metaphorical use. Table 2 shows the religious keywords and frequency of occurrence.

Table 2
*Religious keywords and frequency of occurrence*

| No. | Keywords | Total Occurrences | Metaphorical Occurrences |
|---|---|---|---|
| 1 | Religion, Religious, Religiously | 16 | 7 |
| 2 | Fanatic | 8 | 7 |
| 3 | Faith | 8 | 6 |
| 4 | Sacred | 6 | 6 |
| 5 | Heretic, Heresy | 7 | 7 |
| 6 | Theology, Theological, Theologian | 1 | 1 |
| 7 | Preach | 3 | 3 |
| 8 | Christian | 4 | 1 |
| 9 | Bible | 2 | 2 |
| 10 | Paradise | 2 | 2 |
| 11 | The Good Book | 2 | 2 |
| 12 | God | 2 | 1 |
| 13 | Believers | 1 | 1 |
| 14 | Infidels | 1 | 1 |
| 15 | Divine | 1 | 1 |
| 16 | Missionary | 1 | 1 |
| 17 | Evil | 1 | 1 |
| 18 | Guru | 1 | 1 |
| 19 | Priest | 1 | 1 |
| - | - | 69 | 52 |

Mahathir's use of religious words is marked by selectivity and strategic intent rather than accidental or merely a discourse habit. Although they occur infrequently across the corpus, they are used metaphorically at a notably high rate in a small number of speeches. For example, of the eight occurrences of *fanatic*, seven (87.5%) are metaphorical, while six of the eight instances of *faith* (75%) are used metaphorically. The concentration of these metaphors in specific speeches, rather than their distribution across the corpus, indicates deliberate selection in relation to the audience and topic.

**Interpretation and Explanation**

The most mentioned market ideologies were *globalisation* and *liberalisation*, occurring 165 and 71 times respectively. At the Doha meeting with heads of state, political leaders, and business leaders, Mahathir strongly criticised the form of globalisation promoted by the "North Atlantic countries" which advocated barrier-free trade "to enrich them further and enhance their domination". He argued that despite causing "unprecedented misery", the free market "is still being touted as the solution to the economic problems of the poor". Opposing full liberalisation, Mahathir maintained that market forces must be balanced by social protection policies for the collective good so that developing nations can compete fairly and have equal chance of succeeding (Kamaruddin & Rogers, 2020). His core religious beliefs shaped this perspective, informing his use of religious metaphors to depict a divided global order between wealthy Western countries supporting free-market capitalism and poor Eastern countries adversely affected by it.

Mahathir used religious metaphors to challenge the 'unquestionable' status of the free market and criticise those who condemned his rejection of free-trade orthodoxy, framing market ideology in religious rather than secular terms. By casting his opposition to Western economic systems as a moral and ethical struggle rather than merely a political or economic one, he strengthened the legitimacy of his radical stance both domestically and internationally. These metaphors represented free-market proponents negatively, attributing to them unquestioning devotion akin to religious fanaticism, as reflected in expressions such as 'the god that can do no wrong', 'a religion that tolerates no heresy' and 'a religion that everyone must accept'.

Excerpts 1-4 show the patterns in Mahathir's choice of religious metaphors which have a distinctive negative semantic load. Table 3 shows the religious metaphors of market fanaticism.

These four excerpts illustrate how the argument is structured by stating upfront the central claim: "the market, the god that can do no wrong". The assertion presented in the negative form is a highly contentious assumption, and directly challenges free market capitalism based on neoliberalism. Sentences 2 to 4 that follow illustrate this further. Religious metaphors are used evaluatively to criticise the globalist discourse of globalisation and

Table 3
*Text 1: The religious metaphors of market fanaticism*

| No. | Excerpts 1 to 4 |
|---|---|
| 1 | …It is simply the market. It is that wonderful abstraction, **'the market'**, the **god that can do no wrong**, that can be expected to perform better and to produce better results than anything that individual human beings either in business or public life can do. (11/04/2000, ASEAN Business Summit 2000/Asia 2000, Malaysia) |
| 2 | …Globalisation has already shown signs of becoming a **religion that tolerates no heresy**. (12/04/2000, The South Summit, Cuba) |
| 3 | … The propaganda machine of the West is good at making everyone feel guilty if he does not accept the new ideas and ideologies created by the rich to give them ever more advantage over the poor. Democracy, the free market, a world without borders, liberalism … have all been cooked up in the rich countries and then forced on the poor. They all sound great but somehow their acceptance by the poor invariably destabilise them and put them at the mercy of the rich. Yet today people talk of the free market as if it is a **religion** that everyone must accept. To question its role in shaping the economic development of the world is to **commit heresy**. (20/06/2000, Malaysia's Strategies to Deal with the Financial Crisis, Egypt) |
| 4 | …No longer worried about the socialists, they propounded the **religion of free trade**. Free trade is everything. It is going to enrich the whole world. It is going to lead to a worldly **paradise**… Insidiously free trade became **sacrosanct** through the GATT and the WTO. The World Bank, the IMF and the Western-controlled international media **preached** it. Anyone who dared to oppose free trade became **heretics, infidels, non-believers** who were trying to impoverish the poor. (11/11/2000, The Meeting with Muslim Intellectuals and Businessmen, Qatar) |

the fanatic belief of its proponents in market liberalisation free of restraints to enable companies to act without control.

Sentence (1) is a condemnation of the view that the market is infallible. The use of religious metaphor, "the god that can do no wrong", reinforces this representation of infallibility and sets the scene to foreground the free market economy in negative terms. The word "abstraction" in the phrase "that wonderful abstraction" is used to implicitly criticise the way the term 'market' is reduced to an aspect of the market - its infallible nature - for a particular purpose. The market is claimed to tackle problems in business and public life better than "individual human beings". Another aspect of fanaticism in free market is foregrounded in Extract 2, globalisation as the driving force behind the unrestrained market being described as becoming a 'religion' which 'tolerates no heresy', suggesting intolerance towards different views.

In Excerpt 3, Mahathir highlights the hegemonic nature of free market ideology, describing how people talk about it as if it were a religion. Metaphors are used to create knowledge frames linked to a belief system that free market is "a religion that everyone must accept", and a critical stance is taken against it. Questioning the role of free market in shaping global economic development is comparable to "committing heresy". If some of Mahathir's religious metaphors seem extreme (e.g., "burn the heretics at the stakes", "heretics, infidels and

non-believers"), the context in which they were produced may provide the explanation.

In Excerpt 4, it is asserted that free market proponents (GATT, WTO, World Bank and IMF) "propounded free trade" as "the religion" to reflect their rigidly dogmatic views, namely strongly believing that they are right and refusing to consider contrary opinions. By attributing to them the belief that "Free trade is everything", Mahathir implicitly represents them as dogmatically sticking to a set of beliefs. Notice the use of a religious metaphor in "a worldly paradise" to represent the predicted outcome of free trade ("It is going to lead to a worldly paradise"), which reflects their delusional belief, completely divorced from reality. The free market is further described as sacrosanct, so that it could not be interfered with, and those opposing are labelled "heretics, infidels, non-believers" using words which are specifically part of the vocabulary of religion. In sum, the primary implication of the religious metaphors used in Extracts 1-4 is intolerance of non-adherence and dissent from the western free market.

Excerpts 1-5 in Text 2 contains a response to the "so-called solutions to the problems of human society" accepted by the supporters without question to the extent that any opposition was not allowed, even though the solutions actually caused more harm than good. Given the context and the year, it is possible to infer that Mahathir was indirectly referring to the solutions supported by rich Western nations to deal with the 1997-99 financial crisis, namely trade liberalisation and free-market orientation, to which he was strongly opposed. There is a repeated use of religious metaphors relating to dogmatism and fanaticism (e.g., "burn the fanatics at the stakes"; "ideas … practiced as articles of faith"; "questioning or condemning them would make one a heretic"). The conceptualisation of dogmatism and fanaticism is linked by correlating elements in source (religion) and target domain (free market ideology). The selected religious metaphors are not arbitrary but intended to develop an ideological force in Mahathir's argument against this fanaticism.

It is argued that ideas offered as solutions to problems in society contribute to achieving and sustaining the dominance of practices and so inhibit alternative ideas and ignore the need for realistic evaluation of their results, considering current circumstances. Mahathir's evaluative stancetaking is realised at the lexical microlevel using religious metaphors and extends over longer stretches of text creating "powerful cohesion, which is a textual and not merely lexical phenomenon" and contributing to overall meaning and perspective (Mautner, 2008, p. 43). The metaphors are drawn from religion to construct versions of reality highlighting dogmatism and fanaticism in the adoption and practice of "so-called solutions". They are used to support his ideological positioning, which claims that the economies of poorer countries in the East could be destroyed by the kind of unrestrained market liberalisation offered as a solution to these financial crises.

Mahathir denounces the fanaticism of those who advocate unrestrained market liberalisation as the solution, characterised pejoratively by their uncritical and unquestioning devotion which is taken too far as implied in "practiced as articles of faith". The fanatical views are represented as a religion, positioning those who question them as heretics, thus encouraging their association with dogmatism. There are for example seven words related to "heretic" and "heresy", all used metaphorically. The text begins with a claim that people are fanatical about solutions to problems to "create a better society", which when accepted give no allowance for questions or alternative views (Excerpt 1). The argument ends with weaknesses in the systems created by 'Man' and a reason to explain the need to avoid fanaticism, especially in the information age (Excerpt 5). We now examine these five excerpts (table 4).

Sentence (1) presents Mahathir's central claim about the fanatical nature of the "so-called solutions to the problems of human society", which when accepted give no allowance for questioning or alternative views. An element of evaluation is added with "so-called" in collocation with "solutions" in the phrase "so-called solutions" which suggests that Mahathir did not regard them as genuine solutions.

Table 4
*Text 2: Religious metaphors in Mahathir's argument against fanaticism*

| No. | Excerpts 1 to 5 |
|---|---|
| 1 | Human history is full of so-called solutions to the problems of human society. Each time a solution was found, the efficacy and infallibility of the solution was accepted as being beyond doubt. Those who espouse the solution will permit no criticism or opposition. They become so **fanatical that they would figuratively and sometimes literally burn the heretics at the stakes**… |
| 2 | …The Feudal system, Republicanism, Capitalism, Socialism and Communism are among the ideas invented by men to deal with the inequities and injustices in his society. When first introduced each was regarded as perfect by those who espouse them. They were all **practiced as articles of faith** and anything done in their name were accepted unquestioningly… |
| 3 | **…**The same thing will happen to all human ideas, concepts and ideals. Over time they will all become **quasi-religious, fanatically** believed in until they bring about new problems which are often worse than the problems they were supposed to solve… |
| 4 | **…**But believe me**,** we have turned around and we are much better off than those who **religiously** believe in the floating rate as the only way to ensure sound finances for a country… Malaysia is interested in results not systems. No matter how good a system is, if it delivers a bad result, we are not going to stick to it. Call us **heretics** if you like… |
| 5 | **…**all the systems devised by Man in order to create a better society are imperfect. And they become more imperfect because clever people keep on tempering with them, embellishing them and making them **sacred** so that you may not question them even when they fail to deliver. We must learn not to be too **fanatical about economic theories as much as we should not be fanatical about interpretations of religion**… We must learn not to be **fanatical** especially now, now that the Information Age has descended on us. |

He views as fanatics those who "espoused the solution", accepting it as infallible, and depicts them as dangerous extremists metaphorically burning at the stake as heretics those who oppose them (bold and underlined in the extract) to highlight the intolerance and inflexibility of its proponents. By metaphorically framing his views, meaning from one domain of experience, namely religion, is transferred across to another target domain as the adopted solution.

In (2) Mahathir supports his claim with examples of inflexible practice in the past, derived from ideas created to address problems in society and executed as "articles of faith". Capitalism, Socialism, and Communism are represented as solutions "to deal with inequities and injustices in society" and "regarded as perfect by those who espouse them". Notice how the voice of those who embrace these ideologies (underlined) is incorporated to illustrate their fanatical belief. Mahathir then comments on how they are practised "as articles of faith and […] accepted unquestioningly". This way of metaphorical framing gives rise to an unfavourable interpretation which implies that "those who espouse them" take their devotion too far. The selective mapping which involves foregrounding some aspects of the source domain and backgrounding others evoke notions of intolerance and dogmatism.

The argument in (3) is organised by creating semantic relations with Excerpt (2) using the latter as the basis for his categorical prediction of future happening - "The same thing will happen to all human ideas […]. Over time they will become quasi-religious". He cites experience concerning bigoted beliefs (asserted in (2) - "They were all practiced as articles of faith and […] were accepted unquestioningly") to make assertions about possible outcomes (predicted in (3) - "The same thing will happen to all human ideas"). Notice the change from prediction of future happening "they will become quasi-religious" to a statement of fact "… until they bring about new problems … often worse than the problems they were supposed to solve." Ascribing "all human ideas, concepts, and ideals" the propensity to become "quasi-religious" over time may serve Mahathir's ideological agenda, which makes it possible for him to represent an aspect of experience from his own perspective. Lakoff and Johnson (1980) suggest that creating social realities through metaphor may become significant when those in power get to impose their metaphors.

In (4) Mahathir talks about those, including himself, who oppose the free market, using the us-them dyad to separate "us" the opponents from "them" the supporters of this ideology. The metaphor "religiously" is used to depict the Other's unrelenting dogmatism. Mahathir challenges those who criticise "us" for going against the generally accepted practice to call "us heretics if you like". The use of the religious word "heretics" reflects the fanaticism of the free market ideology supporters, but those who opposed it are not bothered by this name-calling because if the system leads to

"a bad result" "we are not going to stick to it". Religious metaphors provide Mahathir with an effective discursive device to portray a *positive*-Self versus *negative*-Other image that is conceptualised as the forces of 'good' versus 'evil'. Notice the way argument is framed against adherence to neoliberal orthodoxy: "we have turned around and we [the positive-self] are much better off" than "those [the negative-Other] who religiously believe in the floating rate as the only way to ensure sound finances for a country". In this context, the function of this +Self and -Other is simply to encourage 'independence from the West' rather than the more 'common' and 'alienating' function of encouraging the extreme measure of 'war' against the enemy (Bhatia, 2007).

Sentence (5) is structured as a move from critical assertions to expressing commitment to obligation/necessity, making authoritative claims about what is the case and speaking with authority on what must be done on behalf of "We". Mahathir begins the argument by making a strong commitment to the truth of the proposition that "all systems devised by Man […] are imperfect" using the simple present 'are' to signal factuality presenting it as a statement of fact. The gist of his critical evaluation is that despite the flaw in the systems "devised by Man" to improve society, they are made "sacred" to prevent any opposition. The systems are framed as "sacred" being assigned an attribute associated with religion, thus deserving unquestionable devotion "so that you may not question them even that when they fail to deliver".

The second part of the argument imposes obligations upon "We", used inclusively here to represent the global community: "We must learn not to be too fanatical". The obligation to avoid fanaticism is legitimated by the claims that "all the systems devised by Man […] are imperfect". Mahathir makes a connection between claiming what is the case e.g., 'All systems […] are imperfect' and places obligations on what we 'must not/should not do': "We must learn not to be too fanatical about economic theories as much as we should not be fanatical about interpretations of religion"; "We must learn not to be fanatical especially now". "Must not" and "should not" are used in this context to talk about things to avoid. Injunctions about what people must or should not do are legitimised in terms of the failure of the imperfect systems created by Man despite the attempts made to improve them (e.g., *all the systems devised by Man in order to create a better society are imperfect. And they become more imperfect because clever people keep on tampering with them, embellishing them and making them sacred so that you may not question them even when they fail to deliver*).

The representation of "We" as being "too fanatical" incorporates a metaphor for religion itself as a dogmatic force, reflected in irrational devotion to the systems designed by Man to create a better society with no tolerance for the views of others despite evidence to the contrary. Such fanaticism about economic theories provokes Mahathir to respond with strong advice: We must learn not to be too fanatical about economic

theories as much as we should not be fanatical about interpretations of religion. Notice the use of the adverb "too" and how the religious metaphor "fanatical" is linked to 'economic theories' in the main clause and to 'interpretations of religion' in the subordinate clause. Notice also the shift from 'must not' a strong obligation to refrain from being "too fanatical" about "economic theories" to 'should not' a relatively less strong obligation to refrain from being "fanatical' about "religious interpretations". He then repeats "We must learn not to be fanatical especially now". At the higher level of text, Mahathir's key argumentative strategy here is to denounce fanaticism in systems by linking them to failure and bring into focus the need not to be "too fanatical about economic theories. He uses the inclusive 'we' to reduce the force of the imposition imposed by these potentially face threatening actions.

## DISCUSSION AND CONCLUSION

This study investigates the use of religious metaphors in political speeches delivered by Mahathir following the 1997-1998 Asian financial crisis. His speeches attracted global attention not only because of their context, but also because of Mahathir's radical stance and incisive critique of what he perceived as new capitalism - a market system that promoted liberalisation and exposed national economies to unrestrained market forces (see e.g., Shukri, 2024). They were presented in English for international consumption as a form of resistance against the detrimental effects of the globalist view of globalisation. Mahathir discredited the claims that "markets are self-regulating" and "market forces drive the economy to efficient outcomes", and instead debunked the belief that external regulation in the form of state interference "is economically counter-productive and damaging" (Fairclough, 2006, p. 40). This moral critique of Western capitalism enabled him to advance an ethical alternative grounded in religious values, positioning it in opposition to what he perceived as the greed, and moral failings underpinning Western economic practices.

Charteris-Black's Critical Metaphor Analysis (CMA) was used to examine Mahathir's political rhetoric through a three-stage process of metaphor identification, interpretation and explanation. Selected extracts were subjected to close analysis in accordance with Fairclough's textually oriented discourse-analytic approach. Religious metaphors were identified using the metaphor identification procedure proposed by the Pragglejaz Group, which involved careful reading of the entire texts using the context to ascertain the meaning of the words. Five speeches were analysed to illustrate how Mahathir used religious metaphors to construct representations of reality, especially in relation to the hegemonic nature of free market ideology accepted by its "fanatical" proponents as a "religious faith".

Religious metaphors enabled Mahathir to articulate a vision of economic independence for Malaysia and the broader Eastern world and frame his opposition to Western systems within a morally resonant

narrative. By invoking Islamic principles through religious metaphors, Mahathir provides a framework for resistance against neo-colonial economic practices, particularly the dominance of Western financial institutions such as the IMF and the World Bank imposing developing countries unfair conditions in exchange for financial assistance (Mumtaz et al., 2023). The combination of Islamic principles with the broader concept of Asian values not only strengthened Mahathir's domestic political legitimacy but also positioned Malaysia as a leading voice for an alternative, Eastern vision of global governance and development.

Future research could extend this study by examining larger datasets using corpus linguistics tools to identify broader patterns of metaphorical use and trends across genres, and audiences. Combining CMA with corpus-based techniques would enable more systematic generalisation while retaining critical interpretive depth. More broadly the findings of this study may contribute to debates on political rhetoric, ideology and moral framing, foregrounding the role of metaphor in legitimising critique and shaping public perceptions of economic systems.

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## APPENDIX

| No. | Speeches |
|---|---|
| 1 | The Plenary Session of the Tenth United Nations Conference on Trade and Development, 12-02-2000, Bangkok, Thailand |
| 2 | The Opening of Air Freight Asia 2000 Conference, 17-02-2000, Kuala Lumpur |
| 3 | The Official Opening of Ericsson Mobile Phone Plant, 21-02-2000, Shah Alam |
| 4 | The Second World Knowledge Conference, 08-03-2000, Kuala Lumpur |
| 5 | The Official Opening of POLMET 2000, 20-03-2000, Kuala Lumpur |
| 6 | Malam Asia Pacific MSC IT&T Awards (APMITTA), 31-03-2000, Kuala Lumpur |
| 7 | ASEAN Business Summit 2000/Asia 2000: Moving Forward, 11/04/2000 Kuala Lumpur |
| 8 | The South Summit, 12-04-2000, Havana, Cuba |
| 9 | The Official Opening of the Third Asia Africa Forum (AAF III), 23-05-2000, Kuala Lumpur |
| 10 | The Asia Oil & Gas Conference 2000, 29-05-2000, Kuala Lumpur |
| 11 | The Europe-Asia Business Summit 2000, 30-05-2000, Kuala Lumpur |
| 12 | The 6th Nikkei Shimbun International Conference on The Future of Asia, 09-06-2000, Tokyo, Japan |
| 13 | The Millennium Leaders' Summit, 16-06-2000, Kuala Lumpur |
| 14 | The Meeting with Members of The Industrial and Power Committee of The Egyptian Senate, 18-06-2000, Cairo, Egypt |
| 15 | Malaysia's Strategies to Deal with The Financial Crisis as Related to The Impact of Globalisation on Developing Countries, 20-06-2000, Cairo, Egypt |
| 16 | The Opening Ceremony of the 27th Islamic Conference of Foreign Ministers (ICFM), 27-06-2000, Kuala Lumpur |
| 17 | The International Seminar and Dialogue on Enhancing the Understanding of Islam for the Media, 30-06-2000, Kuala Lumpur |
| 18 | The Official Opening of The Malaysian Structural Steel Association Convention 2000, 11-07-2000, Kuala Lumpur |
| 19 | The Opening of The International Association of Historians of Asia, 27-07-2000, Kota Kinabalu, Sabah |
| 20 | At The Official Dinner in Honour of The Honourable Sheikh Hasina Prime Minister of The People's Republic of Bangladesh, 31-07-2000, Putrajaya |
| 21 | At The Official Dinner in Conjunction with The Meeting on Global 2000 International Smart Partnership, 21-08-2000, Maputo, Mozambique |
| 22 | At The 21st Century Conference to Commemorate the Establishment of The Tun Ismail Ali Chair in Monetary and Financial Economics, 29-08-2000, Kuala Lumpur |

| No. | Speeches |
|---|---|
| 23 | At The Lariba Lifetime Achievement Award Ceremony, 01-09-2000, Chicago, USA |
| 24 | The Official Launch Of E-Village, 08-09-2000, Dengkil, Selangor |
| 25 | The Launch of The International Convention on Role of The Media in Non-Aligned Countries, 21-09-2000, Shah Alam |
| 26 | The Opening Ceremony of The Second Meeting of The Regional Steering Committee on The Advancement of Rural and Island Women-Asia Pacific Region 26-09-2000, Kuala Lumpur |
| 27 | At Red Ribbon Gala 2000, 30-09-2000, Mandarin Oriental Hotel, Kuala Lumpur |
| 28 | At The Launch of The International Haji Conference, 30-09-2000, Kuala Lumpur |
| 29 | The Meeting with Muslim Intellectuals and Professionals, 03-10-2000, London, United Kingdom |
| 30 | The Third Meeting of The Malaysian-British Business Council & Conference on Malaysia-British Partnership for the 21st Century, 05-10-2000, United Kingdom |
| 31 | The Conference Organised by Cambridge University Malaysia Society (CUMAS), 07-10-2000, United Kingdom |
| 32 | The Opening Ceremony of The International Meeting of The Royal Commonwealth Society (RCS), 13-10-2000, RCS, Kuala Lumpur |
| 33 | The Official Opening Of K-Economy Conference, 17-10-2000, Petaling Jaya |
| 34 | The International Seminar on Islamic Law in The Contemporary World, 24-10-2000, Kuala Lumpur |
| 35 | The Asia Society Gala Forum, 28-10-2000, Hong Kong |
| 36 | The Opening of the 40th Meeting of the Commonwealth Telecommunications Council, 06-11-2000, Kuala Lumpur |
| 37 | The Meeting with Muslim Intellectuals and Businessmen, 11-11-2000, Doha, Qatar |
| 38 | The Ninth Islamic Summit Conference, 12-11-2000, Doha, Qatar |
| 39 | The Langkawi International Dialogue, 19-11-2000, Langkawi, Kedah |

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# Internalising The External: The Transition from Social Stigma to Self-stigma Among Malaysian B40 Adolescents

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## ABSTRACT

Rarely explored yet deeply consequential, this qualitative study explores how socioeconomic stigma is experienced, interpreted, and internalised as self-stigma among Malaysian adolescents from B40 families. Using a phenomenological research approach, semi-structured interviews were conducted with six late adolescents aged 18-25 years. The data were analysed thematically using Atlas.ti 9. The findings reveal that socioeconomic stigma is encountered through class-based labelling and social separation that mark economic difference in everyday interactions. These experiences do not lead directly to self-stigma but are first interpreted through processes of comparison, shame, and anticipation of social judgement. Over time, when such meanings are accepted as personally relevant, stigma becomes incorporated into self-evaluation, shaping self-regulation, relational withdrawal, and constrained aspirations. The study demonstrates that self-stigma develops through adolescents' interpretive engagement with socially produced judgements during a critical period of identity formation and is shaped by socioeconomic position and cultural context. By foregrounding adolescents' lived experiences, this study offers a process-oriented and contextually grounded understanding of stigma internalisation among socioeconomically marginalised adolescents.

*Keywords:* Adolescents, B40 families, self-stigma, social stigma

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## INTRODUCTION

Stigma is conceptualised as a profound social construct that marginalises individuals or group through mechanisms of labelling, stereotyping, discrimination and exclusion (Goffman, 1963; Link & Phelan, 2001). In contexts of socioeconomic inequities, stigma related to poverty often extends beyond material deprivation to encompass

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moral judgements and assumptions of personal inadequacy, thereby shaping how individuals are perceived and treated in everyday social interactions (Peterman, 2018; Vecchio-Camargo et al., 2022). Such stigma is embedded within social arrangements that normalise inequality and marginalisation.

Adolescence is a critical period during for individuals actively construct their self-identity (National Academies of Sciences, 2019). During this stage, they are particularly sensitive to social evaluation, peer comparison, and external judgement, as these experiences play a significant role in shaping self-perceptions and future orientations (Erikson, 1968). For adolescents from economically disadvantaged backgrounds, repeated exposure to poverty-related stigma may therefore carry heightened significance, influencing not only how they are viewed by others, but also how they come to understand and evaluate themselves (Blajeski et al., 2022; Corrigan et al., 2014; Maina et al., 2025; Mak & Cheung, 2019a; Reutter et al., 2009; Simons et al., 2018).

Although existing research has consistently demonstrated an association between social stigma and self-stigma, whereby negative social judgements are internalised and directed towards the self (Corrigan & Rao, 2012; Livingston & Boyd, 2010), self-stigma does not emerge spontaneously. Rather, it develops through a gradual process in which external social messages are interpreted, negotiated, and incorporated into one's self-concept (Akfirat et al., 2016; Plenty & Mood, 2016; Ropert & Di Masso, 2021). Examining this process requires attention to how adolescents make sense of repeated experiences of social labelling, comparison, and exclusion in their everyday lives (Blajeski et al., 2022; Ferrie et al., 2020). By centring this transition, the present study moves beyond treating self-stigma as an assumed outcome and instead emphasises the psychosocial mechanisms through which social stigma becomes internalised.

Processes of stigma internalisation are further shaped by socio-cultural context. In collectivist societies, social evaluation is closely linked to expectations surrounding family reputation, social harmony, and shared moral or spiritual values, which may intensify the personal meaning of stigma-related experiences (Abdullah & Brown, 2011; Goodpaster, 2021; Plenty & Mood, 2016). Within such contexts, stigma may be experienced not only as an individual judgement but also as a reflection upon one's family or social group (Homan et al., 2017; Vecchio-Camargo et al., 2022). These cultural dynamics indicate that the internalisation of stigma among adolescents cannot be fully understood without considering the social and cultural environments in which they are embedded (Plenty & Mood, 2016).

Adolescents from B40 households who classified as part of Malaysia's bottom 40% income group, typically with household earnings below RM5,250 per month, occupy a structurally marginalised socioeconomic position. This marginalisation stems from

long-standing structural inequalities, including stagnant income growth relative to rising living costs, as well as entrenched class-based divisions that shape access to resources, opportunities, and social mobility (Siwar et al., 2019; Yusuff, 2018). Thus, previous studies have documented how poverty-related stigma in Malaysia is reinforced through labelling, stereotypes of dependency, and subtle forms of social exclusion within educational and community settings (Ibrahim et al., 2019; Sani et al., 2020).

This qualitative study examines how social stigma is experienced, interpreted, and internalised as self-stigma among Malaysian adolescents from B40 families. By drawing on adolescents' lived experiences, the study elucidates the psychosocial processes through which external social judgements are transformed into internal self-evaluations. Through this focus, the study contributes a contextually grounded account of stigma internalisation, while acknowledging the boundaries and limitations inherent in qualitative inquiry.

## LITERATURE REVIEW

### Social Stigma as Social Differentiation

Social stigma has been widely examined as a as a social mechanism through which individuals and groups are categorised, evaluated, and positioned within hierarchical social structures. Early conceptual work framed stigma as an interactional process, whereby certain attributes or social identities become discrediting through everyday encounters that define what is considered normal or acceptable (Goffman, 1963). From this perspective, stigma, is not inherent to individuals themselves but emerges through social relations that attach negative meaning to particular social positions (Phelan et al., 2014).

Building on this interactional understanding, subsequent scholarship has situated stigma within broader systems of power and inequality. Link and Phelan (2001) and Phelan et al. (2014) conceptualise stigma as a convergence of interrelated processes, including labelling stereotypes separation, status loss, and prejudices that lead to discrimination and marginalisation which operate within social, economic, and political contexts. This framework highlights stigma as a mechanism of social differentiation that reinforces existing hierarchies and unequal access to resources and recognition.

Empirical research demonstrates that socioeconomic position constitutes a salient basis for stigma, often through moralised narratives that frame poverty as personal failure or deficiency (Homan et al., 2017; Hunzaker & Mann, 2021). Studies across diverse contexts show that individuals from lower socioeconomic backgrounds are frequently subjected to stereotypes related to irresponsibility, lack of motivation, or dependency, which extend beyond material deprivation to shape social interactions and institutional responses (Homan et al., 2017; Hunzaker & Mann, 2021; Vecchio-Camargo et al., 2022). Such representations contribute to persistent forms of exclusion that position low-income individuals,

including adolescents as socially inferior within educational and community settings (Peterman, 2018; Tighe & Davis-Kean, 2021)

Scholars have noted that socioeconomic stigma is particularly salient in collectivist cultures like Malaysia, where economic disadvantage often framed as a moral deficit rather than a structural condition (Ibrahim et al., 2019; Scheitle & et al., 2023). These narratives create systemic barriers, including reduced access to education, healthcare and community support systems (Pervez & Anjum, 2023; Sani et al., 2020). Moreover, familial reputation is a core value in collectivist societies amplifies the burden of stigma, as adolescents internalise societal judgment not only as personal shortcomings but also as a failure to uphold family honour (Abdullah et al., 2020; Padela, 2023).

Collectively, these perspectives conceptualise social stigma as a relational and structural phenomenon embedded within everyday interactions and institutional arrangements. Rather than representing isolated acts of prejudice, stigma operates as an ongoing process that organises social difference and reproduces social hierarchies.

## Self-stigma as Internalised Social Judgement

While social stigma operates through external labelling and social differentiation, self-stigma refers to the process by which these social judgements are internalised and incorporated into an individual's self-concept (Corrigan & Watson, 2002; Mittal et al., 2012; Scheitle & et al., 2023). Self-stigma reflects a shift in how individuals perceive, evaluate, and position themselves in relation to dominant social narratives, rather than a direct imposition by others (Eriksson, 2019; Mittal et al., 2012). Early models conceptualised self-stigma as self-directed devaluation arising when individuals become aware of, endorse, and apply negative stereotypes to themselves (Corrigan & Rao, 2012; Corrigan & Watson, 2002).

Subsequent scholarship has clarified self-stigma as a cognitive and evaluative process rooted in social meaning-making. Livingston and Boyd (2010), Abdullah and Brown (2011) and Eriksson (2019) describe self-stigma as involving the acceptance of socially shared beliefs and their application to the self, shaping self-worth, perceived capability, and self-evaluation. Similarly, Mak and Cheung (2019b) and Frost (2011) emphasise that self-stigma reflects internalised social evaluation, influencing how individuals anticipate judgement, interpret social interactions, and regulate their behaviour within everyday social contexts.

Empirical studies indicate that self-stigma frequently mirrors broader societal narratives surrounding social value, moral standing, and spiritual worth. Research on socioeconomic disadvantage shows that repeated exposure to poverty-related stereotypes may lead individuals to interpret structural constraints as personal inadequacies, even without explicit discrimination (Reutter et al., 2009). Experimental and survey-based studies

further suggest that perceived socioeconomic inferiority undermines confidence, agency, and aspirations through processes of social comparison and self-evaluation (Gilmore & Harris, 2008; Spencer & Castano, 2007).

Importantly, scholars highlight that self-stigma is shaped not solely by exposure to stigma but by the meanings individuals attribute to social judgement. Major and O'brien (2005) argue that internalised stigma involves an interpretive dimension, whereby individuals assess the legitimacy and relevance of societal stereotypes before integrating them into their self-concept. Supporting this view, empirical findings demonstrate that individuals actively negotiate stigma-related meanings, at times resisting dominant narratives and at other times incorporating them into self-understanding (Peterman, 2018; Reutter et al., 2009).

Taken together, the literature conceptualises self-stigma as an internalised form of social judgement that emerges through ongoing engagement with socially produced meanings. Self-stigma thus reflects the intersection between external social differentiation and individual interpretive processes, rather than an automatic or inevitable consequence of stigma exposure.

## The Internalisation of Stigma: A Process Perspective

Although the association between social stigma and self-stigma has been widely acknowledged, scholars increasingly emphasise that the transition between the two is neither automatic nor uniform. Stigma internalisation is understood as a gradual and interpretive process through which individuals engage with, evaluate, and incorporate social judgements into their self-concept (Major & O'brien, 2005; Swim & Stangor, 1998). This process is shaped by broader systems of meaning, including moral values, cultural norms, and spiritual or religious orientations, which influence how social judgements are assessed and integrated (T. Abdullah & Brown, 2011; Dardas & Simmons, 2015; Fekih-Romdhane & Daher-Nashif, 2023).

One influential framework conceptualises self-stigma as unfolding through three interrelated stages: awareness, agreement, and application (Corrigan & Rao, 2012; Corrigan & Watson, 2002). At the awareness stage, individuals become cognisant of socially shared stereotypes associated with their social group (Corrigan & Rao, 2012; Corrigan & Watson, 2002). Empirical studies show that individuals from socioeconomically disadvantaged backgrounds are often highly aware of moralised narratives surrounding poverty, even in the absence of overt discrimination (Peterman, 2018; Reutter et al., 2009).

The agreement stage involves deeper engagement with these meanings, whereby stigma-related stereotypes are increasingly perceived as legitimate or applicable (Corrigan & Rao, 2012; P. W. Corrigan & Watson, 2002). Agreement is more likely when such messages are encountered repeatedly across multiple contexts, including family interactions, educational settings, media content, and

peer comparisons (Gilmore & Harris, 2008). This stage reflects a shift from recognising stigma as an external judgement to accepting its underlying assumptions.

At the application stage, accepted judgements are directed inward and incorporated into self-evaluation (Corrigan & Rao, 2012; Corrigan & Watson, 2002). Individuals begin to interpret their experiences through the lens of stigma, often reframing structural constraints as personal shortcomings (Hunzaker & Mann, 2021; Major & O'brien, 2005). Empirical evidence suggests that this process shapes self-expectations, aspirations, and social behaviour through self-directed judgement rather than explicit external exclusion (Hunzaker & Mann, 2021; Liamputtong & Rice, 2020; Maina et al., 2025).

Importantly, scholars caution against viewing stigma internalisation as linear or inevitable. The process is mediated by individual meaning-making, contextual factors, and social support, and may involve movement between resistance and acceptance (Reutter et al., 2009). Conceptualising internalisation in this way positions it as a dynamic process through which social differentiation may, under certain conditions, become internalised as self-stigma.

## Adolescence, Socioeconomic Status, and Cultural Context

Adolescence represents a critical developmental phase beginning with the onset of puberty and extending into the mid-twenties characterised by identity formation, heightened self-awareness, and increased sensitivity to social evaluation (Bolton et al., 2009; Erikson, 1968; National Academies of Sciences, 2019). During this period, adolescents actively negotiate their sense of self through social comparison, peer acceptance, and perceived social positioning, rendering them particularly responsive to external judgements (Erikson, 1968; Arnett, 2000). Consequently, experiences of social stigma during adolescence may acquire heightened personal significance, shaping how social meanings are interpreted and incorporated into self-understanding (Major & O'brien, 2005).

Socioeconomic status constitutes an important dimension of social identity during adolescence, particularly in contexts marked by visible inequality. Research indicates that adolescents from economically disadvantaged backgrounds are more likely to encounter class-based labelling, social comparison, and subtle exclusion within educational and community settings (Homan et al., 2017; Peterman, 2018). These experiences may reinforce perceptions of social inferiority, especially when economic hardship is framed through moralised narratives associating poverty with personal failure (Furuya, 2002; Goodpaster, 2021; Plenty & Mood, 2016; Ramzanpour et al., 2023). Socioeconomic stigma thus operates not only as a structural condition but as a lived social experience during adolescence.

Cultural context further shapes how stigma is experienced and interpreted. In collectivist societies, social evaluation is closely linked to communal expectations,

family reputation, and social harmony, potentially intensifying the relational and emotional implications of stigma (Frost, 2011; Liamputtong & Rice, 2020; Swim & Stangor, 1998). In such contexts, stigma may be perceived as reflecting not only on the individual but also on the family or social group, amplifying its impact. These dynamics underscore the importance of situating stigma processes within broader cultural norms and value systems (Major & O'brien, 2005).

In Malaysia, adolescents from B40 households occupy a socioeconomically marginal position shaped by structural inequality and class-based differentiation (Min Fui et al., 2022). Existing studies document how poverty-related stigma is reinforced through everyday interactions, institutional practices, and limited access to resources, contributing to persistent social differentiation (Ibrahim et al., 2019; Sani et al., 2020; Siwar et al., 2019). However, research has largely focused on structural conditions or outcomes, with limited attention to how adolescents interpret and internalise these experiences during a formative developmental period.

Taken together, the intersection of adolescence, socioeconomic status, and cultural context creates conditions under which social stigma may acquire heightened personal meaning, particularly through interpretive processes that shape how social judgements are evaluated and internalised. This perspective underscores the importance of examining stigma internalisation as a context-dependent process rather than assuming uniform mechanisms across populations. By situating stigma internalisation within the lived realities of socioeconomically marginalised adolescents in Malaysia, the present study provides a contextually grounded and theoretically informed basis for the conceptual framework that presented in Figure 1. In this framework, adolescence, socioeconomic status, and cultural context are conceptualised as conditioning factors that shape the interpretation of social stigma and facilitate its transformation into self-stigma.

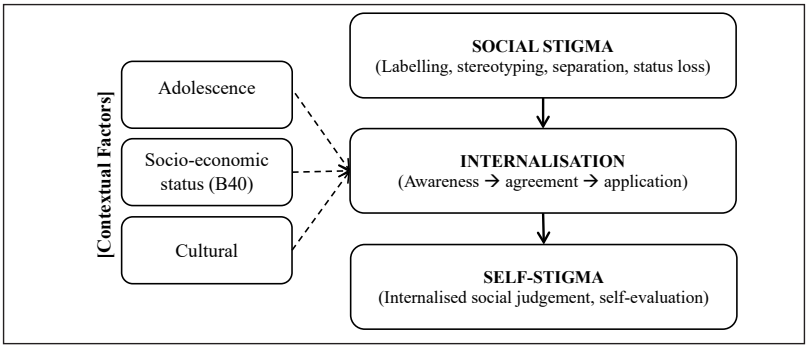



*Figure 1.* Conceptual framework illustrating the internalisation of social stigma as self-stigma among adolescents

## METHODOLOGY

### Research Design

This study adopted a qualitative research design grounded in a phenomenological approach to explore the lived experiences of late adolescents from Malaysia's B40 families, with particular attention to how social stigma is experienced, interpreted, and internalised as self-stigma. Phenomenology is concerned with understanding how individuals make sense of their experiences and the meanings they ascribe to them within specific social contexts (Bevan, 2014; Creswell, 2014; Creswell & Poth, 2018; Flick, 2018; Neuman, 2014). This approach was therefore appropriate for examining stigma internalisation, as the study sought to capture participants' subjective interpretations rather than to measure prevalence or establish causal relationships (Patton, 2014; Silverman, 2020).

Qualitative methods are well-suited for investigating complex psychosocial processes such as stigma, which are embedded in everyday interactions, emotions, and social meanings (Braun & Clarke, 2013; Guest et al., 2006; Neuman, 2014). By prioritising participants' perspectives, this design enabled an in-depth exploration of how adolescents understand socioeconomic stigma and how repeated social judgements gradually shape self-evaluation. The phenomenological orientation further allowed the analysis to remain closely grounded in participants' accounts while attending to shared patterns of meaning across experiences.

### Sampling and Participants

Purposive and snowball sampling strategies were employed to recruit participants who were most relevant to the study's objectives. Initial participants were identified through community networks and personal contacts, including university students and young adults from B40 households. These participants were subsequently invited to refer peers with similar socioeconomic backgrounds and experiences of socioeconomic stigma, facilitating access to a marginalised population and fostering trust during recruitment (Merriam & Tisdell, 2016; Moser & Korstjens, 2017; Nowell et al., 2017; TenHouten, 2017).

Eligibility criteria included: (i) Malaysian late adolescence aged between 18-25 years, (ii) individuals from B40 households, (iii) self-reported experiences of socioeconomic stigma in social, educational, or interpersonal contexts, and (iv) willingness to participate in an in-depth interview. The age range was selected due to its significance as a developmental period marked by identity formation and heightened sensitivity to social evaluation (Jaworska & MacQueen, 2015; National Academies of Sciences, 2019; Puteh, 2001).

A total of six adolescents participated in the study. In line with qualitative phenomenological research, sample size was determined by depth of data rather than representativeness (Guest et al., 2006). Data collection continued until thematic saturated was achieved, indicated by the recurrence of similar meanings and the absence of substantively new insights (Fusch & Ness,

2015). Basic socio-demographic information was collected to contextualise participants' experiences, and pseudonyms were used to ensure confidentiality.

## Data Collection

Data were collected through semi-structured, in-depth interviews, which are widely used in phenomenological research to elicit participants' to subjective experiences while allowing flexibility to probe emerging meanings (Bevan, 2014; Patton, 2014; Quinney et al., 2016). This method enabled participants to reflect on their experiences of socioeconomic stigma in their own words, while providing sufficient structure to ensure alignment with the study's research questions.

Interviews lasted approximately 20-40 minutes, an optimal duration to capture depth without inducing respondent fatigue (Braun & Clarke, 2006, 2013). All interviews were conducted in a private and non-judgemental setting to foster openness and trust. With participants' consent, interviews were audio-recorded and subsequently transcribed verbatim. Conducting interviews in this manner allowed for careful attention to participants' language, expressions, and meanings, which is central to phenomenological inquiry.

## Data Analysis

Data were analysed using thematic analysis, following an inductive and data-driven approach. Thematic analysis was selected for its flexibility and suitability for identifying patterned meanings across qualitative datasets, particularly in studies concerned with social processes and meaning-making (Braun & Clarke, 2013; Guest et al., 2006). Analysis followed the six-phase thematic analysis framework by Braun and Clarke (2006): familiarisation with the data, generation of initial codes, development of themes, review of themes, definition and naming of themes, and final reporting.

Throughout the analytic process, emphasis was placed on identifying how participants described experiences of stigma awareness, interpretation, and application to the self, in line with the study's conceptual framework. Coding and theme development were conducted iteratively, with constant comparison across transcripts to ensure coherence, conceptual clarity, and alignment with the study's process-oriented framework. Atlas.ti (version 9) was used to support data management, coding, and pattern recognition analytic transparency and consistency (Joffe, 2011).

## Ethical Considerations

Ethical approval was obtained from the University Malaya Research Ethics Committee (UMREC, Ref: UM.TNC2/UMREC_4044). Participants were fully informed of their rights, including confidentiality, voluntary participation, and the option to withdraw at any stage. To ensure participant well-being, psychosocial support referrals were made available, aligning with ethical best practices for sensitive qualitative research.

## RESULT

### Participants' Demographic

The characteristics of the participants in this study include age, gender, location, state of residence, and educational background. Participants were aged between 19 and 25 years, representing late adolescence. The sample comprised five female participants and one male participant, residing in both urban and rural areas across several Malaysian states.

All participants self-identified as belonging to B40 households, based on household income thresholds defined by Malaysian authorities, and described ongoing experiences of financial constraint consistent with this classification. Education levels varied, with participants holding SPM, STPM, diploma, and degree qualifications. Table 1 presents a detailed demographic profile of the participants.

### Thematic Findings

This section presents the findings of the thematic analysis, examining how socioeconomic stigma is experienced and gradually internalised among adolescents from B40 households. The findings are organised into three themes that reflect successive stages of stigma internalisation. Together, these themes illustrate a progression from initial awareness of stigma to its interpretation and acceptance, and finally to its application to the self. Table 2 summarises the themes and sub-themes derived from the analysis. The following sections elaborate on these themes in detail using selected participant quotations to support the analytical narrative.

### Theme 1: Becoming Aware of Socioeconomic Stigma (Awareness Stage)

Theme 1 captures participants' initial awareness of socioeconomic stigma as an external social phenomenon. At this stage, stigma was encountered through everyday interactions that rendered economic background socially visible and meaningful. Participants did not yet interpret these experiences as reflections of personal inadequacy; rather, they recognised stigma as something imposed through social evaluation and positioning. Two sub-themes illustrate how this awareness emerged: being

Table 1
*Demographic profile of the participants*

| Participant Code | Age (Years Old) | Gender | Location | State | Education Level |
|---|---|---|---|---|---|
| P1 | 22 | Female | Urban | Selangor | Diploma |
| P2 | 23 | Female | Urban | Kuala Lumpur | Degree |
| P3 | 19 | Male | Urban | Selangor | SPM |
| P4 | 24 | Female | Urban | Kedah | Degree |
| P5 | 25 | Female | Rural | Negeri Sembilan | Degree |
| P6 | 25 | Female | Rural | Kedah | STPM |

Table 2
*Thematic analysis of the internalisation of social stigma among Malaysian B40 adolescents*

| Theme | Stage of Internalisation | Sub-Themes | Indicative Focus of Participant Accounts |
|---|---|---|---|
| Theme 1: Becoming Aware of Socioeconomic Stigma | Awareness | Being labelled through socioeconomic markers | Awareness of stigma through parental occupation, housing type, financial assumptions, and stereotypes associated with the B40 category |
| | | Encountering separation as social difference | Recognition of social distance, relational boundaries, and perceived hierarchy based on socioeconomic background |
| Theme 2: Interpreting Socioeconomic Stigma as Personally Relevant | Agreement | Making Sense of Socioeconomic Difference through Shame | Emergence of shame and self-consciousness through peer comparison, housing-related embarrassment, and discomfort discussing family background |
| | | Anticipating social judgement | Expectation of negative evaluation, fear of rejection, and heightened self-monitoring in social interactions |
| Theme 3: Incorporating Socioeconomic Stigma into Self-Evaluation | Application | Withdrawing from social participation | Self-imposed withdrawal from social activities and invitations due to perceived economic inadequacy |
| | | Restricting relational engagement | Limiting romantic or close relationships based on assumptions about social worth and acceptability |
| | | Evaluating self through economic worth | Assessing self-value, confidence, and aspirations using income, salary comparison, and material standards |

labelled through socioeconomic markers and encountering separation as social difference.

### *Being Labelled through Socioeconomic Markers*

Participants first became aware of socioeconomic stigma through labels attached to visible and symbolic markers of economic position. These markers included parental occupation, housing type, financial capability, and assumptions surrounding dependence on assistance. Such labels were often communicated casually, yet they conveyed implicit social hierarchies that positioned participants' backgrounds as inferior.

P5 recalled being mocked based on their father's occupation "Ada yang ejek-ejek, 'Eh ayah kau bawa bas?" ("Some mocked me, saying, 'Oh, your dad drives a bus?") (P5). Although framed as a passing remark, this interaction made participants aware that certain occupations carried lower

social value. Participants interpreted such comments as signals that family background could invite judgement.

Besides, housing also functioned as a salient marker of socioeconomic status. P3 noted that living in low-cost flats was commonly associated with poverty and the B40 category, explaining that "Orang memandang rumah flat ni sebagai rumah orang miskin ataupun rumah Masyarakat B40." ("People see flats as homes for the poor or the B40 community.") (P3). Through such perception, place of residence became a socially recognisable indicator of economic position.

Beyond occupation and housing, participants encountered labelling through assumptions about financial responsibility. P5 described being questioned about savings, P5 noting that "Ada tanya, 'Kau takkan tak ada simpan langsung?' Dah memang tak ada nak buat macam mana." ("Someone asked, 'You seriously don't have any savings at all?' But there really isn't any. What can I do?") (P5). These interactions framed financial hardship as a personal shortcoming rather than as a situational constraint.

Participants also became aware of broader stereotypes associated with the B40 group. One participant expressed surprise at how B40 individuals were portrayed as dependent, stating that "orang cakap macam B40 ni nak kena suap" ("People say that B40 individuals need to be spoon-fed") (P4). Relatedly, another participant described perceptions of resentment towards assistance provided to B40 households, explaining that "diorang akan rasa tak adil… kenapa banyak bantuan diberi kepada golongan B40" ("They feel it is unfair… why so much assistance is given to the B40 group") (P1).

These findings indicate that participants became aware that socioeconomic background was not neutral but socially evaluated through multiple markers. At this stage, these labels were recognised as external judgements rather than internal self-assessments.

### *Encountering Separation as Social Difference*

Participants' awareness of socioeconomic stigma was further reinforced through experiences of social separation. Rather than overt exclusion, separation was often experienced through subtle distancing and reluctance to associate, signalling social boundaries linked to economic background. P5 recounted how others reacted upon learning about their place of residence:

> Dia [rakan] macam 'Ya ke kau duduk kampung ke?' Teruklah. Dia tak nak rapat dengan orang yang macam tu.(She [Friend] said, 'Do you really live in a village?' It's bad. She don't want to close to people like that.) (P5)

This response highlighted how socioeconomic background shapes perceptions of social acceptability. Participants interpreted such reactions as indications of difference rather than isolated incidents.

Experiences of separation also emerged within close interpersonal relationships. P3 described being explicitly positioned as socially unequal by a former partner, recalling that "Jadi dia menghina saya. Dia kata pada saya macam, 'Kita ni tak sama taraf.'" ("She insulted me, saying, 'We are not on the same level.'") (P3). This statement made social hierarchy explicit, reinforcing participants' awareness that economic background could function as a boundary even within personal relationships.

Taken together, participants' narratives indicate that socioeconomic separation was experienced as a recurring social pattern. At this stage, participants did not describe these experiences as reflections of personal inadequacy. Instead, they understood them as external social judgements that structured interactions and relationships.

## Theme 2: Interpreting Socioeconomic Stigma as Personally Relevant (Agreement Stage)

Theme 2 represents the stage at which participants moved beyond recognising socioeconomic stigma as an external social judgement and began to interpret it as personally meaningful. At this stage, stigma was not yet fully enacted through behaviour, but participants increasingly accepted its relevance to their own identities. This interpretive process was reflected through heightened emotional responses, self-consciousness, and anticipation of how others might evaluate them based on their socioeconomic background. Two interrelated sub-themes capture this stage: making sense of socioeconomic difference through shame and anticipating social judgement.

### *Making Sense of Socioeconomic Difference through Shame*

Participants described feelings of shame emerged as they began to evaluate themselves in relation to socioeconomic norms and peer comparison. This shame did not arise from isolated incidents but developed gradually through repeated exposure to situations in which economic difference became salient. Participants became increasingly self-conscious about their background, particularly when interacting with peers perceived as more economically advantaged.

P1 reflected on how feelings of shame became noticeable in social settings, stating that "Tapi rasanya memang rasa malu. Mungkin sebab kita ni dikelilingi dengan kawan-kawan yang bukan B40 kut." ("I just feel ashamed. Maybe it's because I am surrounded by friends who are not B40.") (P1). This sense of shame was closely tied to awareness of socioeconomic differences rather than to direct confrontation or rejection. Participants began to evaluate themselves through comparison, interpreting difference as a source of embarrassment.

Housing, which had earlier functioned as an external marker of socioeconomic status, increasingly became associated with personal discomfort P3 expressed concern about others knowing where they lived, explaining that "Saya malu lah macam kalau kawan-kawan saya tahu saya duduk flat." ("I feel ashamed if my friends know

that I live in a flat.") (P3). In this way, place of residence began to acquire emotional significance beyond its material function.

For P5, shame extended beyond discomfort to emotional distress linked to family background. Discussing parental occupation became particularly difficult, as P5 shared that "bagi saya benda tu menjadi trauma. Rasa bencinya nak bercerita pasal pekerjaan ayah saya." ("For me, it became a trauma. I hate talking about my father's job.") (P5).

Across participants' narratives, shame functioned as an internal emotional response through which participants began to accept stigma-related meanings as relevant to their own lives. Although stigma remained externally produced, it was increasingly experienced as something that reflected upon the self.

### Anticipating Social Judgment

Alongside internalised shame, participants described a growing tendency to anticipate negative judgement from others. Rather than waiting for explicit discrimination, participants began to monitor how their background might perceive, shaping how they communicated and presented themselves in social interactions.

Some participants expressed fear that their family background would invite stigma or scepticism. P4 stated that "Takut orang ada stigma atau skeptikal pada saya dengan family." ("I'm afraid that people will have stigma or be sceptical about me and my family.") (P4). This anticipation influenced how participants evaluated potential social interactions.

This concern extended to peer relationships, where participants worried that socioeconomic status might affect social acceptance. P3 shared, "Saya takut mereka tidak ingin berkawan dengan saya, ataupun mereka memandang rendah saya lah sebabkan saya ni merupakan seorang daripada golongan B40." ("I'm afraid they won't want to be friends with me, or they will look down on me because I am from the B40 group.") (P3).

Likewise, P2 described highlighted sensitivity to how their situation might affect others, stating that "…takut orang lain tak selesa [datang ke rumah P2]." ("…afraid others might feel uncomfortable [come to P2's home].") (P2). These narratives illustrate how participants began to internalise expectations of judgement, even in the absence of overt exclusion. Anticipating stigma became part of how participants interpreted social situations, prompting increased self-monitoring and emotional vigilance.

### Theme 3: Incorporating Socioeconomic Stigma into Self-Evaluation (Application Stage)

Theme 3 captures the stage at which socioeconomic stigma was actively incorporated into participants' self-evaluation and behavioural regulation. At this stage, stigma no longer functioned only as an interpreted social judgement but became a guiding framework through which participants made decisions, limited

participation, and evaluated their own worth. Participants began to apply stigma to themselves, resulting in self-imposed restrictions across social, relational, and aspirational domains. Three sub-themes illustrate this process: withdrawing from social participation, restricting relational engagement, and evaluating self through economic worth.

### *Withdrawing from Social Participation*

Participants described withdrawing from social activities as a direct consequence of their socioeconomic background. Unlike earlier stages, where discomfort and fear were expressed internally, participants at this stage described concrete actions taken to avoid situations that might expose their economic limitations. P4 explained how financial constraints led to repeated withdrawal from social outings:

> Tapi macam bila nak keluar tu 'tak bolehlah.' Kalau sekarang ni, 'Tak bolehlah, sorry lah, kau orang keluarlah. Tak apalah, aku tak jadi keluar' disebabkan itulah [Status B40]. (When it's time to go out, I just say, 'I can't.' Now it's always, 'I can't, sorry, you guys go ahead, never mind, I won't join' because of that [B40 status].) (P4)

This withdrawal was not framed as a temporary inconvenience but as a recurring pattern of self-exclusion. Participants described choosing absence over participation to manage anticipated discomfort and social comparison.

Similarly, P4 and P5 described limiting social interactions within their own living spaces. What had previously been experienced as shame became translated into behavioural avoidance:

> Tapi seganlah. Itu yang kadang-kadang saya tak berani nak jemput orang datang rumah. (I feel embarrassed. That's why sometimes I don't dare to invite people to my house.) (P4)

> Saya tak suka orang datang rumah saya sebenarnya [kerana bimbang status B40 akan diketahui]. (Actually, I don't like people coming to my house [due to worry about the status of B40 being known].) (P5)

These statements indicate that participants actively reorganised their social lives to minimise exposure to situations perceived as socially risky. Withdrawal thus functioned as a self-protective strategy shaped by internalised stigma.

### *Restricting Relational Engagement*

Beyond general social participation, participants also applied socioeconomic stigma when navigating close and intimate relationships. Economic background became a lens through which participants evaluated their suitability for relationships and anticipated rejection. P3 described how their B40 status shaped decisions about forming romantic relationships:

> Disebabkan saya seorang golongan B40, jadi ketika saya ingin berkenalan dengan seseorang ataupun untuk

> bercinta dengan seseorang, saya jadi macam memikirkan kekurangan saya [latar belakang daripada keluarga B40]. (Because I am from the B40 group, when I want to get to know someone or start a relationship, I start thinking about my weakness [background from B40 families].) (P3)

Here, socioeconomic status was not merely a background characteristic but became central to how participants assessed their own desirability. Participants described pre-emptively limiting relational engagement based on assumptions about how they would be perceived.

Such self-restriction reflected a shift from anticipating judgement to acting upon it. Rather than waiting for rejection, participants regulated their own relational boundaries, narrowing opportunities for connection.

### *Evaluating Self through Economic Worth*

Participants also described incorporating socioeconomic stigma into broader self-evaluation, particularly in relation to confidence, competence, and prospects. Rather than attributing limitations to external conditions, participants increasingly framed them as personal deficiencies linked to economic status.

P5 reflected on how their B40 background contributed to diminished self-confidence: "Lepas tu saya jadi macam kurang keyakinan lah. Itu memang masalah diri saya daripada dulu lagi lah… salah satu punca kurang keyakinan pasal nilah status [sosio-ekonomi]." ("Then I started feeling less confident… one of the reasons for my low confidence is this status [socioeconomic].") (P5)

Another participant described evaluating themselves through income comparison, which reinforced feelings of inadequacy. This experience was articulated by P6: "Saya malu pada gaji… kawan-kawan saya… gaji lebih tinggi daripada saya walaupun saya ni kerja dah lama." ("I feel ashamed about my salary… my friends… earn way higher than me even though I've been working longer.") (P6). P6 also expressed sadness linked to perceived inability to achieve socially valued standards of living, as shared "Ada rasa sedih pada diri sendiri sebab tak mampu nak hidup yang untuk mewah kan diri. (I feel sad about myself because I can't afford to live a luxurious life.) (P6)

These narratives illustrate how socioeconomic stigma became embedded in participants' self-evaluations. Economic worth increasingly served as a benchmark for self-assessment, shaping confidence, aspirations, and perceptions of personal value.

## DISCUSSION

The present study examined how socioeconomic stigma experienced by Malaysian adolescents from B40 families becomes internalised as self-stigma. Rather than conceptualising self-stigma as a direct outcome of social stigma, the findings indicate that internalisation unfolds through a gradual interpretive process shaped by adolescents' engagement with social meanings, developmental conditions, and socio-cultural context. By foregrounding

adolescents' lived experiences, this study advances a process-oriented understanding of how externally produced judgements shape self-evaluation during a critical stage of identity formation.

The findings confirm that socioeconomic stigma represents a salient and pervasive social reality for adolescents from B40 backgrounds. Participants encountered stigma through class-based labelling, stereotyping, and social separation, reinforcing perceptions of socioeconomic hierarchy. These experiences align with conceptualisations of stigma as a mechanism of social differentiation embedded in everyday interactions and institutional arrangements (Goffman, 1963; Link & Phelan, 2001). Importantly, stigma was experienced as a recurring social pattern rather than isolated incidents, supporting the view that socioeconomic stigma operates structurally and relationally (R. Conger et al., 2010; Major & O'Brien, 2005; Peterman, 2018).

However, exposure to social stigma did not automatically result in self-stigma. Adolescents demonstrated awareness that stigma originated externally, recognising labelling and stereotyping as judgements imposed by others. This distinction challenges assumptions that stigma exposure inevitably leads to self-devaluation. Consistent with previous research, awareness emerged as a necessary but insufficient condition for self-stigma (Corrigan & Rao, 2012; Major & O'brien, 2005), highlighting the importance of subsequent interpretive processes.

The transition from social stigma to self-stigma occurred most critically during the interpretive phase, when socioeconomic difference was perceived as personally meaningful. Corresponding to the agreement stage in stigma internalisation models, this phase involved a shift in which external judgements were increasingly considered relevant to self-identity. Emotional responses such as shame, discomfort, and fear of judgement accompanied this process, which developed through repeated social comparison and subtle evaluation across peer, educational, and relational contexts.

This phase illustrates that stigma internalisation involves active meaning-making rather than passive absorption. Adolescents evaluated stigma-related narratives by comparing themselves with peers, anticipating social judgement, and assessing their position relative to dominant norms. This finding extends existing literature by demonstrating how stigma-related meanings are negotiated before being internalised (Livingston & Boyd, 2010; Mak & Kwok, 2010). At this point, socioeconomic stigma began to shape the self-concept as its underlying assumptions were accepted as plausible.

Once accepted, stigma-related meanings were applied to the self through behavioural and self-evaluative changes. Participants described social withdrawal, restricted participation, and reassessments of self-worth and future potential through a socioeconomic lens. Stigma thus functioned as an internal framework guiding self-regulation and decision-making (Corrigan

& Rao, 2012; Corrigan & Watson, 2002). These patterns align with theoretical accounts linking self-stigma to diminished self-efficacy and constrained aspirations, whereby structural disadvantage is reframed as personal inadequacy (Bandura, 1997; Lord et al., 2015; Spencer & Castano, 2007). Notably, participants did not primarily frame these experiences in terms of mental illness, reinforcing the conceptual distinction between self-stigma and psychopathology.

The developmental context of adolescence further shaped this process. Characterised by identity exploration and heightened sensitivity to peer evaluation, adolescence renders social judgement particularly influential (Erikson, 1968; Kroger, 2017; Santrock, 2018). Stigma encountered during this period appeared to exert cumulative effects, as repeated evaluations became incorporated into emerging self-concepts when identity boundaries remain fluid, particularly in the absence of supportive counter-narratives (Hartman et al., 2013; Papadopoulos et al., 2012).

Socioeconomic position intensified internalisation. For adolescents from B40 families, economic constraints functioned not only as material limitations but as socially meaningful indicators of worth and legitimacy. Persistent hardship reduced opportunities to contest stigma-related narratives, increasing the likelihood that repeated judgements were perceived as credible reflections of the self. This supports arguments that stigma internalisation is shaped by structural conditions that constrain alternative interpretations and social mobility (Gui & Alam, 2024; Khaw et al., 2024; Lasalvia et al., 2025).

Cultural context also influenced how stigma was interpreted. Within Malaysia's collectivist setting, where family reputation and social harmony are emphasised, stigma was often experienced as extending beyond the individual to the family. Participants' concern about family image highlights the relational dimension of stigma internalisation, consistent with research showing that stigma in collectivist societies carries shared moral implications and intensifies emotional responses (A. Abdullah et al., 2020; Berry et al., 2020; Swim & Stangor, 1998). By situating stigma internalisation within its cultural context, the study underscores that self-stigma cannot be fully understood without attending to the social norms and values that shape meaning-making.

Taken together, the findings indicate that self-stigma emerges through sustained engagement with socially produced meanings negotiated during a vulnerable developmental period and reinforced by socioeconomic and cultural conditions. This challenges individualistic interpretations and underscores the formative role of social structures. By foregrounding process rather than outcome, the study demonstrates that stigma internalisation is contingent rather than inevitable.

The findings further suggest the possibility of resistance to internalisation. Variations in participants' interpretations indicate that internal resources such as

identity coherence, resilience, and alternative value frameworks may moderate this process (Frost, 2011; Lazarus & Folkman, 1984). Within this context, moral and spiritual orientations may function as interpretive resources that provide alternative criteria of worth beyond socioeconomic status. Existing scholarship suggests that spiritual and moral frameworks can offer meaning systems that buffer against negative self-evaluation by emphasising dignity, purpose, and resilience (Fekih-Romdhane & Daher-Nashif, 2023; Padela et al., 2023). Framed cautiously, such perspectives highlight the potential role of internal resources in shaping how stigma is negotiated, without implying prescriptive or normative solutions.

Overall, this study contributes to the stigma literature by offering a contextually grounded, process-oriented account of how socioeconomic stigma becomes internalised among adolescents. By tracing how stigma is recognised, interpreted, and applied, the findings extend existing frameworks and demonstrate how developmental stage, socioeconomic position, and cultural norms intersect to shape stigma internalisation among Malaysian adolescents from B40 families.

## CONCLUSION

This study highlights how socioeconomic stigma experienced by Malaysian B40 adolescents is gradually internalised as self-stigma. Drawing on adolescents' lived experiences, the findings demonstrate that self-stigma does not emerge spontaneously, nor is it an inevitable consequence of socioeconomic disadvantage. Rather, the internalisation of stigma unfolds through a process in which external social judgements are first recognised, then interpreted as personally meaningful, and, under certain conditions, applied to the self.

The analysis shows that adolescents are initially aware of socioeconomic stigma through experiences of labelling, stereotyping, and social differentiation. At this stage, stigma is understood as originating externally and does not yet define the self. The critical transition occurs when adolescents begin to make sense of socioeconomic difference through emotional and interpretive responses, particularly shame and anticipation of social judgement. When these stigma-related meanings are accepted as relevant to one's own identity, they may subsequently shape self-evaluation, behaviour, and future orientation, marking the emergence of self-stigma.

By tracing this process, the study contributes a process-oriented and contextually grounded account of stigma internalisation. It extends existing stigma frameworks by empirically demonstrating how and why social stigma may transform into self-stigma during adolescence, rather than treating this relationship as automatic or uniform. The focus on Malaysian adolescents from B40 families further enriches stigma scholarship by situating internalisation within the intersecting contexts of developmental stage, socioeconomic position, and cultural norms.

## Implications of the Study

First, they highlight the need to address socioeconomic stigma as a social and relational phenomenon rather than focusing solely on individual psychological outcomes. Efforts to reduce self-stigma among adolescents should prioritise challenging stigma-producing narratives within social environments, particularly in educational and community settings where socioeconomic differentiation is frequently reproduced.

Second, the identification of adolescence as a critical period in the internalisation process underscores the importance of early and preventive approaches. Supporting adolescents' capacity to critically interpret social judgements may help prevent the transition from awareness of stigma to its internalisation. Educators, counsellors, and youth practitioners play an important role in fostering environments that promote inclusive understandings of worth and capability, rather than reinforcing moralised interpretations of socioeconomic status.

Third, the findings suggest that internal resources may influence how adolescents engage with stigma-related meanings. While not examined directly in this study, moral, spiritual, or value-based orientations may provide alternative frameworks through which adolescents interpret social judgement, potentially reducing reliance on socioeconomic status as a basis for self-evaluation. This insight points to the value of culturally sensitive approaches that strengthen adolescents' internal anchors of identity without pathologising their experiences or prescribing uniform coping strategies.

## Limitations and Recommendations for Future Research

Several limitations should be acknowledged. The qualitative design and purposive sampling strategy, while appropriate for in-depth exploration, limit the generalisability of the findings beyond the study context. The aim of this research was not to establish prevalence or causal relationships, but to develop an analytically grounded understanding of stigma internalisation as a social and interpretive process.

As stigma internalisation is gradual and evolving, longitudinal research would be valuable in examining how interpretations of stigma change across adolescence and early adulthood, and how early experiences shape longer-term outcomes related to self-concept, education, and socioeconomic trajectories. Future studies may also benefit from mixed-method approaches that combine qualitative insight with quantitative measurement to enhance empirical robustness.

Finally, while this study did not evaluate interventions, the findings highlight the need for research examining strategies that disrupt stigma-related meanings before they become internalised. Intervention-based studies, particularly those integrating psychosocial support with culturally meaningful sources of resilience, may offer important insights into how cycles of socioeconomic disadvantage can be addressed in evidence-based and contextually appropriate ways.

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# Bentuk dan Makna Kata Ganda Bahasa Melayu Berdasarkan Data Korpus

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## ABSTRAK

Kajian ini membincangkan bentuk dan makna kata ganda bahasa Melayu berdasarkan data korpus. Kata ganda ialah kata yang terbentuk melalui penggandaan kata dasar. Kata inilah yang dianggap sebagai kata ganda tulen. Namun, ada juga kata yang mirip dengan kata ganda tulen tetapi tidak dapat dikembalikan kepada bentuk dasar dan kata ini dianggap sebagai kata ganda semu, seperti *sia-sia*, *hati-hati*, *huru-hara*, *kucar-kacir*, dan *seolah-olah*. Bentuk inilah yang sering mengelirukan kerana mirip dengan kata ganda tulen. Oleh sebab itulah, kajian ini dilakukan untuk mencapai tiga objektif utama, iaitu (i) mengenal pasti kata ganda tulen dan kata ganda semu; (ii) menganalisis dan membandingkan kata ganda tulen dan kata ganda semu; dan (iii) merumuskan bentuk dan makna kata ganda tulen berbanding kata ganda semu. Kajian ini menggunakan pendekatan kualitatif melalui kaedah analisis teks, berpaksikan teori nahu sistemik dan analisis makna komponen oleh Omar. Sampel data kajian diambil secara persampelan bertujuan pada kata ganda tulen dan kata ganda semu dalam pangkalan data Korpus Dewan Bahasa dan Pustaka (DBP). Dapatan kajian ini menunjukkan bahawa kata ganda tulen dan kata ganda semu dapat dibahagikan kepada empat betuk utama, iaitu penuh, berentak, berimbuhan, dan separa. Contohnya*, aspek-aspek*, *mandi-manda*, *beramai-ramai*, dan *gegelung* (kata ganda tulen); serta *anai-anai*, *serta-merta*, *kepura-puraan*, dan *peparu* (kata ganda semu). Kajian ini penting sebagai panduan kepada pengguna bahasa, khususnya penulis buku tatabahasa, dalam memahami dan mengelaskan bentuk kata ganda dengan lebih tepat.

*Kata Kunci:* Bentuk, kata dasar, kata ganda, makna, semu

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## *ABSTRACT*

*This study examines the forms and meanings of reduplicated words in the Malay language based on corpus data. Reduplication refers to words formed through the repetition of a base*

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*word, which are categorised as true reduplications. However, there are also words that resemble true reduplications but cannot be traced back to their original base forms. These are known as pseudo-reduplications, such as* sia-sia *(in vain),* hati-hati *(careful),* huru-hara *(chaos),* kucar-kacir *(disorder), and* seolah-olah *(as if). These forms are often confusing because of their similarity to true reduplications. Therefore, this study was conducted to achieve three main objectives: (i) to identify true and pseudo-reduplications; (ii) to analyse and compare true and pseudo-reduplications; and (iii) to summarise the forms and meanings of true reduplications in contrast to pseudo-reduplications. The study employs a qualitative approach using text analysis methods, grounded in the Systemic Grammar Theory and the Componential Meaning Analysis proposed by Omar (1993). Data samples were purposively selected from both true and pseudo-reduplications found in the Dewan Bahasa dan Pustaka (DBP) Corpus Database. The findings indicate that both true and pseudo-reduplications can be classified into four main types: full, rhythmic, affixed, and partial reduplications. Examples include* aspek-aspek *(aspects),* mandi-manda *(bathing activities),* beramai-ramai *(in groups), and* gegelung *(coil) for true reduplications; as well as* anai-anai *(termites),* serta-merta *(immediately),* kepura-puraan *(pretence), and* peparu *(lungs) for pseudo-reduplications. This study serves as an important reference for language users, particularly grammar writers, in understanding and classifying reduplicated forms in Malay more accurately.*

*Keywords: Form, meaning, reduplication, root word, pseudo*

## PENGENALAN

Kata ganda atau kata ulang merupakan bentuk kata yang terhasil melalui proses penggandaan kata dasar sama ada secara keseluruhan atau sebahagian, dengan atau tanpa perubahan bunyi tertentu. Menurut Karim et al. dalam *Tatabahasa Dewan* (2015), kata ganda dibahagikan kepada tiga bentuk utama, iaitu kata ganda penuh, separa, dan berentak.

Sementara itu, Omar (2015) memperincikan sembilan bentuk penggandaan bahasa Melayu, termasuk penggandaan seluruh kata, berirama, menyalin, bersisipan, serta bentuk berimbuhan. Selain bentuk-bentuk tersebut, Asmah turut menjelaskan kewujudan satu lagi kategori yang dinamakan kata ganda asal atau kata ganda semu, seperti *kura-kura*, *rama-rama*, dan *biri-biri*. Bentuk ini berbeza daripada kata ganda tulen kerana unsur-unsurnya tidak dapat dikembalikan kepada kata dasar yang mempunyai makna tersendiri. Menurutnya, kata ganda asal merupakan satuan utuh yang tidak mendukung makna gandaan, sebaliknya membawa makna sebenar kata itu sahaja.

Kamus Dewan (2015) mendefinisikan perkataan *semu* sebagai "bukan yang sebenarnya" atau "pura-pura". Berdasarkan makna ini, istilah kata ganda semu merujuk kepada bentuk gandaan yang kelihatan seperti pengulangan, tetapi bukan hasil daripada proses penggandaan kata dasar yang sebenar. Kata-kata ini hanya menyerupai bentuk kata ganda tulen secara morfologi, namun tidak berfungsi sebagai hasil proses penggandaan yang membawa maksud jamak, intensif atau berentak.

Dalam konteks ejaan semasa, Sistem Ejaan Rumi Baru (1972) menetapkan penggunaan tanda sempang (-) bagi memisahkan unsur kata ganda, kecuali bagi kata ganda separa. Walau bagaimanapun, bentuk kata ganda semu sering mengelirukan pengguna bahasa kerana bentuk luaran dan struktur penulisannya menyerupai kata ganda tulen. Contohnya *biri-biri*, *pura-pura*, dan *masing-masing* yang kelihatan seperti hasil pengulangan kata dasar, sedangkan unsur pertamanya tidak wujud sebagai kata bebas yang bermakna.

Justeru, pengenalpastian yang jelas antara **kata ganda tulen** dan **kata ganda semu** amat penting dalam analisis linguistik dan pendidikan bahasa Melayu. Kajian terhadap bentuk dan fungsi kata ganda semu dapat memperkukuh pemahaman tentang sistem morfologi bahasa Melayu serta membantu memperjelas batas antara bentuk pengulangan yang sebenar dan bentuk yang hanya menyerupainya dari segi struktur.

### Penyataan Masalah

Kajian ini bertitik tolak daripada premis bahawa tiada "penanda khusus" yang membezakan antara kata ganda semu dengan kata ganda tulen. Kedua-dua kata tersebut sama sahaja dari segi bentuknya kerana kedua-duanya ada tanda hubung atau sempang (-) di tengah-tengahnya, seperti *biri-biri*, *agar-agar*, *kanak-kanak, pura-pura, masing-masing* dan *undang-undang* (Omar, 2015).

Akibatnya, hal ini boleh mengelirukan pengguna bahasa kerana bentuk kata ganda semu sama dengan kata ganda tulen, terutama untuk kata ganda semu yang sama atau menyerupai kata ganda penuh. Unsur pertama kata ganda semu, *agar-agar*, *kanak-kanak, pura-pura, masing-masing* dan *undang-undang*, iaitu *agar, kanak*, *pura, masing*, dan *undang* seolah-olah menjadi kata dasarnya. Walhal, yang menjadi dasarnya ialah keseluruhan kata ganda semu itu.

Penulis buku tatabahasa seperti Karim et al. (2015), Hassan (1994), Othman (1981), dan Omar (2015) masing-masing ada pandangan yang tersendiri berkaitan dengan kata ganda**.** Oleh sebab itu, pengkaji tertarik untuk meneliti aspek kata ganda dengan lebih lanjut.

### Objektif Kajian

Secara khususnya, kajian ini dilakukan untuk mencapai objektif yang berikut, iaitu:

i. Mengenal pasti kata ganda tulen dan kata ganda semu bahasa Melayu;
ii. Menganalisis kata ganda tulen dan kata ganda semu; dan
iii. Merumuskan bentuk dan makna kata ganda tulen dan kata ganda semu.

## KAJIAN LITERATUR

Kajian tentang kata ganda dalam bahasa Melayu telah diperincikan oleh beberapa sarjana utama seperti Za'ba (1941), Karim et al. (2015), Hassan (1994), Othman (1981), dan Omar (2015). Setiap tokoh memberikan pendekatan dan pengelasan tersendiri terhadap bentuk penggandaan, dengan tahap perincian dan istilah yang berbeza mengikut zaman dan kerangka linguistik masing-masing.

Za'ba (1941) merupakan pelopor yang membicarakan kata ganda secara formal dalam *Pelita Bahasa Melayu*. Beliau memperkenalkan tiga bentuk utama, iaitu *pergandaan biasa*, *pergandaan yang dipendekkan*, dan *pergandaan berubah*. Walaupun pengelasannya memberikan asas penting kepada kajian morfologi Melayu, Za'ba belum membezakan bentuk kata ganda semu secara tersendiri. Bentuk seperti *kekura* dan *kekabu* hanya dimasukkan dalam kategori pergandaan yang dipendekkan tanpa penjelasan fonologi atau leksikal mendalam.

Karim *et al.* (2015) dalam *Tatabahasa Dewan* pula menyusun penggandaan kepada tiga kategori sistematik, iaitu *penggandaan penuh*, *penggandaan separa*, dan *penggandaan berentak*. Pengelasan ini menjadi rujukan standard dalam pendidikan bahasa Melayu kerana huraian yang komprehensif meliputi bentuk dan fungsi kata ganda. Namun, *Tatabahasa Dewan* juga tidak mengkaji kata ganda semu secara khusus, menunjukkan adanya kekosongan dalam kategori leksikal yang tidak terbentuk melalui proses pengulangan biasa.

Hassan (1994) dalam *Linguistik Am untuk Guru Bahasa Malaysia* pula memperkenalkan lima kategori utama, iaitu *gandaan penuh, separa, rentak, bersisipan,* dan *bebas*. Pendekatan ini bersifat inklusif kerana menggabungkan pelbagai variasi yang tidak dihuraikan oleh sarjana sebelumnya, termasuk bentuk seperti *jari-jemari* dan *tali-temali*. Walau bagaimanapun, Abdullah juga tidak menempatkan kata ganda semu sebagai kategori khas, meskipun bentuk tersebut sebahagiannya boleh dimasukkan ke dalam kategori *gandaan bebas*. Othman (1981) dalam *Tatabahasa Bahasa Malaysia* pula mengambil pendekatan paling ringkas dengan membahagikan kata ganda kepada dua kategori utama sahaja, iaitu *penggandaan tulen* dan *penggandaan berentak*. Pendekatan ini mudah dan sesuai untuk tujuan pedagogi, namun terlalu umum untuk menjelaskan bentuk yang kompleks seperti kata ganda semu.

Berbeza dengan Za'ba (1941), Karim et al. (2015), Hassan (1994), Othman (1981), dan Omar (2015) melalui *Nahu Melayu Mutakhir* memperluas klasifikasi kepada sepuluh kategori, termasuk memperkenalkan konsep *kata ganda asal atau semu* seperti *biri-biri*, *agar-agar*, dan *pura-pura*. Beliau menegaskan bahawa kata ganda semu ialah bentuk leksikal tetap yang tidak terhasil melalui proses morfologi produktif. Kata ganda semu sering menimbulkan kekeliruan dalam pengelasan morfologi bahasa Melayu kerana bentuknya menyerupai kata ganda tulen, namun tidak terbentuk melalui proses pengulangan produktif. Menurut Omar (2015) dalam *Nahu Melayu Mutakhir*, kata ganda semu ialah bentuk yang menyerupai pola penggandaan tetapi hanya wujud dalam bentuk berganda. Bentuk ini berfungsi dalam sistem leksikal bahasa Melayu dan boleh hadir dalam pelbagai kelas kata, termasuk kata nama, kata kerja, kata adjektif, dan kata adverba. Walau bagaimanapun, penjelasan Asmah lebih bersifat deskriptif dan tidak memperincikan aspek morfologi serta fonologi yang menjelaskan mekanisme kemunculan bentuk semu tersebut.

Kajian Ahmad (2000) melalui disertasi bertajuk *Pengendalian Kata Ganda dalam Kamus Dewan dan Kamus Besar Bahasa Indonesia: Suatu Kajian Perbandingan* turut mengiktiraf kewujudan lima jenis kata ganda dalam bahasa Melayu, termasuk kategori semu seperti *rama-rama*, *kanak-kanak*, dan *kura-kura*. Menurut beliau, bentuk ini tidak mempunyai kata dasar yang bermakna secara bebas dan hanya membawa makna apabila digandakan. Kajian Ibrahim memberi sumbangan penting dari segi leksikografi, namun fokusnya lebih kepada pendekatan kamus dan fungsi penggunaan, bukan kepada struktur linguistik dalaman bentuk semu. Selain itu, terdapat kecenderungan untuk mengelirukan antara bentuk kata ganda penuh dan semu, menunjukkan keperluan penjelasan morfologi yang lebih sistematik.

Lai Foon dan Raja Ariffin (2021) dalam *Petunjuk Bahasa* pula menghuraikan kata ganda semu secara terperinci dari aspek makna dan fungsi. Mereka mentakrifkan kata ganda semu sebagai bentuk yang kelihatan seperti hasil penggandaan penuh, namun kata dasarnya tidak bermakna atau membawa makna yang berbeza daripada bentuk gandaan, seperti *kanak-kanak* dan *kura-kura*. Bentuk ini dianggap sebagai unit makna idiomatik yang stabil dan memainkan peranan penting dalam memperkayakan ekspresiviti bahasa. Huraian mereka memperkukuh pemahaman bahawa kata ganda semu bukan sekadar fenomena morfologi, tetapi juga berkait rapat dengan aspek semantik dan gaya bahasa.

Kasdan et al. (2017) dalam kajian bertajuk *Ganda Separa dalam Terminologi Bahasa Melayu: Analisis Sosioterminologi* mengaitkan fenomena kata ganda semu dengan perkembangan istilah moden. Menurut mereka, bentuk seperti *kura-kura* dan *labi-labi* berpotensi menjadi asas pembentukan istilah baharu yang berunsur separa ganda, misalnya *kekura* dan *lelabi*. Hal ini menunjukkan bahawa kata ganda semu bukan sahaja fenomena leksikal semula jadi, tetapi turut menyumbang kepada peluasan bidang istilah dan penciptaan kosa kata baharu dalam konteks ilmiah dan teknikal.

Dari sudut fonologi, Yin (2025) melalui disertasi *Kata Ganda Semu dalam Fonologi Generatif Melayu* menjelaskan fenomena ini dalam kerangka *Optimality Theory (OT)*. Beliau berhujah bahawa kata ganda semu bukan hasil penggandaan produktif, sebaliknya bentuk yang dikekalkan kerana memenuhi kehendak keseimbangan fonologi dan ritma suku kata. Contohnya, bentuk seperti *renyai-renyai* dan *sepoi-sepoi* menunjukkan keharmonian vokal serta keseimbangan pola suku kata (KVKKVV–KVKKVV). Analisis ini penting kerana buat pertama kali fenomena kata ganda semu dihuraikan secara teori melalui pendekatan fonologi generatif, bukan sekadar deskriptif.

Hwa (2023) dalam *Klasifikasi Tipologi Kata Ganda Semu dalam Bahasa Melayu Moden* memberi perhatian terhadap aspek tipologi dan klasifikasi berdasarkan keserupaan bunyi serta struktur morfem. Beliau menegaskan bahawa kekaburan definisi kata ganda semu dalam literatur menyebabkan ketidakselarasan dalam kamus dan bahan pengajaran bahasa. Oleh itu, beliau mencadangkan sistem klasifikasi

baharu yang lebih teratur bagi membezakan antara bentuk semu, penuh, dan berentak. Sementara itu, Yusof (2024) dalam *Analisis Multidimensi Kata Ganda Semu dalam Bahasa Melayu: Morfologi, Fonologi dan Semantik* menggabungkan pelbagai pendekatan analisis untuk menjelaskan interaksi antara bentuk, bunyi, dan makna. Kajian beliau menegaskan keperluan pendekatan bersepadu berasaskan data korpus bagi memahami fungsi sebenar kata ganda semu dalam wacana moden.

Dalam konteks dialektologi, Hassan (2012) melalui kajian *Kata Ganda Semu dalam Dialek Sarawak* menunjukkan bahawa fenomena ini turut tersebar luas dalam dialek Melayu. Berdasarkan data lapangan daripada penutur asli, beliau mengenal pasti bentuk seperti *ane-ane*, *obor-obor*, *usei-usei*, dan *kojoi-kojoi* yang berfungsi dalam pelbagai kelas kata. Dapatan ini menunjukkan bahawa kata ganda semu merupakan fenomena aktif dalam sistem leksikal dialek Melayu dan bukan unsur periferal dalam bahasa baku.

Fenomena serupa juga ditemui dalam bahasa Indonesia. Badudu (1984) dan Alwi (2003) mengenal pasti bentuk seperti *kupu-kupu*, *agar-agar*, *hati-hati*, dan *tiba-tiba* sebagai kata ganda semu yang berfungsi secara idiomatik. Menurut Alamsyah (2015), bentuk ini telah mengalami proses leksikalisasi makna, manakala Masfufah (2020) mendapati bahawa dalam wacana moden dan media, kata ganda semu sering digunakan untuk kesan stilistik dan retorik. Namun, kajian bahasa Indonesia masih terhad dari segi penggunaan data korpus dan pendekatan teori fonologi moden.

Secara keseluruhannya, perkembangan penyelidikan menunjukkan bahawa fenomena kata ganda semu telah berkembang daripada huraian deskriptif kepada analisis teori dan fonologi yang lebih sistematik. Walaupun pelbagai pendekatan telah diterapkan, integrasi antara aspek morfologi, fonologi, semantik, dan pragmatik masih diperlukan untuk membina model linguistik yang komprehensif tentang status dan fungsi kata ganda semu dalam bahasa Melayu dan bahasa Indonesia kontemporari.

## METODOLOGI KAJIAN

Kajian ini memanfaatkan data-data korpus yang terdapat dalam pangkalan data Korpus Dewan Bahasa dan Pustaka (Korpus DBP). Korpus tersebut merupakan korpus digital daripada buku, akhbar dan majalah. Daripada pangkalan data itulah data-data kata ganda telah dikumpulkan untuk dijadikan bahan analisis dalam kajian ini. Data yang digunakan dalam kajian ini merupakan data kata ganda tulen dan kata ganda semu yang dikumpulkan daripada bahan kajian yang bersumberkan buku dan majalah tahun 2005 hingga 2022 yang terdapat dalam pangkalan data Korpus DBP.

Bagi melaksanakan kajian ini dengan efektif, usaha ini bermula daripada tahap mengenal pasti masalah kajian dan persoalan kajian. Setelah itu, barulah dilakukan kajian deskriptif untuk mendapatkan data-data awal yang terdiri daripada kata ganda (kata ganda tulen dan kata ganda semu). Setelah data-data awal terkumpul, data tersebut dianalisis dan dikelompokkan mengikut kelompok tertentu yang telah ditetapkan,

iaitu bentuk-bentuk kata ganda tulen dan kata ganda semu.

Setelah data kata ganda tulen dan kata ganda semu selesai dikelompokkan mengikut bentuknya, data-data tersebut sekali lagi dianalisis untuk ditentukan makna setiap kata ganda semu bahasa Melayu. Setelah itu, barulah dibuat perbandingan dan kesimpulan dapatan. Untuk kajian ini, data-data kata ganda tulen dan kata ganda semu akan dijelaskan ciri-ciri khusus dan proses pembentuknya. Seterusnya, kata tersebut dibandingkan antara kata ganda tulen dengan kata ganda semu untuk melihat persamaan dan perbezaannya. Kaedah kualitatif digunakan untuk menganalisis komponen kata yang membentuk sesuatu kata ganda itu. Dalam kajian ini, pengkaji menggunakan pendekatan Karim et al. (2015) dalam *Tatabahasa Dewan* dan Omar (2015) dalam *Nahu Melayu Mutakhir*.

**Persampelan**

Sampel kajian yang digunakan dalam kajian ini ialah sampel yang terdiri daripada sebahagian kecil data yang dipilih daripada Korpus DBP dengan menumpukan pada bentuk kata ganda. Pemilihan ini dibuat secara persampelan bertujuan *(purposive sampling)* berdasarkan kriteria tertentu, iaitu kata ganda tulen dan kata ganda semu yang dikenal pasti melalui ciri-ciri morfologi. Data sampel inilah yang kemudiannya dikumpulkan untuk dijadikan bahan analisis terperinci.

Dalam kajian ini, data yang digunakan merupakan data kata ganda tulen dan kata ganda semu yang dikumpulkan daripada bahan kajian yang bersumberkan buku dan majalah tahun 2005 hingga 2022 yang terdapat dalam pangkalan data Korpus DBP. Secara keseluruhannya, untuk artikal ini, pengkaji menggunakan sebanyak 74 data (37 X 2) yang diambil daripada **480 data** lengkap (data asal yang digunakan dalam tesis yang mengandungi kata dan ayat serta sumber data) yang bersumberkan Korpus DBP. Ayat contoh yang digunakan dalam arikel ini diambil dari buku dan majalah dalam Korpus DBP.

**Pengumpulan Data**

Dalam kajian ini, data dikumpul secara sistematik dan berasaskan pendekatan kualitatif deskriptif yang menggunakan kaedah analisis kandungan linguistik dan analisis makna komponen terhadap data yang diperoleh daripada Korpus DBP. Data utama kajian terdiri daripada bentuk kata ganda dalam bahasa Melayu yang dikenal pasti melalui pengekstrakan data korpus secara dalam talian. Proses menganalisis data dilakukan dalam tiga peringkat utama, iaitu:

i. **Peringkat Pengenalpastian -** Pada peringkat awal, semua entri yang menunjukkan bentuk kata ganda dikenal pasti daripada korpus dengan menggunakan kata kunci seperti kata ganda yang tertera dua kali (contoh: *rumah-rumah*, *kucar-kacir*); kata yang disaring mengikut padanan bentuk dan fungsi; dan gabungan bentuk kata yang lazim diklasifikasikan sebagai ganda tulen atau semu.

Kriteria pengenalpastian termasuk struktur bentuk, konteks penggunaan, dan padanan dalam sumber rujukan tatabahasa seperti Karim et al. (2015) dalam *Tatabahasa Dewan* dan Omar (2015) dalam *Nahu Melayu Mutakhi*.

ii. **Peringkat Pengelasan dan Pengkategorian -** Setelah kata ganda dikenal pasti, bentuk tersebut diklasifikasikan kepada dua kategori utama berdasarkan ciri morfologi dan semantik, iaitu kata ganda tulen dan kata ganda semu. Kata ganda tulen ialah kata yang dihasilkan oleh penggandaan penuh kata dasar yang dapat dikembalikan kepada bentuk asal, seperti *buku-buku* dan *pelajar-pelajar*. Kata ganda semu pula ialah bentuk kata ganda yang tidak dapat dikembalikan kepada satu kata dasar dengan jelas, contohnya *kucar-kacir*, *sia-sia*, dan *bertalu-talu*. Pengkategorian ini dibuat dengan merujuk prinsip penggandaan dalam Karim et al. (2015) dalam *Tatabahasa Dewan* dan Omar (2015) dalam *Nahu Melayu Mutakhi* serta makna leksikal yang dibincangkan dalam teori makna komponen.

iii. **Peringkat Analisis dan Penafsiran -** Analisis dijalankan dengan menggunakan dua kaedah utama, iaitu analisis kandungan linguistik dan analisis makna komponen. Analisis kandungan linguistik ialah analisis untuk mengkaji aspek bentuk, struktur morfologi, dan jenis penggandaan. Teknik ini melibatkan pemerhatian terhadap pola pembentukan kata ganda dan hubung kaitnya dengan sistem morfologi bahasa Melayu. Analisis makna komponen pula diterapkan berdasarkan pendekatan yang dicadangkan oleh Omar (2011), iaitu menganalisis unit-unit makna dalam kata ganda untuk memahami perbezaan semantik antara ganda tulen dengan kata ganda semu. Ini termasuk kajian terhadap dimensi makna seperti intensiti, kekerapan, kekaburan, dan retorik.

Penafsiran data dibuat dengan membandingkan bentuk kata ganda berdasarkan konteks penggunaan sebenar dalam teks korpus, seterusnya merumuskan prinsip umum tentang takrif dan struktur kata ganda dalam bahasa Melayu.

## DAPATAN DAN PERBINCANGAN

Hasil daripada kajian ini, pengkaji menemukan dua jenis utama kata ganda dalam bahasa Melayu, iaitu kata ganda tulen dan kata ganda semu. Kata ganda tulen itu pula secara keseluruhannya, ada empat bentuk utamanya, iaitu kata ganda tulen penuh, kata ganda tulen berentak, kata ganda tulen berimbuhan, dan kata ganda tulen separa.

Daripada empat bentuk utama itu, kata ganda semu juga ada yang bentuknya menyerupai kata ganda tulen, iaitu bentuk kata ganda semu penuh (semu biasa), kata ganda semu berentak, kata ganda semu berimbuhan (termasuk semu berimbuhan jati) dan kata ganda semu separa.

## Kata Ganda Tulen Penuh dan Kata Ganda Semu Penuh

Kata ganda tulen penuh, bentuknya sangat mirip dengan kata ganda semu penuh (semu biasa). Walau bagaimanapun, sekiranya difahami, ada ciri utama yang membezakannya, iaitu dari segi pembentukannya.

Kata ganda tulen penuh ialah kata ganda yang terbentuk daripada penggandaan keseluruhan kata dasar. Kata dasar boleh terdiri daripada kata tunggal, kata berimbuhan, atau kata majmuk. Apabila dipisahkan, setiap unsur dapat berdiri sendiri dan unsur pertamanya merupakan kata dasar untuk kata ganda tersebut. Rumus pembentukannya adalah seperti Jadual 1.

**kata dasar -> kata dasar + kata dasar = kata ganda tulen penuh**

aspek -> aspek + aspek = aspek-aspek

Hal ini berbeza dengan kata ganda semu. Kedua-dua unsur yang membentuknya merupakan kata dasar untuk kata ganda tersebut. Apabila dipisahkan, kata tersebut tidak ada makna atau berlainan sama sekali maknanya dengan kata dasar tersebut. Misalnya kata *hati-hati*, yang bermaksud sifat atau perasaan dan tidak sama dengan kata *hati* sekiranya dipisah kerana kata hati bermaksud organ dalam badan.

Proses pembentukan kata ganda semu ini dapatlah dianggap terhasil daripada gabungan sebahagian kata (1/2 kata) dengan sebahagian kata (1/2 kata) lagi, dan terbentuklah satu kata ganda semu yang kelihatan seperti kata ganda tulen penuh. Rumus pembetukannya:

**½ + ½ = 1 (kata ganda semu penuh)**

**sebahagian kata + sebahagian kata = kata ganda semu penuh**

rama + rama = rama-rama

Contoh data yang ditemukan dalam kajian ini adalah seperti yang berikut:

Contoh penggunaan kata tersebut dalam ayat yang bersumberkan buku dan majalah:

### Kata Ganda Tulen Penuh

1a. **Aspek-aspek** kebudayaan Melayu diperincikan dengan jelas dalam kajian

Jadual 1
*Kata ganda tulen penuh dan kata ganda semu penuh*

| Kata Ganda Tulen Penuh | | | | Kata Ganda Semu Penuh | | | |
|---|---|---|---|---|---|---|---|
| **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** | **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** |
| 1. | aspek | aspek-aspek | banyak (objek) | 4. | kupu-kupu | kupu-kupu | asal/nama |
| 2. | pelajar | pelajar-pelajar | banyak (objek) | 5. | sia-sia | sia-sia | asal/sifat |
| 3. | kakitangan | kakitangan-kakitangan | banyak (objek) | 6. | hati-hati | hati-hati | asal/sifat |

ini. (*Asas Kebudayaan Melayu*, DBP 2010)

1b. Artikel ini membincangkan **aspek-aspek** gaya hidup sihat. (*Dewan Masyarakat*, 2018)

2a. **Pelajar-pelajar** itu diberi penerangan tentang teknik penulisan karangan. (*Pedagogi Bahasa Melayu*, DBP 2015)

2b. **Pelajar-pelajar** sekolah menengah diraikan dalam program motivasi. (*Dewan Siswa*, 2018)

3a. **Kakitangan-kakitangan** kerajaan diberi latihan intensif. *Pengurusan Sumber Manusia* (DBP, 2011)

3b. **Kakitangan-kakitangan** universiti mengadakan mesyuarat persediaan. *Dewan Ekonomi*, Ogos 2017

**Kata Ganda Semu Penuh**

4a. **Kupu-kupu** itu berwarna-warni di taman bunga. *Tatabahasa Dewan* (DBP, 2015)

4b. **Kupu-kupu** sering dijadikan simbol keceriaan dalam karya seni. Dewan Bahasa, Julai 2018

5a. Segala usahanya **sia-sia** kerana tidak mendapat sokongan." *Tatabahasa Dewan* (DBP, 2015)

5b. Segala usaha tanpa perancangan hanya akan menjadi **sia-sia**. *Dewan Bahasa*, Disember 2017

6a. Kita mestilah **hati-hati** dalam memilih perkataan agar tidak menimbulkan salah tafsir makna. *Tatabahasa Dewan* (DBP, 2015)

6b. Pembaca diseru agar **hati-hati** ketika menilai maklumat dalam majalah atau media sosial supaya tidak terpengaruh dengan berita palsu. *Dewan Bahasa*, Julai 2020

Jadual 1 menunjukkan perbezaan antara **kata ganda tulen penuh** dengan **kata ganda** semu penuh dari segi bentuk dan makna yang dihasilkan. Dari aspek **bentuk**, kedua-dua jenis kata ini sama-sama memperlihatkan pengulangan keseluruhan unsur kata dengan penggunaan tanda sempang (-) di antara dua unsur gandaan. Namun begitu, perbezaannya dapat dilihat pada **sumber pembentukannya**.

Kata ganda tulen penuh seperti *aspek-aspek*, *pelajar-pelajar*, dan *kakitangan-kakitangan* terbentuk hasil daripada proses pengulangan kata dasar yang wujud dan bermakna secara bebas. Unsur gandaan ini berfungsi menandakan makna jamak atau banyak, iaitu bilangan yang lebih daripada satu. Dalam hal ini, makna gandaan mempunyai hubungan langsung dengan kata dasarnya.

Sebaliknya, kata ganda semu penuh seperti *kupu-kupu*, *sia-sia*, dan *hati-hati* tidak terbentuk melalui proses penggandaan kata dasar yang bermakna. Unsur pertama dalam bentuk ini tidak mempunyai makna bebas atau tidak dapat berdiri sendiri sebagai kata dasar. Dari segi **makna**, kata ganda semu penuh bukan membawa maksud jamak, tetapi makna asalnya menunjukkan nama sesuatu benda atau makna sifat dan keadaan, seperti *kupu-kupu* (nama haiwan), *sia-sia* (keadaan atau sifat yang tidak berguna), dan *hati-hati* (sifat berhati atau berwaspada).

Oleh itu, dapat dirumuskan bahawa kata ganda tulen penuh ialah bentuk gandaan sebenar yang menunjukkan makna jamak atau pengulangan benda yang sama, manakala kata ganda semu penuh pula hanyalah bentuk gandaan yang tetap dan tidak menandakan makna jamak, sebaliknya membawa makna asal yang bersifat tetap sama ada sebagai nama, sifat, atau keadaan.

## Kata Ganda Tulen Berentak dan Kata Ganda Semu Berentak

Kata ganda tulen berentak ialah kata ganda yang terbentuk hasil daripada penggandaan kata dasar. Kata dasar yang digandakan itu, mengalami perubahan pada unsur yang digandakan, atau unsur yang hanya sebahagian yang digandakan, baik vokal atau konsonan). Hasil daripada penggandaan itu ialah kata ganda tulen berentak. Kata ganda tulen berentak ini pula ada tiga jenis, iaitu penggandaan berentak perubahan vokal, penggandaan berentak perubahan konsonan, atau penggandaan berentak bebas. Rumus pembentukannya:

**kata dasar -> kata dasar + ulang konsonan/vokal = kata ganda tulen berentak**

mandi -> mandi + manda = mandi-manda (perubahan vokal/ulang konsonan)

kuih -> kuih + m*ui*h = kuih-m*ui*h (perubahan konsonan/ulang vokal)

segar -> segar + bugar= segar-*bu*gar (berentek bebas)

Kata ganda tulen berentak ini juga bentuknya mirip dengan kata ganda semu berentak. Walau bagaimanapun untuk kata ganda semu berentak, tidak mempunyai kata dasar secara tersendiri sebagaimana kata ganda tulen berentak yang ada kata dasarnya. Kedua-dua unsur itulah kata dasarnya. Contoh data yang ditemukan dalam kajian ini adalah seperti Jadual 2.

Contoh penggunaan kata tersebut dalam ayat yang bersumberkan buku dan majalah:

Jadual 2
*Kata ganda tulen berentak dan kata ganda semu berentak*

| Kata Ganda Tulen Berentak | | | | Kata Ganda Semu Berentak | | | |
|---|---|---|---|---|---|---|---|
| **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** | **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** |
| 7. | mandi | mand*i*-mand*a* | berulang-ulang (perbuatan) | 13. | huru-hara | huru-hara | asal/sifat |
| 8. | warna | warn*a*-warn*i* | banyak (objek) | 14. | kucar-kacir | kucar-kacir | asal/sifat |
| 9. | kuih | kuih-muih | banyak/macam-macam (objek) | 15. | porak-peranda | porak-peranda | asal/sifat |
| 10. | balik | bolak-balik | berulang-ulang (perbuatan) | 16. | selok-belok | selok-belok | asal/sifat |
| 11. | baki | *s*aki-baki | banyak (objek) | 17. | serta-merta | serta-merta | asal/sifat |
| 12. | segar | segar-*bu*gar | sangat (situasi) | 18. | mundar-mandir | mundar-mandir | asal/kerja |

**Kata Ganda Tulen Berentak**

7a. Kanak-kanak **mandi-manda** di sungai pada waktu petang. Geografi Alam Sekitar (DBP, 2013)

7b. Tempat peranginan itu terkenal sebagai lokasi **mandi-manda** keluarga. Dewan Pelancongan, September 2018

8a. Corak batik itu memaparkan motif bunga yang **warna-warni**. *Seni Tekstil Melayu* (DBP, 2014)

8b. Pameran tersebut menampilkan hiasan **warna-warni** yang menarik. *Dewan Budaya*, Julai 2017

9a. **Kuih-muih** tradisional dijual semasa bulan Ramadan. *Warisan Makanan Melayu* (DBP, 2013)

9b. Pameran itu memperkenalkan **kuih-muih** tempatan. *Dewan Budaya*, Oktober 2017

10a. Kereta api itu **bolak-balik** dari bandar ke pinggir kota setiap hari. *Pengangkutan Awam Malaysia* (DBP, 2014)

10b. Cerpen itu menggambarkan watak utama **bolak-balik** ke hospital menjaga ibunya. *Dewan Sastera*, April 2017

11a. **Saki-baki** makanan itu dibuang ke dalam tong sampah." *Tatabahasa Dewan* (DBP, 2015)

11b. Artikel tersebut meneliti **saki-baki** peninggalan sejarah di Melaka." *Dewan Sejarah*, Mei 2017

12a. Pokok-pokok di taman itu kelihatan **segar-bugar** selepas hujan. *Botani Tropika* (DBP, 2012)

12b. Puisi tersebut melukiskan sawah padi yang **segar-bugar** menghijau. *Dewan Sastera*, Mei 2016

**Kata Ganda Semu Berentak**

13a. Kota itu menjadi **huru-hara** akibat serangan musuh. *Sejarah Asia Tenggara* (DBP, 2010)

13b. Cerpen tersebut menggambarkan suasana **huru-hara** selepas rusuhan. *Dewan Sastera*, Jun 2016

14a. Pasukan itu **kucar-kacir** kerana kurang perancangan. *Strategi Kepimpinan* (DBP, 2012)

14b. Rencana majalah itu menyentuh keadaan ekonomi yang **kucar-kacir**. *Dewan Ekonomi*, Oktober 2017

15a. Kehidupan mereka **porak-peranda** selepas bencana alam. *Psikologi Bencana* (DBP, 2014)

15b. Novel itu menampilkan watak keluarga yang **porak-peranda** akibat konflik. *Dewan Sastera*, Mac 2016

16a. Pelajar perlu memahami **selok-belok** sistem pendidikan negara. *Tatabahasa Dewan* (DBP, 2015)

16b. Artikel itu menjelaskan **selok-belok** kehidupan pelaut tradisional. *Dewan Budaya*, Ogos 2017

17a. Arahan itu perlu dilaksanakan **serta-merta** tanpa penangguhan. *Pentadbiran Awam Malaysia* (DBP, 2011)

17b. Rencana tersebut menekankan pentingnya tindakan **serta-merta** dalam isu alam sekitar. *Dewan Kosmik*, April 2016

18a. Dia **mundar-mandir** di ruang tamu kerana gelisah. *Psikologi Remaja* (DBP, 2013)

18b. Cerpen itu menggambarkan seorang ayah **mundar-mandir** menunggu kelahiran anaknya. *Dewan Sastera*, Februari 2018

Jadual 2 memperlihatkan perbezaan antara kata ganda tulen berentak dengan kata ganda semu berentak dari segi bentuk pembentukan dan fungsi makna. Dari segi bentuk, kedua-dua jenis kata ini mempunyai pola pengulangan yang disertai perubahan bunyi tertentu, sama ada pada vokal atau konsonan, sehingga menghasilkan kesan irama atau rentak yang seimbang antara dua unsurnya.

Kata ganda tulen berentak seperti *mandi-manda*, *warna-warni*, *kuih-muih*, *bolak-balik*, *saki-baki*, dan *segar-bugar* terbentuk hasil pengulangan kata dasar yang mengalami sedikit perubahan bunyi bagi menghasilkan irama atau keseimbangan fonologi. Bentuk-bentuk ini tetap mempunyai kata dasar yang jelas dan bermakna, manakala penggandaan berentak memberikan makna tambahan seperti banyak, pelbagai, atau berulang-ulang. Contohnya, *warna-warni* membawa maksud "banyak warna", *kuih-muih* bermakna "pelbagai kuih", dan *mandi-manda* bermaksud "bermain air secara berulang-ulang". Ini menunjukkan bahawa kata ganda berentak tulen masih mengekalkan hubungan makna dengan kata dasarnya.

Sebaliknya, kata ganda semu berentak seperti *huru-hara*, *kucar-kacir*, *porak-peranda*, *selok-belok*, *serta-merta*, dan *mundar-mandir* dikategorikan sebagai kata ganda semu berentak yang membawa makna perbuatan atau tindakan berulang-alik tanpa tujuan tertentu, bukan hasil daripada proses pengulangan kata dasar yang bermakna, sebaliknya merupakan bentuk tetap dan tidak boleh dikembalikan kepada unsur bebas yang bermakna. Dari aspek makna, kata ganda semu berentak tidak menunjukkan makna jamak atau berulang, tetapi membawa makna sifat, keadaan atau perbuatan tertentu, seperti *huru-hara* (keadaan kacau-bilau), *kucar-kacir* (tidak teratur), *porak-peranda* (rosak atau hancur), *selok-belok* (ada hubungannya dengan yang lain), *serta-merta* (segera atau spontan), dan *mundar-mandir* **(**perbuatan atau tindakan tanpa tujuan tertentu)**.**

Oleh itu, dapat dirumuskan bahawa kata ganda tulen berentak berfungsi untuk menambah intensiti makna atau menunjukkan kepelbagaian sesuatu perkara melalui perubahan bunyi yang berirama, manakala kata ganda semu berentak pula berfungsi sebagai satuan leksikal tetap yang tidak menunjukkan makna gandaan, sebaliknya membawa makna sifat, keadaan, atau perbuatan yang tetap dan tidak berubah.

## Kata Ganda Tulen Berimbuhan dan Kata Ganda Semu Berimbuhan

Kata ganda tulen berimbuhan ialah kata ganda yang mempunyai satu imbuhan, baik awalan, akhiran, sisipan, mahupun apitan. Bentuknya berbeza dengan kata ganda tulen penuh yang terbentuk daripada kata berimbuhan kerana kata ganda ini wujud

daripada kata berimbuhan yang sama dalam kedua-dua unsurnya (tiap-tiap unsur ada imbuhan yang sama), baik awalan, akhiran, sisipan, mahupun apitan.

Proses pembentukan kata ganda tulen berimbuhan bermula daripada kata dasar yang berupa kata tunggal. Kata dasar ini kemudiannya digandakan secara keseluruhan, dan unsur pertamanya akan menerima imbuhan, baik awalan, akhiran, sisipan, mahupun apitan. Rumus pembentukannya:

**kata dasar -> (imbuhan + kata dasar) + kata dasar = kata ganda tulen berimbuhan**

kerut -> (ber + kerut) + kerut = *ber*kerut-kerut (kata ganda tulen berawalan)

bunyi -> bunyi + (bunyi + *an*) = bunyi-bunyian (kata ganda tulen berakhiran)

tali -> tali + (tali + *em*) = tali-temali (kata ganda tulen bersisipan)

malu -> (malu + malu) + *ke-…-an* = kemalu-maluan (kata ganda tulen berapitan)

Kata ganda tulen berimbuhan ini bentuknya mirip dengan kata ganda semu berimbuhan. Kata ganda semu berimbuhan ini pula ada dua bentuk, iaitu kata ganda semu yang berkombinasi dengan imbuhan dan kata ganda semu berimbuhan jati atau asal. Kata ganda semu penuh (semu biasa) dan semu berentak boleh menerima imbuhan.

Kata ganda ini berasal daripada kata ganda semu penuh atau kata ganda semu berentak, setelah itu barulah menerima imbuhan dan imbuhan yang diterima itu merupakan apitan. Kata ini sekali imbas kelihatan seperti kata ganda tulen penuh berimbuhan. Rumus pembentukannya:

**kata ganda semu (semu penul/berentak) + apitan = kata ganda berapitan**

(sia + sia) + meN-...-kan = mensia-siakan (semu penuh berapitan)

(huru + hara) + meN-...-kan = menghuru-harakan (semu berentak berapitan)

Kata ganda semu berimbuhan jati pula bentuknya tidak boleh dipisahkan sama sekali. Unsur pertama kata ganda semu tersebut merupakan bentuk imbuhan yang telah bercantum secara asal atau semulajadi bersama-sama kata yang mengikutinya. Rumus pembentukannya:

**(sebahagian kata + sebahagian kata) = kata ganda semu beimbuhan jati**

seolah + olah = seolah-olah

terbahak + bahak = terbahak-bahak

Contoh data yang ditemukan dalam kajian ini adalah seperti Jadual 3.

Contoh penggunaan kata tersebut dalam ayat yang bersumberkan buku dan majalah:

**Kata Ganda Tulen Berimbuhan**

19a. Mukanya **berkerut-kerut** menahan kesakitan. *Psikologi Klinikal* (DBP, 2012)

Jadual 3
*Kata ganda tulen berimbuhan serta kata ganda semu berimbuhan dan kata ganda semu berimbuhan jati*

| Kata Ganda Tulen Berimbuhan | | | | Kata Ganda Semu Berimbuhan | | | |
|---|---|---|---|---|---|---|---|
| **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** | **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** |
| 19. | kerut | *ber*kerut-kerut | sangat (situasi) | 25. | sia-sia | mensia-siakan | asal/sifat |
| 20. | ramai | *be*ramai-ramai | sangat (situasi) | 26. | huru-hara | menghuru-harakan | asal/sifat |
| 21. | bunyi | bunyi-bunyi*an* | banyak/ berulang (situasi) | | | | |
| | | | | | **Kata Ganda Semu Berimbuhan Jati** | | |
| 22. | tali | tali-temali | banyak (objek) | 27. | seolah-olah | seolah-olah | asal/sifat |
| 23. | gilang | gilang-gemilang | sangat (situasi) | 28. | terbahak-bahak | terbaha-bahak | asal/kerja |
| 24. | malu | kemalu-maluan | agak (situasi) | 29. | terkekeh-kekeh | terkekeh-kekeh | asal/kerja |

19b. Cerpen itu menggambarkan wajah tua yang **berkerut-kerut** penuh pengalaman. *Dewan Sastera*, Julai 2016

20a. Penduduk kampung bergotong-royong **beramai-ramai** membina surau. *Budaya Gotong-Royong* (DBP, 2011)

20b. Pelajar **beramai-ramai** menyertai perarakan sambutan kemerdekaan. *Dewan Pelajar*, September 2017

21a. Upacara itu diiringi dengan **bunyi-bunyian** tradisional. *Warisan Muzik Melayu* (DBP, 2011)

21b. Artikel tersebut meneliti penggunaan **bunyi-bunyian** dalam teater moden. *Dewan Budaya*, Ogos 2017

22a. Ilmu **tali-temali** sangat penting dalam bidang pelayaran. *Ilmu Kelautan* (DBP, 2011)

22b. Artikel itu membincangkan kegunaan **tali-temali** dalam aktiviti rekreasi luar. *Dewan Kosmik*, Ogos 2016

23a. Majlis konvokesyen itu berlangsung dengan **gilang-gemilang**. *Sejarah Universiti Tempatan* (DBP, 2013)

23b. Rencana tersebut melaporkan sambutan **gilang-gemilang** ulang tahun kemerdekaan. *Dewan Budaya*, September 2017

24a. Gadis itu tersenyum dengan **kemalu-maluan**. *Psikologi Remaja* (DBP, 2012)

24b. Cerpen tersebut menggambarkan watak utama yang penuh **kemalu-maluan**. *Dewan Sastera*, Februari 2016

**Kata Ganda Semu Berimbuhan**

25a. Janganlah kita **mensia-siakan** peluang yang ada. *Motivasi Diri* (DBP, 2013)

25b. Artikel itu menegur sikap masyarakat yang **mensia-siakan** masa. *Dewan Masyarakat*, Jun 2017

26a. **Kepura-puraan** hanya akan merosakkan hubungan persahabatan. *Psikologi Sosial* (DBP, 2011)

26b. Cerpen itu mengkritik watak yang penuh dengan **kepura-puraan**. *Dewan Sastera*, Januari 2016

**Kata Ganda Semu Berimbuhan Jati**

27a. Dia berdiam diri **seolah-olah** tidak tahu apa-apa. *Psikologi Sosial* (DBP, 2010)

27b. Cerpen itu menggambarkan suasana kampung **seolah-olah** hidup kembali. *Dewan Sastera*, Mac 2017

28a. Mereka ketawa **terbahak-bahak** mendengar cerita lucu itu. *Bahasa dan Humor* (DBP, 2012)

28b. Artikel itu menyebut pelawak yang ketawa **terbahak-bahak** di pentas. *Dewan Budaya*, Mei 2016

29a. Kanak-kanak itu ketawa **terkekeh-kekeh** melihat gelagat badut. *Psikologi Kanak-Kanak* (DBP, 2013)

29b. Cerpen itu menggambarkan dua sahabat yang ketawa **terkekeh-kekeh**. *Dewan Sastera*, Januari 2017

Jadual 3 memperincikan tiga bentuk utama kata ganda yang melibatkan penggunaan imbuhan, iaitu kata ganda tulen berimbuhan, kata ganda semu berimbuhan, dan kata ganda semu berimbuhan jati. Dari aspek **bentuk**, ketiga-tiga jenis ini menunjukkan kehadiran imbuhan awalan, akhiran, atau apitan yang dilekatkan sama ada pada unsur pertama atau keseluruhan bentuk kata ganda. Walaupun sama-sama memperlihatkan kehadiran imbuhan, perbezaan ketara dapat dilihat pada asal-usul dan fungsi maknanya.

Kata ganda tulen berimbuhan seperti *berkerut-kerut*, *beramai-ramai*, *bunyi-bunyian*, *tali-temali*, *gilang-gemilang*, dan *kemalu-maluan* dibentuk melalui proses pengimbuhan terhadap kata ganda yang mempunyai kata dasar sebenar dan bermakna bebas. Bentuk ini mengekalkan hubungan langsung antara makna kata dasar dan makna gandaan, serta menambah unsur intensiti, kekerapan, atau darjah sesuatu sifat atau perbuatan. Contohnya, *berkerut-kerut* bermakna "sangat berkerut", *beramai-ramai* bermaksud "dalam kumpulan ramai", dan *bunyi-bunyian* bermakna "pelbagai bunyi". Oleh itu, imbuhan dalam bentuk ini berperanan memperkukuh makna gandaan tanpa mengubah asas semantiknya.

Sebaliknya**, kata ganda semu berimbuhan** seperti *mensia-siakan* dan *menghuru-harakan* tidak terbentuk daripada kata dasar yang bermakna bebas. Unsur pertama pada bentuk ini (*sia*, *huru*) tidak berfungsi sebagai kata dasar, sebaliknya merupakan unsur tetap dalam bentuk gandaan yang telah mantap secara leksikal. Dari segi makna, kata ganda semu berimbuhan tidak menunjukkan makna gandaan sebenar, tetapi membawa makna keadaan atau sifat yang diperluas melalui imbuhan kata kerja, contohnya *mensia-siakan* (melakukan sesuatu yang tidak berguna) dan *menghuru-harakan* (menimbulkan kekacauan).

Sementara itu, kata ganda semu berimbuhan jati seperti *seolah-olah*,

*terbahak-bahak*, dan *terkekeh-kekeh* merupakan bentuk yang telah mantap dalam sistem bahasa dan tidak dapat dikembalikan kepada unsur kata dasar. Bentuk ini menunjukkan perpaduan penuh antara imbuhan dan penggandaan, menjadikannya kata yang berdiri sebagai satu unit makna yang utuh. Dari aspek semantik, bentuk ini membawa makna keadaan atau perbuatan spontan, misalnya *seolah-olah* (menunjukkan perbandingan atau andaian), *terbahak-bahak* (tertawa kuat), dan *terkekeh-kekeh* (tertawa kecil berulang).

Secara keseluruhan, dapat dirumuskan bahawa kata ganda tulen berimbuhan berfungsi menambah makna darjah, jumlah atau intensiti pada kata dasar yang wujud, manakala kata ganda semu berimbuhan dan kata ganda semu berimbuhan jati tidak berpunca daripada kata dasar bebas, sebaliknya merupakan bentuk mantap yang membawa makna sifat, keadaan, atau perbuatan tertentu tanpa unsur jamak atau pengulangan sebenar. Ketiga-tiga bentuk ini membuktikan bahawa proses penggandaan dan pengimbuhan dalam bahasa Melayu saling berinteraksi secara produktif untuk menghasilkan pelbagai bentuk dan lapisan makna.

## Kata Ganda Tulen Separa dan Kata Ganda Semu Separa

Kata ganda tulen separa pula mirip dengan kata ganda semu separa. Kata ganda tulen separa boleh melibatkan tiga jenis kata, iaitu kata tunggal, kata majmuk, dan frasa. Dalam penggandaan tulen separa kata tunggal, unsur yang digandakan boleh berupa suku kata awal atau suku kata akhir kata dasar.

Proses pembentukan kata ganda tulen separa kata tunggal bermula daripada kata dasar. Seterusnya, kata dasar ini diulang sebahagian sahaja, iaitu suku kata awal, dan suku kata awal yang diulang itu diletakkan sebelum kata dasar. Vokal dalam suku kata awal yang digandakan itu kemudiannya mengalami proses pelemahan dan bergeser ke posisi tengah menjadi *e* pepet (sekiranya vokal dalam suku kata awal sememangnya sudah *e* pepet, vokal tersebut tidak berubah). Rumus pembentukannya:

**kata dasar -> suku kata pertama kata dasar (e) + kata dasar = kata ganda tulen separa**

jari -> ja (*a* -> *e*) + jari = jejari

Untuk penggandaan separa suku kata akhir pula, kata ini terbentuk daripada kata dasar yang sememangnya dalam bentuk kata berimbuhan. Proses pembentukan kata tersebut bermula dari kata dasar, dan kata dasar ini diulang sebahagian sahaja, iaitu dua suku kata akhir atau bahagian akhir kata. Dua suku kata akhir yang diulang itu kemudiannya diletakkan selepas kata dasar. Rumus pembentukannya:

**kata dasar -> kata dasar + dua suku kata akhir kata dasar = kata ganda tulen separa**

perlahan -> perlahan + lahan = perlahan-*lahan*

Jadual 4
*Kata ganda tulen separa dan kata ganda semu separa*

| Kata Ganda Tulen Separa | | | | Kata Ganda Semu Separa | | | |
|---|---|---|---|---|---|---|---|
| **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** | **No.** | **Kata Dasar** | **Kata Ganda** | **Makna** |
| 30. | gelung | gegelung | banyak (objek) | 34. | paru-paru | peparu | asal/nama |
| 31. | perlahan | perlahan-lahan | sangat (perbuatan) | 35. | rama-rama | rerama | asal/nama |
| 32. | tanda baca | tanda-tanda baca | banyak (objek) | 36. | kupu-kupu | kekupu | asal/nama |
| 33. | buku latihan | buku-buku latihan | banyak (objek) | 37. | labi-labi | lelabi | asal/nama |

Kata ganda semu separa pula ialah kata ganda semu yang berasal daripada kata ganda semu penuh yang telah dipendekkan bentuknya dan telah digugurkan tanda sempang di tengah-tengahnya. Unsur yang dipendekkan ialah unsur pertama. Sekali imbas kelihatannya seperti kata ganda separa yang sebenarnya tetapi tiada kata dasar secara tunggal. Rumus pembentukannya:

**kata ganda semu** – **sebahagian kata kata ganda semu = kata ganda semu separa**

paru-paru -> paru-paru – pa (a -> e) (unsur pertama) = peparu

rama-rama -> rama-rama – ra (a -> e) (unsur pertama) = rerama

Contoh data yang ditemukan dalam kajian ini adalah seperti Jadual 4.

Contoh penggunaan kata tersebut dalam ayat yang bersumberkan buku dan majalah:

**Kata Ganda Tulen Separa**

30a. Ular itu membelit dalam beberapa **gegelung**. *Haiwan Melata Tropika* (DBP, 2012)

30b. Artikel itu membincangkan **gegelung** logam dalam seni kraf. *Dewan Budaya*, Februari 2017

31a. Kereta itu bergerak **perlahan-lahan** menyusuri jalan sempit. *Teknologi Automotif* (DBP, 2012)

31b. Puisi tersebut menggambarkan air sungai yang mengalir **perlahan-lahan**. *Dewan Sastera*, November 2016

32a. **Tanda-tanda baca** menentukan intonasi dan kefahaman ayat. *Panduan Menulis* (DBP, 2013)

32b. Majalah ini menekankan penggunaan **tanda-tanda baca** yang betul dalam esei. *Dewan Bahasa*, September 2016

33a. Guru mengedarkan **buku-buku latihan** kepada murid. *Tatacara Pengajaran* (DBP, 2014)

33b. Artikel itu menekankan kepentingan **buku-buku latihan** dalam membina kemahiran menulis. *Dewan Pelajar*, Mei 2017

**Kata Ganda Semu Separa**

34a. Penyakit **peparu** boleh merebak melalui jangkitan udara. *Kesihatan Umum* (DBP, 2014)

34b. Artikel itu membincangkan kajian baharu mengenai barah **peparu**. *Dewan Kosmik*, November 2017

35a. **Rerama** sering dijadikan motif dalam seni ukiran Melayu. *Seni Rupa Tradisional* (DBP, 2013)

35b. Majalah ini menyiarkan gambar **rerama** yang indah di hutan tropika. *Dewan Budaya*, Mei 2016

36a. **Kekupu** berwarna-warni hinggap di bunga orkid. *Fauna Tropika* (DBP, 2012)

36b. Artikel ini memperkenalkan spesies **kekupu** yang jarang ditemui. *DewanKosmik*, Februari 2017

37a. Haiwan seperti **lelabi** dan kura-kura hidup di dua alam, iaitu di darat dan di air. *Ensiklopedia Fauna Malaysia* (DBP, 2012)

37b. Kanak-kanak perlu diperkenalkan dengan nama haiwan tempatan seperti **lelabi**, pelanduk, dan tenggiling yang semakin jarang dilihat. *Dewan Pelajar*, April 2018

**Jadual 4** memperlihatkan dua jenis bentuk penggandaan yang unik dalam bahasa Melayu, iaitu kata ganda separa dan kata ganda semu separa. Kedua-duanya menampilkan proses pengulangan sebahagian unsur kata dasar, tetapi berbeza dari segi asal bentuk, fungsi, dan makna semantik yang dihasilkan. Kata ganda separa ialah bentuk yang dihasilkan melalui penggandaan sebahagian daripada suku kata awal kata dasar, lazimnya suku kata pertama, bagi menandakan makna jamak, banyak, atau intensiti.

Dalam jadual ini, bentuk seperti *gegelung*, *perlahan-lahan*, *tanda-tanda baca*, dan *buku-buku latihan* menunjukkan pola pengulangan yang masih mengekalkan kata dasar yang wujud dan bermakna bebas. Misalnya, *gegelung* membawa maksud "banyak gelung", *perlahan-lahan* bermaksud "dengan sangat perlahan", manakala *tanda-tanda baca* dan *buku-buku latihan* menandakan bilangan yang banyak atau pelbagai. Oleh itu, bentuk ini memperlihatkan ciri produktif dalam proses morfologi bahasa Melayu. Pengulangan sebahagian kata dasar berfungsi menambah makna dari segi kuantiti atau darjah sifat.

Sebaliknya, kata ganda semu separa seperti *peparu*, *rerama*, *kekupu*, dan *lelabi* merupakan bentuk yang tidak lagi dapat dikembalikan kepada kata dasar yang bermakna bebas, walaupun secara fonologi tampak seperti hasil proses penggandaan. Unsur pengulangan suku kata awal pada bentuk ini bukan lagi berfungsi untuk menandakan makna jamak atau intensiti, sebaliknya telah menjadi sebahagian **daripada bentuk kata yang mantap secara leksikal dan idiomatik.**

Dari aspek makna, semua contoh kata ganda semu separa dalam **Jadual 4** (*peparu*, *rerama*, *kekupu*, dan *lelabi*) menunjukkan **makna asal atau nama bagi sesuatu benda hidup**, khususnya haiwan atau organ. Misalnya, *peparu* ialah nama organ pernafasan (paru-paru), manakala *rerama* dan *kekupu* merujuk kepada jenis serangga bersayap (rama-rama dan kupu-kupu).

Dari segi analisis bentuk, kata ganda separa masih bersifat produktif dan

berpotensi membentuk kata baharu dengan mengikuti pola penggandaan separa yang teratur. Sebaliknya, kata ganda semu separa bersifat tertutup dan tidak produktif, kerana bentuknya telah membeku dalam sistem bahasa serta tidak boleh dimanipulasi untuk membentuk kata baharu yang serupa.

Secara keseluruhan, dapat dirumuskan bahawa kata ganda separa membawa fungsi makna kuantiti dan intensiti, manakala kata ganda semu separa membawa makna asal atau nama yang tetap. Kedua-dua bentuk ini membuktikan bahawa unsur pengulangan separa dalam bahasa Melayu bukan sahaja berperanan dalam proses morfologi yang produktif, tetapi juga berfungsi sebagai asas pembentukan kata semu yang stabil dan terserap sepenuhnya dalam sistem leksikal bahasa.

## KESIMPULAN

Secara keseluruhannya, kajian ini membuktikan bahawa kata ganda dalam bahasa Melayu memperlihatkan dua sistem yang berbeza dari segi bentuk, makna dan fungsi, iaitu kata ganda tulen dan kata ganda semu. Kata ganda tulen menunjukkan proses morfologi yang produktif melalui pengulangan kata dasar bagi menandakan makna kuantiti, kepelbagaian, intensiti dan pengulangan. Sebaliknya, kata ganda semu memperlihatkan bentuk yang menyerupai penggandaan tetapi telah membeku sebagai unsur leksikal yang membawa makna sifat, keadaan, nama atau perbuatan tanpa menunjukkan proses morfologi aktif.

Melalui kerangka Teori Morfologi Prosodik dan Morfologi Leksikal, kajian ini menjelaskan bahawa kata ganda tulen berfungsi sebagai mekanisme penghasilan bentuk baharu, manakala kata ganda semu mencerminkan unsur leksikal lama yang kekal dalam sistem bahasa. Oleh itu, fenomena penggandaan bukan sahaja menggambarkan keaktifan morfologi bahasa Melayu, tetapi juga menandakan kesinambungan sejarah dan keutuhan identiti leksikalnya.

### Implikasi Kajian

Hasil kajian ini memberikan implikasi yang luas merangkumi teori linguistik, analisis semantik dan pragmatik, pendidikan bahasa, serta perancangan dan dokumentasi bahasa. Kajian ini membuktikan bahawa teori morfologi bahasa Melayu oleh sarjana seperti Karim et al. (2015) dan Omar (2015) masih relevan. Data kontemporari menunjukkan perkembangan baharu, khususnya dalam penggunaan kata ganda semu yang bukan sahaja bersifat idiomatik tetapi turut memainkan peranan retorik dalam wacana media. Dapatan ini menegaskan keperluan menafsir semula teori morfologi dengan memasukkan dimensi semantik dan pragmatik, memandangkan kata ganda bukan sekadar bentuk, tetapi berfungsi menyampaikan makna literal, figuratif, dan emosi bergantung pada konteks. Selain itu, dapatan kajian menyokong usaha perancangan dan dokumentasi bahasa, khususnya dalam perkamusan, dengan mencadangkan agar *Kamus Dewan* dan tatabahasa rasmi menambah baik huraian tentang kata ganda semu dari aspek bentuk, fungsi dan makna supaya menjadi rujukan yang lebih komprehensif dan konsisten.

## Cadangan Kajian Lanjutan

Kajian seterusnya boleh memperluas korpus dengan memasukkan data daripada media sosial dan blog bagi mencerminkan variasi bahasa semasa, terutamanya dalam wacana digital yang semakin dominan. Kajian lanjutan boleh menilai keberkesanan modul pengajaran yang berasaskan korpus kata ganda. Modul ini boleh diuji dalam bilik darjah bagi melihat tahap peningkatan kefahaman pelajar terhadap variasi dan fungsi kata ganda.

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# Integrating Literacy and Creative Problem-solving in Javanese Language Education: A Qualitative Study using Atlas.ti for Curriculum Innovation

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## ABSTRACT

In the 21st century, reading competence and creativity in problem-solving play an important role in nurturing cognitive development and flexibility among students. This paper explores the implementation of the competences in Javanese teaching at the primary level, focussing on its implications for curriculum innovation and pedagogical strategies. Using a qualitative research approach, data was collected in semi-structured interviews with teachers, politicians, and language professionals. The data were analysed methodically using Atlas. ti, for analyse common themes and significant patterns that influence literacy-based problem-solving in Javanese learning. Findings reveal that while literacy in Javanese language instruction is acknowledged as critical, its integration with creative problem-solving remains inconsistent due to structural curriculum constraints and educators limited pedagogical resources. Additionally, technology-enhanced learning tools have been identified as pivotal in enriching students' cognitive engagement and problem-solving abilities. This study underscores the need for adaptive curriculum models that support contextualised language learning, as well as professional development programmes for teachers to foster innovative instructional techniques. By bridging language literacy and problem-solving frameworks, this research contributes to the broader discourse on transformative education, offering strategic recommendations for policy formulation and pedagogical advancements. The findings serve as a foundation for enhancing Javanese language education, ensuring it remains relevant and effective in nurturing critical thinkers in a rapidly evolving academic and sociocultural landscape.

*Keywords:* Atlasti, creative problem-solving, curriculum innovation, Javanese language education, literacy, pedagogical strategies

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## INTRODUCTION

In the era of 21st century education, literacy and creative problem-solving skills are the main foundations in shaping individuals who can think critically, adapt, and innovate. Global education organisations such as the OECD and UNESCO emphasise that learning should not only focus on academic comprehension, but also encourage reflective, creative, and solution-based thinking skills (Adeoye, 2023; Ismuni et al., 2024). During the transformation of the education system that is increasingly technology-based, the integration of these two competencies is becoming increasingly important, especially in learning regional languages, such as Javanese (Barkah, 2024; Maruti et al., 2025).

Javanese, as one of the largest regional languages in Indonesia, faces serious challenges in its sustainability in the digital era (Subrata, 2022). Younger generations are increasingly using this language in everyday conversation, and the education system has not fully developed learning strategies that can link linguistic literacy with creative thinking and problem-solving skills. In fact, Javanese language literacy is not only the ability to read and write, but also reflects cultural understanding, life philosophy, and local values that can enrich students' critical thinking skills (Rapti et al., 2025; Yu & Zadorozhnyy, 2022).

In the context of primary education, the integration of literacy and creative problem-solving skills still faces several challenges: a curriculum that tends to prioritise memorisation over exploration (Bhardwaj et al., 2025). Teachers' readiness to adapt problem-solving-based learning methods is still limited, as well as the lack of technological support to increase the effectiveness of regional language learning (Kaban et al., 2024; Puyol-Cortez, 2023). Several previous studies have highlighted the importance of literacy in improving students' critical thinking and creativity. For example, research by Hsia et al. (2021) found that problem-solving-based approaches can enhance student innovation, while Olaofe and Wibowo (2025) showed that project-based learning models can improve their thinking flexibility (Ningsih et al., 2020). However, most studies are still limited to general education and lack exploration of how this method can be applied in regional language learning (Law, 2024; Parraga et al., 2024).

While the integration of literacy and creative problem-solving has been widely promoted within 21st-century education discourse, it is important to recognise that this approach is not inherently superior to all instructional models. Alternative perspectives, including content-centred instruction, cognitive load theory, and traditional literacy development models, emphasise the importance of structured input, repetition, and form-focussed learning, particularly in early language education. In the context of regional languages such as Javanese, which possess complex linguistic forms and strong cultural norms, these conventional approaches continue to play a crucial role. Therefore, this study does not position creative

problem-solving as a replacement for traditional literacy instruction, but rather as a complementary pedagogical strategy that can be selectively integrated to enhance learner engagement, cultural relevance, and curriculum innovation in primary education.

From this research gap, a fundamental question arises regarding how literacy and creative problem-solving can be effectively integrated in Javanese language learning at the elementary level, and how technology can support this process. Unlike previous studies that focus on general literacy or problem-solving skills, this study specifically examines their integration in Javanese language education using qualitative data visualisation through Atlas.ti. This study aims to explore the integration of literacy and creative problem-solving skills in Javanese language learning in elementary schools using a qualitative approach supported by Atlas.ti as an analytic tool.

An analysis of previous research articles shows that project-based and technology-based approaches have been shown to improve literacy and problem-solving skills (Widyadhari et al., 2024; Zin & Wan Adnan, 2024). However, some weaknesses are still found, such as the lack of exploration of regional language education and the lack of studies using technology-based analysis, such as Atlas.ti, and the lack of research linking pedagogical innovation with national education policies (Deroncele-Acosta & Ellis, 2024).

From this research gap, a fundamental question arises: how can the integration of literacy and creative problem-solving be effectively applied in Javanese language learning in elementary schools, as well as how technology can help improve students' critical thinking skills? To answer this question, this study focusses on using a qualitative approach with Atlas.ti based analysis, thus allowing an in-depth exploration of learning patterns, implementation challenges, and curriculum innovation recommendations (Morales et al., 2024; Ñañez-Silva et al., 2024).

This research has novelty in several aspects. First, it is one of the first studies to link Javanese language learning with creative problem-solving in a technology-based pedagogical framework. Second, the use of Atlas.ti as an analysis tool provides a new perspective in understanding how regional language literacy can be developed through innovative problem-solving methods. Third, this research not only contributes to the development of educational theory but also offers concrete recommendations for policymakers and educators to strengthen Javanese language learning in primary education.

This study aims to explore the integration of literacy and creative problem-solving skills in Javanese language learning in elementary schools with a qualitative approach using Atlas.ti as an analysis tool. Specifically, this study seeks to identify effective strategies in the application of these two competencies, uncover the challenges faced by educators in the implementation of literacy-based curriculum and problem-solving, and provide innovative

recommendations for curriculum and education policy development to ensure that Javanese language learning remains relevant and adaptive to the demands of the 21st century (Pacheco-Velazquez et al., 2024).

## LITERATURE REVIEW

### Theoretical Foundations of Literacy and Creative Problem-solving

Literacy and creative problem-solving are fundamental competencies in 21st century education, shaping students' ability to engage critically with information and develop innovative solutions to complex challenges. The Constructivist Learning Theory (Isti'anah et al., 2023), Piaget (1950), and Sociocultural Theory (Mahmoodi-Shahrebabaki, 2019) emphasise that literacy is not merely the ability to read and write but involves higher thinking skills, including problem-solving and critical reasoning. Additionally, the Creative Problem-solving (CPS) Model (Borko et al., 2021; Giacomazzi et al., 2022) outlines a structured approach to fostering creativity through iterative problem analysis, idea generation, and solution implementation.

### Literacy and Problem-solving in Basic Education

Recent studies highlight the increasing importance of integrating literacy with problem-solving skills in basic education to enhance students' cognitive flexibility and adaptability (Bayley, 2024; Calafato & Hunstadbråten, 2025; Kiettikunwong et al., 2025). Research indicates that literacy-based problem-solving approaches improve students' ability to analyse information critically and apply knowledge in real-world contexts (Promma et al., 2025; Rachmadyanti, 2023). Furthermore, pedagogical strategies such as Project-based Learning (PBL) and Inquiry-based Learning (IBL) have been found to significantly enhance literacy and problem-solving competencies among elementary students (Akaygun & Adadan, 2023; Allsop et al., 2022; Bayley, 2024; Lethulur et al., 2025; Sam, 2024).

### The Role of Technology in Literacy and Problem-solving

The integration of technology in literacy education has transformed traditional pedagogical approaches, enabling more interactive and personalised learning experiences (Genc & Rabia, 2024; Hendratno., 2025). Digital tools such as Atlas.ti facilitate qualitative analysis of literacy development and problem-solving strategies, providing educators with insights into students' cognitive processes (Mena-Guacas et al., 2025; Vieira et al., 2025; Zou et al., 2025). Additionally, studies suggest that technology-enhanced learning environments foster collaboration and critical thinking, essential for developing problem-solving skills in basic education (Hennessy et al., 2022; Mustadi et al., 2024; Yin et al., 2024).

### Challenges and Research Gaps

Despite the growing emphasis on literacy and problem-solving integration, several challenges persist, including rigid curricula,

limited teacher training, and inadequate technological infrastructure (Alejandro et al., 2024; Avelino & Ismail, 2022; Kazu & Kurtoğlu, 2022). Moreover, while existing studies explore literacy and problem-solving in general education, research specifically focussing on language literacy in regional languages such as Javanese remains scarce (Chu et al., 2024; Hidayatullah et al., 2025; Istiq'faroh et al., 2025; Krissandi et al., 2023). Addressing these gaps requires further investigation into culturally responsive pedagogical models and adaptive curriculum frameworks (Abdalla & Moussa, 2024; Berlian & Huda, 2022; Chu et al., 2024).

### Implications for Curriculum and Pedagogical Innovation

The findings from recent studies underscore the need for curriculum innovation that integrates literacy and problem-solving skills through technology-enhanced learning and contextualised language instruction (Grimus, 2020; Maruti et al., 2024; Zuliana et al., 2023). Policymakers and educators must prioritise teacher training programmes that equip instructors with the necessary skills to implement problem-solving-based literacy instruction effectively (Kohnke et al., 2025; Mahara, 2024; Napitupulu et al., 2024). Additionally, leveraging qualitative analysis tools like Atlas.ti can provide deeper insights into student learning patterns, informing evidence-based curriculum development (Han et al., 2021; Järvelä et al., 2023; Valtonen et al., 2025).

This literature review highlights the theoretical and empirical foundations of literacy and creative problem-solving in basic education, emphasising the role of technology and pedagogical innovation (Arrahmi & Praheto, 2024; Henriksen et al., 2021; Li & Yu, 2025). While existing research provides valuable insights, further studies are needed to explore regional language literacy, particularly in Javanese language education, and its intersection with problem-solving competencies. Addressing these gaps will contribute to the development of more inclusive and effective educational frameworks that align with the demands of 21st century learning.

## METHODOLOGY

### Research Design

This study employed a qualitative design within an interpretive paradigm to explore how literacy competencies and creative problem-solving skills are integrated into Javanese language education at the elementary level. The approach emphasised depth of understanding through multiple perspectives and data sources.

### Participants

Participants were purposively selected to ensure relevance to the research objectives. They included 10 elementary school teachers, 5 principals, 3 educational observers, 3 literacy activists, and 3 policymakers from Surabaya and Sidoarjo. This diverse composition represented perspectives across classroom practice, school leadership, academic expertise, community engagement, and policy frameworks shown in Table 1.

Table 1
*Research participants*

| Participant Group | Number | Selection Criteria | Contribution to Study |
|---|---|---|---|
| Elementary school teachers | 10 | Actively teaching the Javanese language; involved in literacy- and problem-solving-based pedagogy | Provide firsthand experiences of classroom implementation and challenges |
| School principals | 5 | Implementing policies/ programmes on literacy and critical thinking in the Javanese language | Offer insights into school-level policy and curriculum innovation |
| Educational observers | 3 | Academics with publications/ research on local language education and instructional innovation | Provide analytical and research-based perspectives |
| Literacy activists | 3 | Active in Javanese literacy movements (training, publications, community activities) | Contribute community-based perspectives on literacy practices |
| Policy makers | 3 | Officials/staff from Surabaya and Sidoarjo Education Offices | Share policy-level perspectives on support or constraints to innovation |

## Data Collection

Data were gathered through semi-structured interviews, classroom observations, and document analysis. Interviews captured participants' experiences and perspectives, while observations offered real-time insights into classroom practices. Documents, such as curricular, teaching modules, and policies, provided contextual grounding. This combination of methods supported triangulation and enhanced the validity of findings.

## Data Analysis

Data were analysed using thematic analysis supported by Atlas.ti software as an analytic tool. The analysis followed an inductive process that moved from familiarisation with the data to initial coding, category development, and theme interpretation. First, all interview transcripts, observation notes, and documents were read repeatedly to gain an overall understanding of the data. Initial open codes were then generated inductively based on recurring patterns and meaningful units across the data sources. These codes were subsequently compared and refined before being grouped into broader analytical categories. The categories were further synthesised into overarching themes representing patterns in the integration of literacy and creative problem-solving in Javanese language learning. Throughout this process, Atlas.ti was used to assist in organising data, managing codes, and visualising relationships among themes; however, all

analytical decisions and interpretations were conducted by the researchers. Triangulation across data sources, member checking, and peer debriefing were applied to enhance the credibility and dependability of the findings.

### Trustworthiness

Rigor was ensured through credibility (triangulation, member checking), transferability (thick description), dependability (audit trail, peer debriefing), and confirmability (reflexivity, documentation of analytic decisions). These strategies are aligned with internationally recognised criteria for qualitative research.

## RESULTS

The findings presented in this section are based on the researchers' thematic interpretation of interview transcripts, classroom observations, and document analysis. Atlas.ti was used as a qualitative data management and visualisation tool to support the organisation of codes, categories, and themes. All analytical decisions, interpretations, and conclusions were made by the researchers through a systematic thematic analysis process.

### Integration of Literacy and Creative Problem Solving in Javanese Language Learning

The thematic analysis indicates the distribution of key categories related to literacy and creative problem-solving in Javanese language education, as illustrated in Figure 1.

Data analysis shows that most teachers have recognised the importance of integrating literacy and creative problem-solving in Javanese language learning, particularly in relation to students' engagement with Javanese texts and cultural content. However, instructional practices were still largely characterised by memorisation-oriented approaches rather than problem-solving-based exploration. The instructional strategies identified included interactive discussions, reflective

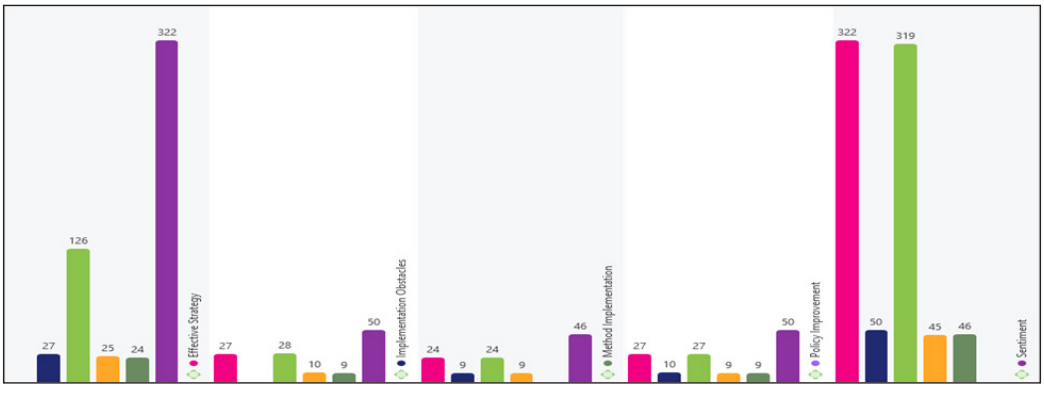



*Figure 1*. Coding results of literacy and creative problem-solving integration in Javanese language learning using Atlas.ti

use of folklore, and case-based problem-solving exercises derived from Javanese texts. Teachers reported observable changes in student participation and engagement when problem-solving-oriented activities were introduced in the classroom.

## Challenges in the Implementation of Literacy-based Curriculum and Problem Solving

Analysis of interview data from teachers, principals, and education supervisors revealed several key challenges in the implementation of literacy-based instruction and creative problem-solving in Javanese language education. These challenges included curriculum structures that remained strongly oriented toward academic targets and memorisation, which limited opportunities for exploration-based learning. In addition, variations in teachers' readiness to apply problem-solving-oriented instructional strategies were identified, particularly in relation to Javanese language literacy. Participants also reported limited availability of resources and insufficient technological support to facilitate the integration of digital literacy and creative problem-solving practices. These challenges were thematically interconnected and are summarised in Figure 2.

Figure 2 illustrates a concept map of the systemic challenges identified in the data. The visualisation indicates that major obstacles included limited technological resources, rigid curriculum structures, lack of contextual alignment between curriculum content and classroom practices, and uneven levels of teacher readiness. The map also reflects issues related to institutional and policy support, as well as constraints in student involvement and school-community collaboration. Together, these themes demonstrate the complexity of implementing literacy-based and creative problem-solving approaches in Javanese language learning.

Despite these challenges, the data also revealed that some schools had initiated alternative instructional practices, including project-based activities such as the analysis of Javanese literary texts combined with problem-solving reflections. Teachers who applied problem-solving-oriented strategies reported observable differences in student participation and students' ability to relate language concepts to everyday contexts. These variations in practice indicate differing levels of adoption across schools. This mapping illustrates how categories such as sentiment, student involvement, support, and instructional strategies are related and collectively shape curriculum innovation, as shown in Figure 3.

Figure 3 presents a network visualisation generated through Atlas.ti to illustrate thematic relationships identified in the data. The network shows connections among themes such as student involvement, instructional strategies, institutional support, and sentiment. This visualisation supports the thematic findings by illustrating how these elements are related within the context of literacy and creative problem-solving integration in Javanese language education.

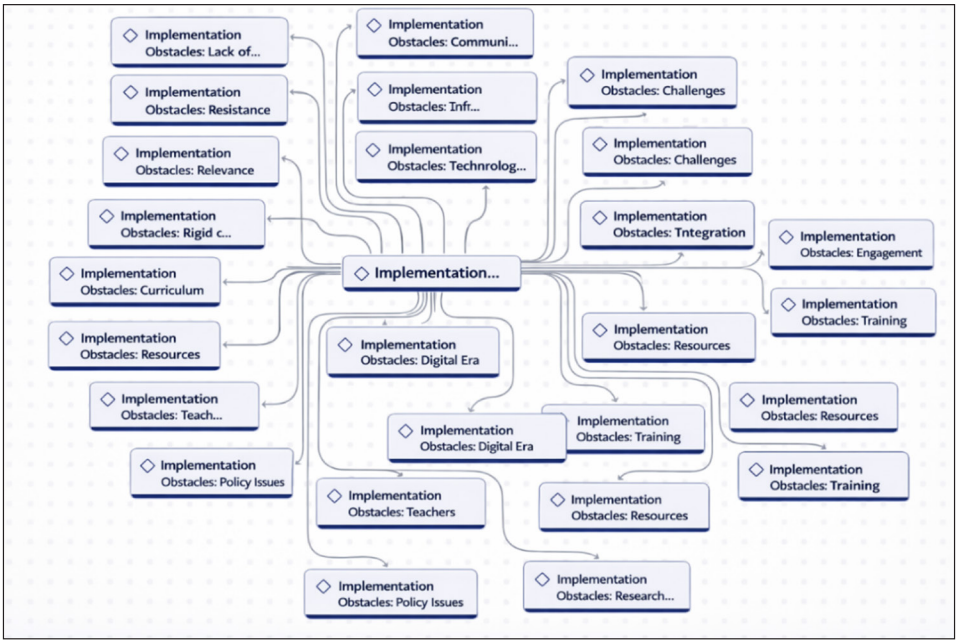



*Figure 2*. Concept map of implementation obstacles in integrating literacy and creative problem-solving in Javanese language education

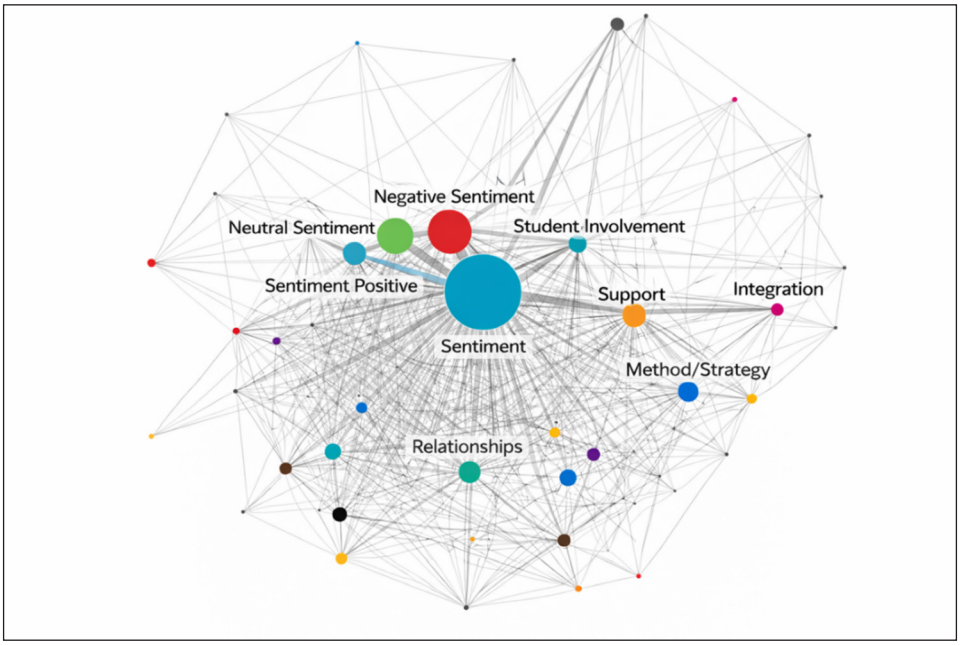



*Figure 3*. Network view of thematic relationships in integrating literacy and creative problem-solving in Javanese language education

### Systemic Relationships among Literacy, Student Response, and Instructional Contexts

To better understand the systemic interaction among literacy, student engagement, teaching challenges, and the use of technology, the analysis employs a Sankey diagramme. This visualisation maps how different categories contribute to curriculum design and pedagogical outcomes, as shown in Figure 4. The Sankey diagramme is used as a descriptive visualisation to illustrate thematic distributions and relationships identified in the data. It is not intended to represent causal or dynamic effects, but rather to support a systemic interpretation of how different themes are connected within the context of curriculum implementation.

At the core of this visualisation is the interaction between "Literacy Understanding" and "Student Response." The connections indicate that students' comprehension of literacy is directly influenced by their engagement with creative problem-solving methodologies. The diagram shows patterned connections between literacy understanding and student response within the dataset. These connections reflect how participants described student engagement when creative problem-solving activities were present in instructional practices.

The sentiment nodes, categorised as negative, neutral, and positive, represent participants expressed perceptions of the integration process as identified through the coding. These categories summarise how participants described their experiences related to literacy integration, without implying evaluative judgments or causal effects. The distribution of positive sentiment reflects participants' favourable perceptions of the integration process, as expressed in the coded data, particularly in relation to

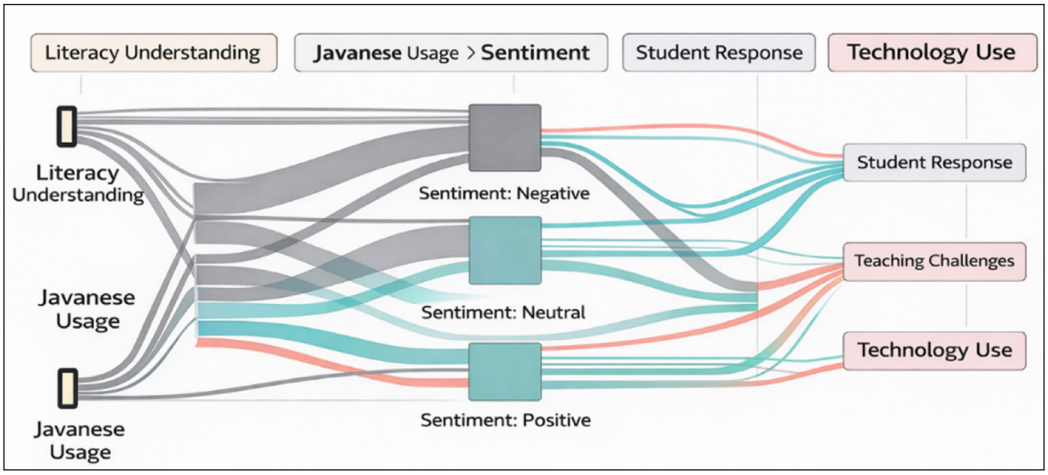



*Figure 4*. Sankey diagramme illustrating systemic interactions of literacy, sentiment, student response, teaching challenges, and technology use in Javanese language education

classroom engagement and instructional experiences. Negative sentiment reflects participants' reported challenges during implementation, including references to limited resources and constraints in teacher preparation.

"Technology Use" emerges as a significant factor in this framework, linking both literacy understanding and teaching challenges. The integration of technology in the classroom can facilitate innovative teaching practices, enabling students to engage with literacy in dynamic and interactive ways. However, the associated challenges such as access to technology or the need for professional development underscore the importance of addressing these barriers to maximise the potential benefits of technology-enhanced learning.

Lastly, the node "Teaching Challenges" encapsulates the difficulties educators encounter when attempting to integrate literacy with problem-solving methods. These challenges may include curriculum constraints, varying student abilities, and the need for ongoing support and training. Addressing these challenges is crucial for the successful implementation of integrated literacy programmes. In summary, the image reflects the intricate relationships between literacy understanding, student responses, technology use, and the challenges faced in teaching. This visualisation summarises the interrelated themes identified in the data, highlighting how literacy practices, student responses, technology use, and instructional challenges are represented within the dataset.

## Systemic Relationships among Educational Components Identified through Sankey Visualisation

To provide a comprehensive overview of how various educational components interact in the integration of literacy and creative problem-solving, a Sankey-based visualisation was employed. This diagram captures the systemic relationships among student response, school support, teacher strategies, and policy frameworks, leading to curriculum design and implementation outcomes, as presented in Figure 5.

The Sankey visualisation presents a systemic mapping of the relationships among key components in Javanese language learning at the elementary level, with particular attention to the integration of literacy and creative problem-solving. The diagramme illustrates how coded categories such as student response, school support, student engagement, teacher strategies, and policy-related themes are interconnected within the dataset. The thickness of the flow lines represents the relative frequency of coded references, indicating the prominence of each category in relation to curriculum design, instructional strategies, implementation barriers, and levels of integration. This visualisation supports the descriptive presentation of thematic distributions and relationships identified through the qualitative analysis.

In this study, Atlas.ti was used to facilitate the organisation and visualisation of thematic categories and their interconnections. The Sankey diagramme serves as a data-driven representation of how themes were

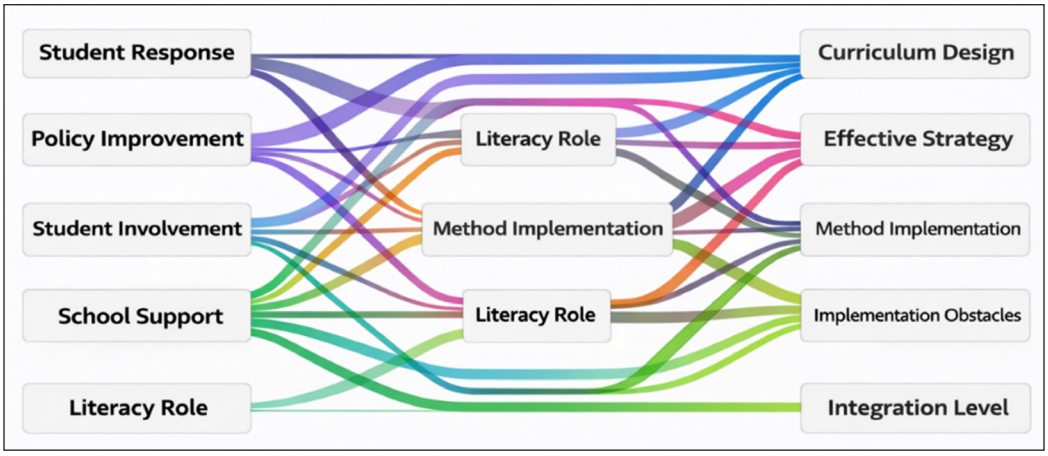



*Figure 5.* Sankey diagramme of systemic interactions among student response, school support, policy improvement, and curriculum outcomes in Javanese language education

distributed across participant groups and analytical categories, providing an overview of the structural relationships identified in the coding process. The distribution of coded categories and respondent contributions is presented in Table 2.

The following table presents the thematic distribution of coded data across different educational stakeholders, including teachers, observers, supervisors, principals, and practitioners. It shows how each group contributed to categories such as curriculum design, effective strategies, integration level, policy recommendations, and sentiment, as summarised in Table 3.

The data describe the results of thematic analysis from various educational stakeholders, including Teachers, Observers, Supervisors, Principals, and Practitioners, with a total of 1,861 coded citations. Teachers and Observers contributed the highest number of coded references across most themes. In the category of Curriculum Design, Teachers (Gr=24) and Observers (Gr=26) accounted for the largest proportion of coded data. The sub-theme Curriculum Design: Exploration showed a relatively even distribution of coded references across stakeholder groups.

The category Effective Strategy also contained a high number of coded references, including the sub-theme Innovative Approaches, which appeared across all respondent groups. Integration Level emerged as the category with the highest number of citations (Gr=112), including the sub-theme Significant Integration, which was represented across all stakeholder groups.

In contrast, the categories Implementation Obstacles and Policy Improvement were coded primarily in data from Teachers and Observers. The category Policy Recommendations, including the sub-theme Resource Allocation, contained coded references from all respondent

Table 2
*Distribution of coded categories and respondents' contributions in the integration of literacy and creative problem-solving in Javanese language education*

| Category/Respondent | Curriculum design, Gr=111 | Effective strategy, Gr=109 | Implementation Obstacles, Gr=16 | Integration level, Gr=112 | Literacy role, Gr=13 | Method implementation, Gr=14 | Policy improvement, Gr=16 | Policy Recommendations Gr=106 | School support, Gr=12 | Sentiment, Gr=144 | Student involvement, Gr=11 | Student response, Gr=15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Curriculum design, Gr=111 | 0 | 125 | 27 | 126 | 24 | 25 | 28 | 120 | 23 | 163 | 21 | 26 |
| Effective strategy, Gr=109 | 125 | 0 | 27 | 126 | 25 | 24 | 27 | 120 | 23 | 161 | 21 | 26 |
| Implementation obstacles, Gr=16 | 27 | 27 | 0 | 28 | 10 | 9 | 10 | 25 | 9 | 34 | 9 | 10 |
| Integration level, Gr=112 | 126 | 126 | 28 | 0 | 25 | 24 | 27 | 121 | 23 | 164 | 21 | 28 |
| Literacy role, Gr=13 | 24 | 25 | 10 | 25 | 0 | 9 | 9 | 22 | 9 | 27 | 9 | 10 |
| Method implementation, Gr=14 | 25 | 24 | 9 | 24 | 9 | 0 | 9 | 22 | 9 | 29 | 10 | 10 |
| Policy improvement, Gr=16 | 28 | 27 | 10 | 27 | 9 | 9 | 0 | 25 | 9 | 34 | 9 | 9 |
| Policy recommendations, Gr=106 | 120 | 120 | 25 | 121 | 22 | 22 | 25 | 0 | 21 | 158 | 19 | 24 |
| School support, Gr=12 | 23 | 23 | 9 | 23 | 9 | 9 | 9 | 21 | 0 | 25 | 9 | 10 |
| Sentiment, Gr=144 | 163 | 161 | 34 | 164 | 27 | 29 | 34 | 158 | 25 | 0 | 23 | 31 |
| Student involvement, Gr=11 | 21 | 21 | 9 | 21 | 9 | 10 | 9 | 19 | 9 | 23 | 0 | 10 |
| Student response, Gr=15 | 26 | 26 | 10 | 28 | 10 | 10 | 9 | 24 | 10 | 31 | 10 | 0 |

Table 3
*Thematic distribution of coded categories and stakeholder contributions in the integration of literacy and creative problem-solving in Javanese language education*

| Category/Respondent | Teacher, Gr=65 | Observer, Gr=59 | Supervisor, Gr=53 | Principal, Gr=56 | Practitioners, Gr=57 | Total |
|---|---|---|---|---|---|---|
| Curriculum Design, Gr=111 | 24 | 26 | 20 | 20 | 21 | 111 |
| Curriculum Design: Exploration, Gr=103 | 22 | 20 | 20 | 20 | 21 | 103 |
| Effective Strategy, Gr=109 | 24 | 24 | 20 | 20 | 21 | 109 |
| Effective Strategy: Innovative Approaches, Gr=103 | 21 | 21 | 20 | 20 | 21 | 103 |
| Implementation Obstacles, Gr=16 | 6 | 10 | 0 | 0 | 0 | 16 |
| Integration Level, Gr=112 | 25 | 26 | 20 | 20 | 21 | 112 |
| Integration Level: Significant Integration, r=103 | 22 | 20 | 20 | 20 | 21 | 103 |
| Policy Improvement, Gr=16 | 6 | 10 | 0 | 0 | 0 | 16 |
| Policy Recommendations, Gr=106 | 23 | 22 | 20 | 20 | 21 | 106 |
| Policy Recommendations: Allocation, Gr=103 | 22 | 20 | 20 | 20 | 21 | 103 |
| Sentiment, Gr=290 | 65 | 59 | 53 | 56 | 57 | 290 |
| Sentiment: Negative, Gr=56 | 17 | 10 | 8 | 12 | 9 | 56 |
| Sentiment: Neutral, Gr=108 | 18 | 26 | 21 | 19 | 24 | 108 |
| Sentiment: Positive, Gr=132 | 32 | 27 | 24 | 25 | 24 | 132 |
| Student Response, Gr=14 | 6 | 8 | 0 | 0 | 0 | 14 |
| Total | 515 | 526 | 266 | 272 | 282 | 1861 |

groups. Sentiment analysis showed that positive sentiment (Gr=132) occurred more frequently than neutral (Gr=108) and negative sentiment (Gr=56). The category Student Response appeared only in coded data from Teachers and Observers. Overall, the tables summarise the distribution of coded themes and stakeholder contributions identified in the dataset.

## DISCUSSION

As has been revealed in various previous studies by Wulandari and Tümen Akyıldız, Seçil, the integration of literacy with critical thinking skills, such as creative problem solving, is an effective pedagogical strategy in regional language learning to build 21st-century competencies (Akyıldız & Şahin, 2024; Wulandari, 2021). The results of this study show that teachers have realised the urgency of this approach, although the dominant practice is still centred on memorisation rather than context-based exploration. The approaches used, such as interactive discussions and the use of reflective folklore, have been shown to improve students' critical thinking skills and deep understanding of Javanese texts (Darwin & Saputra, 2024; Yulianto et al., 2023).

These findings are consistent with Murti's and Kadir's study, which shows that problem-solving-based learning encourages higher cognitive engagement and stronger meanings of local cultures (Kadir et al., 2020; Murti et al., 2024). However, these results have not previously been comprehensively explained in the context of the use of technology and data visualisation to support Javanese curriculum innovation. The lack of use of digital projects and learning analytics technologies, such as Atlas. The report shows that there is a gap between the potential for innovation and the reality of implementation in the field.

The explanation of these findings reflects that despite pedagogical awareness, structural limitations such as rigid curriculum, diverse teacher readiness, and low support for digital literacy also hinder the optimisation of innovative approaches. Therefore, the interpretation of these findings needs to be done carefully, considering that the adoption of new methods does not solely depend on micro actors (teachers and students), but also on macro conditions such as policies and institutional resources.

The important implications of these findings lead to the need to reformulate regional language education policies that are more adaptive, data-based, and provide space for the integration of creative learning strategies and technology (Nykyporets, 2023; Saddhono & Rohmadi, 2014). Sankey-based visualisation and thematic analysis through Atlas.ti not only strengthen the legitimacy of the findings but also become a reflective instrument in designing more transformative and contextual policy interventions to support the preservation of local culture through Education (Wang, 2024).

## CONCLUSION

This study explored the integration of literacy and creative problem-solving skills within Javanese language education in primary schools, analysing its implications for curriculum innovation and pedagogical strategies. Findings indicate that while educators recognise the importance of these competencies, their implementation remains inconsistent due to rigid curriculum structures and limited pedagogical resources. The study also highlights the transformative potential of technology-enhanced learning, particularly through Atlas.ti, in refining instructional approaches and evaluating student engagement in literacy-based problem-solving tasks.

This research contributes to the ongoing discourse on educational innovation, particularly in regional language education. By integrating qualitative analysis tools, such as Atlas.ti, with literacy and problem-solving frameworks, the study presents a novel approach to enhancing students' cognitive development. Additionally, findings offer empirical insights into how pedagogical strategies can be refined to support culturally responsive education, bridging the gap between traditional literacy instruction and 21st century learning demands.

The study underscores the necessity of curriculum adaptation, ensuring flexibility in literacy instruction and fostering contextualised learning experiences that incorporate problem-solving tasks. Furthermore, policymakers should consider teacher training initiatives that emphasise the application of interactive and technology-driven teaching methodologies to enhance the effectiveness of language instruction. The findings advocate for greater investment in digital tools to support educators in analysing students' learning behaviours and shaping evidence-based curriculum development.

While this study provides valuable insights, its scope is limited to primary schools in Surabaya and Sidoarjo, necessitating further research to examine broader regional trends and comparative analysis across different linguistic contexts. Future studies should explore longitudinal approaches to assess the sustained impact of literacy-based problem-solving models and evaluate digital literacy integration within primary education frameworks. Additionally, cross-disciplinary perspectives, incorporating educational psychology and cognitive science, could further enrich understanding of problem-solving and literacy acquisition.

This study reinforces the critical role of literacy and creative problem-solving in preparing students for an increasingly complex academic and sociocultural landscape. By advocating for innovative, culturally grounded, and technology-enhanced learning frameworks, this research provides actionable recommendations for educators, curriculum developers, and policymakers seeking to advance regional language education within the broader spectrum of transformative learning models.

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# Gamification as Pedagogical Innovation: Evaluating the Story Cube Approach to Reduce English-speaking Anxiety

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## ABSTRACT

This study aims to design, develop, and evaluate a gamified instructional tool Story Cube to reduce English-speaking anxiety among primary Tamil school students in Malaysia. Using a Design and Development Research (DDR) approach (Richey & Klein, 2013), data were gathered from interviews and focus groups with English teachers and SISC+ officers in Tamil schools. The iterative process involved analysis, design, development, and implementation phases, with thematic analysis conducted to identify key patterns in teachers' and officers' perceptions. Results revealed that students often avoid speaking lessons due to fear, anxiety, and lack of engaging activities. Teachers emphasised the need for tools that are interactive, student-centred, and sustainable. Features such as gamified elements (points, scores, competition) and storytelling components were identified as crucial in reducing speaking anxiety. Teachers highlighted that "Story Cube" can provide a safe, motivating, and non-threatening environment for speaking practice. The findings suggest that gamified interventions can complement existing teaching practices, enhance student motivation, and address the persistent issue of English-speaking anxiety in vernacular schools. This study contributes to the limited body of literature on anxiety reduction in Tamil vernacular schools and introduces a contextually relevant, teacher-informed gamified solution that may be adapted in other multilingual educational settings.

*Keywords:* Design-based research (DBR), educational innovation, English language anxiety, gamification in education, language learning anxiety, speaking skills, story cube intervention, vernacular Tamil schools

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## INTRODUCTION

English has long been positioned as a critical subject in the Malaysian education system, taught from preschool through tertiary levels and consistently emphasised in successive national education blueprints and language policies (Mohamed Jamrus, & Razali, 2021). Numerous initiatives spearheaded by the Ministry of Education, alongside contributions from non-governmental organisations and international agencies, have sought to elevate English language proficiency across generations. The prominence of English within Malaysia's linguistic and socio-political landscape is partly a legacy of the colonial era, which positioned the language as a tool of governance, commerce, and upward mobility. Given this historical and policy-driven emphasis, one might expect Malaysian learners to acquire proficiency in English with relative ease. However, empirical evidence continues to reveal a persistent gap between policy aspirations and the actual communicative competence of students, particularly in spoken English.

One of the most critical barriers contributing to this gap is the prevalence of speaking anxiety among Malaysian learners. Even though English is no longer categorised as a foreign language but rather as a second language within the Malaysian context, many students continue to perceive it as difficult to use, especially in oral communication (Pabro-Maquidato, 2021). Speaking anxiety is not only an affective challenge but also a pedagogical barrier that undermines students' willingness to communicate, restricts opportunities for practice, and consequently impedes language development (Shanmugan et al., 2025). This issue is particularly acute in vernacular Tamil schools, where the sociolinguistic environment is dominated by the mother tongue, and cultural factors often reinforce reluctance to engage in English-speaking tasks. Within such contexts, English is frequently perceived as distant, formal, and anxiety-inducing, thereby exacerbating the psychological barriers faced by learners.

Teachers play a pivotal role in mediating these challenges, as they are positioned at the intersection of curriculum mandates and classroom realities. Their ability to design, adapt, and implement effective strategies to alleviate speaking anxiety is crucial for cultivating more supportive and engaging learning environments. However, studies have shown that many teachers in vernacular schools face resource constraints, curricular rigidity, and limited exposure to creative instructional tools, which further inhibit their ability to address speaking-related challenges effectively (M. Ramalingam et al., 2022). This underscores the need for contextually relevant innovations that can both support teachers' pedagogical practices and directly target students' affective barriers to communication.

In response to these enduring challenges, the present study adopts a Design and Development Research (DDR) framework to conceptualise, design, and evaluate an innovative gamified instructional tool, Story Cube, with the primary aim of reducing

English-speaking anxiety among Tamil school students. DDR is particularly suited for this inquiry as it combines systematic design processes with empirical testing in authentic classroom contexts, thereby ensuring both theoretical relevance and practical usability (Richey & Klein, 2013). Specifically, this study pursues three interrelated objectives: (i) to explore English teachers' and SISC+ officers' perceptions of speaking anxiety among Tamil vernacular school students; (ii) to identify the design features of a gamified tool that can motivate, engage, and support learners in overcoming speaking-related anxiety; and (iii) to evaluate the feasibility and perceived impact of implementing Story Cube in real classroom settings.

By addressing these objectives, the study seeks to contribute both to the theoretical discourse on language anxiety and to the practical advancement of instructional innovations that are responsive to the unique needs of vernacular school contexts. In doing so, it aims to bridge the enduring gap between English language policy aspirations and the lived realities of Malaysian classrooms.

## BACKGROUND OF THE STUDY

Students in Tamil vernacular schools often demonstrate reluctance to speak in English, largely due to fear and anxiety. Pillai et al. (2021) observed that this reluctance is closely tied to the stigma of making mistakes, particularly in pronunciation and word usage, which creates heightened self-consciousness among learners. As second language learners with Tamil as their mother tongue, these students naturally encounter challenges in acquiring spoken English. However, when anxiety is layered on top of linguistic difficulty, teachers face even greater challenges in fostering effective oral communication (Kumaran & Krish, 2021). In many cases, this anxiety has been directly linked to mother tongue interference, which shapes how students perceive and produce English in classroom contexts.

The issue of first language dominance is not unique to Malaysia. In a study with undergraduates, found that language interference continues to influence learners' oral performance across contexts. Early linguistic theories also reinforce this perspective: Chomsky's view of the first language as a naturally dominant structure suggests that its influence inevitably shapes subsequent language learning (Siregar, 2021). Addressing such interference requires reducing fear rather than simply increasing exposure. Siregar (2021) argued that non-formal, student-centred activities can lower speaking anxiety more effectively than rigid classroom practices.

In Malaysia, this understanding is reflected in the Highly Immersive Programme (HIP) under the Memartabatkan Bahasa Malaysia dan Mengukuhkan Bahasa Inggeris (MBMMBI) policy. HIP seeks to reduce learners' anxiety by creating engaging, supportive environments where English is used meaningfully (Zainal et al., 2024). Nevertheless, despite these national initiatives, Tamil vernacular school students remain underrepresented in intervention-

based research. This underscores the need for innovative, contextually relevant tools such as gamified approaches that directly address their anxiety and foster confidence in speaking English.

**Schema Theory by Jean Piaget (1952)**

The Schema Theory by Piaget (1952) is a foundational construct in cognitive psychology, as it explains how learners organise, interpret, and process new information through pre-existing mental structures. Schema-based perspectives on cognitive development are essential for understanding how meaningful learning occurs in classroom settings. A crucial aspect involves the role of teachers in creating experiences that stimulate schema activation, thereby enabling learners to connect prior knowledge with new input. Within the context of English language learning, this process is particularly salient, as students rely extensively on stimuli and scaffolding provided by teachers. When such stimuli are appropriately structured, they can foster positive and enduring learning outcomes. Fang (2023) further underscores that positive experiences enhance long-term retention of communicative skills, particularly in speaking. The schema theory is closely related to the present study, as Story Cube is intentionally designed to stimulate schema activation by encouraging learners to construct ideas incrementally. By piecing together small components into coherent narratives, students are empowered to engage in process-oriented thinking, thereby reducing anxiety and facilitating spontaneous oral communication. This structured yet flexible design supports the transition from passive knowledge reception to active language production, which is crucial for second language acquisition.

**Anxiety in English Language Speaking**

An article written by K. Ramalingam et al. (2022) is the latest account that elaborates on the specific challenges faced by teachers in Tamil schools in Malaysia when teaching speaking skills. Although the article concerns teaching Tamil speaking skills, it addresses themes relevant to the teaching of speaking skills. K. Ramalingam et al. (2022) found that one of the major reasons that prevent the effective teaching of speaking skills of speaking skills is the teachers' incapabilities to create relevant teaching materials and tools. A study by Tran (2022) with 150 non-native college students in Vietnam uncovered several factors that caused anxiety among the respondents when speaking in English. Among the results were embarrassment caused by mistakes when speaking in English, bullying by classmates when speaking in English, lack of speaking activities in the classroom, and lack of support from the teachers for English speaking.

Another study conducted by Hu et al. (2024) where 631 primary school students in a province in China took part in the foreign language anxiety scale survey. Hu et al. (2024) found that the anxiety level of the students was inversely correlated with the foreign language achievements. Another study by Sosas (2021) with

foreign language learners at a university in Indonesia also reported similar findings. Sosas (2021), however, also suggested an intervention where an application was developed to help students lower their language anxiety. Collectively, these studies affirm that speaking anxiety transcends national contexts, affecting learners across educational levels and cultural settings. However, they also suggest that targeted interventions, particularly innovative tools can mitigate these barriers.

**Role of Gamification**

The Story Cube is a form of game and hence, gamification is related. Theoretically, the concept of gamification is related to the mechanics of gamification, which are in-built elements within a game that make the concept of gamification. In a study by Yaccob et al. (2022), game elements include storyline of the game, roles played by the players, the goals and objectives, and rewards. These elements complete the gamification concept and make the concept rooted to the very core of constructivism where pupil-centred learning is emphasised (Yaccob et al., 2022). Arip and Hashim (2024) stated that constructivism can be considered as the core theory in understanding gamification in the classroom because of its principles such as the pupil-centred strategies, communication and collaboration among pupils, interactions and the idea of learning through meaningful interactions.

According to a study by Kıyançiçek and Uzun (2022), gamification has become a common thing in the English language classroom. The introduction of applications like "Kahoot!" has taken the concept of gamification to a whole new level. Kıyançiçek and Uzun (2022) conducted a review and found that the application provides numerous benefits for English language teachers, especially in terms of encouraging second language learners to use the language more proactively. In relation to that, it is also very important to note that gamification in the classroom aid in enhancing students' motivation levels. A study by Jiménez-Sánchez and Gargallo-Camarillas (2020) explored the use of gamification to increase students' motivation when learning English. The experimental study by Jiménez-Sánchez and Gargallo-Camarillas (2020) exposed how the use of games affected the motivation levels of students in the experimental group compared to the control group. The results were significant in understanding the impact of games in the classrooms globally.

The Malaysian context reflects similar benefits. Perumal and Subramaniam (2020) demonstrated that an innovation kit grounded in gamification principles improved Tamil vernacular school students' attention and performance in English. Such findings illustrate that gamification can be tailored to address local needs while aligning with global best practices. Importantly, gamified activities such as Story Cube extend beyond entertainment; they create safe, competitive, and engaging learning environments where learners can practice speaking without fear of judgement. As reported by Kohnke and

Moorhouse (2022), modern-day games for language learning in the classroom are more generic compared to more contextual innovations like the Story Cube and other innovations created by language teachers based on specific needs of the students. This is an advantage of the Story Cube innovation.

Together, the reviewed literature highlights three critical insights: (i) Schema Theory underscores the importance of structured cognitive scaffolding in speaking tasks, (ii) speaking anxiety remains a universal challenge among second language learners, and (iii) gamification offers a powerful means of reducing anxiety while enhancing motivation. Despite this, few studies have examined gamified tools specifically designed for Tamil vernacular schools in Malaysia, leaving a significant gap in addressing the cultural and linguistic realities of these learners. This study responds to that gap by designing and testing Story Cube, a gamified intervention that draws on both theoretical and practical insights to reduce speaking anxiety and promote learner confidence.

## NOVELTY OF THE STUDY

The novelty of this study lies in its contribution at the levels of students, teachers, and the broader educational ecosystem. At the learner level, the development and evaluation of Story Cube as a gamified instructional tool offer a fresh pedagogical approach to addressing one of the most persistent challenges in second language acquisition, particularly speaking anxiety. While research on language anxiety has been extensive, few studies have translated theoretical insights into practical classroom tools specifically designed for the Malaysian vernacular school context. By providing learners with an engaging and low-stakes environment in which to practise speaking, Story Cube has the potential to reduce affective barriers and foster greater confidence. This innovation empowers students to view English not as a subject of fear but as a medium of enjoyment and expression, thus supporting more sustainable language acquisition. Importantly, its utility is not limited to Tamil vernacular schools, as the tool is adaptable and scalable across Malaysia.

At the teacher level, this study underscores the importance of pedagogical creativity and responsiveness in addressing classroom challenges. The introduction of Story Cube highlights how teachers can transcend reliance on traditional, textbook-driven practices by adopting innovative methods tailored to learner needs. Beyond the immediate use of the tool, the study is expected to inspire teachers to adopt a more research-informed orientation, whereby classroom challenges are systematically observed, analysed, and addressed through evidence-based instructional innovations. In this regard, Story Cube functions not only as a teaching aid but also as a catalyst for cultivating teachers' design thinking and problem-solving skills. Such an orientation resonates with the 21st century pedagogical expectations, where adaptability, innovation, and learner-centredness are increasingly recognised as core teacher competencies.

At the institutional and systemic levels, the findings of this study offer significant implications for educational leadership and policy. The integration of Story Cube into classroom practice exemplifies the potential of grassroots innovations to inform systemic educational improvement. It signals to the Ministry of Education, state departments, and district education offices the importance of fostering a culture of innovation among teachers. This can be achieved by institutionalising support structures such as workshops, professional learning communities, and innovation-sharing platforms, where teachers are both empowered and incentivised to design context-specific solutions. In doing so, the study aligns with broader national aspirations of cultivating creative and critical thinkers, not only among learners but also among educators.

Furthermore, the novelty of this research lies in its methodological positioning. By employing a Design and Development Research (DDR) framework, the study bridges the often-observed gap between theoretical research and practical application. The DDR's iterative nature ensures that the intervention is grounded in real classroom needs, co-designed with practitioners, and refined through systematic feedback loops. This methodological rigour elevates Story Cube beyond being a mere instructional tool, positioning it instead as an empirically validated innovation with both pedagogical and scholarly significance.

In sum, the study advances the discourse on English language teaching by offering a concrete, contextually relevant, and empirically tested innovation. Its novelty lies not only in addressing a pervasive problem English-speaking anxiety but also in demonstrating how design-based approaches can generate scalable solutions with direct relevance to policy, practice, and theory. Through this, the study makes a timely and meaningful contribution to the Malaysian education landscape, while offering insights that may resonate with other multilingual contexts globally.

## METHODS

This study adopted a Design and Development Research (DDR) methodology as outlined by Richey and Klein (2013), a framework that is widely recognised for its applicability in the systematic creation, refinement, and evaluation of instructional interventions. The DDR is inherently iterative, encompassing sequential yet overlapping phases of analysis, design, development, implementation, and evaluation. Such a methodological orientation is particularly germane to this study, which sought to conceptualise and assess a gamified instructional tool Story Cube to mitigate English-speaking anxiety among primary school learners. By integrating iterative refinement with empirical validation, the DDR provides a robust mechanism for addressing both theoretical and practical concerns in instructional innovation.

The participant group consisted of 10 English language teachers drawn from Tamil vernacular primary schools and 5

School Improvement Specialist Coaches Plus (SISC+) officers affiliated with the district education office. A purposive sampling strategy was employed, premised on the rationale that practitioners with direct pedagogical responsibilities and supervisory expertise would yield nuanced insights into the phenomena under investigation. This deliberate selection ensured that the data reflected both classroom-level challenges and broader systemic considerations in English language pedagogy.

Data were collected through semi-structured interviews and focus group discussions, allowing for both depth and breadth in the exploration of participant experiences. The interview protocol was designed to elicit participants' perspectives on the prevalence and manifestations of students' English-speaking anxiety, their experiences with existing intervention tools, and their expectations regarding the feasibility and pedagogical affordances of a gamified solution. Sessions were audio-recorded in their entirety and subsequently transcribed verbatim to preserve the authenticity of participant narratives.

Thematic analysis served as the primary analytic technique, enabling the categorisation and synthesis of data into coherent thematic patterns. Coding was conducted both inductively, to allow unanticipated themes to emerge, and deductively, based on the study's research objectives. Particular attention was paid to three overarching dimensions: (i) teachers' and officers' perceptions of student anxiety in English speaking; (ii) essential features and characteristics of effective pedagogical interventions; and (iii) the practical and pedagogical feasibility of integrating Story Cube into classroom contexts. To ensure analytical rigour, triangulation was achieved by juxtaposing the perspectives of teachers with those of SISC+ officers, thereby enhancing the comprehensiveness of the findings. Member checking was further conducted to validate the accuracy and credibility of the interpretations.

Ethical considerations were meticulously observed in accordance with established guidelines for educational research. Participants were fully informed of the purpose and scope of the study, and informed consent was obtained prior to data collection. Confidentiality was assured through anonymisation of data, and participation remained entirely voluntary, with the right to withdraw at any stage without prejudice.

Figure 1 provides a schematic overview of the DDR phases undertaken in this study, illustrating the iterative progression from needs analysis to the design and evaluation of the intervention tool. This structured yet flexible approach enabled the study to balance methodological rigor with practical relevance, thereby aligning with the dual aims of the DDR: the advancement of theory and the production of usable, context-sensitive educational solutions.

## RESULTS

The thematic analysis of the interview and focus group transcripts revealed several salient findings related to the development,

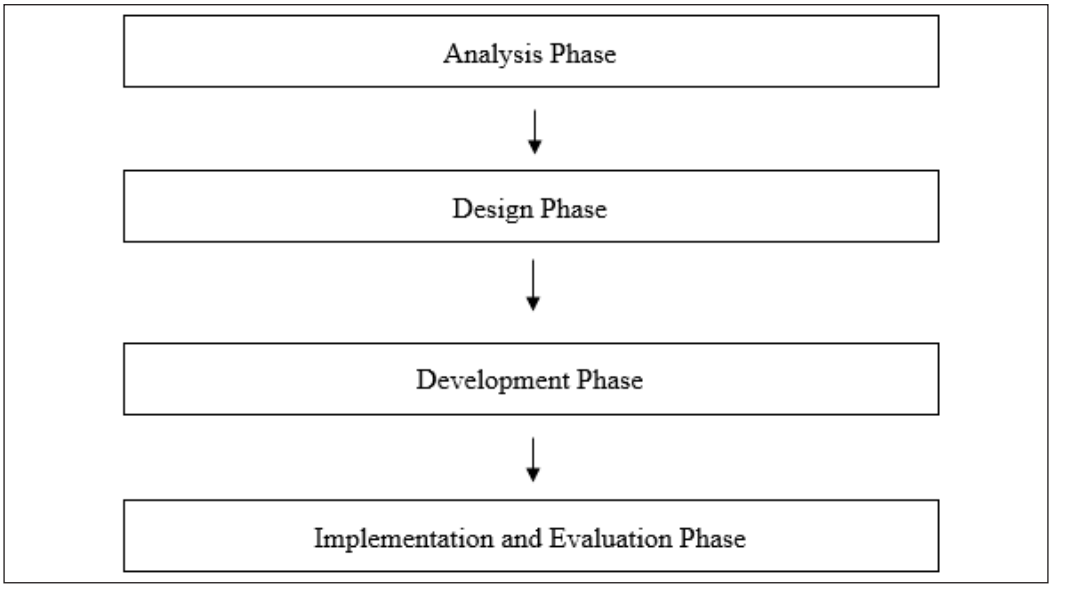



*Figure 1*. DDR Model
*Source*: Richey & Klein (2013)

design, and potential implementation of the Story Cube intervention. These findings are presented according to the emergent themes, supported by both teacher and officer perspectives.

### Theme 1: Student Avoidance and Fear of Speaking

Across participants, there was a consistent observation that students frequently demonstrate avoidance behaviours during English-speaking activities. Teachers described learners as "afraid," "anxious," and often "bored" during oral tasks. This avoidance was linked not only to a lack of engaging classroom activities but also to negative prior experiences that have reinforced fear and reluctance toward English speaking (Shanmugan et al., 2025). Consistent with Tran (2020), manifestations of embarrassment, heightened peer pressure, and unequal speaking opportunities were identified as aggravating factors, thereby creating persistent barriers to student participation. Importantly, the findings suggest that English-speaking anxiety is not an isolated or episodic issue but rather a continuous behavioural and emotional pattern. This persistent anxiety directly constrains students' willingness to communicate, highlighting the urgent need for structured interventions such as Story Cube that reduce affective barriers while promoting sustained engagement.

### Theme 2: Teacher Practices, Challenges, and Resource Gaps

Teachers articulated significant challenges in addressing speaking skills, primarily due to curriculum rigidity, limited instructional

time, and the scarcity of creative teaching resources. Although multimedia tools such as videos, games, and project-based learning were acknowledged as potentially useful, participants expressed reservations regarding their efficacy in reducing anxiety. Concerns centred on uncertainty about alignment with curricular goals and the practical challenges of classroom management. SISC+ officers echoed these concerns, emphasising the predominance of "too much teacher control," reliance on "traditional approaches," and a general "lack of creativity" in teaching practices. These findings corroborate M. Ramalingam et al. (2022), who reported that teachers in Tamil vernacular schools often struggle with material design and innovation due to resource constraints. The results therefore highlight a systemic gap between pedagogical aspirations for communicative language teaching and the practical realities of classroom implementation.

**Theme 3: Desired Features of Gamified Interventions**

Gamification emerged as a central consideration among both teachers and officers. Participants consistently highlighted the motivational potential of gamified elements, particularly competitiveness, collaboration, and interactivity, to engage students more meaningfully in English-speaking tasks. Storytelling activities, when designed to be interactive, were viewed as especially valuable in reducing anxiety and encouraging expression. Furthermore, several teachers advocated for kinaesthetic and tactile features in instructional resources, arguing that physical, hands-on activities can further stimulate participation. Officers, however, stressed the importance of designing resources that are "self-usable" and "self-sustainable," underscoring the need for practical scalability. These insights align with Jiménez-Sánchez and Gargallo-Camarillas (2020), who demonstrated that gamification, when anchored in usability and interactivity, significantly enhances learner motivation. Conceptually, this resonates with schema theory, as Story Cube enables learners to activate prior knowledge, organise ideas, and construct meaning through gameplay, thereby supporting cognitive processes essential for language acquisition.

**Theme 4: Implementation Feasibility and Perceived Impact**

The initial classroom implementation of Story Cube generated encouraging responses. Students reportedly exhibited heightened levels of excitement and enthusiasm, frequently describing the tool as "fun," "interesting," and "engaging." Nevertheless, anxiety was not eliminated, with some students continuing to display hesitation, particularly during the initial introduction of the tool. Teachers unanimously agreed that long-term, consistent integration of Story Cube would be necessary to observe sustained improvements in confidence and communicative competence. At the same time, SISC+ officers emphasised the importance of ensuring alignment with curriculum standards and instructional objectives, cautioning against ad hoc

usage. These perspectives resonate with the findings of Hu et al. (2024), who argued that interventions to address language anxiety must be progressive and consistently embedded in teaching practice to yield meaningful impact.

Overall, the results underscore that while Story Cube demonstrates strong potential as an engaging and anxiety-reducing tool, its effectiveness depends on iterative refinement, curricular integration, and sustained use over time. When compared to other applications like the Story App as studied by Cahyani (2023), the Story Cube has the advantage of giving students the freedom to customise the stories. Cahyani (2023) agreed that applications which give students the ability to build on their creativity are better than applications which provide prepared contents. The tool was thus received as a promising innovation, but one that requires further adaptation and empirical validation before full-scale adoption across diverse school contexts.

### Future Recommendations

The results reported in this study have several indications for future research and development. Most importantly, the although the Story Cube projects positive results, it must be subjected to refinement in line with the comments from the participants. Improvements must focus on increasing interactivity, sustainability and user independence so that the tool can be effectively integrated into diverse classroom contexts.

Next, in the future, studies must consist of a larger sample group. The sample must represent different regions, school types and socioeconomic backgrounds. This is to strengthen the data obtained so that it can be generalised further. Experimental or mixed-method approaches should be implemented to complement qualitative insights, providing more robust evidence of the tool's impact on speaking anxiety.

Finally, gamification in education is a growing trend with increasing demand. Future work on the Story Cube should focus on enhancing the competitive elements of the game as well as its incorporation into the digital as well as the physical world. Future research must evaluate the potential of the Story Cube as a fully digitalised game that could be used by any student from any part of the world at any time of the day. This will make the Story Cube a tool that is truly revolutionary and connect global learners in one platform.

## CONCLUSION

In summary, the study explored the design processes and the development of Story Cube as a tool that could help English language teachers in managing the English-speaking anxiety among students in Tamil vernacular schools in Malaysia. The reports showed that gamification is increasingly popular among teachers in Malaysia. The elements of it such as competitiveness and collaboration made the concept more appealing. The use of the Story Cube with the students showed that their speaking

anxiety can be overcome gradually when they are given the opportunity to use the language in a fun and meaningful way.

Consequently, the study does contribute to the larger field of study. It promotes the need to understand innovative, context-sensitive solutions to long-standing challenges in second language learning. It reinforces the view that addressing speaking anxiety requires more than traditional pedagogy; it calls for creative approaches that reframe speaking as an enjoyable and achievable skill.

The study also provides invaluable input for teachers that teach English. It shows how teachers should develop a tool that can effectively help students in reducing their anxiety when having to speak in the English language. Since teachers can also eventually become researchers, it shows them the iterative nature of design and development research, were continuous cycles of testing and refinement lead to more effective outcomes. Policymakers can also use the input to support innovation and create more room for professional development among teachers.

Finally, the Story Cube has proven that when a tool is designed with the right intention and process, it can achieve its goal which is to reduce English-speaking anxiety. Although it has its flaws, the Story Cube is a tool that can continuously evolve based on the students' needs and the teachers' goals. Beyond the tool itself, the Story Cube inspires teachers to become researchers and game developers who take part directly in solving the problems faced by their students.

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# Digitally Mediated Problem-based Learning Integrating Aneuk Jamee Cultural Values to Enhance Computational Thinking and Cultural Identity in Primary Education

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## ABSTRACT

This study aimed to develop a problem-based learning model that integrates Aneuk Jamee cultural values through the use of digital platforms to improve the quality of learning in elementary schools. The method used is research and development (R&D) based on the Plomp approach, which includes the stages of initial investigation, design, development, formative evaluation, implementation, and dissemination of the product. The participants were thirty fourth-grade students (N=30; aged 9-11 years) in a public elementary school in Malang, Indonesia. The research instruments included learning tools, student books, activity sheets, and computational thinking ability tests. The results show that integrating local culture into learning increases motivation, active participation, and students' understanding of the material and cultural values. This model has also been proven to support the development of 21st century skills such as critical thinking, creativity, and collaboration. Expert validation indicated that the developed tools were highly feasible for use, and trial results showed a significant improvement in students' computational thinking abilities. This research makes a tangible

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contribution to innovation in culturally based and contextually relevant digital technology learning while strengthening students' cultural identity in the global era.

*Keywords:* 21st century skills, Aneuk Jamee, digital platform, elementary school, local culture, problem-based learning

## INTRODUCTION

Digital transformation in education has fundamentally revolutionised the way students learn and teachers teach. Digital platforms such as learning management systems, interactive applications, and multimedia learning resources are increasingly used to enhance the effectiveness of learning and student engagement at various educational levels. According to UNESCO (2022), more than 1.6 billion students worldwide were affected by school closures during the COVID-19 pandemic, which accelerated the adoption of digital technology in over 190 countries worldwide (Kasmini, et al., 2024). The OECD (2023) also reported that more than 70% of member countries have integrated digital skills into their basic education curriculum. In this context, technology serves as a strategic tool for shaping collaborative, personalised, and contextual learning environments in line with the demands of 21st-century education. (Voogt et al., 2013). Competencies such as critical thinking, creativity, collaboration, and digital literacy have become essential skills that students must possess to face future global challenges (Forum, 2020; Zhao & Watterston, 2021).

Along with technological advancements, attention to the importance of integrating local cultural values into education has increased. Multicultural and culture-based education is now considered a strategic approach to shaping students' character to be adaptive and strongly rooted in identity (J. Banks & C. Banks, 2019; Gay, 2013). Local culture has great potential as a contextual learning resource, capable of connecting learning materials with students' everyday realities. However, learning approaches in elementary schools remain largely conventional and have yet to fully utilise local culture optimally. This disparity contributes to low student engagement and weakens students' connection to their cultural identity (Paris & Alim, 2014).

One of the cultural communities rich in educational values is Aneuk Jamee, an ethnic group resulting from the acculturation between the Minangkabau people and the local inhabitants of the West Coast of Aceh. Aneuk Jamee culture embodies social values such as cooperation, respect for elders, collective responsibility, and local wisdom in preserving the environment. (Ansari & Mardhatillah, 2020; Mardhatillah & Adisaputera, 2021). These values have great potential to be contextualised in basic education that emphasises character building, social responsibility, and sensitivity to cultural diversity. Unfortunately, to this day, there are still few learning models that explicitly integrate Aneuk Jamee culture into innovative, technology-based instructional design. Integrating local wisdom with pedagogical approaches such as digital-

based Problem-based Learning (PBL) has significant potential to improve the quality of learning, strengthen cultural values, and synergistically foster 21st-century skills. (Hmelo-Silver, 2004; Hung, 2011). Aneuk Jamee communities are primarily located along the west and southwest coast of Aceh, and they commonly use the Jamee language alongside Indonesian in daily communication. This cultural-linguistic background is important for understanding the local narratives and values embedded in the learning tasks.

Various studies have shown that problem-based learning is effective in enhancing students' critical thinking, collaboration, and problem-solving skills at various educational levels (Dolmans et al., 2005; Hmelo-Silver, 2004). Meanwhile, culture-based learning contributes positively to strengthening local identity and students' motivation to learn (Chen et al., 2021; Gay, 2019; He et al., 2021; Sung et al., 2020; Wang & Torrisi-Steele, 2019). However, most of these studies remain partial and have not yet comprehensively combined both approaches. The development of instructional models that integrate problem-based pedagogy with local cultural content into a single, cohesive design is still limited in literature.

Furthermore, very few studies have adopted an instructional design approach that integrates specific local cultural values, such as Aneuk Jamee, into problem-based learning (PBL) supported by digital technology. Digitalisation offers a great opportunity to revitalise local culture through interactive media and contextual digital content that is easily accessible and adaptive (Belland et al., 2020; Kim & Reeves, 2021; Lai & Hwang, 2019; Looi et al., 2021; Marty & Jones, 2020). Approaches such as curriculum-based ecosystems also emphasise the importance of the connection between learning and students' sociocultural ecology (Bang & Vossoughi, 2019; Erickson & Shultz, 2019; Kim et al., 2021; Roth & Lee, 2019; Voogt et al., 2020). The absence of a learning model that synergises local culture and technology within a structured pedagogical framework represents a significant gap in developing value-based contextual learning innovations.

This gap indicates an urgent need to design and develop a learning model that is not only responsive to 21st-century skill demands but also adaptive to the local context and relevant to strengthening students' cultural identities. This study aims to address these challenges by formulating and developing a problem-based learning model that integrates Aneuk Jamee cultural values using digital platforms, as an effort to bridge the gap between theory and practice in primary education in Indonesia.

The original contribution of this research lies in its integrative approach, which brings together three main components: the local cultural wisdom of Aneuk Jamee, innovative problem-based pedagogy, and digital technology as a learning medium. This approach not only offers a comprehensive solution to the challenges of contextual learning in the modern era but also strengthens the discourse on multicultural education grounded in values relevant to local needs. This study is expected to make a practical contribution

to the development of technology-based local curricula and enrich the conceptual framework of primary education in regions rich in cultural resources.

Unlike previous studies that separately examined digital problem-based learning or culturally responsive pedagogy, this study offers a distinct contribution by integrating Aneuk Jamee cultural epistemology within a digitally mediated PBL framework specifically designed to develop computational thinking and cultural identity simultaneously at the primary education level. This research does not merely embed local culture as contextual content but structurally aligns cultural values with problem-solving processes and digital learning design, resulting in a cohesive instructional model that bridges cognitive, technological, and cultural dimensions. To the best of our knowledge, such an integrative model focusing on Aneuk Jamee culture in digital PBL for computational thinking development has not been systematically explored in prior literature.

The integration of local culture in learning holds strategic significance in shaping students' character to be inclusive, environmentally conscious, and possess a strong sense of cultural identity. In the context of Aneuk Jamee, values such as cooperation, social responsibility, and respect for the environment serve as important foundations that can be transformed into meaningful learning experiences in elementary education. This study offers an innovative learning model that combines PBL strategies with local cultural values through the support of digital technology to create contextual, interactive, and transformative learning.

Through the development of a problem-based learning model specifically designed to accommodate the cultural values of Aneuk Jamee and supported by a digital platform, this study aims to increase student engagement, strengthen conceptual understanding, and foster a love for the local culture. In addition, this approach is expected to reinforce 21st century competencies that serve as benchmarks for successful learning in the digital age. The results of this study are relevant for teachers, curriculum developers, and educational institutions looking to adopt a value- and technology-based learning model in a contextual manner.

More broadly, this study contributes to the development of critical pedagogy discourse and digital-based multicultural education. The research findings not only enrich the literature in the fields of elementary education and contextual curriculum development but also serve as a practical reference for other regions with rich cultural diversity seeking to integrate it into modern learning. Thus, this study has a significant impact both theoretically and practically in strengthening education based on local wisdom that is globally relevant.

The main objective of this study is to develop and evaluate a problem-based learning model integrated with Aneuk Jamee cultural values through digital technology support, in order to improve the quality of learning and 21st-century competencies of elementary school students. Specifically, this research aims to design digital learning tools that contextually incorporate local cultural content, as well as test the validity,

practicality, and effectiveness of the developed model in relation to student engagement and understanding. In addition, this study also analyses the model's impact on students' computational thinking skills and the strengthening of their cultural identity. By addressing gaps in current educational practice and literature, this study is expected to produce innovative learning solutions that are adaptive to local needs and aligned with global developments.

## LITERATURE REVIEW

### Digitally Mediated Learning

Digital transformation has reshaped contemporary educational practices by enabling learning environments that are interactive, accessible, and personalised. Digital platforms, including learning management systems, multimedia resources, and interactive applications, support students' engagement and facilitate more comprehensive knowledge construction (Reid et al., 2022; Veluvali & Surisetti, 2021). Within primary education, the use of digital tools provides multimodal representations that help students visualise abstract concepts and engage in exploratory learning aligned with 21st century competencies (Moon et al., 2024; Tang et al., 2024).

Digital mediation also enables scaffolding, where learning tasks are structured with guided feedback, improving cognitive accessibility for younger learners (Chang & Yang, 2023). In the context of culturally embedded education, digital environments offer opportunities to revitalise local wisdom by transforming cultural values into interactive, visual, and contextually relevant learning content (Kumi-Yeboah et al., 2020; Mcdaniel, 2024). This aligns with global trends highlighted in digital education reports that emphasize the fusion of technological innovation with contextual learning to promote holistic student development (Tan et al., 2024). Through digitally mediated instruction, learners can engage with real-world problems and cultural narratives in meaningful ways, bridging local identity and global digital literacy demands.

### Problem-based Learning (PBL)

Problem-based Learning is an instructional approach grounded in constructivist principles that situates students in authentic problem scenarios requiring inquiry, collaboration, and critical thinking (Gaviria Alzate et al., 2024). Research consistently shows that PBL enhances learners' higher-order thinking skills, including critical analysis, problem-solving, and reflective reasoning (Dias-Oliveira et al., 2024). At the primary school level, PBL supports the development of self-directed learning habits and encourages students to construct knowledge through exploration rather than rote instruction (Varadarajan & Ladage, 2022). When integrated with digital tools, PBL becomes more dynamic: students can simulate solutions, test hypotheses, and create digital artefacts that represent their thinking processes.

The recursive cycle of problem analysis, information gathering, solution planning, and reflection aligns strongly with the core principles of computational thinking. Moreover, embedding PBL in learners'

cultural contexts strengthens authenticity and ensures that learning tasks resonate with students lived experiences (Crespi et al., 2022). This is consistent with research asserting that PBL must evolve beyond generic problem contexts towards culturally meaningful, community-rooted inquiry tasks (Saad & Zainudin, 2024). In this study, the fusion of PBL with Aneuk Jamee cultural values represents an effort to contextualise learning in social realities familiar to students while retaining the cognitive rigour of the PBL model.

**Aneuk Jamee Cultural Values**

Aneuk Jamee represents a distinctive ethnocultural group formed through acculturation between Minangkabau migrants and communities along the West Coast of Aceh. The culture embodies values of cooperation, respect for elders, social responsibility, and environmental stewardship. These cultural concepts carry pedagogical significance because they foster moral development, social awareness, and strong identity grounding among children (Pham et al., 2021). Cultural values also serve as contextual anchors for problem formulation, allowing learners to engage with tasks that are meaningful and connected to community life. Nevertheless, existing educational practices rarely integrate Aneuk Jamee wisdom into structured pedagogical models, despite its potential to enrich character education and contextual relevance.

Digitally mediated instruction expands the possibilities for integrating these cultural values by presenting them through stories, scenarios, images, and multimedia-based problem tasks. Prior work on culturally relevant pedagogy argues that students demonstrate stronger engagement and motivation when learning materials reflect their cultural backgrounds. By embedding Aneuk Jamee narratives and values within digital PBL contexts, learners not only deepen their understanding of academic content but also foster pride and connectivity to their heritage (Orphanidou et al., 2024). This is particularly important in culturally diverse regions where local identities risk being overshadowed by standardised curricula.

**Computational Thinking (CT)**

Computational thinking has emerged as a foundational skill for 21st century learners, extending beyond computer science into general problem-solving and reasoning development. CT encompasses several core components: decomposition, pattern recognition, abstraction, and algorithmic thinking (Ballard & Haroldson, 2021). Primary school learners benefit significantly from early exposure to CT-oriented tasks, as these experiences shape structured thinking habits crucial for future learning (Molina-Ayuso et al., 2023). Research highlights that CT can be effectively developed through model-based tasks, inquiry cycles, and scaffolded problem-solving features inherent in PBL (Lee, 2024).

Digital platforms further enhance CT development by enabling students to interact with dynamic representations, model algorithms visually, and manipulate

data in exploratory ways (Yuan et al., 2021). Assessments of CT also align with performance-based tasks that evaluate students' abilities to break down problems, identify relationships, and plan logical steps. In the context of this study, students' CT abilities improved significantly when exposed to a digitally mediated PBL model enriched with local cultural values, demonstrating that contextual relevance enhances both engagement and cognitive outcomes (Amanda et al., 2023; Rehman et al., 2023). Thus, CT serves as both a cognitive target and an evaluative measure for the effectiveness of the instructional model developed.

**Cultural Identity**

Cultural identity refers to an individual's sense of belonging to a cultural group, shaped by shared values, traditions, language, and practices. In childhood, cultural identity is formed through exposure to community norms, family practices, and social interactions. Education plays a crucial role in reinforcing or diminishing this identity, depending on the extent to which cultural elements are represented within learning environments. Literature on culturally sustaining pedagogy contends that embedding cultural knowledge in instruction promotes positive identity formation, enhances motivation, and validates students' sociocultural backgrounds (Dunham et al., 2011; Steketee et al., 2021).

In primary education, culturally grounded learning activities can foster emotional connection and intrinsic motivation, especially when students see their traditions reflected in classroom content (Suarta et al., 2022; Yüksel et al., 2024). Digital media further strengthens cultural identity formation by allowing learners to engage with cultural narratives in immersive and interactive formats (Sun et al., 2023). In this study, the integration of Aneuk Jamee values supported by digital platforms provided students with opportunities to explore and appreciate their heritage while engaging in academic inquiry. This dual development of cultural awareness and academic skills exemplifies a holistic approach to education that reconciles local wisdom with global digital competencies.

This study is grounded in an integrated theoretical framework that connects digitally mediated Problem-based Learning, computational thinking, and cultural identity within a culturally responsive pedagogy paradigm. Digitally mediated PBL serves as the core instructional strategy that situates learners in authentic, culturally contextualised problem scenarios derived from Aneuk Jamee values. Through iterative cycles of problem analysis, information seeking, solution design, and reflection, students engage in structured cognitive processes that foster core elements of computational thinking, including decomposition, pattern recognition, abstraction, and algorithmic reasoning.

Simultaneously, embedding Aneuk Jamee cultural narratives and values within problem contexts facilitates the internalisation of local wisdom, promoting students' cultural identity and socio-cultural awareness. Digital platforms function as mediating tools that visualise cultural content, support interaction, and

scaffold learning, thereby bridging local cultural knowledge with global digital competencies. This framework positions learning as a synergistic interaction between cognition, culture, and technology, ensuring that computational skill development is inseparable from cultural grounding and identity formation.

In this study, learning is conceptualised as a dual developmental process encompassing both cognitive transformation and socio-cultural formation. Cognitively, learning is reflected in the development of students' computational thinking skills, including problem decomposition, abstraction, and algorithmic reasoning. Socio-culturally, learning is manifested in the strengthening of students' cultural identity through engagement with culturally contextualised problems rooted in Aneuk Jamee values. Thus, learning is not viewed merely as knowledge acquisition, but as a holistic process integrating thinking skills, cultural internalisation, and identity formation through meaningful digital learning experiences.

## METHODOLOGY

This study uses a research and development (R&D) approach based on the Design-based Research (DBR) model by Plomp (2013), which includes five main stages: initial investigation, design, construction (realisation), formative and summative evaluation, as well as implementation and dissemination. This approach was chosen to develop a problem-based learning model integrated with Anak Jamee cultural values through the utilisation of a digital platform that is contextual, valid, practical, and effective for application among elementary school students.

The subjects of this study were fourth-grade students at a public elementary school in Malang City, totalling 30 individuals, consisting of both boys and girls aged 9-11 years. The selection of subjects was purposive, considering the representation of students' cognitive characteristics and the classroom teacher's readiness to implement the learning model. The research was conducted during the odd semester of the 2023/2024 academic year. Here, "cognitive characteristics" refer to age-related learning needs (9-11 years, concrete-operational reasoning), readiness to engage in digitally mediated tasks, and suitability for collaborative PBL processes.

In the initial investigation stage, the researcher conducted a literature review, classroom observations, and interviews with teachers and local cultural experts to identify learning needs, challenges faced by students, and the potential cultural values of Aneuk Jamee that could be contextualised in learning English. The results of this analysis served as the basis for preparing the initial design of the learning materials.

The design phase is carried out by developing an initial prototype (Draft A) consisting of a complete set of learning materials, namely the Lesson Implementation Plan, Teacher's Handbook, Student Book, Student Activity Sheets, and a computational thinking skills test instrument (Mardhatillah et al., 2019). The learning design refers to Bruner's

theory (enactive, iconic, symbolic) and the Problem-Based Learning (PBL) approach, which is connected to the local cultural context of Aneuk Jamee. Draft A is then validated by five experts using validation instruments that assess content, language, and visual appearance aspects.

After revisions were made based on expert validation results, the materials were developed into a digital prototype (Draft-B) and then tested for readability and practicality with 12 students. The test results showed that the materials were deemed practical, only requiring minor revisions. The refined materials were used in two stages of trials: the first trial was a simulation conducted by the researcher, and the second trial was carried out by the classroom teacher involving students in actual learning. Data was collected through observation of student activities, assessment of teachers' ability to manage learning, and student questionnaires regarding the materials and the learning process.

The research instruments included validation sheets for the materials and test instruments, observation sheets, student response questionnaires, and computational thinking ability tests. The test was administered before and after the intervention (pre and post-test) to measure students' improvement. Test blueprints, assessment rubrics, and answer keys were developed and validated to ensure the quality of the instruments. Validation results showed that all materials and instruments were in the "highly valid" category, with inter-rater reliability ranging from moderate to high (r = 0.41-0.55).

Quantitative data analysis was conducted using descriptive statistics (mean and standard deviation) and inferential statistics in the form of independent t-tests with the assistance of SPSS software version 17.0 to examine the differences in learning outcomes between the experimental group and the control group. Meanwhile, qualitative data from observations and interviews were analysed thematically to provide an in-depth overview of the students' engagement processes and the effectiveness of the developed model.

This study has received approval from the Ethics Committee of the State University of Malang. Informed consent was obtained from the students' parents or guardians, and official permission from the school was secured prior to data collection. All participants' confidentiality was protected, and they were given the right to withdraw from the study at any time without any consequences.

## RESULTS

### Description of the Definition Stage (Define)

#### *Initial Analysis*

Based on the observations and conversations between the researcher and several teachers at a public elementary school in Malang City, student participation has not yet become part of the learning process. Teachers still use standard teaching strategies, such as giving practice questions, providing example problems, and summarising ideas or processes through a series of questions and answers. As a result, students are not

accustomed to creating their own knowledge or problem-solving strategies.

The problem-based learning model is one of the teaching strategies that can prioritise students' work outcomes by emphasising the importance of using contextual problems. Therefore, creating high-quality learning tools becomes very important. The learning resources created for this research consist of:

1. Lesson Plan

   The lesson plan, which consists of four sessions, outlines the core competencies, basic competencies, indicators, learning objectives, main materials, teaching models, methodologies and techniques, required resources, and stages of the learning activities. The five phases of the learning activities, or the learning scenario, are as follows: sharing goals and students' motives sets the stage for learning, which is then followed by information presentation, group organisation, group guidance, evaluation, and giving rewards.

2. Teacher's Guidebook

   Lesson plans and contextual problems relevant to the topic are included in the teacher's guidebook. Four (4) meetings on the subject are scheduled, each featuring contextual problems. Bruner's learning theory, which comprises three different modes of presentation-enactive (through action), iconic (internal imagery), and symbolic (using words or language) - is used in designing the content presented in the teacher's book. In addition to the fact that students play a dominant role in the process of constructing knowledge, the problems presented are real difficulties related to the students' environment.

3. Student Handbook

   The narrative about my field was chosen with the understanding that elementary school students should be taught this subject because of its importance and based on observations by elementary school teachers that students struggle with the material when faced with real-world problems. This textbook is intended to serve as a guide for students. Bruner's learning theory, which consists of three methods of presentation-enactive (through actions), iconic (internal mental images), and symbolic (using words or language)- is used in the design of the content presented in this book. The issues raised are current topics related to the learning environment, and students also have a significant influence on the process of knowledge creation.

4. Student Activity Sheet

   With the help of the teacher, students must formulate concepts, principles, and methods from the material discussed in structured learning activities developed for this subject. Four sets of reinforcement challenges and problem-solving exercises make up the developed LAS.

5. Students' Computational Thinking Ability Test

The instrument for assessing computational thinking skills, the computational thinking test questions before and after the test, the scoring guidelines, and the answer key are all included in the test blueprint for learning outcome assessment.

### *Student Analysis*

This study focuses on three main features of fourth-grade students in the 2023-2024 academic year: cognitive development, academic aptitude, and socioeconomic background. Students in fourth grade at elementary school are typically between 9 and 11 years old. Fourth-grade students are in the concrete operational stage if Piaget's stages of cognitive development are to be trusted. Students at this age still need concrete materials to learn, even in the form of everyday occurrences. Therefore, the application of Bruner's learning theory in mathematics education is very sensible. There are three (3) ways to present Bruner's theory: the enactive mode (through action), the iconic approach (in the mind), and the symbolic mode (using words or language), in which challenges are drawn from their real-life experiences. Learning materials are organised from more concrete to more abstract concepts to facilitate students' understanding of the subject matter.

Based on the academic achievements of fourth-grade elementary students, it appears that they have never been involved in a learning approach based on local culture. For students, this means that such a learning model is still relatively new. In terms of socioeconomic background, students' parents work in a variety of fields, such as traders, entrepreneurs, civil servants, and others. The school and the students' parents or guardians have established a good relationship. In addition, parents provide a lot of support for their children's school activities.

## Description of the Planning (Design) Stage

The results of each activity in the planning stage can be described as follows:

### *Media Selection Results*

At this stage, suitable instructional media are produced for use in implementing the problem-based learning model based on the culture of the Aneuk Jamee ethnic group for 4th grade students at SDN, as shown in the following Table 1.

### *Selection Results Format*

The format of learning support tools is selected by considering the process, attributes, and guiding principles of the Problem Based Learning model. Core competencies, basic competencies, indicators, learning objectives, main materials, models, approaches, and learning techniques, as well as the necessary materials and stages of learning activities (learning scenarios), are all included in the lesson implementation plan. There is an introduction, three main activities, and a conclusion in the learning scenario. To spark students' interest and encourage them to keep learning, color is used throughout the teacher's guidebook, student book, and Student Activity Sheets.

Table 1
*Learning media for the PBL learning model based on Aneuk Jamee ethnic culture*

| No. | Lesson Plan | Media |
|---|---|---|
| 1. | Lesson Plan I | Lesson plan I, student worksheet I, student worksheet, teacher management sheet, and student book are all used in the learning process |
| 2. | Lesson Plan II | Lesson plan II, student activity sheet II, student handbook, student book, teacher management sheet, and student activity sheet in the learning process |
| 3. | Lesson Plan III | Lesson plan III, student worksheet III, teacher management sheet, student book, and instructor handbook in the learning process |
| 4. | Lesson Plan IV | Lesson plan IV, student activity sheet IV, instructor management sheet, student handbook, and student book in the learning process |

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### *Initial Design Results*

At this stage, a computational thinking skills test, assessment criteria, answer key, teacher's guidebook, student book, and lesson plans for four meetings were developed. All outputs from this design stage are referred to as draft-A.

### Development Stage Results (Develop)

The following is the display of the learning device development results from each activity in this development stage:

### *Expert Validation Results*

The validator or expert validates Draft-A. Validation is now carried out on the learning materials by examining the graphics, language, content, format, and compatibility with the problem-based learning approach. The Lesson Plan (RPP), the problem-based learning model, and the Student Activity Sheet (LAS), which adhere to Bruner's theory of learning, are the learning materials evaluated by the validator. The revised materials are referred to as draft-B. Draft-B is the name given to the learning materials considered valid by the validator. The following is an overview of the validation results from the experts:

1. Validation Results of the Lesson Plan (RPP) (Table 2)

Table 2
*Learning media for the PBL learning model based on Aneuk Jamee ethnic culture*

| No. | Aspect Assessed | Validators who gave Grades | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | Criterion Average | Aspect Average |
| 1. | Format | | | | | | | |
| | Clarity of material division | 0 | 0 | 1 | 2 | 2 | 4.2 | 4.35 |
| | Clarity of the numbering system | 0 | 0 | 0 | 2 | 3 | 4.6 | |
| | Layout and spacing | 0 | 0 | 1 | 3 | 1 | 4.0 | |
| | Size and font suitability | 0 | 0 | 0 | 2 | 3 | 4.6 | |

Table 2 *(continued)*

| No. | Aspect Assessed | Validators who gave Grades | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** | **Criterion Average** | **Aspect Average** |
| 2. | Language | | | | | | | |
| | The sentence must be grammatically correct | 0 | 0 | 0 | 5 | 0 | 4.0 | 3.96 |
| | According to the age and level of reading ability of the students | 0 | 0 | 1 | 4 | 0 | 3.8 | |
| | Sentences should be simple in structure | 0 | 0 | 0 | 5 | 0 | 4.0 | |
| | A phrase must not have two meanings | 0 | 0 | 0 | 5 | 0 | 4.0 | |
| | The sentence must be grammatically correct | 0 | 0 | 1 | 3 | 1 | 4.0 | |
| 3. | Content | | | | | | | |
| | Logically, the truth of the content of the material is divided into parts | 0 | 0 | 0 | 2 | 3 | 4.6 | 4.32 |
| | Activities designed for instructors and students are formulated in a straightforward and practical way, making it easier for teachers to incorporate them into the classroom learning process | 0 | 0 | 1 | 3 | 1 | 4.0 | |
| | In accordance with the PBL learning model | 0 | 0 | 0 | 3 | 2 | 4.4 | |
| | In accordance with the state curriculum (independence) | 0 | 0 | 0 | 1 | 4 | 4.8 | |
| | Adequacy of material arrangement | 0 | 0 | 1 | 4 | 0 | 3.8 | |
| | **Sum** | | | | | | 58.8 | 12.63 |
| | **Total Average** | | | | | | 4.21 | |
| | **Validation Results** | | | | | | Excellent | |

[1] Tables may have a footer.

Information:

1: means "not good" 4: means "good"

2: means "not good" 5: means "very good"

3: means "good enough"

$$\text{Average score} = \frac{jumla\ h\ skor\ \ yang\ \ diperole\ h}{banyak\ \ aspek\ \ pengamatan}$$

The validity criteria for learning tools are:

$4 \leq RTV_{PP} \leq 5$ Very valid

$3 \leq RTV_{PP} < 4$ Valid

$2 \leq RTV_{PP} < 3$ Less Valid

$1 \leq RTV_{PP} < 2$ Invalid

The components of the learning implementation plan are considered quite good, good, or very good based on the results of expert validation calculations conducted by five experts on the Learning Implementation Plan (RPP) in Table 2. Thus, a total average of 4.21 was obtained from the calculation results. The results of the

validation of the learning implementation plan are included in the "Excellent" category. The validator's response to the lesson plan has the following reliability levels:

$$JK_b = \frac{1}{k}\sum X(i)\ 2 - \frac{(\sum X\ldots)^2}{n_t} = 7.20$$

$$JK_k = \frac{1}{k}\sum X(j)\ 2 - \frac{(\sum X\ldots)^2}{n_t} = 2.62$$

$$JK_t = \frac{1}{k}\sum X(ij)\ 2 - \frac{(\sum X\ldots)^2}{n_t} = 23.20$$

$$JK_e = JK_t - JK_k - JK_b = 13.37$$

$$RJK_b = \frac{JK_b}{db_b} = 0{,}55$$

$$RJK_e = \frac{JK_e}{db_e} = 0{,}25$$

$$r = \frac{RJK_b - Rjk_e}{RJK_b} = 0.53$$

The level of suitability of the learning implementation plan must be 0.53 in the medium category to meet the validator assessment criteria. Corrections, criticisms, and suggestions are collected from validator assessments and considered when the learning implementation plan is revised.

2. Results of Teacher Handbook Validation (Table 3)

The components of the teacher's handbook received a good, good, and very good assessment based on the results of expert validation calculations carried out by five experts on the Teacher's Handbook in Table 3. Thus, an average total of 4.65 was obtained from the calculation results. "Very Good" is the classification given to the results of the teacher's handbook validation. The following is the validity of the validator's response to the teacher's handbook (BPG):

$$JK_b = \frac{1}{k}\sum X(i)\ 2 - \frac{(\sum X\ldots)^2}{n_t} = 7.68$$

$$JK_k = \frac{1}{k}\sum X(j)\ 2 - \frac{(\sum X\ldots)^2}{n_t} = 8.67$$

$$JK_t = \frac{1}{k}\sum X(ij)\ 2 - \frac{(\sum X\ldots)^2}{n_t} = 34.48$$

$$JK_e = JK_t - JK_k - JK_b = 18.12$$

$$RJK_b = \frac{JK_b}{db_b} = 0{,}51$$

$$RJK_e = \frac{JK_e}{db_e} = 0{,}30$$

$$r = \frac{RJK_b - Rjk_e}{RJK_b} = 0.41$$

Table 3
*Results of Teacher Handbook Validation (BPG)*

| No. | Aspects Assesed | Validators who gave Grades | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | Average Criteria | Aspect Average |
| 1. | Format | | | | | | | |
| | Clarity of material division | 0 | 0 | 0 | 1 | 4 | 4.8 | 4.80 |
| | Clarity of the numbering system | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| | Layout and spacing | 0 | 0 | 0 | 0 | 5 | 5.0 | |
| | Size and font suitability | 0 | 0 | 0 | 1 | 4 | 4.8 | |

Table 3 (*continued*)

| No. | Aspects Assesed | Validators who gave Grades | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** | **Average Criteria** | **Aspect Average** |
| 2. | Language | | | | | | | |
| | Correct grammar | 0 | 0 | 0 | 1 | 4 | 4.8 | 4.48 |
| | Sentences that are appropriate for the age and cognitive level of the student | 0 | 0 | 1 | 2 | 2 | 4.2 | |
| | Simple structured sentences | 0 | 0 | 1 | 3 | 1 | 4.0 | |
| | Ambiguity-free sentences | 0 | 0 | 0 | 0 | 5 | 5.0 | |
| | Clear instructions and instructions | 0 | 0 | 1 | 1 | 3 | 4.4 | |
| 3. | Content | | | | | | | |
| | Logically, the truth of the content of the material is divided into parts | 0 | 0 | 1 | 0 | 4 | 4.6 | 4.60 |
| | Activities designed for students and instructors are structured in a clear and practical way, making it easy for teachers to incorporate them into classroom lesson plans | 0 | 0 | 1 | 1 | 3 | 4.4 | |
| | In line with the PBL learning paradigm | 0 | 0 | 0 | 1 | 4 | 4.8 | |
| | In accordance with the state curriculum (independence) | 0 | 0 | 0 | 2 | 3 | 4.6 | |
| 4. | Illustration | | | | | | | |
| | Support the concept with illustrations | 0 | 0 | 0 | 0 | 5 | 5.0 | 4.73 |
| | Provide visual stimulation | 0 | 0 | 0 | 0 | 5 | 5.0 | |
| | Easy to understand | 0 | 0 | 2 | 0 | 3 | 4.2 | |
| | **Sum** | | | | | | 74.2 | 18.61 |
| | **Total Average** | | | | | | 4.65 | |
| | Validation Result | | | | | | Excellent | |

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3: means "good enough"

$$\text{Average score} = \frac{jumlah\ skor\ yang\ diperoleh}{banyak\ aspek\ pengamatan}$$

The validity criteria for learning tools are:

$4 \leq RTV_{PP} \leq 5$ Very valid

$3 \leq RTV_{PP} < 4$ Valid

$2 \leq RTV_{PP} < 3$ Less Valid

$1 \leq RTV_{PP} < 2$ Invalid

The teacher handbook conformity rate is 0.41 with a medium category, according to validator assessment standards.

Corrections, criticisms, and suggestions are collected from validator assessments and considered when the teacher handbook is revised.

3. Student Handbook Validation Results (Table 4).

Based on Table 4, which shows the results of expert validation calculations carried out by five experts on Student Books (BS), the components of the student book are considered quite good, good, or very good. Thus, a total average of 4.41 was obtained from the calculation results. The student's book was rated "Excellent" in the validation process. The validator's response to the student's book (BS) has the following levels of reliability:

$$JK_b = \frac{1}{k}\sum X(i)\ 2\ _\ \frac{(\sum X\ldots)^2}{n_t} = 8.18$$

$$JK_k = \frac{1}{k}\sum X(j)\ 2\ _\ \frac{(\sum X\ldots)^2}{n_t} = 32.17$$

$$JK_t = \frac{1}{k}\sum X(ij)\ 2\ _\ \frac{(\sum X\ldots)^2}{n_t} = 54.98$$

$$JK_e = JK_t - JK_k - JK_b = 14.62$$

Table 4
*Student Book Validation Results*

| No. | Aspects Assesed | Validators who gave Grades | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | Average Criteria | Aspect Average |
| 1. | Format | | | | | | | |
| | Clarity of material division | 0 | 0 | 1 | 0 | 4 | 4.6 | 4.60 |
| | Clarity of the numbering system | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| | Layout and spacing | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| | Size and font suitability | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| 2. | Language | | | | | | | |
| | Correct grammar | 0 | 0 | 2 | 3 | 0 | 3.6 | 4.04 |
| | Sentences that are appropriate for the age and cognitive level of the student | 0 | 0 | 1 | 2 | 2 | 4.2 | |
| | Simple structured sentences | 0 | 0 | 1 | 4 | 0 | 3.8 | |
| | Ambiguity-free sentences | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| | Clear instructions and instructions | 0 | 0 | 1 | 3 | 1 | 4.0 | |
| 3. | Content | | | | | | | |
| | Logically, the truth of the content of the material is divided into parts | 0 | 0 | 1 | 0 | 4 | 4.6 | 4.55 |
| | Activities designed for students and instructors are structured in a clear and practical way, making it easy for teachers to incorporate them into classroom lesson plans | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| | In line with the PBL learning paradigm | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| | In accordance with the state curriculum (independence) | 0 | 0 | 1 | 1 | 3 | 4.4 | |

Table 4 (*continued*)

| No. | Aspects Assesed | Validators who gave Grades | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | Average Criteria | Aspect Average |
| 4. | Illustration | | | | | | | |
| | Support the concept with illustrations | 0 | 0 | 1 | 0 | 4 | 4.6 | 4.47 |
| | Provide visual stimulation | 0 | 0 | 1 | 0 | 4 | 4.6 | |
| | Easy to understand | 0 | 0 | 2 | 0 | 3 | 4.2 | |
| | **Sum** | | | | | | 70.2 | 17.66 |
| | **Total Average** | | | | | | 4.41 | |
| | Validation Result | | | | | | Excellent | |

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Information:

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5: means "very good"

$$\text{Average score} = \frac{jumlah\ skor\ yang\ diperoleh}{banyak\ aspek\ pengamatan}$$

The validity criteria for learning tools are:

$4 \leq RTV_{PP} \leq 5$ Very valid

$3 \leq RTV_{PP} < 4$ Valid

$2 \leq RTV_{PP} < 3$ Less Valid

$1 \leq RTV_{PP} < 2$ Invalid

$$RJK_b = \frac{JK_b}{db_b} = 0{,}54$$

$$RJK_e = \frac{JK_e}{db_e} = 0{,}24$$

$$r = \frac{RJK_b - Rjk_e}{RJK_b} = 0.55$$

The student book (BS) has a conformity rate of 0.55 with a medium category, according to the validator's assessment criteria.

Revisions, criticisms, and recommendations are received from validator evaluations and incorporated into the student's book.

4. Results of Validation of Student Activity Sheet (LAS) (Table 5).

The student activity sheet component obtained a good, good, and excellent rating based on the results of expert validation calculations conducted by five experts on the Student Activity Sheet (LAS) in Table 5.

Table 5
*Results of Validation of Student Activity Sheet (LAS)*

| No. | Rated Aspect | Validator who gave the Scores | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** | **Criteria Average** | **Average Aspect** |
| 1. | Format | | | | | | | |
| | Clarity of material division | 0 | 0 | 0 | 1 | 4 | 4.8 | 4.40 |
| | Clarity of the numbering system | 0 | 0 | 1 | 3 | 1 | 4.0 | |
| | Layout and spacing | 0 | 0 | 1 | 1 | 3 | 4.4 | |
| | Appropriateness of font size and type | 0 | 0 | 1 | 1 | 3 | 4.4 | |
| 2. | Language | | | | | | | |
| | The sentence must be grammatically correct | 0 | 0 | 0 | 5 | 0 | 3.8 | 4.24 |
| | Appropriate for the age and reading level of the students | 0 | 0 | 1 | 4 | 0 | 4.2 | |
| | Sentences should be simple in structure | 0 | 0 | 0 | 5 | 0 | 4.2 | |
| | A phrase must not have two meanings | 0 | 0 | 0 | 5 | 0 | 5.0 | |
| | The sentence must be grammatically correct | 0 | 0 | 1 | 3 | 1 | 4.0 | |
| 3. | Content | | | | | | | |
| | Truthful information divided into logical parts | 0 | 0 | 0 | 2 | 3 | 4.6 | 4.60 |
| | Bruner's learning theory states that the following criteria must be met: enactive, iconic, and symbolic Appropriateness of material order | 0 | 0 | 1 | 3 | 1 | 5.0 | |
| | The truth of the information is divided into logical parts | 0 | 0 | 0 | 3 | 2 | 4.2 | |
| | **Sum** | | | | | | 52,6 | 13,24 |
| | **Total Average** | | | | | | 4,41 | |
| | Validation Results | | | | | | Very Good | |

[1] Tables may have a footer

Information:

1: means "not good"
2: means "not good"
3: means "good enough"
4: means "good"
5: means "very good"

$$\text{Average score} = \frac{jumlah\ skor\ yang\ diperoleh}{banyak\ aspek\ pengamatan}$$

The validity criteria for learning tools are:

$4 \leq RTV_{PP} \leq 5$ Very valid

$3 \leq RTV_{PP} < 4$ Valid

$2 \leq RTV_{PP} < 3$ Less Valid

$1 \leq RTV_{PP} < 2$ Invalid

Thus, a total average of 4.41 was obtained from the calculation results. The results of the validation of student activity sheets are included in the "Very Good" category.

Corrections, criticisms, and recommendations are received from the results of the validator's evaluation and are considered when the student activity sheet is revised.

## Results of Expert Validation of Research Instruments

The Pre and Post Cultural Value Ability Test is an instrument that will be validated by qualified validators. The suitability of the question content with the ability indicator will determine the validity of the question.

### *Results of Validation of Computational and Differentiated Thinking Ability Tests*

The computational thinking ability *pre-test* component obtained good and excellent ratings, according to the expert validation calculations conducted by five experts on the computational thinking ability *pre-test* and differentiation in the table above. As a result, a total average of 4.27 was determined from the calculation results. "**Very Good**" was the classification given to the computational thinking ability pre-test validation results (Table 6).

### *Computational Thinking Ability Test Validation Results*

The components of the computational thinking post-test were rated as good or excellent based on the expert validation calculations conducted by five experts, as shown in Table 7. Thus, a cumulative average of 4.40 was determined by the calculation results. "Very Good" was the classification given for the post-test validation results of computational thinking ability.

## Readability and Practicality Test

Before the pilot test, the readability test of draft-B was first conducted to 12 fourth grade students and to the predetermined validators. The results of the readability test analysis and the validation results by validators were used to revise the draft-B. It turned out that the device that was prepared did not undergo any changes, only a few revisions occurred. Based on the information in chapter III, the device is said to be practical if the learning device developed can be applied and used in the field with little or no revision. So, the draft-B that has been declared valid is called draft-C, which will be used for the trial.

### *Trial 1*

The first trial or simulation of learning devices was conducted by researchers in this initial trial. We conducted this trial/simulation in class IV. Researchers conducted this trial/simulation directly, acting as teachers to practice the use of learning devices. The first trial was conducted for four meetings in accordance with the lesson plan that had been prepared.

Based on the results of the first trial, the LAS did not undergo any changes, but the lesson plan underwent changes, especially

Table 6
*Validation results of computational and differentiated thinking ability tests*

| No. | Aspect Assessed | Validator who gave the Scores | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | Criteria Average | Average Aspect |
| 1. | Instructional Clarity | | | | | | | |
| | Guidelines for conducting the proficiency test | 0 | 0 | 0 | 5 | 0 | 4.00 | 4.00 |
| 2. | Content | | | | | | | |
| | The content of the proficiency test is aligned with the achievement indicators | 0 | 0 | 0 | 4 | 1 | 4.20 | 4.20 |
| 3. | Language | | | | | | | |
| | Grammar appropriate for students' age, reading level, and cognitive capacity | 0 | 0 | 0 | 1 | 4 | 4.80 | 4.60 |
| | Simplicity of sentence structure | 0 | 0 | 0 | 4 | 1 | 4.20 | |
| | The language used is communicative | 0 | 0 | 0 | 1 | 4 | 4.80 | |
| | **Total** | | | | | | 22 | 12.80 |
| | **Total Average** | | | | | | 4.27 | |
| | Validation Result | | | | | | Very Good | |

[1] Tables may have a footer

Information:

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4: means "good"
5: means "very good"

$$\text{Average score} = \frac{jumlah\ skor\ yang\ diperoleh}{banyak\ aspek\ pengamatan}$$

The validity criteria for learning tools are:

| | |
|---|---|
| $4 \leq RTV_{PP} \leq 5$ | Very valid |
| $3 \leq RTV_{PP} < 4$ | Valid |
| $2 \leq RTV_{PP} < 3$ | Less Valid |
| $1 \leq RTV_{PP} < 2$ | Invalid |

regarding the information to be discussed at the first meeting and changes in time allocation.

The second trial of the learning tools was subsequently analysed to finalise Draft-C and inform minor revisions prior to implementation.

The lesson plan that has been created requires four meetings to conduct the second trial, in addition to two meetings for pre- and post-tests. You can see the trial schedule in Appendix 9. Class IV was the selected class. In this exercise, the

Table 7
*Computational thinking ability test validation results*

| No. | Aspect Assessed | Validator who gave the Scores | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | Criteria Average | Average Aspect |
| 1. | Instructional Clarity | | | | | | | |
| | Guidelines for conducting the proficiency test | 0 | 0 | 0 | 5 | 0 | 4.00 | 4.00 |
| 2. | Content | | | | | | | |
| | The content of the proficiency test is aligned with the achievement indicators | 0 | 0 | 0 | 2 | 3 | 4.60 | 4.60 |
| 3. | Language | | | | | | | |
| | Grammar appropriate for students' age, reading level, and cognitive capacity | 0 | 0 | 0 | 1 | 4 | 4.8 | 4.60 |
| | Simplicity of sentence structure | 0 | 0 | 0 | 4 | 1 | 4.2 | |
| | The language used is communicative | 0 | 0 | 0 | 1 | 4 | 4.8 | |
| | **Total** | | | | | | 22.40 | 13.20 |
| | **Total Average** | | | | | | 4.40 | |
| | Validation Result | | | | | | Very Good | |

[1] Tables may have a footer

Information:

1: means "not good"
2: means "not good"
3: means "good enough"
4: means "good"
5: means "very good"

$$\text{Average score} = \frac{jumlah\ skor\ yang\ diperoleh}{banyak\ aspek\ pengamatan}$$

The validity criteria for learning tools are:

| | |
|---|---|
| $4 \leq RTV_{PP} \leq 5$ | Very valid |
| $3 \leq RTV_{PP} < 4$ | Valid |
| $2 \leq RTV_{PP} < 3$ | Less Valid |
| $1 \leq RTV_{PP} < 2$ | Invalid |

researcher used the created device as a tool and acted as the teacher. Two observers who had separate tasks attended the trial. Two observers observed the students' actions and the teacher's capacity to supervise the instruction.

Students were divided into 5 groups during the learning process: 2 students were in the middle group, 2 students were in the lower group, and 1 student was in the upper group. Based on odd semester grades and interviews or meetings with relevant teachers, students were grouped into upper, middle, and lower grades. Thus, it can be concluded that the average competence of students in each group is comparable.

Group selection has a significant impact on how well LAS is completed. In this study,

the groups used are problem-based groups. The LAS problems tailored to the topic will be worked on by the students. Students with group number 1, for example, worked on the LAS according to their number, that is, they only worked on problem 1 or problem number 1, and so on. When students' ability determined the difficulty level of the problems, the problem numbers were modified to match the sequential numbers of the students in the initial group, so that the expert group discussion could proceed as planned.

Only one group of students was observed as they were engaged in their activities. This observation covered four meetings (4 lesson plans). This was done for the following reasons:

1. Since the average skills of each group were relatively similar, one group could represent the other groups.
2. It is impossible for a single observer to thoroughly document several groups.
3. During the learning process, observations were made constantly every four minutes (plus one additional minute for notetaking).

Draft-C was revised into the final device after the data from the second trial was examined and the results were considered. Statistics on students' responses before, after, and after were included in the data collected from the pilot test, along with information on students' activities and teachers' capacity to supervise learning.

***Results of Observations of Student Activity During Learning***

Student activities were observed by an observer. Of the six groups formed, the observer only saw one group of five students. During the learning process, observations were made and the results are shown in Table 8.

With the exception of the first meeting (lesson plan I), where the percentage of student activity exceeded the activity cut-off criteria - that is, actively paying attention and listening to the teacher's or friends' explanations - it is clear from the table above that, on average, student activity was within the parameters of the learning effectiveness cut-off as described in chapter III.

This makes sense as regular learning continues to impact educators and students as they adapt to the new learning model. Thus, most of the students' work was still listening to the teacher explain things. To prepare for this, the researcher encouraged students to participate more actively in the learning process on the second meeting. For example, the researcher in this case provides questions that encourage the emergence of students' ideas for solutions to the given contextual difficulties. It is expected that the predetermined aspects will be at the threshold of learning effectiveness at the next meeting. The learning device was not revised based on the findings of the student activity observations because in general the proportion of student activity was at the threshold of the limitations of learning efficacy.

Table 8
*Percentage of student activity during learning*

| No. | Observation Category | Percentage of Student Activity in Learning | | | | Criteria Limit Activity (%) |
|---|---|---|---|---|---|---|
| | | Lesson Plan I | Lesson Plan II | Lesson Plan III | Lesson Plan IV | |
| 1. | Attending/listening to teacher/ friend explanation actively | 19.667 | 14.333 | 10.667 | 10.333 | 9 - 19 |
| 2. | Reading/understanding the contextual problem on the student LAS | 9.000 | 13 | 12.333 | 12.667 | 6 - 16 |
| 3. | Solving problems/finding answers and ways to answer contextual problems | 33.333 | 35.000 | 35.333 | 36.333 | 33 - 43 |
| 4. | Discussion/questioning between students and teacher | 20.000 | 21.000 | 24.667 | 25.000 | 19 - 29 |
| 5. | Draw conclusions of a procedure/concept | 13.333 | 14.667 | 15.333 | 14.333 | 8 - 18 |
| 6. | Behaviour that is not relevant to the KBM | 4.667 | 2.000 | 1.667 | 1.333 | 0 - 5 |

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### *Assessment Result of Teacher's Ability to Manage Learning*

The results of the assessment of teachers' ability to manage learning are presented in the Table 9.

### *Results of Student Response Questionnaire*

After following the Aneuk Jamee culture-based problem-based learning model, thirty students were given a student response questionnaire. The results are shown in detail in the Table 10.

The table above shows that, overall, and particularly about learning devices, student responses are above 80%. This includes their evaluation of the learning component, which includes student books, student activity sheets (LAS), and computational thinking skills assessments. This indicates that all elements received good feedback from students, preventing any revisions to the learning tools based on student feedback.

### *Research Results on Students' Computational Thinking Ability Test*

The entire learning process during the research, both in the experimental class and the control class, was obtained to determine the learning output on computational thinking skills.

### *Description of Students' Computational Thinking Skills*

The output findings of the use of SPSS 17 software to handle post-test data regarding

Table 9
*Teacher's ability to manage learning*

| No. | Activity/Aspect Observed | Lesson Plan I | Lesson Plan II | Lesson Plan III | Lesson Plan IV |
|---|---|---|---|---|---|
| | | Average | Average | Average | Average |
| 1. | The introduction consists of | | | | |
| | Conveying learning objectives | 4 | 4.5 | 4 | 4 |
| | Motivating students | 4 | 4.5 | 4 | 4 |
| 2. | Core activities consist of | | | | |
| | Presenting information | 4 | 4 | 5 | 5 |
| | Organizing into learning groups | 3.5 | 5 | 5 | 5 |
| | Guiding group work and learning | 3 | 5 | 5 | 5 |
| | Providing evaluation | 3 | 4 | 4 | 4 |
| | Giving awards | 3 | 4 | 4 | 4 |
| 3. | The cover consists of | | | | |
| | Reaffirm the conclusion of the material | 4 | 5 | 5 | 5 |
| | Gave some questions as independent assignments | 4 | 4 | 4 | 4 |
| 4. | Learning time management | 4 | 5 | 4 | 4 |
| 5. | The atmosphere in the classroom consists of | | | | |
| | Students' enthusiasm for learning | 3 | 4 | 4.5 | 4 |
| | Teachers' enthusiasm in managing learning. | 3.5 | 5 | 5 | 4 |
| | **Number** | 43 | 54 | 53.5 | 52 |
| | **Average** | 3.58333 | 4.5 | 4.45833 | 4.33333 |

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students' computational thinking skills are shown in Table 11.

The Tables and Figure 1 show that the experimental-class highest score for computational thinking skills is 50 higher than the control class score, which is 45, while the experimental class's minimum score of 39 is much lower than the control class score, which is 28. The average score of the experimental class on the computational thinking ability test, which was 44.00, was higher than the control class score of only 37.60. In terms of achievement scores, the experimental class obtained an average of 88% of the ideal score, compared to 75.2% for the control group.

Table 12 shows the results of the calculation of the mean difference test for the post-test computational thinking ability test:

As can be seen from the previous table, the calculation yields tcount = 9.50 ttable = 1.701, which means that or is accepted. As a result, children who learned using Aneuk Jamee's culture-based problem-based learning model had higher computational thinking skills than students who received normal learning. These results indicate that students in the experimental class

Table 10
*Results of student response questionnaire to the device and implementation of problem-based learning model*

| No. | Aspect Observed | Percentage | |
|---|---|---|---|
| | | **Happy** | **Not Happy** |
| 1. | How do you feel about the: | | |
| | Course Content | 100 % | 0 % |
| | Student Book | 93.33 % | 6.67 % |
| | Student Activity Sheet (LAS) | 90 % | 10 % |
| | Classroom Learning Atmosphere | 96.67 % | 3.33 % |
| | The way the teacher teaches | 93.33 % | 6.67 % |
| | | **New** | **Not New** |
| 2. | How do you feel about the components? | | |
| | Course Content | 90 % | 10 % |
| | Student Book | 93.33 % | 6.67 % |
| | Student Activity Sheet (LAS) | 100 % | 0 % |
| | Classroom Learning Atmosphere | 100 % | 0 % |
| | The way the teacher teaches | 100 % | 0 % |
| | | **Interested** | **Not Interested** |
| 3. | Are you interested in participating in further learning activities like the one you have participated in now? | 93.33% | 6.67% |
| | | **Yes** | **No** |
| 4. | What do you think about the student book and the Student Activity Sheet (SAS)? | | |
| | Were you able to understand the language used in the student book/LAS? | 96.67% | 3.33% |
| | Are you interested in the appearance (writing, illustrations, pictures, and the location of the pictures) contained in the student book/LAS? | 96.67% | 3.33% |

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Table 11
*Data of students' computational skills test results*

| | N | Minimum | Maximum | Mean | Std. deviation |
|---|---|---|---|---|---|
| Experiment | 30 | 39 | 50 | 44.00 | 4.000 |
| Control | 30 | 28 | 45 | 37.60 | 6.157 |
| Valid N (listwise) | 30 | | | | |

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outperformed the control class on the computational thinking post-test, supporting the effectiveness of the digitally mediated PBL model integrating Aneuk Jamee values.

## DISCUSSION

The results of this study highlight the significant impact of integrating Aneuk Jamee cultural values into digital problem-

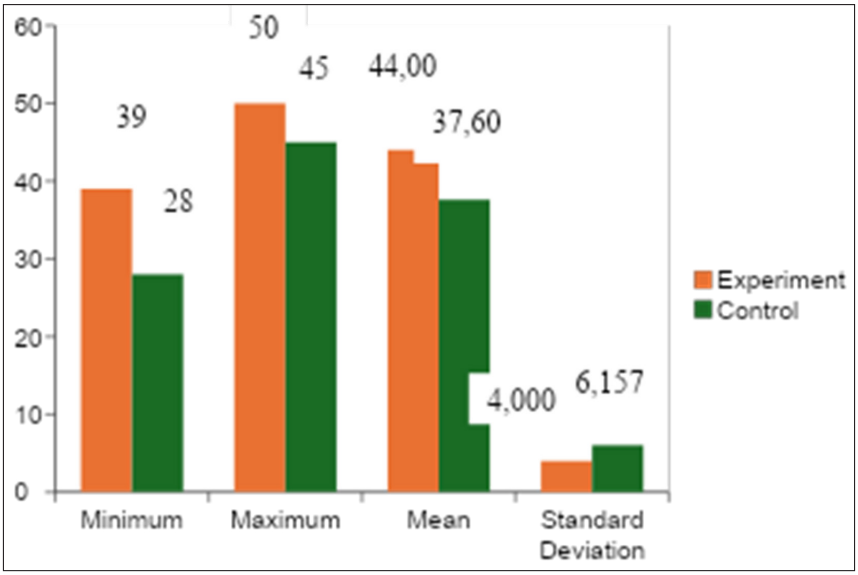



*Figure 1.* Mastery of students' computational thinking ability post-test in experimental and control classes

based learning (PBL) on students' learning outcomes, engagement, and cultural awareness. The improvement in students' computational thinking skills, observed through statistically significant differences between experimental and control groups, confirms the hypothesis that culturally contextualised digital learning can enhance not only cognitive development but also socio-cultural competence in elementary education.

The magnitude of improvement in computational thinking observed in the experimental group is not only statistically significant but also pedagogically meaningful. An average achievement of 88% compared to 75.2% in the control group indicates that the developed model substantially enhanced students' problem-solving capabilities and logical reasoning in authentic classroom settings. This level of improvement suggests that the integration of culturally grounded problem contexts within a digital PBL framework provides learners with cognitively rich and emotionally engaging learning experiences that exceed conventional instructional approaches. From a classroom practice perspective, this finding demonstrates that culturally contextualised digital learning can effectively translate abstract computational concepts into concrete learning actions suitable for primary learners.

The integration of Aneuk Jamee values-such as cooperation, respect for elders, and environmental stewardship-provided a meaningful learning context that fostered greater student motivation and active participation. This is consistent with Gay (2013), who emphasises that culturally responsive teaching creates relevance between students' cultural experiences and

Table 12
*Test the difference in average points test students' computational thinking ability*

| Aspects | $\overline{X_e}$ | t | S2e | $\overline{X_k}$ | Cs | S2k | Conclusion | | Conclusion |
|---|---|---|---|---|---|---|---|---|---|
| Computational Thinking Ability | 44.00 | 2.45 | 6 | 37.60 | 2.75 | 7.6 | 9.50 | 1.701 | Better |

$H_0$:Aneuk Jamee's culture-based problem-based learning paradigm does not change the computational thinking skills of students who receive regular instruction from those who learn using learning devices.

academic content, resulting in improved learning engagement. Furthermore, the digital delivery of these values through student-centered materials enabled students to visualise, manipulate, and internalise abstract cultural and academic concepts in a more interactive and intuitive manner.

The application of the Bruner learning theory-enactive, iconic, and symbolic representation-proved to be an effective framework for structuring instructional materials that align with the cognitive development stage of 9-11-year-old learners. This aligns with Hung (2011), who asserts that the cognitive scaffolding inherent in PBL can be optimised through concrete and localised problem contexts, which in this study were derived from Aneuk Jamee culture. The LAS (Student Activity Sheets), textbooks, and digital materials provided layered cognitive support that facilitated gradual abstraction of knowledge, supporting Piaget's operational concrete stage of development theory.

Notably, positive feedback from students, with over 90% indicating enjoyment, novelty, and interest, suggests that the model resonates with learners' psychological and emotional dimensions. This supports Voogt, Fisser, et al. (2013) and Zhao (2022), who argue that 21st century education must incorporate affective dimensions of learning, including cultural identity and student agency.

This study's findings also extend the discourse on the synergy between local culture and digital pedagogy. While previous studies (Dolmans et al., 2005; Hmelo-Silver, 2004) explored the effectiveness of PBL, few have examined its implementation through a digital cultural framework in elementary school settings. The digital contextualisation of local values in this study demonstrates how technology can revitalise indigenous knowledge systems and promote inclusive, multicultural learning experiences. This is particularly relevant in post-pandemic educational transformation, where hybrid learning models and localised content are crucial (OECD, 2023).

Nevertheless, this study has limitations. The research was conducted in a single elementary school with a relatively small sample size, which may affect the generalisability of findings. Moreover, the long-term retention of cultural knowledge

and computational thinking skills was not assessed. Future studies are encouraged to implement longitudinal designs and explore comparative cultural frameworks across different ethnic groups and geographical regions in Indonesia.

In conclusion, the discussion underscores that integrating culturally rich, digitally mediated PBL models into elementary education not only enhances core academic skills but also strengthens students' cultural rootedness and global readiness. The study contributes a novel instructional design that bridges local wisdom and global competencies, making it a relevant and scalable model for future curriculum development in multicultural contexts.

Despite the promising findings, this study has several limitations that should be acknowledged. First, the research was conducted in a single elementary school with a relatively small sample size, which may limit the generalisability of the results to broader educational contexts. Second, the cultural specificity of Aneuk Jamee values means that the instructional model may require contextual adaptation before being applied in other cultural settings. Third, this study did not examine long-term retention of computational thinking skills or cultural identity development, focussing instead on short-term learning outcomes. Future research is therefore encouraged to employ longitudinal designs, larger and more diverse samples, and cross-cultural comparisons to further validate and extend the applicability of the proposed model.

From a practical perspective, this study offers concrete guidance for teachers and schools seeking to implement culturally responsive digital learning: teachers can adapt the digitally mediated PBL model by designing problem scenarios rooted in local cultural contexts relevant to their students to enhance engagement and contextual understanding, while schools and curriculum developers can integrate local wisdom systematically into digital learning platforms as part of culturally grounded curriculum innovation. From a research perspective, the study also opens pathways for further investigation into integrating diverse local cultures within digital pedagogical models, including examining scalability across regions, integration with emerging technologies such as artificial intelligence or virtual reality, and assessing long-term impacts on both cognitive and identity-related learning outcomes.

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# Bibliometric Analysis of AI-driven FinTech Revolution: Mapping Global Trends, Thematic Evolution, and Future Directions

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## ABSTRACT

The introduction of Artificial Intelligence (AI) to Financial Technology (FinTech) has revolutionised financial services by reshaping digital banking, risk assessment, and financial decision-making. This paper presents a bibliometric review of the intellectual landscape, thematic development, and academic influence of AI-based FinTech research published between 2012 and 2025. Using the PRISMA methodology, 978 articles from the Web of Science (WoS) database were analysed to identify research trends, collaboration patterns, and citation networks. Results show an immersive publication growth rate of 26.84%, indicating rising academic interest in AI-driven FinTech, with global collaboration accounting for 38.4%, as supported by an increase in international co-authorship in areas such as robo-advisory services and fraud detection. A notable surge in this research has occurred since 2021, particularly in the areas of big data analytics, conversational AI, and algorithmic risk management, accelerated by the rapid industry transformation of post COVID-19 pandemic. However, despite such advances, issues related to algorithmic bias, transparency,

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and cybersecurity risks remain persistent. This study presents a full map of AI-powered FinTech scholarly research, outlining research topics, trends, and perspectives of future research, offering valuable insights for scholars, policymakers, and industry champions to navigate the changing AI landscape of the financial services sector.

*Keywords:* Artificial intelligence, digital banking, financial transformation, fintech, machine learning, pre-post-COVID-19

## INTRODUCTION

The integration of AI into FinTech has fundamentally reshaped financial services, transforming digital banking delivery, risk management, and customer interaction (Lu et al., 2024; Mohsen et al., 2024). AI-embedded machine learning, big data analytics, and blockchain systems have enabled financial institutions to enhance operational efficiency, improve decision-making accuracy, and create more personalised customer experiences (Priyadarshana et al., 2024; Rane et al., 2023). Consequently, market dynamics are changing, whereby automated trading, predictive analytics, and customised wealth management are increasingly driven by intelligent systems that are superior in learning even from constantly changing financial information (Khurana, 2024; Pillai, 2023; Ouyang, 2024).

As AI adoption accelerates, scholarly attention has expanded beyond efficiency gains to encompass issues of AI regulation, ethics, and inclusion (Kumar et al., 2024; Nair et al., 2024). Nevertheless, existing studies remain fragmented across application domains such as digital banking, robo-advisory services, fraud detection, and financial risk assessment, which are often studied in disciplinary isolation (Barile et al., 2024; Rizinski et al., 2022). This fragmentation has limited cumulative understanding of how AI-driven FinTech research has evolved as a coherent intellectual field.

Prior bibliometric studies suggest that AI-FinTech research heightened following the COVID-19 pandemic, reflecting the rapid digitalisation of financial services (Zhang et al., 2023). During this period, the reliance on AI-based solutions intensified, corresponding to the heightened cybersecurity risks and the disruption of physical banking channels (Abdul-Rahim et al., 2022; Chang et al., 2024; Dawood et al., 2022; Piotrowski & Orzeszko, 2023). However, the intellectual gap persists, particularly the extent to which pre- and post-pandemic research trajectories differ in substantive directions (Zhang et al., 2023).

Using diverse theoretical perspectives, including technology acceptance models, innovation diffusion theory, and risk management frameworks to explain adoption and performance, inconsistencies in theoretical application and methodological approaches remain persistent. With limited cross-disciplinary integration, particularly in studies addressing financial inclusion, digital

banking transformation, and algorithmic bias (Andronie et al., 2023; Elia et al., 2023; Issa et al., 2023), the need for a systematic synthesis is worth exploring to clarify how theoretical and thematic strands intersect and evolve within AI-FinTech research.

Accordingly, with a comprehensive compilation of AI-FinTech studies and in-depth examination using bibliometric techniques and thematic evolution analysis, the study offers an interpretive account of how the field has progressed across pre- and post-COVID-19 periods. Rather than merely cataloguing publication trends, the paper elucidates how early research emphasising adoption, security, and model development has gradually shifted towards post-pandemic concerns related to value realisation, explainability, and governance. In doing so, the study contributes a structured synthesis of the intellectual trajectory of the AI-driven FinTech domain that informs future theoretical development, policy design, and industry practice. Specifically, the study is guided by the following research questions:

RQ1 : What are the key drivers of AI adoption within the FinTech sector?

RQ2 : How have AI applications within the FinTech sector evolved across the pre- and post-COVID-19 periods?

RQ3 : What are the dominant themes, emerging concepts, and theoretical lenses shaping AI-driven FinTech research?

Addressing these research questions will offer a data-driven overview of AI-driven FinTech developments. The citation patterns and research partnerships provide a clear map of the dynamic state of AI integration in financial services, highlighting key technological trends shaping the financial ecosystems. The findings should promote interdisciplinary insights into the relevance of AI in transforming the financial industry. Additionally, beyond academic value, the study implies practical insights for financial institutions formulating digital innovation while managing risks and compliance standards within a highly uncertain market. Overall, the paper depicts a foundation for future research to navigate the sector advancement towards an intelligent, automated, and data-driven financial system.

## METHODOLOGY

Bibliometric study provides effective methods for examining and visualising the information within published research in a specific academic domain (Dawood et al., 2022; Pop et al., 2024). It can discover research patterns, emerging trends, keyword frequency and relationships between key constructs. There are two visualisation categories: (1) bibliometric maps, and (2) bibliometric graphs. This paper utilises bibliometric graphs to convey research trends in AI-driven FinTech, as the latter provides more constructive information than maps (Van Raan, 2014).

The Web of Science (WoS) database was chosen as the primary data source instead of other alternative databases, such as Scopus, due to its rigorous journal selection criteria, providing quality and reliability assurance

in accessing high-impact peer-reviewed journals (Pranckute, 2021). WoS also offers advanced search and indexing features, supporting systematic data extraction, rigour, and quality of bibliometric analysis across interdisciplinary fields of social science studies such as finance, banking, and business economics (Aria & Cuccurullo, 2017).

## Study Design

This study conducts a bibliometric study to trace the evolution of AI-FinTech research between 2012 and 2025. The objective is to determine the dominant thematic trends, intellectual frameworks, and research trajectories within the field. Using the PRISMA methodology, relevant documents were extracted from the Web of Science, resulting in a final dataset of 978 articles. The search string used for the document selection is presented in Table 1.

## Justification of Data Source Selection

Web of Science was selected as the primary data source for this study due to its stringent journal selection criteria, citation indexing consistency, and strong coverage of high-impact journals across finance, information systems, and interdisciplinary social science research. As the objective of this study is to examine the intellectual structure and thematic evolution of AI-driven FinTech scholarship, the use of Web of Science enables a reliable assessment of influential works, citation networks, and longitudinal research trajectories. Although Scopus indexes a broader range of technical and conference-oriented publications, Web of Science is widely recognised as more suitable for bibliometric studies that prioritise research quality, citation integrity, and theoretical influence. Accordingly, the exclusive use of the Web of Science supports the study's aim of capturing the core scholarly discourse shaping AI-driven FinTech research while ensuring transparency and replicability.

## Bibliometric Methodologies

Bibliometric analysis was carried out using R-Studio, Biblioshiny, and VOSviewer, focussing on citation networks, co-authorship network, and thematic clustering. While the systematic literature review (SLR) synthesised the key findings within

Table 1
*The search string*

| Database | Search String |
|---|---|
| WoS | TS=(("FinTech" OR "Financial Technology" OR "Digital Banking" OR "Mobile Payment*" OR "E-Payment*" OR "Online Banking" OR "Electronic Banking" OR "Digital Wallet*") AND ("Artificial Intelligence" OR "AI-driven" OR "Machine Learning" OR "Deep Learning" OR "Big Data Analytics" OR "AI in Finance" OR "AI in Banking" OR "AI-powered FinTech" OR "Robo-advisory" OR "Financial Forecasting" OR "AI for Risk Management" OR "AI in Credit Scoring" OR "Chatbot*" OR "Conversational AI" OR "AI-driven Customer Service") |

the research domain, the bibliometric technique provided quantitative insights on research evolution in terms of growth, collaboration, and emerging research domains. Thus, the integration of these two methodologies, as demonstrated in Figure 1, offers a comprehensive insight into understanding the development trajectory of AI-FinTech research.

## Data Selection

The second stage involved data selection, where relevant manuscripts were systematically identified using VOSviewer and R-Studio. A thorough screening process ensured that only relevant articles that aligned with the study's scope were included. This process generated a .bib file, compiling the complete bibliographic data for subsequent bibliometric analysis. The article selection was performed within the framework of a high-quality systematic search strategy in the Web of Science database, selecting only the most relevant publications for this paper (Cao, 2022).

## Data Analysis and Visualisation

The third stage focussed on data analysis and visualisation, using the R software and bibliometric tools to perform a descriptive bibliometric analysis of the selected manuscripts. Matrix tables were generated to categorise studies based on major themes, conceptual relationships, and intellectual

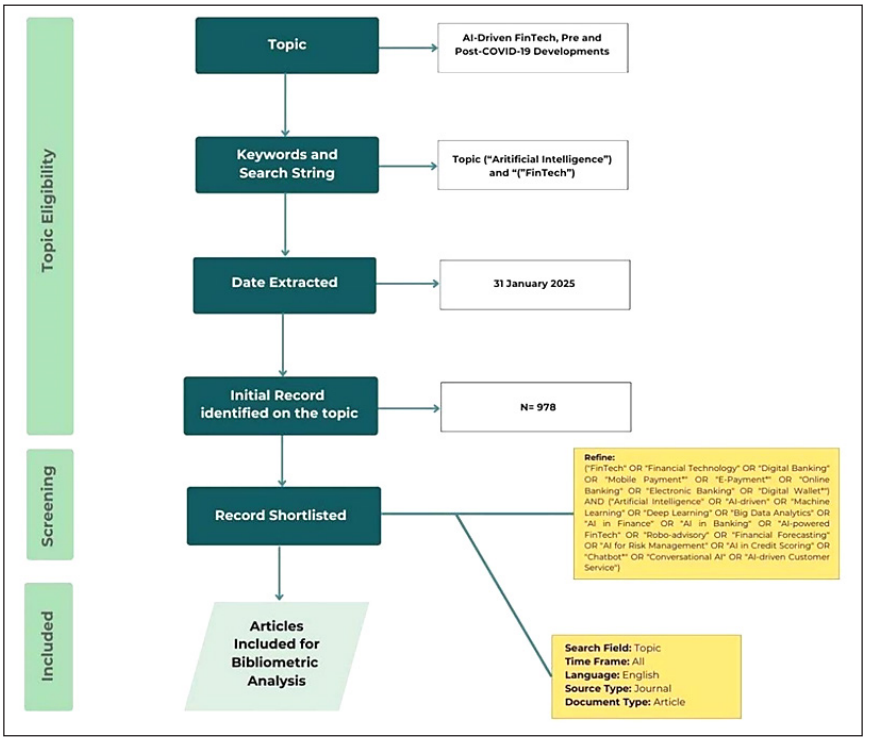



*Figure 1.* PRISMA technique

connections (Aria & Cuccurullo, 2017). Cluster networks and conceptual maps were then developed using Bibliophily, a web-based bibliometric tool to examine thematic linkages and intersections across literature. Data reduction techniques were used to visualise patterns while retaining structural complexity (Cobo et al., 2011; Donthu et al., 2021). This multi-layered method provided a clearer understanding of prevailing trends and the intellectual framework shaping AI-FinTech research.

### Interpretation

The final stage involved interpreting the bibliometric findings to examine the evolution of AI-driven FinTech research. This step provided an overarching trend in scholarly output, institutional involvement, national contributions, and thematic clustering (Abramo & D'Angelo, 2011; Ismail et al., 2020). Interpretation was supported by several visualisation techniques such as descriptive bibliometric analysis, annual publication patterns, the Bradford law of identifying core sources, word clouds, tree maps, topic trends, authorship-country distributions, co-word networks, theoretical lenses, and cluster networks (Ahmad et al., 2024; Ha et al., 2025). Together, these analysis tools showcased a structured overview of the field's intellectual orientation, highlighting shifts not only in which knowledge structures and thematic priorities have changed over time but also offer an emerging direction that is likely to shape its future development.

## RESULTS AND DISCUSSION

### Descriptive Bibliometric Analysis

The descriptive bibliometric profile indicates that AI-driven FinTech has evolved into a consolidated and institutionally recognised research domain. Expanding publication output, increasingly interconnected authorship networks, rising citation trajectories and thematic diversification collectively signal a transition from exploratory experimentation towards cumulative and theory-informed knowledge production. As illustrated in Figure 2, the field is progressively characterised by empirical validation, methodological refinement and cross-disciplinary collaboration. This maturation aligns with the growing operational deployment of AI technologies in financial services, which continues to stimulate sustained academic engagement.

#### *Research Growth and Annual Increase in Publications*

The development of the number of publications per year (26.84%) reflects a strong and sustained research focus in the AI-FinTech domain. The increasing publication volumes are likely triggered by expanding AI applications and innovations in the financial sector. AI technology transmissions in digital banking, mobile payments, credit scoring, and fraud detection have been accelerated by the pandemic, changing industry demands for adaptive and innovative solutions and thus sought scholarly attention to keep pace with the challenging development.




*Figure 2.* Descriptive bibliometric analysis

### *Global Collaboration and Network of Authors*

International collaboration accounts for 38.34% publications, with an average of 3.97 co-authors per article. These figures indicate the global nature of AI-FinTech research, implying the shared recognition of AI's transformative potential across worldwide financial systems. It also assists in the production of a vast array of research centres and academic facilities in different parts of the world, which will enable maximum focus and exploration of AI and Financial contributions.

### *Authorial Impact and Citation Metrics*

3,122 authors have made contributions to the field of AI-driven FinTech, showing that it is becoming an academic debate and acquiring a multidisciplinary nature. Out of this group, 88 authors have created solo work, meaning that research in the field is created in most cases in collaboration, often inter-institutional or inter-disciplinary. The citation score of 16.32 on average documents points to the scholarly contribution of the field, and the citation rate is rather high, which supports not only the significance of the published works but also the suitability of AI applications in the financial services sector.

### *Document Average Age*

The document average age of 2.78 years indicates the very recentness of the scholarship in AI-driven FinTech and relates to the speed of technological innovation taking place in the realm of artificial intelligence and the financial technology sector. Relatively young literature can be used to emphasise the acceleration of the discipline, with constant data science and algorithmic innovations bankrolling an active academic approach and a dynamic empirical aspect.

### *Key Trends and Thematic Focus*

Author keywords and reference patterns identify major themes, including big data analytics, AI-based fraud detection, digital banking, and machine learning. More recent studies increasingly emphasise conversational AI and regulatory compliance, in response to post-pandemic

digitalisation and cybersecurity concerns. The thematic emphasis of conversational AI and regulatory compliance as a nascent trend shows a level of discourse maturity, given its connotation of more emphasis on the creation of technology stack constructs that provide data protection, counter cybersecurity threats, and enable individualised conversationally driven interactions with customers via smart financial services. Moreover, big data analytics has also received a lot of interest, especially in the contribution of AI to the improvement of financial decision-making. In the future of personalised financial services, including robo-advisory and automated trading systems, the rising significance of data-driven solutions in FinTech is pivotal.

### *References and Citation Analysis*

The number of references used throughout the documents is 47,137, which demonstrates the wide academic network that AI-driven FinTech research uses. This extensive literature highlights the interdisciplinary character of the field, which relies on information obtained in the fields of computer science, economics, business, and regulatory studies. The variety of theoretical frameworks and methodologies used also reinforces the comprehensive approach that the field has towards the integration of AI in financial services.

### Annual Scientific Production

The development and publication rate of annual scientific articles in the field of AI-driven FinTech is portrayed graphically from 2012 to 2024 in Figure 3. The acceleration of publication output after 2020 reflects more than a numerical increase; it signals a structural shift in research priorities driven by the pandemic-induced digitalisation of financial services. COVID-19 did not simply expand interest in AI-enabled finance but

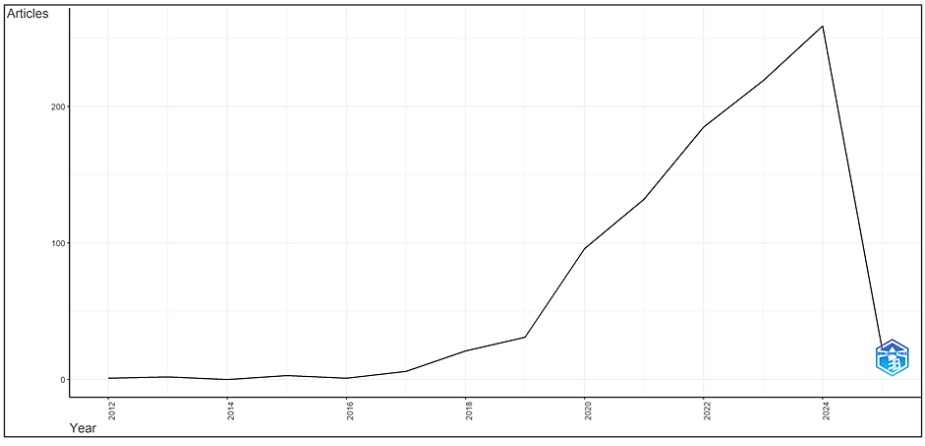



*Figure 3.* Annual scientific article production (Year 2012-2024)

altered the function of AI within financial systems—from experimental innovation to operational necessity. Consequently, research focus shifted towards applied problem-solving, including fraud analytics, automated risk assessment and digital service continuity, explaining the sharp post-2020 surge in scholarly output.

The upward trend in publications noticeably gained momentum since 2018, but the overall pace of the research output has grown exceptionally rapidly since the middle of 2020. The unprecedented expansion of scientific literature in the domain can be explained by the global necessity of rapid digitalisation caused by the COVID-19 pandemic. The crisis promoted the extensive application of AI technologies in the financial services sector, including digital banking and online finance, fraud detection, and algorithmic manufacturing of risk analysis. Thus, the analysed period captures the early academic response to post-pandemic disruptions in the financial sector.

Research by Fu et al. (2021, 2022) shows that the COVID-19 pandemic hastened the uptake of FinTech innovations, drawing attention to notable progress in AI-centred applications across the financial domain. While Fu and Mishra (2022) explore the part played by artificial intelligence in reinforcing banks' approaches to risk management during this period, focussing particularly on algorithmic assessment and fraud-detection processes. Together, these works illustrate how the disruption of the pandemic acted as a catalyst for the swift and adaptive incorporation of AI into financial services, as organisations sought to navigate operational pressures and rising security demands.

Finally, the graph shows a peak of publications around 2022, after which a minor decrease started in 2024. Once again, it is an incidental trend that can be explained by the over-productivity of recent years. In general, researchers in the field of AI-driven FinTech have achieved dramatic progress in terms of new approaches and technologies and lack the need to fill in the gaps with discoveries now. Future topics will probably include AI ethics, regulatory challenges, and the perspective of AI longevity in the context of the financial industry.

**Three-Field-Plot**

The relational patterns linking author affiliations, contributing countries and dominant keywords in AI-driven FinTech research are presented in Figure 4. The concentration of institutional and thematic linkages within a small group of countries reflects asymmetries in technological readiness, regulatory capacity and data infrastructure rather than uneven academic interest. China and India demonstrate strong alignment between institutional output and application-oriented keywords, suggesting the research in these contexts is closely integrated with large-scale digital finance initiatives. In contrast, the United States and United Kingdom indicate a more diversified research agenda, where AI is embedded within established financial systems.

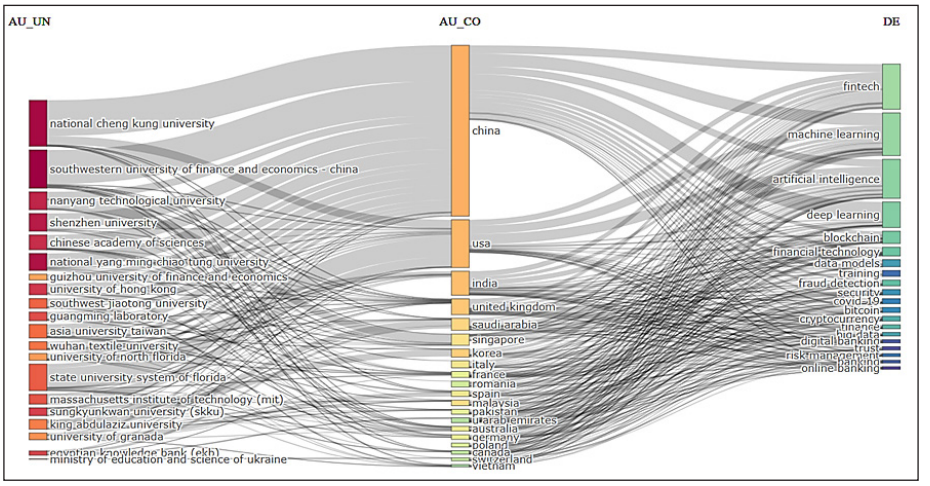



*Figure 4.* Three-field-plot (affiliation-country-keywords used by authors)

### *Keywords and Thematic Focus*

The keyword plot highlights the dominant terms such as FinTech, machine learning, and artificial intelligence, confirming the research direction on enhancing financial service performance through advanced AI technology. Additional keywords, including blockchain, data mining, and fraud detection, indicate an increasing focus on security, risk management, and regulatory governance within digital finance. Together, these themes suggest a heightened emphasis on data governance, cybersecurity, and the development of personalised digital services.

### *Geographic and Thematic Trends*

Geographically, China and India are highly associated with themes such as blockchain, digital banking, and cryptocurrency. This suggests priorities related to financial technology innovation and diffusion in emerging markets. Conversely, the USA and United Kingdom plots are strongly linked to financial technology and machine learning, reflecting the integration of AI within established financial systems. The various thematic priorities across the regions are indicative of different infrastructure and readiness contexts.

### Tree Map

The frequency distribution of keywords in AI-based FinTech research reveals the thematic priorities shaping the field's intellectual trajectory, as presented in Figure 5. Dominant terms such as model, impact, risk and artificial intelligence signal a strong emphasis on analytical modelling and performance evaluation. The prominence of these terms indicates a transition from feasibility-oriented experimentation towards evaluation-centred inquiry, where scholarly attention increasingly addresses the consequences of AI deployment rather than its technical novelty. This development

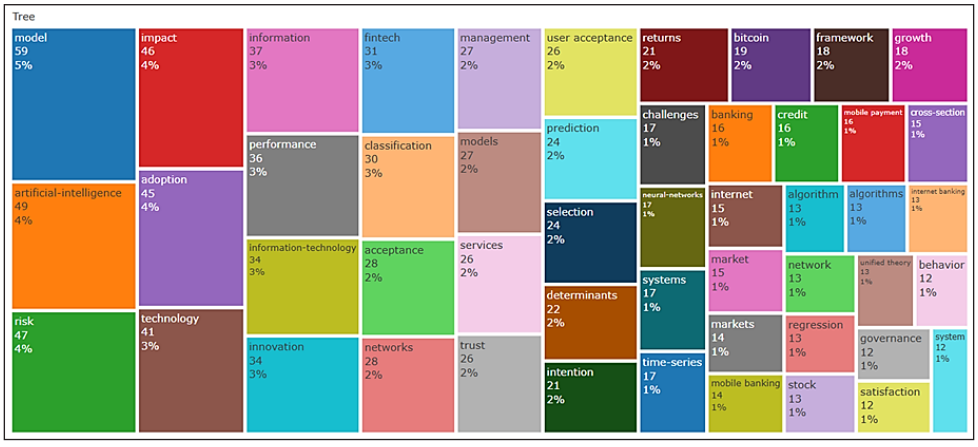



*Figure 5.* Tree map

reflects a reflexive phase in which performance optimisation, algorithmic accountability and regulatory governance are examined alongside predictive accuracy and automation efficiency.

The tree map also reflects the extent of issues in the field. Keywords such as adoption, technology, information technology, and fintech suggest a focus on the comprehension of the spread and adoption of AI technologies in the financial framework. While terms like user acceptance and trust are indicative of the significance of consumer trust in AI-enabled solutions, the focus on the societal and ethical aspects is still present. Other terms, such as performance, prediction, and selection, underline technical dimensions of the area, which are the enhancement of predictive accuracy, optimisation of decision-making, and choosing suitable algorithms. Overall, the treemap underscores the interdisciplinary nature of AI-based financial services, integrating technological, behavioural, managerial, and regulatory aspects.

## Trend Topics

The temporal evolution of key terms in AI-driven FinTech research between 2020 and 2024 indicates a noticeable shift in thematic relevance, as presented in Figure 6. Terms such as prediction, growth and model show substantial increases, with model and artificial intelligence demonstrating steady escalation over time. The peak in predictive analytics observed in 2023 suggests heightened scholarly engagement by forecasting financial trends, risk assessment and customer behaviour modelling. This trajectory aligns with the expanding adoption of AI in risk management, personalised finance and algorithmic trading (El Hajj & Hammoud, 2023).

The temporal rise of predictive and impact-related terms reflects a maturing research agenda that prioritises outcome-oriented assessment over conceptual exploration. The increasing attention to adoption and information further suggests

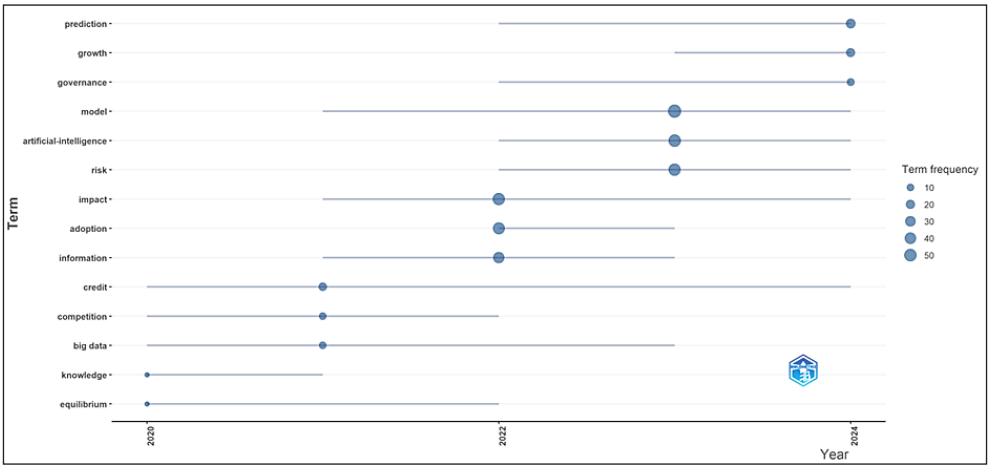



*Figure 6.* Trend topics

that AI-driven FinTech research is responding to practical implementation challenges, including data governance, organisational readiness, and consumer trust. Together, these trends lead to a convergence between technological capability and institutional feasibility within contemporary FinTech scholarly work.

The rise of keywords such as big data, credit, and competition further underscores the competitive benefits that AI can bring to data analytics, customer segmentation, and credit scoring. Conversely, terms like equilibrium and knowledge exhibit less balanced patterns, which implies these directions are not the primary points of the recent AI-based FinTech studies, but they are still pertinent.

## Thematic Mapping

The thematic positioning of AI-based FinTech research emerges from the density–centrality structure shown in Figure 7. This density-centrality map offers a brief survey of the field, including research topics and already established ones, and provides a perspective on the current situation and maturation of AI-based FinTech studies.

In the Niche Themes quadrant, terms such as incremental learning, banking industry, and continuous learning seem to be emerging, yet are still in their early development phase within the AI-driven FinTech research. Keywords like adversarial attack and computer vision imply experimental, while relevant to AI development, yet to gain relevance and applicability to the FinTech industry. Accordingly, the field is a specialised area, targeted at very minimal application in scholarly FinTech research (Qiu et al., 2019; Voulodimos et al., 2018).

The Motor Themes quadrant includes highly focussed and developed topics such as deep learning, fraud detection, and cryptocurrency. These topics are

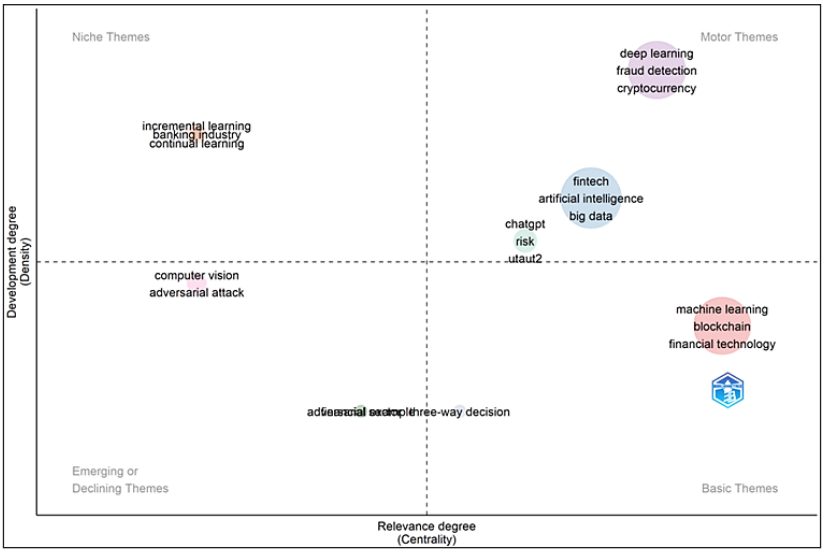



*Figure 7.* Thematic mapping

central forces behind the development of AI in Fintech, specifically as blockchain technologies become more popular and AI models are being used to detect real-time fraud monitoring. The use of the terms deep learning and fraud detection allows highlighting the focus of the industry on creating AI systems that could detect and prevent financial risks when they occur. The term cryptocurrency is used to indicate the increased attention to financial applications based on blockchains and the regulatory, security, and scaling problems they present (Corbet et al., 2019; Fischer & Krauss, 2018).

The Basic Themes quadrant includes foundational concepts, including machine learning, blockchain, and financial technology, which have a strong presence in the current AI-driven FinTech research and practice. These terms signify continued prominence in methodological and technological bases, as it reflects established research infrastructure that continues to be at the centre of AI-powered FinTech. The fact that they remain prominent and featured in the scholarly and industrial circles proves their continued relevance, and importantly, this research domain may have attained relative stability in addressing fundamental research questions.

Overall, the thematic map indicates a shift toward high-impact application segments like "fraud detection", "cryptocurrency", and "artificial intelligence" alongside close integration of AI with blockchain, machine learning, and big data analytics. As AI technologies have become more mature and widely deployed in the financial industry, this trend reflects the role of AI technologies as a strong mechanism to address complex, real-world challenges in financial systems (Odeyemi et al., 2024; Pillai, 2023; Rane et al., 2023).

## Cluster Network

The cluster network introduced in Figure 8 illustrates the interactions among key terms in the AI-driven FinTech research. Central nodes such as machine learning, artificial intelligence, and Fintech highlight the core development of the research field, as they show the great importance of AI technologies in changing the financial services industry. The dominance of Fintech, closely interrelated to terms like blockchain, cryptocurrency, and risk management, reflects the broad application of AI across digital transactions, digital assets, and financial risk analysis.

The central themes are surrounded by other clusters, which depict other specialised fields of AI in FinTech. A cluster that revolves around deep learning and fraud detection emphasises the increased role of sophisticated forms of AI models in detecting and preventing risks in real-time financial transactions. Strong links between digital banking, online banking, and mobile payment indicate the role of AI-supported technologies in accelerating financial digitalisation. Additionally, the closeness of explainable AI and trust indicates the increasing focus on transparency, accountability, and ethical concerns in financial systems.

The links between big data, data mining, and cybersecurity further suggest the valuable role of data-driven models in AI frameworks in terms of using massive amounts of data to enhance the efficiency and safety of financial decision-making practices. The presence of the words robo-advisor, credit scoring, and digital finance indicates the potential practices related to AI in the sphere of financial advisors, credit analysis, and digital finance in general. This cluster network provides an overall perspective of how AI-based innovations are transforming various fronts within the financial industry, including the security of

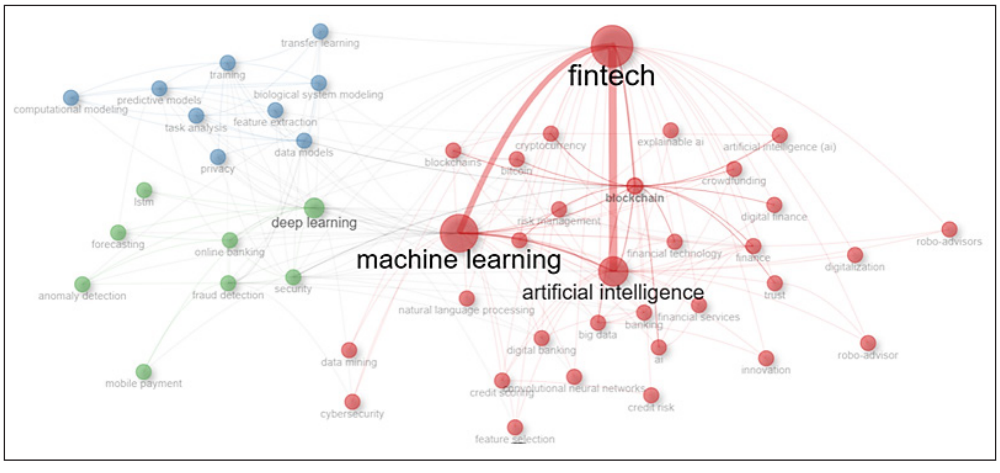



*Figure 8.* Co-word net

transactions and customer confidence, as well as financial prediction and personalised services.

## Thematic Evolution

Figure 9 shows the significant changes in AI-based FinTech research that can be observed in terms of two different periods: 2012-2020 (pre-COVID-19) and 2021-2025 (post-COVID-19). In 2012-2020, the literature focussed on the underlying themes, which were artificial intelligence, adoption, security, and model. These pioneering studies played a crucial role in indicating the possibilities of AI in the financial industry, and the effort was directed at theorising and analysing AI systems as financial tools. The focus on the term model represents the stage of the field development because the researchers tailored AI models to predictive analytics, fraud detection, as well as financial forecasting. Moreover, the long-term focus on the adoption and safety highlights long-term issues regarding the introduction of AI into financial services, such as the organisational resistance to emerging technologies and the difficulty in providing efficient and safe digital financial services.

The thematic evolution observed across the pre- and post-COVID-19 periods illustrates a decisive shift from foundational modelling towards value realisation and accountability. While early research prioritised security, adoption and system design, post-pandemic scholarship increasingly focusses on returns, explainability and decentralised financial architectures. This transition reflects the normalisation of AI within financial infrastructures, where the central research challenge is no longer whether AI can be implemented, but how it can be deployed responsibly, profitably and transparently at scale.

The research of 2021-2025 changed to a more developed, practice-oriented topic. The term model still dominated,

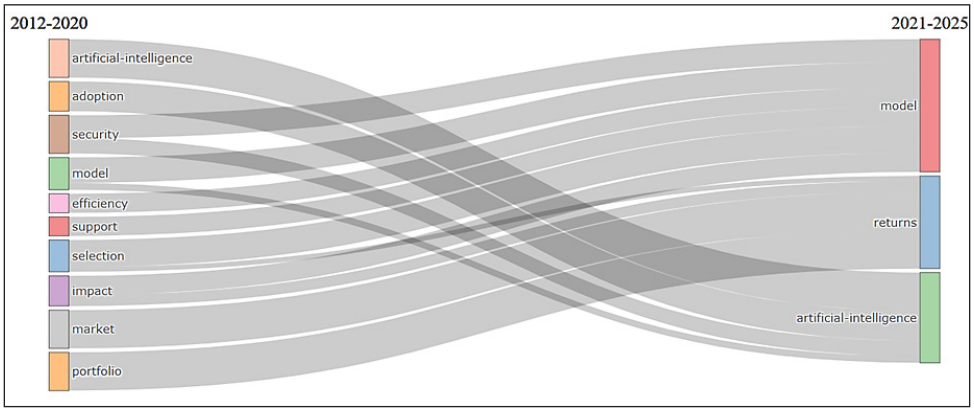



*Figure 9.* Thematic evolution

but the focus was expanded to refine the models to more targeted and high-impact financial applications. Interestingly enough, the concept of returns became one of the most represented ones, as the role of AI in delivering measurable financial results is becoming increasingly intertwined. This transformation is a transition toward theoretical advancement to a practical one, as AI models are currently used to streamline trading algorithms, optimise portfolio management, and advance financial decision-making. The emergence of returns as a major research topic is an indication that AI has ceased to be regarded just as a means of enhancing operations but has become one of the strategic resources that can produce a substantial amount of financial growth in financial markets.

The idea of artificial intelligence remained hegemonic in 2021-2025, albeit in a shifted set of circumstances. AI has not only been limited to research, but it has also become a key force in digital finance, and some technologies, such as blockchain, cryptocurrency, and explainable AI, are gaining traction. The overlap between blockchain and the emergence of interest in cryptocurrencies as the 2021 - 2025 trend is indicative of a more centalised priortisation of financial services, which has been accelerated by the digital acceleration of the pandemic. Also, explainable AI is used to reflect the trend in the industry towards making AI systems more transparent and accountable, as companies increasingly struggle with the increasing anxieties surrounding ethical implications and regulatory aspects of AI in finance.

The overwhelming research agenda in the field of artificial intelligence in financial services during the pre-pandemic decade (2012-2020) was concerned with the boost of security and operational efficiency. This set of priorities has come to lose its relevance over time in the post-COVID-19 environment, mostly since such abilities have been internalised in the technical and organisational architecture of AI-based financial systems. Instead of trying to gain basic research on these areas, modern research has focussed on optimising the use of AI in area-specific financial innovations, especially in fraud analytics, digital banking, and algorithmic credit evaluation. This shift is an indication that AI is no longer an emergent technology. It is now an essential field of research with the goal of maximising its utility to society, enhancing applied performance, and the creation of trustworthy, data-guided financial ecosystems.

Figure 9 shows that AI-based research in FinTech has significantly developed before 2020 and after 2021. The pre-pandemic emphasis on basic investigations and theory development has been replaced by the post-pandemic studies of practical outcomes and applications. The introduction of terms such as returns, blockchain, and explainable AI is an indication that the field of AI in finance is facing the very real concerns and opportunities it presents. This development signifies a more advanced and practical sphere, where AI technologies are not only transforming financial services but also creating measurable value across the business.

### Analysis of the Emerging Themes from 2012 to 2020

The main new themes defining AI-driven FinTech studies in the period between 2012 and 2020 are depicted in Figure 10. The thematic structure shown in the figure represents an early stage of the evolution of the implementation of artificial intelligence in financial systems, where the focus of scholarship was mostly on the development of theoretical and methodological backgrounds. These initial research directions offered both conceptual and technical frameworks on which later post-pandemic studies have proceeded, making it possible to shift the exploratory development to applied and impact-based research in the financial world.

The Niche Themes quadrant includes phrases like support, stork, and network, which refer to research topics that continued to be marginal to the overall evolution of AI-powered FinTech research after 2020. It is reflected in their comparatively low density and centrality, implying limited conceptual development and ability to impact the wider research environment. It appears that these areas are early attempts to automate specialised financial tasks, like automating customer service or optimising the data network, as opposed to a fully-fledged research agenda. Even though these pioneering works led to the technical foundations of the discipline, these works failed to reach the scholarly exposure and spread of more central concepts like "artificial intelligence" and the model.

The Basic Themes quadrant demonstrates the significance of such terms as model, innovation, technology, and selection. These clusters have marked the stage of AI development in finance, when the academic focus was shifted to the creation and optimisation of core AI architectures to be used in practice. The main research activity at this time was to develop frameworks that could result in improved basic financial processes, such

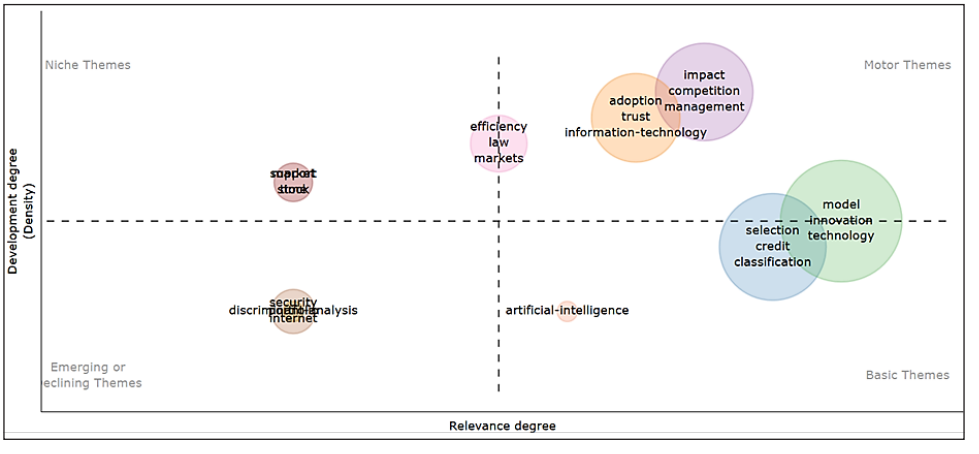



*Figure 10.* Emerging themes during 2012 - 2020

as credit scoring, risk management, and automated trading. The repetitive use of the word model highlights how the field is obsessed with the idea of creating adaptive and data-driven models that can meet the demands of finance in terms of analytical and predictive needs. At the same time, the focus of the concept of innovation and the term technology also indicates the key position of technological advancement in the process of forming the initial outlines of the AI-based FinTech ecosystem.

The quadrant of Motor Themes, which includes such terms as impact, competition, management, adoption, trust, and information technology, displays the shift in the field to the analysis of applied and organisational aspects of AI within the financial systems. These themes take a leading place in the development of AI-based FinTech, and this is the time when academic research started to focus more on the practical consequences of AI implementation in financial institutions and markets. The relevance of the terms adoption and trust between 2012 and 2020 demonstrates the increased interest among scholars in the behavioural and institutional determinants of the adoption of AI technologies. In the meantime, the focus on the impact and competition implies a similar change toward the realisation of how AI restructures the market, increases the competitive edge, and triggers innovation within the financial ecosystem.

The thematic relevance in this stage shows the appearance of such concepts as efficiency, law, as well as markets. The increasing importance of the concept of efficiency also throws more weight on a growing interest in using AI systems to optimise financial decision-making, streamline operations, and minimise institutional costs. The emergence of law is indicative of initial scholarly interest in the regulatory and ethical aspects of AI in financial practice, to which the term has since acquired significant momentum in the post-pandemic period. In the meantime, the focus given to the concept of markets demonstrates the increased popularity of the idea of an AI that can be used to improve the analytics of various markets and contribute to better predictive modeling and the reconstruction of financial market behaviour.

## Analysis of the Emerging Themes from 2021-2025

The *Niche Themes* quadrant identifies authentication as a more and more topical field of investigation. This focus indicates the increasingly important concern regarding the safety of financial operations within the context in which digital banking and mobile payment systems have assumed a significant role in the daily economic process. With the institutions and consumers progressively increasing their dependence on digital platforms, the dependability of AI-based authentication systems has become a characterising research agenda. The word decision, which is contained in the Emerging or Declining Themes quadrant, indicates a differing trend. Decision-making models, once central to the study of AI in finance,

now play a less prominent role in the field, especially due to the development of algorithmic intelligence that have automated many evaluative processes that previously required theoretical modelling.

The quadrant of Basic Themes identifies the enduring core of centrality around the word model, a proof of the fact that AI frameworks are the pillars of financial services research and practice. What has started as conceptual work has slowly evolved into highly specialised tools employed to analyse risk, identify fraud, and predict market flow. The fact that the idea of risk still prevails in this group indicates that researchers remain in doubt as to how intelligent systems can transform financial stability, particularly in areas where algorithmic bias, data insecurity, and market instability converge. The repetition of the word impact narrates a similar tale: scientists are becoming more worried about the ways in which AI is changing the nature of judgement, affecting the ways in which institutions behave, and has effects on financial performance that can be quantified.

The quadrant of the most intense shift of academic interest after the pandemic is the Motor Themes one. The central themes include the concept of returns, the concept of bitcoin, and the concept of time-series, each of which is an indicator of the AI penetration into the structure of modern finance. The increasing focus on returns indicates the move towards quantifying actual financial returns of AI implementation in high-frequency trading settings and optimisation of portfolios. This emphasis shows an industry that is relying more and more on the data-driven logic of investment as the role of intelligent algorithms increases in the production of yield. The prominence of the term bitcoin begs another change, with studies now investigating how AI and decentralised digital currencies are interacting, on transaction efficiency, valuation modelling, and how crypto assets should be governed. This trend is further enhanced by the focus on the methodological aspect of time-series analysis, whereby the asset-based forecasting tools provided by AI are re-forming market analytics, pre-empting price changes, and overall volatility and economic conditions.

The background influence of AI is not in any way over yet, and the current trend of research has artificial intelligence and adoption at the centre of focus. The popularity of the term artificial intelligence in this span is an indication that it is becoming a defining force, transforming the way financial systems are being run in terms of customer engagement and the architecture of backend infrastructures. Instead of being a process-enhancement tool, AI has turned out to be a strategic catalyst of innovation and organisational change. The above coverage of the topic of adoption indicates that both academics and professionals are becoming more worried about the challenges that impede the implementation of AI, such as regulatory ambiguity, organisational readiness, and consumer confidence. Even since 2021, one can see a certain change in the direction of the fact that these technologies should not

only be practical and profitable but also transparent and believable to both financial institutions and consumers.

To sum up, Figure 11 shows that the development of AI-driven FinTech research is marked by more advanced and application-specific research post 2021, where AI technologies are used to create a measurable financial value. The appearance of terms such as returns, bitcoin, time-series, and adoption indicate the development of AI applications and the further significant role of applying these technologies to the financial ecosystem. Additionally, the fact that the emphasis on the issue of risk and impact remains reminds us of the necessity to find a moderate path, when the benefits of AI are brought to fruition, with the consideration of its overall consequences on security, ethics, and regulation.

## Theoretical Lenses

The theoretical lenses identified through co-citation and thematic analyses reflect the dominant conceptual frameworks that have guided AI-driven FinTech research rather than serving as prescriptive models imposed a priori. These lenses, including technology adoption, innovation diffusion, risk management, and governance-oriented perspectives, emerge organically from patterns of scholarly engagement within the literature. Their identification enables an interpretive reading of how researchers have framed AI not only as a technical tool but also as a socio-technical phenomenon embedded within regulatory, organisational, and ethical contexts. By analysing the evolution and relative prominence of these lenses across time periods, the study provides insight into shifting epistemological priorities within the field, particularly the transition from efficiency-driven adoption studies towards governance, accountability, and explainability-oriented research in the post-pandemic phase.

AI-enabled FinTech is fundamentally interpreted under two major theoretical

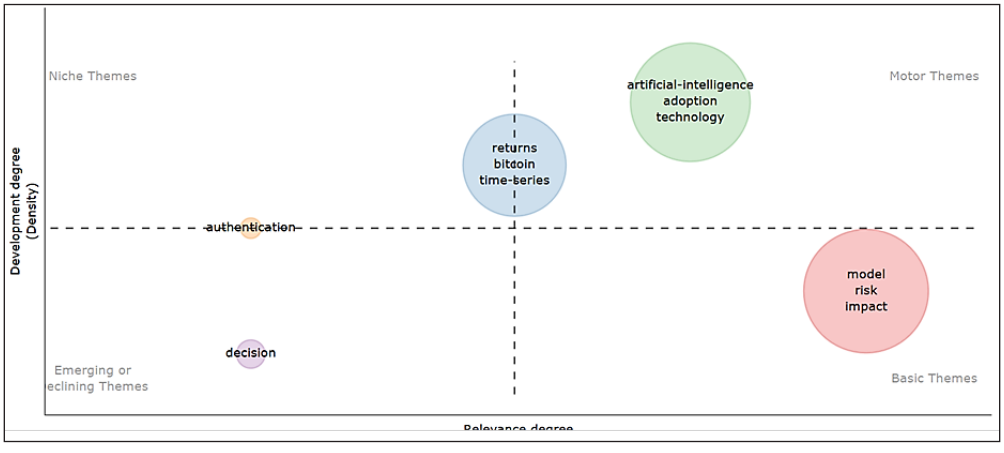



*Figure 11.* Emerging themes during 2021-2025

frameworks, UTAUT and Commitment-Trust Theory. Every lens offers a useful perspective on the uptake, embedding and longevity of AI in financial services. These frameworks improve not only the conceptual clarity, but also inform design and implementation of AI solutions in the FinTech domain.

The unified theory of acceptance and use of technology (UTAUT) acts as a base model to understand factors that may influence the acceptance of AI-based FinTech solution. There are four main drivers of user behaviour, these being identified from the UTAUT model as performance expectancy, effort expectancy, social influence, and facilitating conditions. These considerations are essential for the adoption of FinTech tools like robo-advisors, predictive models, and decision-making applications. FinTech AI technology is built to remove all complexities, offering user-friendly solutions which are very similar to what the users expect, which encourages its utility. Performance expectancy, for example, focusses on the perceived benefits of AI tools in improving financial decision-making and effort expectancy is about the use simplicity of these technologies. Social influence and facilitating conditions further explain why societal and organisational pressures, as well as institutional support, affect the implementation of AI solutions. Hence, Figure 12 visually represents the interconnectedness of these factors, to demonstrate how adoption factors link in AI-Driven FinTech. Table 2 also presents the main constructs of UTAUT and their relevance to the FinTech context, given us

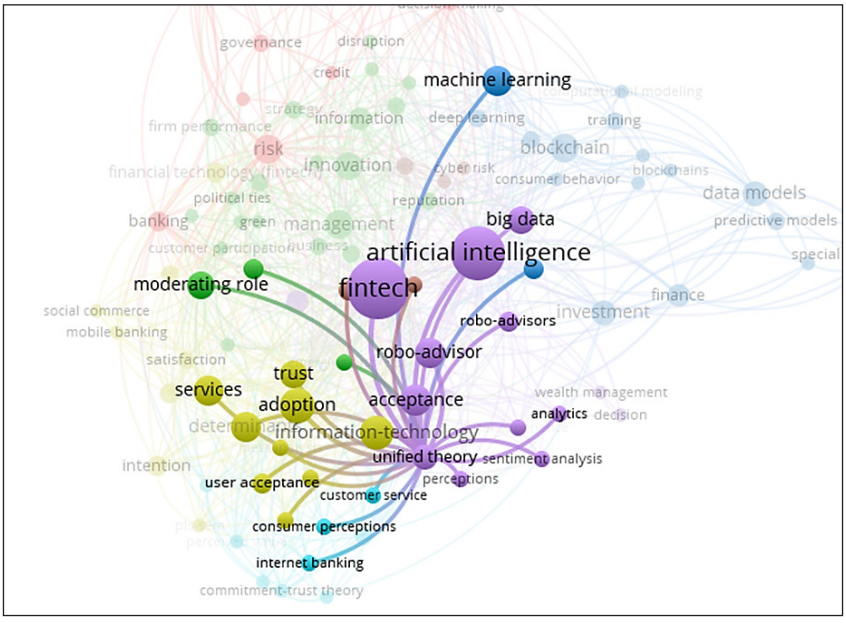



*Figure 12.* Unified theory network link visualisation

Table 2
*Lenses on unified theory, key terms, and connections to AI*

| Theoretical Lens | Key Terms | Connections to AI/Fintech |
|---|---|---|
| Unified Theory | adoption | Key driver of technology adoption in AI-driven FinTech |
| Unified Theory | user acceptance | Critical factor influencing ease of adoption and use |
| Unified Theory | intention | Behavioural intention for continued usage |
| Unified Theory | UTAUT model | Framework for adoption factors in technology use |
| Unified Theory | determinants | Identifies key factors influencing adoption behaviour |
| Unified Theory | continuance intention | Explains sustained usage intentions in FinTech |
| Unified Theory | technology acceptance | Addresses user perceptions of ease and usefulness |
| Unified Theory | user experience | Focusses on enhancing the user-friendliness of FinTech tools |

a well-rounded perspective on how does framework contribute to AI adoption.

Commitment–Trust Theory centres on the relational dynamics that sustain long-term user engagement with AI technologies in FinTech. The framework stresses that the relationships between financial institutions and clients are built on trust and commitment as the base contributing to long-term relationships. Trust, customer satisfaction, and service quality are the concepts to be considered in the central context of this theoretical lens. The trust is enhanced in FinTech applications, especially robo-advisory systems, through the presence of well-developed data security measures and transparency in algorithm design. According to Figure 13, consistency, personalisation, and transparency between the users and the service providers contribute to an enhanced relationship between them, which leads to increased loyalty of the customers. The theory also states that satisfaction and further use are determined by perceived value, which includes both functional and emotional dimensions of the value. Table 3 summarises the key constructs of the Commitment-Trust Theory and describes how such trust-building processes should work in AI-based FinTech situations.

These theoretical approaches can be combined to provide a consistent basis for the analysis of the adoption and the long-term sustainability of AI technologies in the FinTech industry. UTAUT framework explains the behavioural and organisational variables that affect early adoptions, whereas the Commitment-Trust Theory is used to explain the relational processes that precondition continuity and loyalty in the long term. Taken together, they present a moderate context of how efficiency and trust are functioning as the twin forces in influencing user interaction with AI-supported financial applications. The combination of these thinking approaches elucidates how FinTech innovations combine technical usefulness with the relationship confidence to generate not only useful systems, but also believable systems in the eyes of end-users. The synthesis of concepts, which is backed by Figure 12

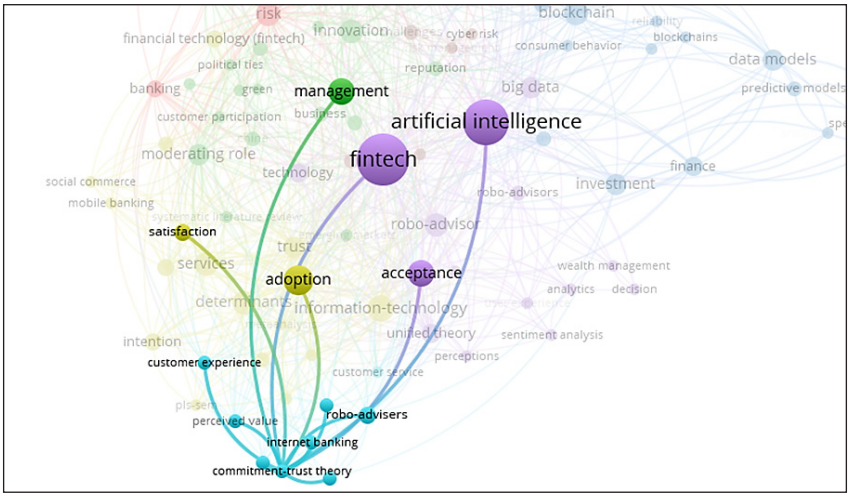



*Figure 13.* Commitment trust theory network link visualisation

Table 3
*Theoretical lenses on commitment-trust theory, key terms, and connections to AI*

| Theoretical Lens | Key Terms | Connections to AI/Fintech |
|---|---|---|
| Commitment-Trust Theory | trust | Builds user confidence in FinTech services |
| Commitment-Trust Theory | advisor | Explains long-term trust and commitment in FinTech adoption |
| Commitment-Trust Theory | customer satisfaction | Measures satisfaction with AI-enhanced FinTech services |
| Commitment-Trust Theory | service quality | Highlights quality improvement through AI applications |
| Commitment-Trust Theory | perceived value | Assesses user-perceived benefits of AI in FinTech |
| Commitment-Trust Theory | customer experience | Focusses on improving user interactions through AI-driven personalisation |
| Commitment-Trust Theory | reliability | Ensures dependable FinTech operations via AI systems |
| Commitment-Trust Theory | transparency | Emphasises the need for clarity in AI-driven financial decisions |

and 13 and summarised in Table 3 and Table 4, provides researchers and practitioners with the organised foundation of enhancing AI adoption strategies and maintaining user trust in the digital financial environment.

## Interpretive Synthesis of Thematic Evolution

Beyond documenting shifts in dominant keywords and thematic clusters, the observed evolution of AI-driven FinTech

research reflects a deeper reorientation in how scholars conceptualise the role of AI within financial systems. Early studies predominantly framed AI as a technological enabler, focussing on adoption drivers, algorithmic performance, and system security within specific applications such as fraud detection and credit scoring. These contributions largely emphasised technical optimisation and efficiency gains, aligning with a problem-solving orientation rooted in information systems and quantitative finance. However, as AI technologies became increasingly embedded within financial infrastructures, particularly following the COVID-19 pandemic, scholarly attention expanded towards broader governance and socio-technical concerns.

Post-pandemic research exhibits a marked shift towards debates surrounding explainability, accountability, and regulatory oversight, signalling a growing recognition that AI in FinTech cannot be assessed solely through technical performance metrics. Instead, recent studies increasingly interrogate the ethical risks associated with opaque algorithms, data asymmetries, and potential exclusionary effects on vulnerable populations. This transition suggests that AI governance and ethical risk are no longer peripheral considerations but constitute a central intellectual backbone of the field. Accordingly, the thematic prominence of governance-oriented research reflects an evolving understanding of AI-driven FinTech as a socio-technical system in which technological design, regulatory frameworks, and organisational practices are deeply intertwined. This interpretive shift highlights a maturation of the literature, moving from application-centric inquiry towards reflexive engagement with the long-term societal implications of AI-enabled financial innovation.

## PRACTICAL IMPLICATIONS OF THE STUDY

### Implications for Financial Institutions

The findings suggest that financial institutions are moving beyond exploratory experimentation with artificial intelligence towards operational integration across core FinTech functions. The prominence of themes related to fraud detection, credit risk modelling, and digital banking indicates that AI adoption is increasingly driven by performance optimisation and scalability considerations rather than technological novelty. Consequently, financial institutions are encouraged to prioritise governance-ready AI systems that balance predictive efficiency with transparency, particularly in consumer-facing applications where trust and explainability have become critical determinants of adoption.

### Implications for Regulators and Policymakers

The thematic shift towards explainable AI, regulatory technology and accountability-oriented research reflects growing regulatory scrutiny over algorithmic decision-making in financial services. For policymakers, this evolution highlights the need to align regulatory frameworks with the pace of AI deployment, ensuring that innovation does

not outstrip oversight capacity. Regulatory sandboxes, adaptive compliance mechanisms and cross-jurisdictional coordination may therefore play an increasingly important role in facilitating responsible AI-driven FinTech development while mitigating systemic and ethical risks.

### Implications for Technology Developers and FinTech Firms

For FinTech developers and technology providers, the observed transition towards value realisation and impact-oriented research underscores the importance of designing AI systems that are not only technically robust but also institutionally and socially acceptable. Emphasis on explainability, data governance, and interoperability suggests that future competitive advantage will depend on the ability to embed ethical safeguards and regulatory compliance within system architecture. Developers are thus encouraged to integrate design-for-governance principles early in the development lifecycle to enhance long-term adoption and sustainability.

## LIMITATIONS AND FUTURE RESEARCH

Despite its contributions, this study is subject to several limitations that should be acknowledged. First, the bibliometric analysis is based exclusively on the Web of Science database. While Web of Science provides high-quality and curated coverage of peer-reviewed journals, this reliance may exclude relevant studies indexed in other databases, particularly technical and conference-oriented research that is more commonly represented in alternative indexing platforms. As a result, the findings should be interpreted as reflecting dominant and established scholarly trends rather than the full breadth of AI-driven FinTech research activity.

Second, bibliometric techniques primarily capture structural patterns in publication output, citation networks and thematic co-occurrence, but do not directly assess the empirical quality or real-world effectiveness of the underlying studies. Consequently, the identified themes and trends represent intellectual prominence rather than evaluative judgments about methodological robustness or practical impact.

Building on these limitations, future research could extend the present analysis by incorporating multiple databases to provide a more comprehensive representation of interdisciplinary and technical contributions. In addition, qualitative synthesis and systematic review approaches may be employed to complement bibliometric mapping, allowing for deeper examination of causal mechanisms, governance challenges and ethical implications associated with AI deployment in financial services. Such efforts would further enrich understanding of how AI-driven FinTech evolves across regulatory, institutional, and societal contexts.

## CONCLUSION

This paper gives a comprehensive review of the promising development path of AI-

enabled FinTech with key lines of research and narrative from 2019 to 2022. According to a systematic study and a bibliometric examination, it identifies the objects in which the technological advancement is most noticeable, such as the growing interest in predictive models, fraud detection systems, as well as artificial intelligence-enabled risk management systems after 2021. The report indicates that the COVID-19 pandemic was among the essential factors that stimulated digital transformation and that the implementation of AI in the financial sector has become a strategic priority among banks and regulators. The alteration noticed in the structure of the themes suggests that a shift in the basic research towards more applied research is taking place when transitioning between AI model development and adoption of new technology ideas, i.e., blockchain and cryptocurrencies.

Factorial Map and Dendrogram are the tools of analysis employed in this paper that prove the complicated interrelations between AI-driven FinTech themes. These tools show how initial stage themes, including "artificial intelligence" and "adoption" and "model" provided the basis of the field, and the pandemic led to the development of more sophisticated research themes, such as "returns", "bitcoin", and "predictive models", etc. In the wake of the 2021 period, AI has come out of its theoretical background to become an instrument with both financial implications, as online banking and blockchain applications are only some of the ways in which the financial services industry has changed. This change of focus can be seen as a mark of a more developed and active industry, in which AI has already outgrown simple applications and is being used to fuel the growth of digital finance and decentralised systems.

The inferences also offer clues to significant participants in the AI-driven FinTech. Banks are seeking AI to simplify operations, reduce risk, and make superior decisions in the context of more complex market environments. It implies that regulators will be forced to design regulations that will be able to embrace these technologies and their adoption without necessarily leaving the playing field level. The challenge to developers of technology has been to develop systems that are long-lived, scalable, and transparent yet are also able to operate on all platforms, including the new generation of blockchain and cryptocurrency. Ethical issues of transparency, algorithmic discrimination, and privacy of data are still outstanding as well. The way of dealing with those issues will determine whether AI will be able to grow, become responsible, and gain sustainable legitimacy in the financial sector.

Finally, this paper will be valuable in its insights into the direction of AI-based FinTech research, its initial developmental phase, and the subsequent rapid pace of adoption and application during the post-pandemic period. The results support the idea that AI will influence the future of the financial sector and not only enhance the current financial infrastructure but also establish new disruptive technologies. Going

forward, further development of AI would entail the constant work of researchers, industry stakeholders, and policymakers to overcome the ethical, regulatory, and technological issues that will emerge in the future. The future of AI in FinTech looks like a continuation of the innovations where AI will be central in digitalising the financial services sector, making it efficient, convenient, and inclusive to all, no matter the location.

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# Measuring Lifelong Career Planning in Inclusive Education: Psychometric Properties of the PRISMA Scale using Rasch Analysis

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## ABSTRACT

This research created and validated PRISMA (PRencanaan Inklusif Siswa untuk MAsa Depan), a psychological tool intended to assess lifelong career planning competencies among Indonesian secondary school students in inclusive educational environments. A cross-sectional survey gathered data from 541 students aged 15 to 18 years across various educational tracks. The original instrument had 60 questions based on Super's life-span, life-space theory, Krumboltz's learning theory of career counselling, Savickas' career construction theory, and Banks' multicultural education framework. The development process included expert judgment for face and content validity, a pilot study, and psychometric testing with Rasch analysis (Winsteps). The results showed that the psychometric performance was very good, with a person reliability of 0.96, an item reliability of 0.99, and a Cronbach's alpha of 0.96. Principal Component Analysis of Residuals validated unidimensionality, and local dependency stayed beneath critical thresholds. The four-point Likert scale functioned effectively, though the lowest category was infrequently utilised. The Wright map showed that the difficulty of the items matched the students' abilities well. However, it also showed that more difficult items were needed to test students with very advanced career planning skills. Differential Item Functioning (DIF) analysis revealed that the majority of items operated comparably across gender and

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age demographics, exhibiting negligible bias. In general, PRISMA is a valid, reliable, and fair tool that can help counsellors give career advice that is fair and includes everyone.

*Keywords:* Career assessment; inclusive education; instrument development; lifelong career planning; Rasch analysis

## INTRODUCTION

Such factors as globalisation, digitalisation and the fourth industrial revolution have changed the world of work dramatically. Therefore, people are expected to possess not only academic knowledge but also need to develop skills, to be self-confident and to be able to look ahead in an environmentally friendly way (Sima et al., 2020; Yaqub & Alsabban, 2023). The younger generation has to learn how to manage their careers throughout their lifetime to be able to cope with the challenges of the 21st century. The competency comprises the knowledge, skills, and adaptable attitudes that individuals require to sustain their careers in a constantly changing world of work, (Van den Broeck et al., 2024; Zhang et al., 2022). It is quite a challenge to develop career planning skills which will last a lifetime in an inclusive education environment as students that attend such schools may have certain additional issues namely; difficulties in accessing career information, lack of support from the environment, and social stereotypes which make them less prepared for future planning (Kuijpers, 2025; Makhambetova & Magauova, 2023; Thwe & Kálmán, 2024). If this situation is not handled properly, it can become a factor to widen the difference in the gap of opportunities between the disadvantaged groups of students and students overall. To narrow down this gap, the education system requires assessment tools that can neutrally and precisely depict career readiness in all students.

The availability of tools to assess career competencies is not enough because most of the earlier research works have not given the dimension of sustainability (lifelong) and inclusiveness full prominence while the validation is usually only through confirmatory factor analysis without testing for fairness across different groups. The instrument available now includes a multidimensional validated Career Crafting Assessment (CCA) but the testing related to aspects of fairness among demographic groups is still very limited (Chifor & Oprea, 2023; Lee et al., 2021; Verkooijen et al., 2024). Verkooijen et al. conducted a systematic review that identified 18 instruments focussing on lifelong learning, and most of them only recognised content validity and internal consistency, and hardly any dimensions of sustainability or clear concept operationalisation were addressed (Verkooijen et al., 2024). Both Thailand and China have modified career planning instruments according to their local cultures; however, they use confirmatory factor analysis (CFA) without considering fairness evaluation for different respondent groups (Chaiyama & Kaewpila, 2022; Wang et al., 2023).

Despite the growing availability of career planning instruments, empirical evidence regarding their adequacy in inclusive educational contexts remains limited. Widely used measures such as the Career Adapt Abilities Scale (CAAS), Career Crafting Assessment (CCA), and Planning for Career and Family Scale (PLAN) have demonstrated satisfactory construct validity; however, their validation is predominantly based on confirmatory factor analysis (CFA), which provides limited information about how items function across diverse learner groups. In particular, issues related to measurement fairness, sustainability (lifelong orientation), and inclusivity across different educational tracks, socio-cultural backgrounds, and learner characteristics are rarely examined explicitly. Consequently, existing instruments offer insufficient evidence to support their use as equity sensitive assessment tools in inclusive secondary school settings, highlighting the need for a career planning instrument that integrates lifelong orientation with explicit evaluation of measurement fairness (Kakara Anderson et al., 2025; Townend et al., 2025).

Unlike these approaches, PRISMA was developed using the Rasch measurement integrated with Differential Item Functioning (DIF) analysis to evaluate both psychometric quality and measurement fairness. Rasch modelling was selected because it enables simultaneous evaluation of item functioning, person ability, and measurement fairness, making it particularly suitable for inclusive education contexts (Andrianie et al., 2024; Ifdil et al., 2024). PRISMA is an instrument developed in a Global South context, specifically Indonesia, which remains underrepresented in global career assessment research.

There is a growing demand for inclusion-based lifelong career planning instruments in Indonesia, a country that is rich in cultural, social, and educational backgrounds. The existence of such tools is important to ensure that every student has the same opportunity to plan their career futures (Aminah et al., 2024; Nieminen, 2024). PRISMA (Inclusive Student Planning for the Future) is a solution to this problem. It includes 60 statement items that were specially created to lower the level of lifelong career planning skills of secondary school students in Indonesia, who are an inclusive group. The resulting instrument was designed to reflect different levels of career readiness among students of various backgrounds.

PRISMA represents a scale comprising 60 statement items specifically developed to measure the lifelong career planning competencies of secondary school students in Indonesia. The instrument was developed from an inclusive point of view and hence was expected to capture career readiness variations among students from diverse backgrounds. For reliability, item fit, unidimensionality, and measurement fairness, the instrument uses a contemporary psychometric approach, the Rasch Model, along with the Differential Item Functioning (DIF) analysis to account for demographic characteristics such as gender, age, and residential location (Andrianie et al., 2024; Boone, 2016; Stetz, 2022).

Although sustainable and inclusive career planning is gaining more importance, most of the tools that are presently available do not consider equity differences between various student groups. The gap underscores the necessity of PRISMA as a tool that first of all measures career competencies over a lifetime and secondly, guarantees inclusiveness according to the norms of multicultural education. This research is purposed to perform a validation of PRISMA through Rasch analysis thereby providing a trustworthy, fair, and theoretically sound instrument which can be implemented in inclusive educational settings. The aim of this research is to make a theoretical contribution by broadening the career assessment literature through the creation of instruments that emphasise fairness and sustainability (lifelong). On the ground, the output of this research may be of great help to educators, guidance and counselling teachers, and policymakers in designing career intervention programmes that are accessible to all, thus providing equal opportunities for every student to shape a better future.

Consequently, this research will serve to validate PRISMA as a tool that sensitively measures equity for assessing lifelong career planning competences among secondary school students in inclusive education settings through Rasch analysis.

## LITERARTURE REVIEW

### Lifelong Career Planning

Lifelong Career Planning idea is based on the idea that a career is not just a series of different jobs, but rather a continuous and changing process which goes along with a person's life. The concept of career planning on a lifelong basis implies the holding of an attitude which is flexible, integrative, and long-term oriented, taking into consideration the mutual interaction between work and other roles as well as the necessity to adapt to the ever-changing world of work (Hirschi et al., 2022; MacKinnon, 2020). The theory of lifespan, which was developed by Super and holds that one goes through life continuous staging from exploration to maintenance (Super, 1980), is the base of the recent studies. These studies are in line with what was earlier argued by Super and even extend the notion by articulating that sustainable careers are dynamic processes which involve the interaction between work and non-work roles as well as the adjustment to changing life goals throughout the individual's lifespan. The concept of sustainable careers is not far from professional success as it emphasises also the balance between work, social life, and family for the goal of health, happiness, and productivity being kept sustainably (De Vos et al., 2020; Russo et al., 2023).

### Lifelong Career Planning in an Inclusive Framework

Lifelong career planning within an inclusive framework should highlight that careers are not static but rather evolutions of stories that happen throughout one's lifetime involving different roles and transitions affected by personal and impersonal factors. Such a plan takes into consideration the individual's

life holistically, even the aspects that do not involve work such as family, community, and personal well-being and still provide equal access to and opportunities for everybody without discrimination (Litano & Major, 2016; Savickas et al., 2009a). Moreover, an inclusive framework calls for organisational policies and practices that promote diversity, accessibility, and work-life balance, for instance, among the vulnerable groups or persons with disabilities. Career planning interventions that are successful, thus, have to be specific to the individual's requirements, offer resources that are easily accessible, provide culturally appropriate guidance, and give exposure to relevant practical activities (Savickas et al., 2009b; Y. Zhang & Perey, 2024).

Career planning should be thorough and must uphold the principle of equity, which guarantees that each person gets career services that are of real value to them regardless of whether they have a physical, social, cultural, or psychological background (Bennett, 2021). Studies indicate that accessing career development services unequally can lead to wage gaps in education and employment outcomes, and therefore, minorities and other marginalised groups such as students from racial minorities, students with disabilities, and those from low socioeconomic backgrounds may be most affected by this situation (Ansel et al., 2022; Bennett, 2016). Therefore, career assessment instruments designed to capture the sustainability, adaptability, and long-term career orientation of individuals are needed, especially those based on inclusion, so that students have equal opportunities in planning their career futures. Banks and Banks (2019) through the Multicultural Education framework emphasise the importance of fair assessment to ensure no student groups are marginalised (Banks & Banks, 2019)

## Development of Career Planning Instruments

Several career planning instruments have been developed and validated for measurement across various groups and contexts. One widely used instrument is the Planning for Career and Family Scale (PLAN), which has been tested on engineering students and proven to have validity across gender, race/ethnicity, and academic year, thus can be used to wunderstand career and family planning needs among diverse student groups (Hu et al., 2025). Moreover, the Career Futures Inventory is a tool that aims at clarper aspects like career adaptability, career optimism, and market knowledge. It has been employed in studies to locate the predictors of career planning attitudes among university students (Kirikkanat, 2023). The Career Adapt-Abilities Scale (CAAS) is a relevant and r method for measuring student career planning, by focussing on career adaptability (Xu, 2020). The instruments grounded in Cognitive Information Processing (CIP) theory depict career planning as a process, where children's grades and personalities are considered along with interests, abilities,

and values (Wang et al., 2023). The work values instruments in Indonesia, by way of example, have also been modified to recognise the work value preferences of the graduating university students, hence making their career plans more comprehensive before getting the degree. (Sulistiobudi & Hutabarat, 2022).

Several instruments have been widely used in career assessment research, including the Career Adapt-Abilities Scale (CAAS; Savickas & Porfeli, 2012), the Career Crafting Assessment (CCA; Lee et al., 2021), and the Planning for Career and Family Scale (PLAN; Hu et al., 2025). All three of these instruments have been significant in their respective fields but they are still somewhat restricted in terms of their range. CAAS is centred around the concept of adaptability when encountering career challenges, CCA is more about using self-directed strategies for career crafting, whereas PLAN shows the planning aspect as being related to the family roles. However, none of these instruments was specifically designed to capture inclusivity within educational contexts or to provide a comprehensive orientation towards lifelong career planning.

International literature has lately been amplifying on how career assessment tools should be designed to be inclusive and fair for all groups of learners, especially in multicultural and inclusive education settings. Researchers claim that if measurement equivalence is not explicitly evaluated, assessment instruments may end up perpetuating the existing social and educational inequalities (Khalatbari-Soltani et al., 2022). As a result, fairness evaluation and measurement invariance have been central issues nowadays in the development of instruments along with traditional validity evidence and enhancing the interpretability of the assessment outcomes across demographic groups.(Khalatbari-Soltani et al., 2022; Strijbos et al., 2021)

The majority of these career planning assessment instruments emphasise construct validity through CFA, rarely exploring issues of sustainability (lifelong) and inclusivity. Furthermore, validation of fairness aspects across demographic groups remains very limited. PRISMA is designed based on major career theories (Super, Krumboltz, Savickas) and inclusivity principles (Banks), while being validated using Rasch analysis. This approach enables testing of reliability, unidimensionality, scale functioning, and measurement fairness through DIF, allowing PRISMA to provide an original contribution to equitable career assessment relevant to student diversity in Indonesia.

## METHODS

### Research Design

The present investigation utilised a quantitative design with a cross-sectional approach. The main emphasis of the study was to determine the validity and reliability of the PRISMA (Inclusive Student Planning for the Future) instrument in the case of Indonesian adolescents. The researchers decided on this design to get a single snapshot of the PRISMA psychometric

properties and the changes in students' responses within a specific timeframe.

## Participants

The instrument was administered online through dedicated links distributed via school networks, youth communities, and social media platforms. Purposive sampling was employed to ensure that participants were drawn from inclusive secondary schools and represented diverse student characteristics relevant to fairness testing (Berndt, 2020; Etikan et al., 2016) Participants were drawn from secondary schools implementing inclusive education programmes. In this study, inclusive education refers to educational settings in which students with diverse learning needs are enrolled in regular classrooms and provided with educational services without segregation. This approach ensured the representation of students from diverse backgrounds and characteristics, such as gender and educational tracks, which is essential for testing the fairness and inclusiveness of the instrument.

The research participants were adolescents aged 15-18 years enrolled in different secondary school pathways. In the initial phase, 897 students completed the online survey. Prior to Rasch analysis, the dataset was reviewed to identify and remove extreme response patterns and outliers that could potentially affect item calibration and person estimation. Following this refinement process, data from 541 participants were retained for final analysis. The final sample consisted of 129 male and 412 female students.

## Instrument

The creation of the PRISMA tool involved five different phases, which are detailed in Table 1.

Each phase of the PRISMA design work was methodically planned to address a particular scientific need. Content relevance and conceptual clarity were ensured through the theoretical foundation and expert validation; pilot testing helped to demonstrate empirical feasibility. Rasch analysis was used to offer measurement at the interval level and to study item functioning and measurement fairness, which are key aspects of equity-sensitive assessment in inclusive education contexts.

The deluxe version of this instrument consists of 60 statement items directed at assessing lifelong career planning competencies in an inclusive education framework context. The 4-point Likert scale (1 = strongly disagree to 4 = strongly agree) is incorporated in each item, thus enabling the level of agreement of the respondents with the statements concerning lifelong career planning competencies to be captured. For example, one representative item assessing career planning readiness states: “I actively organise daily or weekly study plans as concrete steps towards achieving my future career goals” (Item I21). Apart from the primary items, the tool also comprises straightforward demographic questions like age, gender, and educational background. The additional information is intended to make the difference in response patterns based on individual characteristics analysis easier while at the same time,

Table 1
*Stages of PRISMA Instrument Development*

| Stage | Description | Output |
|---|---|---|
| Item Construction | Items were developed based on a literature review of career planning and referred to three main theories: Super's Career Development Theory, Krumboltz's Career Learning Theory (Saunders, 2021)), and Savickas's Career Construction Theory (2013), as well as Multicultural Education theory by James A. Banks (Banks & Banks, 2019b). | Initial draft of the instrument (60 items) |
| Validity Phase | Experts in guidance and counselling, psychometrics, and education were involved in the evaluation of face validity and content validity to check the relevance, clarity of the language, and the readability of the items. | Validated instrument (content and language) |
| Pilot Testing | A pilot test was conducted with students to examine readability, response distribution, and initial reliability. | Pilot test data for reliability and distribution analysis |
| Psychometric Analysis (Rasch Model) | The investigation considered item and person reliability, unidimensionality, item fit (Infit/Outfit MNSQ), scale diagnostics, and Differential Item Functioning (DIF) analysis according to gender and age. | Psychometric statistics (reliability, item fit, DIF, Wright map) |
| Instrument Refinement | Revision or elimination of problematic items was conducted based on Rasch analysis, including items with significant DIF or low fit. | Final version of the PRISMA instrument (valid, reliable, fair) |

ensuring that the instrument can be used fairly across different student populations.

## Statistical Analysis

Data analysis was carried out through the Rasch model method, using the Winsteps programme. Unidimensionality, reliability, and item fit were examined using standard Rasch model criteria. The Rasch model was selected for its feature of checking the consistency between the items while the measurement stays stable for different types of respondents. The analytical procedures involved: the estimation of person and item reliability, unidimensionality test through principal component analysis of residuals, item fit examination based on Outfit MNSQ values (0.5–1.5), local dependency analysis with residual correlations, differential item functioning (DIF) evaluation to confirm the absence of bias between groups, and rating scale diagnostic review (Andrich & Marais, 2019; Medvedev & Krägeloh, 2022; Storey, 2021).

The first analysis results with 897 respondents showed person reliability = 0.95, item reliability = 1.00, and Cronbach's alpha = 0.95. As a result of the removal of outlier data and the refinement of the sample to 541 respondents, better measurement

consistency has been achieved with person reliability = 0.96, item reliability = 0.99, and Cronbach's alpha = 0.96. These metrics are evidence that PRISMA has very good psychometric quality.

### Ethical Clearance

This study obtained ethical approval from the Research Ethics Committee of Universitas Negeri Malang (Letter No. 28.4.24/UN32.14/PB/2025). All participation was voluntary, and complete confidentiality of respondent data was guaranteed. Informed consent was explicitly obtained from each prospective respondent after they received a clear explanation of the study's purpose, procedures, and their rights prior to participation. For participants who were minors, informed consent was also obtained from parents or legal guardians through coordination with the participating schools, in accordance with institutional ethical guidelines.

## RESULTS

### Demographic Characteristics of the Participants

Table 2 summarises the demographic characteristics of the participants (N = 541). The sample comprised 129 male students (23.8%) and 412 female students (76.2%). Participants were aged 15–18 years, with most being 17 years old (45.8%), followed by those aged 16 years (28.5%), 18 years (15.3%), and 15 years (10.4%). More than half of the participants were enrolled in Grade XII (55.3%), while 29.6% were in Grade XI and 15.2% in Grade X. The majority of participants were from schools located on Java Island (98.9%), with a small proportion from outside Java Island (1.1%).

### Summary Statistics of Rasch Measurement Model

Based on Table 3, the PRISMA instrument demonstrates a person reliability value of 0.96 with a separation index of 4.75,

Table 2
*The demographic details of the participants* (N=541)

| Demography | Category | N | % |
|---|---|---|---|
| Gender | Male | 129 | 23.8 |
| | Female | 412 | 76.2 |
| Age Group (Years) | 15 | 56 | 10.4 |
| | 16 | 154 | 28.5 |
| | 17 | 248 | 45.8 |
| | 18 | 83 | 15.3 |
| School Grade | Grade X | 82 | 15.2 |
| | Grade XI | 160 | 29.6 |
| | Grade XII | 299 | 55.3 |
| Geographical Region | Java Island | 535 | 98.9 |
| | Outside Java Island | 6 | 1.1 |

Table 3
*Summary statistic of person and item (I=60, N=541)*

| | Reliability | Separation Index | Mean Measure *) | SD | Cronbach's Alpha |
|---|---|---|---|---|---|
| Person | 0.96 | 4.75 | 2.33 | 1.28 | 0.96 |
| Item | 0.99 | 13.62 | 0.00 | 0.00 | |

indicating that the instrument is capable of differentiating respondents across dimensions of lifelong career planning ability. The person mean measure value of 2.33 with a standard deviation of 1.28 indicates that generally students possess career planning levels above the average logit, with considerable variation in abilities. Infit and Outfit MNSQ values show that the items function appropriately, while ZSTD values were interpreted cautiously due to sample size sensitivity (Boone et al., 2013; Boone & Staver, 2020).

Based on item values, PRISMA shows an item reliability of 0.99 with a separation index of 13.62, demonstrating that instrument items are widely distributed across the difficulty spectrum, thus capable of capturing respondent ability variations from low to high levels. The item mean measure value at 0.00 logit with zero deviation aligns with Rasch model expectations, as items are calibrated against the centre of the distribution. The combination of very high reliability values, adequate separation indices, and consistent Cronbach's alpha (0.96) strengthens evidence that PRISMA is a stable, consistent, and sensitive instrument for measuring variations in lifelong career planning competencies among secondary school students in Indonesia.

## Unidimensionality and Local Dependency

Table 4 shows that the Principal Components Analysis of Residuals (PCAR) indicates 44.7% of the variance is explained by the instrument, with

Table 4
*Unidimentionality*

| Category | Eigenvalue | Observed | Expected |
|---|---|---|---|
| Raw variance explained by measures | 44,7 | 42.7% | 42.6% |
| Raw variance explained by person | 23.2 | 22.2% | 22.1% |
| Raw variance explained by items | 21.5 | 20.5% | 20.5% |
| Unexplained variance in 1st contrast | 4.6 | 4.5% | 7.8% |

contributions of 23.2% from persons and 21.5% from items. The values here could also be interpreted for the most part as Rasch model figures, which would imply that the main source of variance in the dataset remains that of the construct being measured, i.e., lifelong career planning (Boone & Staver, 2020). Furthermore, the variance unexplained by the first contrast amounted to 4.6 (4.5%), thus still being under the eigenvalue threshold of 5.0 or 10% of the variance, which means that no secondary dimension is sufficiently strong to disrupt the instrument's structure. PRISMA, therefore, based on this evidence panel, is a single-dimensional function assumption model in which items operate in a consistent manner to measure a single primary construct. Hence, the device used is capable of producing a single, lucid representation of students' lifelong career planning skills, unaffected by other dimensions.

Local dependency analysis was conducted to examine whether there is excessive inter-item dependence beyond what should be explained by the primary construct (Han, 2022). As reported in Table 5, residual correlation analysis identified several item pairs with moderate associations, including I59–I60 (0.52), I37–I38 (0.48), and I54–I56 (0.44). These correlations suggest that the items share similar content, leading to aligned student responses.

The PRISMA set of items can be seen as fairly safe in terms of the risk of item redundancy. Some items are conceptually similar, but this does not influence the Rasch model's reliability. Instead, the findings signal that the tool is able to deliver extensive content coverage while not causing structural bias, though editorial refinements might be taken into consideration for further studies.

Table 5
*Local dependency*

| Correlation | Item 1 | Item 2 |
|---|---|---|
| 0.52 | I59 | I60 |
| 0.48 | I37 | I38 |
| 0.44 | I54 | I56 |
| 0.43 | I13 | I14 |
| 0.42 | I30 | I31 |
| 0.41 | I53 | I54 |

## Rating Scale Diagnostics

Analysis of the four-point Likert scale suggests that the response categories were well-functioning (Table 6). The Andrich thresholds were aligned, varying from −4.07 to +3.92, and the Observed Average went up steadily through the categories, which shows that the respondents understood the categories consistently. Most of the responses were in Agree (58%) and Strongly Agree (24%) categories, whereas Strongly Disagree was almost not used. Infit and Outfit MNSQ values were around 1.0 for the three main categories, while the lowest category had increased values due to a few responses. In general, these findings are confirmation of the PRISMA four-point scale as a valid instrument and effective in capturing the variation of students' levels of agreement.

Table 6
*Item threshold and fit indices of response format*

| Category | Andrich Threshold | Observed Average | Observed Count (%) | Infit MNSQ | Outfit MNSQ |
|---|---|---|---|---|---|
| Strongly Disagree | NONE | -1.24 | 0 | 1.72 | 1.64 |
| Disagree | -4.07 | 0.54 | 17 | 0.97 | 0.98 |
| Agree | 0.15 | 2.19 | 58 | 0.95 | 0.93 |
| Strongly Agree | 3.92 | 3.99 | 24 | 1.01 | 1.00 |

Table 7
*The summary of item measure*

| Item | Total Score | Measure | S.E. | Infit MNSQ | Outfit MNSQ | Pt Measure Corr |
|---|---|---|---|---|---|---|
| I14 | 1196 | 3.4 | 0.09 | 1.02 | 1.02 | 0.36 |
| I13 | 1233 | 3.11 | 0.09 | 1.14 | 1.11 | 0.38 |
| I21 | 1345 | 2.27 | 0.09 | 0.97 | 0.96 | 0.54 |
| I45 | 1435 | 1.63 | 0.09 | 1.82 | 1.84 | 0.43 |
| I11 | 1441 | 1.59 | 0.09 | 1.54 | 1.54 | 0.45 |
| I15 | 1441 | 1.59 | 0.09 | 1.13 | 1.13 | 0.49 |
| I23 | 1454 | 1.5 | 0.09 | 1.16 | 1.16 | 0.56 |
| I16 | 1460 | 1.46 | 0.09 | 1.34 | 1.34 | 0.46 |
| I41 | 1461 | 1.45 | 0.09 | 1.11 | 1.12 | 0.52 |
| I12 | 1510 | 1.1 | 0.09 | 1.18 | 1.18 | 0.5 |
| I40 | 1876 | -1.65 | 0.09 | 0.74 | 0.7 | 0.57 |
| I43 | 1910 | -1.93 | 0.09 | 1.11 | 0.99 | 0.51 |
| I4 | 1919 | -2.01 | 0.09 | 1.03 | 1.04 | 0.42 |
| I7 | 1946 | -2.24 | 0.09 | 0.9 | 0.9 | 0.46 |
| I6 | 1955 | -2.32 | 0.09 | 1.03 | 1.04 | 0.38 |
| I56 | 1787 | -0.95 | 0.09 | 0.75 | 0.73 | 0.57 |
| I48 | 1788 | -0.96 | 0.09 | 0.81 | 0.81 | 0.6 |
| I60 | 1800 | -1.05 | 0.09 | 0.72 | 0.71 | 0.59 |
| I2 | 1843 | -1.39 | 0.09 | 0.94 | 1 | 0.46 |
| I44 | 1768 | -0.8 | 0.09 | 0.72 | 0.69 | 0.64 |

## Item Measures

The following are the 10 items with the highest measures and the 10 items with the lowest measures (Table 7).

The analysis of student skills through item measure describes the extent of the students' career planning skills variation which have the highest logit score of +7.18 and the lowest of about +2.31. The substantial number of respondents are credentialed from the moderate to the high level which is indicative of a generally

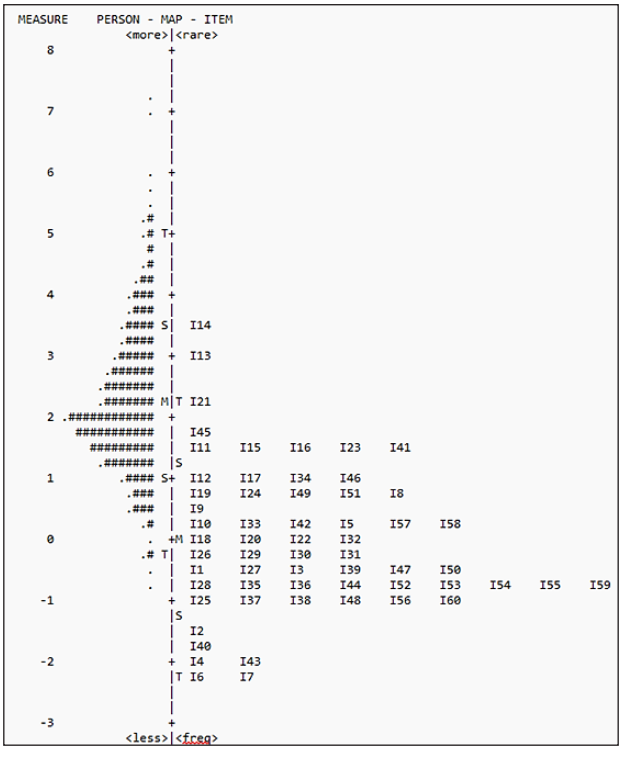



*Figure.1* Item wrightmap

positive level of career readiness. Most people's Infit and Outfit MNSQ values are within the 0.5–1.5 range, which means that the response data are consistent with the Rasch model expectations, although there are a few respondents who have extreme values and it is acceptable for a large sample. These findings confirm that PRISMA accurately maps the heterogeneity of lifelong career planning ability within the secondary school student population.

The Wright Map (Figure 1) displays the distribution of student abilities on the left and item difficulties on the right on the same logit scale. Most students fall within the moderate to high range (+1 to +4 logits), while the majority of items are concentrated between 0 and +2 logits, indicating good alignment between respondent ability and item difficulty. The most difficult item is I14 (+3.4 logits), and the easiest is I6 (−2.3 logits), suggesting that the instrument provides sufficiently broad coverage to map variation in career planning ability. Although there is a slight gap in item coverage at very high ability levels (above +5 logits), overall PRISMA represents and accurately captures the distribution of students' competencies.

## Person Measure

The person measure results displayed in Table 8 indicate substantial variability in students' abilities, with the highest value reaching +7.18 logits and the lowest

Table 8
*The summary of person measure*

| Entry | Total Score | Measure | S.E. | Infit MNSQ | Outfit MNSQ | Pt Measure Corr | Person |
|---|---|---|---|---|---|---|---|
| 105 | 236 | 7.18 | 0.56 | 1.68 | 1.62 | 0.23 | Female 18 |
| 29 | 235 | 6.9 | 0.51 | 1.26 | 0.67 | 0.41 | Female 18 |
| 533 | 235 | 6.9 | 0.51 | 1.47 | 0.52 | 0.49 | Female 17 |
| 546 | 235 | 6.9 | 0.51 | 1.24 | 0.94 | 0.23 | Female 17 |
| 115 | 231 | 6.11 | 0.4 | 0.8 | 0.81 | 0.51 | Male 17 |
| 483 | 231 | 6.11 | 0.4 | 0.98 | 0.97 | 0.4 | Female 16 |
| 374 | 230 | 5.96 | 0.38 | 1.18 | 0.67 | 0.56 | Male 16 |
| 893 | 230 | 5.96 | 0.38 | 1.24 | 0.63 | 0.62 | Female 17 |
| 791 | 229 | 5.82 | 0.37 | 1.51 | 0.97 | 0.39 | Female 17 |
| 13 | 228 | 5.69 | 0.36 | 1.18 | 1 | 0.52 | Female 16 |
| 243 | 188 | 2.31 | 0.26 | 1.32 | 1.29 | 0.56 | Female 15 |
| 341 | 188 | 2.31 | 0.26 | 1.45 | 1.47 | 0.48 | Female 17 |
| 456 | 188 | 2.31 | 0.26 | 1.45 | 1.47 | 0.48 | Female 18 |
| 670 | 188 | 2.57 | 0.26 | 1.45 | 1.47 | 0.48 | Female 18 |
| 747 | 188 | 2.57 | 0.26 | 1.37 | 1.37 | 0.83 | Female 18 |
| 794 | 188 | 2.57 | 0.26 | 0.76 | 0.75 | 0.63 | Female 17 |
| 823 | 188 | 2.57 | 0.26 | 0.85 | 0.86 | 0.1 | Female 17 |
| 865 | 188 | 2.57 | 0.26 | 1 | 1.02 | 0.44 | Female 18 |
| 876 | 188 | 2.57 | 0.26 | 1.17 | 1.19 | 0.25 | Male 18 |
| 760 | 186 | 2.44 | 0.26 | 1.26 | 1.28 | 0.49 | Female 17 |

around +2.31 logits, suggesting a small group with very high as well as relatively low lifelong career planning competencies. Most students fall within the moderate to high range (approximately +2 to +6 logits), reflecting generally favourable career readiness among the majority of respondents. The majority of individuals' Infit and Outfit MNSQ values lie within the 0.5–1.5 range, consistent with Rasch model expectations, although a few respondents exhibit extreme values, which is reasonable in a large sample. Overall, PRISMA accurately captures the heterogeneity of student ability and effectively differentiates competency levels from low to very high.

## The DIF Analysis

Differential Item Functioning (DIF) analysis by gender indicates that most items align closely between male and female students (Figure 2), meaning the majority of items function equivalently across groups. The differences between the genders are quite small in most of the items, but a few items show significantly different patterns of response. To give an example, male students are I13, I14, I15, I16, I45, and I46 in which

these items mostly favour them, while I43, I50, and I54 are the ones that mostly favour female students. These differences do not extend beyond the small subset of 60 items total and thus, the overall fairness of the instrument is not affected by them. The findings, in general, indicate that PRISMA does not have much gender bias. However, the team should consider revising the wording of the items that show a significant difference in gender response in their next development.

Differential Item Functioning (DIF) analysis by age indicates that most items function equivalently across the 15, 16, 17, and 18 years old groups, as reflected by largely overlapping lines across the logit range (Figure 3). Nevertheless, several items exhibit notable differences: for example, I7 is easier for 17 years old, I9 favours 18 years old, and I17, I20, I24, I34, I41, and I58 tend to favour 15 years old. Even so, the number of items with significant DIF is small relative to the total

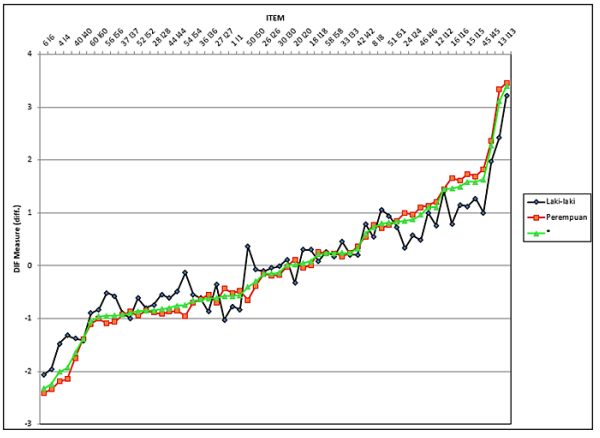



*Figure 2.* DIF gender

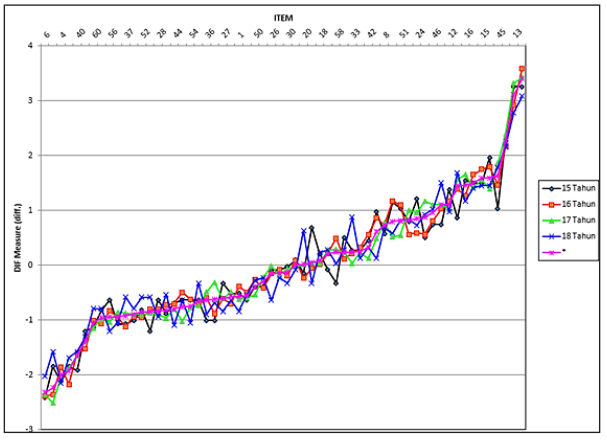



*Figure 3.* DIF age

of 60 items. Accordingly, the PRISMA instrument can still be considered fair for measuring lifelong career planning ability across age groups, with the caveat that these specific items may warrant revision in future development.

Observed DIF in a small number of items may be associated with contextual and developmental variations among students. Rather than indicating systematic bias, these results highlight areas for cautious interpretation and potential refinement in future instrument development

This research identified a limited number of items exhibiting Differential Item Functioning (DIF) across gender and age groups. The DIF extent, in general, was minor, which is a good indication of the fairness of measurement across demographic groups. The DIF flagged items will be reviewed to check for any possible changes in wording or context that should be kept in mind when covering lifelong career planning competencies.

## DISCUSSION

The findings highlight that the PRISMA tool reveals top-notch psychometric attributes. It has eminent person (0.96) and item (0.99) reliability along with a perfectly working four-point response scale. The results from this study are an encore to the significance of measurement tools that can recognise developmental changes in career trajectories throughout the lifespan. A very recent publication on sustainable careers points to the requirement for such instruments that can depict the interaction of the work and non-work roles and also reflect the changes in individual goals and priorities during different life stages (Hirschi et al., 2022; Van der Heijden et al., 2020). Moreover, the Wright map exhibits that both persons and items are well-distributed which means that PRISMA offers genuinely representative coverage for charting students' career planning skills.

In terms of the fairness of the measurement, DIF analyses indicate that the majority of the items operate similarly for males and females as well as younger and elder groups. A few items not fitting the model or indicating DIF were observed, these changes are probably due to developmental or contextual differences rather than a bias in the instrument and these findings do not substantially affect the overall psychometric integrity of the instrument.

However, there is a subset of items (e.g., I13–I16 and I45–I46 that are more positive for males; I43, I50, and I54 that are more positive for females; and I7, I9, and I17 that are more positive for specific age groups) that have significant bias. This is in agreement with Krumboltz's Learning Theory of Career Counselling which believes that learning experiences and environmental conditions influence individuals' perceptions of career tasks (Saunders, 2021). Hence, the DIF found may represent real differences in access to learning experiences among groups rather than just the technical imperfections of the (Baker & Hawn, 2022; Skinner et al., 2020). Therefore, items with significant DIF are not only due for a technical overhaul but also

may be conceived as openings to investigate the socio-cultural milieus that influence students' career readiness.

PRISMA has similar psychometric properties in terms of reliability and construct clarity when compared to previous tools like CAAS, CCA, or PLAN. However, these tools mainly use confirmatory factor analysis, whereas PRISMA uses Rasch modelling supplemented by Differential Item Functioning (DIF) analysis to test for measurement fairness. The current study takes the existing concepts of equity based and psychometric assessment at a local level one step further by unveiling PRISMA which is a fairness-driven instrument created in a Global South, non-Western educational setting. This difference highlights PRISMA's role in helping equity focussed educational assessments for inclusive secondary school settings.

These are significant contributions to the world-wide research base on the assessment of careers. As an illustration, the Career Crafting Assessment (CCA) validation in Turkey has been reported to be based on a stable four-factor structure linked to protean career attitudes and career attainment, thus, supporting cross-cultural reliability (Kilic & Kitapci, 2025). In the case of Thailand, while creating the Career Adapt-Abilities Scale (CAAS), the researchers found the CFA model fit to be satisfactory, but they did not fully investigate DIF issues, which point to the necessity of even more thorough analytical methods (Khampirat, 2024). The recent study also suggests next-generation career crafting instruments that put emphasis on the active reflection and career construction as life-long behaviours and have high internal consistency but have limited validation of fairness across demographic groups (Lee et al., 2021). Moreover, cultural differences in the CAAS model have led to the suggestion that a cooperation dimension be added to the five-factor model, thus, extending the concept of career adaptability to different countries, though the majority of this work is still based on CFA (Nye et al., 2018).

In comparison to these tools, PRISMA has distinctive advantages in that it focuses on sustainability (lifelong orientation) and inclusiveness and uses Rasch analysis to check for unidimensionality and item consistency, at the same time, measurement fairness across gender and age is also ensured (Alnahdi et al., 2025). The inclusive nature of PRISMA is in line with the Multicultural Education framework, which mainly concerns the equitable access to educational and guidance services. Therefore, guidance and counselling teachers may use PRISMA to not only implement inclusive and fair career guidance programmes but also to make certain that all students have equal opportunities to prepare for their futures (Banks & Banks, 2019).

This research, from a theoretical point of view, is a valuable addition to the career field as it has come up with an instrument that combines lifelong career planning with inclusivity. It provides an example of how Rasch-based instrument development can result in measures that are fairer and more sensitive to demographic diversity and that

this can be a step forward from the traditional CFA-centric approaches. To put it simply, PRISMA is a very helpful and practical tool for guidance and counselling professionals as well as education practitioners to assess and map the career readiness of the students on a one-to-one as well as group basis. Therefore, the provision of career guidance that is based on equality of access and thus making it possible for every student to prepare for the future under fair conditions is supported by the inclusive nature of the programme.

From a practical perspective, PRISMA can be implemented as an assessment tool to support career guidance in secondary schools, particularly within inclusive education settings. The instrument can be used at different times, e.g., once a year, to keep track of the students' gaining of skills for lifelong career planning. The results should be seen as a degree of readiness rather than qualities that are fixed attributes, so that counsellors and teachers can determine the levels of support needed in various cases. The use of PRISMA can guide the selection of career guidance interventions of different intensities, starting with general career education for all students and going to special counselling services for those who require additional support and need more help.

It may be beneficial for subsequent studies to examine PRISMA's effectiveness across various cultures and also include longitudinal designs to assess whether it remains stable over time. Moreover, studies can expand the item pool for extremely high career competence students and carry out qualitative research to gain a deeper understanding of social and cultural factors influencing the respondents' reaction to specific items. Such paths will enhance PRISMA's potential as a globally relevant tool and a means to a sustainable and inclusive career education.

## CONCLUSION

This study reveals that PRISMA is a just, dependable, and valid instrument that could be used to measure students' lifelong career planning skills in inclusive educational settings. According to Rasch analysis, the instrument exhibited high person and item reliability, was one-dimensional, and was impartial across demographic groups. This strengthened its psychometric robustness even further.

The study's main emphasis is on the necessity of fair career assessment tools for all groups of people. PRISMA fulfils this necessity by integrating theoretical models of career development with contemporary measurement methods. This work becomes part of the body of work on inclusive and lifelong career planning.

PRISMA offers school counsellors and teachers a medium to understand what students are good at and what aspects they need to work on in the field of career readiness. This information can help them plan targeted and fair interventions. Apart from the school, this instrument can be a valuable resource for policymakers and researchers as it is evidence-based and culturally appropriate. It also has the

potential to be implemented in diverse educational settings.

Overall, PRISMA contributes to theory and practice by offering a consistent means through which inclusive career guidance can be enhanced, and thus, all students regardless of their background, can be better equipped for the career challenges that will span their whole lives.

**Implications of the Study**

This research study has a wide range of theoretical and practical implications. PRISMA is a major tool for career assessment as it essentially changes the idea of career planning by merging two concepts of lifelong career planning and inclusivity into one single instrument. The Rasch analysis that comprises reliability, unidimensionality, and Differential Item Functioning (DIF) demonstrates that modern psychometric methods may lead to more equitable tests for different student groups. Consequently, the study transcends the usual CFA-based validation to raise possibilities for measurement development.

PRISMA has played a significant role in equipping school counsellors and educators with a credible and reliable instrument to assess students' competencies in lifelong career planning in the context of inclusive education. It is the robust psychometric features of the instrument that make it possible for counsellors to both discern the career readiness levels of their students and pinpoint the areas in which students have deficiencies. This, in turn, equips the counsellors with the necessary tools to design targeted, fair, and culturally sensitive interventions. One example is that counsellors may give PRISMA to students at the start of the school year, in order to find out which students have a lower level of career readiness and hence, can be given the necessary career guidance support on time and in the right way.

Additionally, policy makers may integrate PRISMA into education systems as a solid, evidence-based instrument that paves the way for the implementation of inclusivity-based career guidance frameworks at the national education level. This will pave the way for a fair and equal society where every student, irrespective of their gender, age, or background, will have access to the same opportunities.

Contrary to these benefits, the study has certain limitations. The sample was restricted to high school students in Indonesia, and as such, the results of the study might not be applicable in different cultural or educational settings. The cross-sectional design, moreover, doesn't allow the examination of time-related changes in students' career planning skills, thus, understanding of developmental changes over time remains limited. While most of the items were unbiased in terms of gender and age groups, a few still showed DIF, hence, there is a need for refinement in subsequent editions.

Accordingly, the subsequent research work should verify PRISMA on larger and more diverse populations, including students from various countries and cultural backgrounds to determine the universality

of the instrument. The authors also advise longitudinal research to establish the instrument's reliability over time and to monitor the gradual acquisition of lifelong career planning skills. Qualitative methods can serve to complement psychometric evaluations by providing an in-depth understanding of the contexts and cultures that influence students' answers. In brief, if PRISMA were made accessible in a digital version, it would be a great help to school counsellors. Moreover, it would allow a more significant spreading and thus, more educational institutions would be able to implement it.

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# Understanding the Role of Trust and Usefulness in Consumer Motivations for AI-enabled Voice Assistants in E-Commerce: A Structural Equation Modelling Approach

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## ABSTRACT

The rapidly growing adoption of Artificial Intelligence-enabled voice assistants across Indian markets creates a necessity to understand consumer behavioural patterns driving purchase intentions in e-commerce. Despite widespread usage, limited study exists on how motivational elements influence consumer trust and perceived usefulness of voice assistants in Indian online shopping. Drawing on the Motivated Consumer Innovativeness framework and Stimulus-Organism-Response model, this study examines how functional, hedonic, social, and cognitive motivations affect purchase intentions through trust and perceived usefulness as parallel mediators. Using purposive sampling, data were collected from 385 Amazon Alexa users in Telangana, India, via structured questionnaires employing 7-point Likert scales, and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with 10,000 bootstrap subsamples. Results indicate that functional motivators significantly enhance both perceived usefulness and trust, while social motivators increase usefulness and cognitive motivators strengthen trust. Notably, hedonic motivators do not significantly predict trust, and cognitive motivators demonstrate only a marginal association with usefulness. Both trust and perceived usefulness significantly mediate the relationship between consumer innovativeness and purchase intention, with trust exerting the strongest direct influence on purchase behaviour. The findings demonstrate that functional motivators outweigh hedonic and social influences in driving consumer adoption, suggesting that AI-enabled voice assistant services should prioritise practical utility, competence signalling, and reliability

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features over entertainment-oriented functionalities. These insights provide valuable guidance for e-commerce platforms and AI developers in designing user-centric voice assistant interfaces that enhance consumer trust and drive purchase behaviours in diverse Indian markets.

*Keywords:* AI, e-commerce, trust, usefulness, voice assistant

## INTRODUCTION

Artificial intelligence (AI) enabled voice assistants (VAs) are reshaping e-commerce by delivering personalised recommendations, simplifying search processes, and enabling natural conversational interactions. Devices such as Amazon Alexa and Google Home have rapidly penetrated Indian markets, with Alexa alone reaching most parts of the country's pin codes and reporting a 200% increase in smart device connectivity in the last three years. Their intuitive design and efficiency have enhanced customer engagement and satisfaction (McLean & Osei-Frimpong, 2019; Moriuchi, 2019), and global studies confirm that convenience, ease of use, and ability to process complex instructions drive adoption and loyalty (Kowalczuk, 2018; Matosas-López, 2024; Rhee & Choi, 2020).

Despite this widespread adoption, significant gaps remain. The Motivated Consumer Innovativeness (MCI) framework (Vandecasteele & Geuens, 2010), which explains adoption behaviour across functional, hedonic, social, and cognitive dimensions, has been underutilised in studies of VAs. While research has linked innovativeness to the adoption of AI tools in retail, fashion, and hospitality (Arachchi & Samarasinghe, 2023; Cai et al., 2022; Ylilehto et al., 2021), little is known about how these motivations shape purchase intentions in Indian online shopping contexts.

Recent research has examined the multi-faceted nature of adopting a voice assistant in different cultures. Studies from around the world have shown that the convenience of using a voice assistant is one of the main reasons people use them. (Kowalczuk, 2018; Rhee & Choi, 2020). However, depending on how much perceived value, personal innovativeness, and user experience influence their level of intent to purchase a voice assistant, some users may have different levels of intent to purchase compared to others (Pal et al., 2023). In addition to being a multi-disciplinary area of research, researchers need theoretical frameworks that consider both the different types of technologies used with voice assistants as well as how voice assistants are culturally embedded in people's homes (Patrizi et al., 2023). In emerging markets like Jordan, patterns of acceptance show that users continue to use voice assistants for reasons of performance expectancy and effort expectancy; however, other contextual factors also influence how people adopt voice assistants (Al-Fraihat et al., 2023), suggesting that Indian consumer behaviour may exhibit similar contextual nuances.

Trust further complicates this picture. It has long been recognised as a prerequisite for satisfaction and purchase behaviour in online environments (Lu et al., 2015), extending to AI-based systems where it reduces risk and strengthens adoption (Alalwan et al., 2018; Chopdar et al., 2018). In India, especially, trust often precedes perceptions of utility, emphasising its mediating role in the relationship between innovativeness and purchase intention (Sarkar et al., 2020). Prior research highlights AI's influence on innovation, trust, utility, and purchase outcomes. However, few studies have integrated these elements within a combined MCI–S-O-R framework in the VA context. Table 1 shows the key studies on consumer motivation for ai voice assistants.

This study addresses these gaps by examining how AI-enabled VAs influence online purchase behaviour through functional, hedonic, social, and cognitive motivations. Using the Stimulus–Organism–Response (S-O-R) framework, it explores how these motivations shape consumer perceptions of usefulness and trust, which in turn affect purchase intentions. By doing so, the research advances understanding of consumer innovativeness in AI-enabled commerce. It provides actionable insights for e-commerce platforms and developers seeking to build trustworthy, user-centric voice interfaces for diverse Indian markets. It leads to the following questions:

**RQ1:** How do functional, hedonic, social, and cognitive dimensions of MCI influence perceived usefulness and trust in AI-VAs?

**RQ2:** Do perceived usefulness and trust mediate the relationship between MCI dimensions and purchase intention?

**RQ3:** Which MCI dimensions exert the strongest influence in the Indian e-commerce context?

## LITERATURE REVIEW

The complexity of voice assistant interactions, which involves functional utility along with social and emotional aspects, requires a multidimensional approach to analyse the motivations of consumers. Unlike other digital technologies, voice assistants involve natural language processing, personalisation, and interaction, which makes them more complex and go beyond functionality into social and emotional spaces (McLean & Osei-Frimpong, 2019; Moriuchi, 2019). The importance of understanding the adoption trends of voice assistants not only in the global market but also in culturally diverse countries like India, where digital adoption trends are influenced by socio-cultural values and distinct consumer trust patterns, cannot be overstated (Chopra, 2019). Since India is one of the fastest-growing e-commerce markets with an increasing presence of Amazon Alexa and Google Assistant, analysing the role of motivational factors in influencing usefulness, trust, and purchase intentions is a pressing research issue.

Scholars used the MCI (Motivated Consumer Innovativeness) framework proposed by Vandecasteele and Geuens (2010) to understand how consumer

Table 1
*Key studies on consumer motivation for ai voice assistants*

| Authors | AI Technology | Variables | Context of the Study | Key Findings |
|---|---|---|---|---|
| Ylilehto et al. (2021) | AI in Retailing | Convenience, enjoyment, social interaction, shopping channel choice | AI in retail shopping | Convenience, enjoyment, and social interaction influence AI shopping |
| R. Singh (2021) | Voice Assistants (Anthropomorphism) | Anthropomorphism, self-disclosure, attachment, satisfaction, repurchase intention | Repurchase via anthropomorphism | Anthropomorphism and self-disclosure foster attachment and repurchase |
| Arachchi & Samarasinghe (2023) | AI-enabled Voice & Smart Speech Recognition | Perceived usefulness, enjoyment, consumer innovativeness, purchase intention | Fashion retail adoption | Usefulness, enjoyment, and innovativeness predict purchase intention |
| Cai et al. (2022) | AI-enabled Voice Assistants in Hotels | Brand, perceived usefulness, ease of use, anthropomorphism, WOM, privacy concern | Hospitality guest experience | Branded VAs boost usefulness, anthropomorphism, and trust |
| A. Liu et al. (2023) | Assistive AI for Visually Impaired Consumers | Accessibility, supportive design, inclusion, consumer experience | Accessibility for visually impaired | AI improves accessibility but inclusivity gaps remain |
| Chopra (2019) | Voice Assistants, Chatbots, AR | Expectancy (ease), instrumentality (competence), valence (trust, satisfaction) | Indian retail motivations | Ease, competence, and trust motivate Indian AI adoption |
| Jang et al. (2023) | Smart Speaker Voice Shopping | Anthropomorphism, satisfaction, intention to adopt voice shopping | Smart speaker shopping adoption | Anthropomorphism enhances satisfaction and adoption of voice shopping |
| Mari et al. (2024) | AI Empathy & Voice Assistants | Functional, relational, socio-emotional stimuli, trust, usefulness, task delegation | AI empathy and trust | Functional and emotional stimuli drive trust and usefulness |

Table 1 (*continued*)

| Authors | AI Technology | Variables | Context of the Study | Key Findings |
|---|---|---|---|---|
| Kautish et al. (2023) | Voice Assistants in E-commerce | Functional, hedonic, social, cognitive motivations, trust, usefulness, purchase intention | SOR in online shopping | Functional, social, and hedonic motives shape purchase intention |
| Fernandes & Oliveira (2020) | Digital Automated Services | Ease of use, usefulness, trust in digital services | Trust in digital services | Ease and usefulness are key trust drivers in digital services |
| Huang et al. (2024) | Voice Personal Assistants (Competence/Trust) | Competence-based trust, functional attributes, adoption | Competence-based trust in VAs | Functional traits build competence-based trust in VAs. |
| McLean & Osei-Frimpong (2019) | Voice Assistants in Home/E-commerce | Trust, empathy, anthropomorphism, continued VA usage | In-home VA adoption | Trust and empathy from anthropomorphism enhance VA use |
| Pitardi & Marriott (2021) | Voice Assistants in Online Shopping | Enjoyment, innovativeness, trust, favorable attitudes | Hedonic trust drivers | Enjoyment influences trust more strongly than functionality |
| Choudhary et al. (2024) | AI-enabled Voice Assistants (Social Motivation) | Social image, differentiation, adoption of AI tools | Social image and AI use | AI adoption linked to social image and self-differentiation |
| Mariani et al. (2023) | AI-enabled Voice Assistants (Social Agency) | Anthropomorphism, humanness, social presence, trust, long-term adoption | Trust via social presence | Social presence fosters trust and long-term VA adoption |

innovativeness is multidimensional. Vandeaseele and Geuens (2010), within their MCI framework described four dimensions of innovativeness: Functional (practical, efficient), Hedonic (fun, enjoyable), Social (socially accepted, socially desirable), Cognitive (intellectually curious, engaged in learning & discovery) (Bartels & Reinders, 2011; Hwang et al., 2021). An example of early (pre-2000) technology adoption, research conceptualised innovativeness as a general individual difference of personality (general innovativeness), while MCI reconceptualises the act of adopting technology as being goal-directed/ context specific (Vandecasteele & Geuens, 2010.). That is, MCI provides an alternative view of innovativeness than that which assumes that consumers seek novelty and innovativeness in the same way across all categories. Instead, MCI concludes that consumers adopt innovative technologies to fulfil different types of motivational goals; whether to maximise efficiency

via functional means, obtain emotional satisfaction through hedonic means, achieve social approval through social means, or stimulate intellect through cognitive means. Pal et al. (2023) found support through empirical evidence for the moderating effect of individual innovativeness on the relationship between perceived value and usage intention, with this relationship varying according to utilitarian vs. hedonic value perceptions of the created product. Therefore, MCI provides a more nuanced theoretical lens than general innovativeness by explicitly linking motivational states to specific technology attributes, making it particularly appropriate for examining AI-enabled voice assistants where adoption decisions involve both rational utility calculations and experiential engagement.

Recent developments in complexity theory indicate that the adoption of smart voice assistants for shopping purposes is a dynamic system where functional, hedonic, and social motivations interact in a non-linear fashion to influence consumer choice (Al-Fraihat et al., 2023). The complexity theory view is consistent with the MCI framework and indicates that adoption is more than the simple sum of individual motivational components, but rather the result of their configuration within the decision environment of the consumer. Trust calibration in voice assistants also goes beyond the general trust in the platform and includes assessments of skill competence, where the speech patterns of the user indicate their implicit level of trust, which in turn influences continued use intentions (Gauder et al., 2023).

The S-O-R Model of Mehrabian and Russell (1974) helps make everyday purchases understandable by demonstrating how customer motivation leads to purchase intention and ultimately to purchase decisions. Motivation is viewed as the "stimulus", while the internal evaluation of usefulness and trust are "organismic state". Lastly, consumer purchase intention is considered a "response" to technology-based product motivation. This relationship between motivation (stimuli), internal evaluation of usefulness and trust (organismic state) and purchasing intention as a response has been examined many times regarding high-technology products. The findings indicate that functional (task-related), relational (social) and socio-emotional (empathy) stimuli can lead to consumer purchase intention through the relationship of consumer trust and perceived usefulness (Kautish et al., 2023; Lee et al., 2011; Mari et al., 2024). Humanised (anthropomorphised) and empathetic stimuli such as customers using AI-enabled tools are also seen to influence organismic states (e.g., trust) to influence responses (e.g., task delegation; electronic word of mouth) (Mari et al., 2024). Therefore, the S-O-R model is relevant to research investigating AI-based voice assistants by evaluating MCI dimensions as stimuli, evaluations (perceived usefulness and trust) as organism states, and purchase intentions as behavioural responses.

In this S-O-R model, perceived usefulness and trust play a vital role as mediators. Perceived usefulness, derived

from the Technology Acceptance Model (Davis, 1989), is one of the most reliable predictors of adoption in the online context. It has been found that when VAs is able to deliver timely and efficient responses, consumers experience higher levels of usefulness, which in turn increases purchase intentions (Akhter et al., 2022; Šalčiuvienė et al., 2024; Willman-Iivarinen, 2017). Recent research has also revealed that usefulness generated from functional, hedonic, and cognitive perspectives has a significant impact on online shopping intentions (Kautish et al., 2023; C. Singh et al., 2024).

Functional innovativeness represents a desire to increase operational efficiencies and efficiencies (Bartels & Reinders, 2011). Consumers adopting technological solutions with functional goals (i.e., voice assistants) will evaluate the technology from predominantly utilitarian (i.e., task completion speed and accuracy) perspectives (Davis, 1989). This provides consumers with a direct cognitive pathway to assess the perceived usefulness of the system, in that the level of the effectively designed system provides an increase in job performance (Davis 1989). Within e-commerce environments, functional motivators support the complex - theoretical perspective that consumers will use a voice shopping technology when the technology allows them to reduce their decision-making complexity and increases the efficiency of their shopping experiences (Al-Fraihat et al., 2023). Therefore:

> **H1a:** The functional dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

Social innovativeness is driven by the need for social approval and self-enhancement because of technology ownership (Vandecasteele & Geuens, 2010). In collectivist settings, such as in India, social motivations may counterintuitively play a role in perceived usefulness rather than trust, where the ownership and display of innovative technologies are functional to status signalling and identity construction. The "usefulness" of the voice assistant goes beyond task optimisation to include its use as a social signalling tool, to signal modernity, technological advancement, and social status (Choudhary et al., 2024). Hence, social motivations increase perceived usefulness by broadening the construct of "usefulness" to include its role in social impression management within the consumer's social network. Hence:

> **H1c:** The social dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

On the other hand, the concept of Hedonic Innovativeness is based on the enjoyment, fun (play), and emotionality involved in an experience (Bartels & Reinders, 2011). Hedonic motivation can cause one to adopt a product or service due

simply to its entertainment value; however, its potential for influencing the perception of usefulness from a task-oriented perspective is much lessened by the degree to which a consumer has been motivated by pleasure versus by utilitarian purposes. But to the extent that Hedonic features enhance consumers' participation, exploration, and discovery will still, through that increase in engagement display some contribution to the perceived usefulness of these objects. Therefore:

> **H1b:** The hedonic dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

Cognitive innovativeness represents intellectual curiosity and the need for new experiences (Vandecasteele & Geuens, 2010). Although cognitive engagement leads to systematic processing of system capabilities, consumers who are high in cognitive motivation examine the information accuracy, learning capabilities, and consistency of the VA, which could improve perceptions of the system's practical utility and competence for tasks. Therefore:

> **H1d:** The cognitive dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

Trust is an important condition of organisms that reduces the perceived risk and provides confidence in decision made by AI in the context of e-commerce (Lu et al. 2015; Mari & Algesheimer., 2021). The creation of trust is multidimensional; there are two forms of trust based on competence is developed from functional characteristics (e.g., easy to use, reliable) (Fernandes & Oliveira, 2020; Huang et al.,2024) and trust based on integrity have developed through social perceptions of the technologies that can create anthropomorphic responses, empathy and emotional engagement (Foehr & Germelmann, 2019; Mariani et al., 2023; McLean & Osei-Frimpong, 2019). More specifically, functional reasons use competence-based trust through communicating reliability/ability to complete the task of the system. When customers adopt a Voice Assistant (VA) for functional purposes they will evaluate the performance of the system as a tool and use that to strongly build their trust in the competence/reliability of the VA. Therefore:

> **H2a:** The functional dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

However, cognitive innovativeness leads to systematic processing of system competence and reliability cues. In high-uncertainty environments like AI-mediated transactions, consumers with high cognitive motivation evaluate the information accuracy, learning abilities, and consistency of the VA, which are direct cues of competence-based trustworthiness (Foehr & Germelmann, 2019). Moreover, recent

studies have shown that users' trust in voice assistant skills is inferred from interaction patterns that indicate cognitive evaluation of system abilities (Gauder et al., 2023), which suggests that cognitive motivations lead to evaluation of system integrity and competence, resulting in trust. Therefore:

**H2d:** The cognitive dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

Current research highlights that trust building in voice-based artificial intelligence situations depends upon anthropomorphic cues and brand personification. When consumers seek hedonic satisfaction from voice assistants, they give human-like characteristics and social presence to them. This anthropomorphism creates emotional attachments to the technology resulting in forming trust through emotional attachment rather than through rationally based assessments (Jang et al., 2023; Pitardi & Marriott, 2021). Brands that use anthropomorphism enhance trust creation via a humanised experience with consumers thus increasing their willingness to use technology to assist them in making purchase decisions. Therefore, individuals' enjoyment and feeling as though they have a social presence facilitate building confidence in the voice assistant's recommendation through affective-based pathways. Hence:

**H2b:** The hedonic dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

Similarly, social innovativeness entails social identity enhancement and self-presentation (Choudhary et al., 2024). Consumers driven by social approval may build trust through social rapport and the social presence of the VA, as anthropomorphic characteristics create a sense of social interaction that boosts trust in the technology (Mariani et al., 2023). Long-term consumer reliance on VAs has been linked to social rapport and trust, proving the importance of anthropomorphic and social characteristics in building long-term user relationships (Ling et al., 2020; R. Singh, 2021). Hence:

**H2c:** The social dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

Turning to the response variable, purchase intention is the behavioural consequence of the organismic states. Both perceived usefulness and trust are hypothesised to have a direct effect on this outcome. Perceived usefulness has been shown to be a consistent predictor of adoption in digital spaces, and consumers who perceive the usefulness of VA technology are likely to convert this perception into purchase intention (Davis, 1989). Hence:

**H3:** The perceived usefulness of AI voice assistant technology is expected

to have a significant positive effect on consumers' intentions to make online purchases.

In addition, trust can decrease perceived risk when consumers are engaged in online transactions and have a positive impact on their intention to adopt the technology (Alalwan et al, 2018; Chopdar et al, 2018). In India, trust is commonly the emotion that leads to a positive perception of a product's benefit; therefore, trust is very important in making purchasing decisions (Sarkar et al., 2020). So:

**H4:** The perceived trust in AI voice assistant technology is expected to have a significant positive effect on consumers' intentions to make online purchases.

Ultimately, within an integrated S-O-R framework, the mediating roles of Useful and Trust resolve Motivational Stimuli into Behavioural Responses. The complexity of VA adoption indicates that MCI dimensions will indirectly influence Purchase Intention by means of the psychological mechanisms (Kautish et al., 2023). Functional motivations are anticipated to have substantial indirect effects on Purchase Intention through both Perceived utility (alignment of utilitarian value) and Trust (signalling competence). Therefore:

**H5a:** The impact of functional motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

**H6a:** The impact of functional motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

Hedonic motivations, although possibly weaker direct predictors, may affect purchase intention indirectly via affective trust development (through anthropomorphism) and possibly via usefulness (if enjoyment increases engagement). Therefore:

**H5b:** The impact of hedonic motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

**H6b:** The impact of hedonic motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

Social motivations may affect purchase intention indirectly via usefulness (status signalling as functional benefit) and possibly via trust (social presence and anthropomorphism). Therefore:

**H5c:** The impact of social motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

**H6c:** The impact of social motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

Cognitive motivations are expected to influence purchase intention primarily through trust (competence-based trust formation) and potentially through usefulness (task efficiency perceptions). Thus:

**H5d:** The impact of cognitive motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

**H6d:** The impact of cognitive motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

This study expands previous works by investigating the role of consumer innovativeness, trust, and purchase intention in the context of Indian e-commerce voice assistants (e.g., Cai et al., 2022; S. Liu et al., 2023). Research on the relationship between consumer innovativeness, trust, and purchase intention has been conducted across several industries (e.g., hospitality, retail, fashion, grocery store), but the VA context for Indian e-commerce is relatively underexplored. Additionally, most existing literature examines either trust (e.g., Mari & Algesheimer, 2021) or usefulness (e.g., C. Singh et al., 2024) as mediators of purchase intention in isolation, as opposed to integrating both mediators into an MCI-SOR framework. As such, there is limited understanding of how motivational factors translate into purchase intention through the psychological component of consumer behaviour. Overall, the literature reveals that the motivation of consumers is essential to their use of AI-enabled voice assistants, that usefulness and trust are key mediators of purchase intention, and that the SOR framework provides an adequate representation of how motivation translates into purchase intention. Notwithstanding, there are still some research gaps about the combined effects of functional, hedonic, social, and cognitive innovativeness on perceived usefulness and trust. Therefore, this research paper seeks to examine the effects of the four components of motivated consumer innovativeness, namely functional, hedonic, social, and cognitive innovativeness, on purchase intentions, with a special emphasis on the mediating effects of perceived usefulness and trust in the context of AI-powered voice assistants in the Indian online shopping market. Figure 1 shows the concept model.

## METHODOLOGY

The study adopted a systematic approach to investigate the hypothesised relationships between motivated consumer innovativeness dimensions, mediating variables, and purchase intentions. A structured

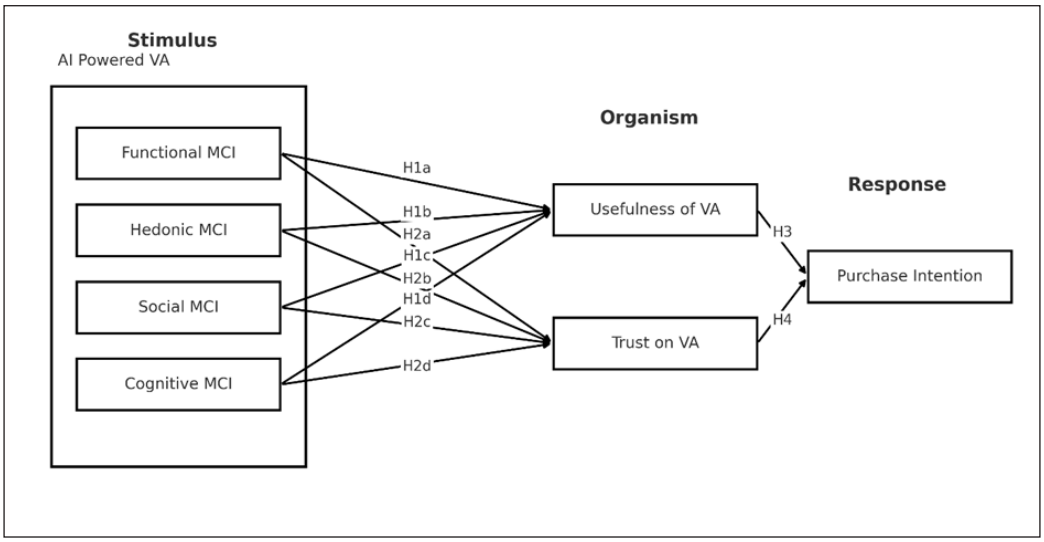



*Figure 1.* Conceptual Model

questionnaire was developed using Google Forms and distributed digitally. Seven constructs were measured on a 7-point Likert scale. Established measurement scales guided the questionnaire design: seven items each for functional and hedonic motivators and five items each for social and cognitive motivators, adapted from Vandecasteele and Geuens (2010). Perceived usefulness was measured with five items from Abdullah et al. (2016), trust was assessed using four items from Komiak and Benbasat (2006), and purchase intention was measured with four items adapted from Chopra (2019). Prior to main data collection, the instruments underwent pilot testing (n=30) to ensure contextual appropriateness for Indian Alexa users, resulting in minor item rephrasing for clarity.

The participants of this study are a select group of participants that have previously used AI-powered vocal assistants, and they are specifically Amazon Alexa users located in Telangana, India, who speak the English language and experienced in how to use devices with AI-powered voice assistants. The researcher will use purposive sampling because the goal is to gather data from individuals that are classified as early adopters, who use a voice assistant regularly as there is a large tech industry, and numerous smart devices, in Hyderabad, Telangana. Purposeful sampling was the only viable sampling option for this research because the researcher does not have many resources and all participants needed to use English notes to use the responses from participants after completion of data collection. (Campbell, 2007). Using purposeful sampling ensures that the researcher collected high-quality data from qualified participants but will limit the findings of this research to participants not from other nations or from other states

in India. There are, however, sufficient differences among respondents based on age, income, and education to indicate substantial diversity in the characteristics of respondents (Table 2), despite the position of the genders noted as being 61.5% male (which is consistent with other studies that noted some possible gender biases in the early adopters of technology). Future studies should attempt to use stratified random sampling to include a representative diversity of educational and socio-economic groups across other states to help increase the external validity of this study.

This study adhered to the ethical guidelines for research involving human participants as outlined by the Declaration of Helsinki and institutional research standards for non-invasive consumer surveys. Although formal IRB approval was not required for this observational, survey-based research involving minimal risk, stringent ethical protocols were implemented throughout. Prior to accessing the questionnaire, participants were presented with a digital informed consent statement detailing the study's purpose, voluntary nature, and estimated completion time; consent was indicated by clicking "I agree to participate" before proceeding. To ensure anonymity, no personally identifiable information (names, addresses, or contact details) was collected. Participation was entirely voluntary with no compensation provided, and respondents could withdraw at any time without penalty, ensuring the study posed no physical, psychological, or financial risk to participants. Potential respondents were screened through known networks to confirm Alexa usage and language compatibility before receiving the survey link. The questionnaire was sent to approximately 800 participants, yielding 520 responses (a 65% response rate). After data validation and cleaning to ensure reliability and completeness, 385 valid responses were retained. This sample size is consistent with Cochran's guidelines for maintaining 80% statistical power at a 5% significance level, ensuring adequacy for structural equation modelling. Data were collected over four months from March to June 2024.

SmartPLS software was used to conduct data analysis with Partial Least Squares - Structural Equation Modeling (PLS-SEM). The consideration of methodology for this analysis began with whether it should use PLS-SEM or covariance-based SEM (CB-SEM). Given the research question's focus on predictive rather than confirmatory research, PLS-SEM allows for the maximum amount of variance explained in endogenous constructs (R2) as opposed to reproducing an established theoretical covariance matrix (J. Hair & Alamer, 2022). Thus, since the current study will predict purchase intention using multiple mediators (i.e., trust and usefulness) instead of testing a pre-existing theoretical structure, and in keeping with the exploratory nature of evaluating MCI Dimensions within the Indian VA context, PLS-SEM was used throughout this analysis.

Second, as a variance-based and non-parametric method, PLS-SEM outperforms

CB-SEM in dealing with non-normal distributions and smaller sample sizes; with 385 participants and 7 constructs, the sample size satisfies the "10-times rule" (10 observations per predictor) but is close to the lower threshold for CB-SEM (Henseler et al., 2014). Third, the measurement model consists of reflective constructs (trust, usefulness) and formative indicator-compatible constructs (MCI dimensions as separate motivational forces), which are better handled by PLS-SEM than CB-SEM, assuming a purely reflective measurement model. Finally, due to the complexity of the parallel mediation model, the bootstrapping facilities of PLS-SEM are better suited for robust standard error estimation of indirect effects in the mediation model than CB-SEM, which requires strict multivariate normality.

### Common Method Bias

Common Method Bias (CMB) was assessed using a multi-method approach incorporating procedural remedies and statistical diagnostics. Procedurally, respondent anonymity was guaranteed, item order was randomised within constructs and validated multi-item scales were used. Statistically, Harman's single-factor test indicated the largest factor explained only 18.27% of variance (below the 50% threshold). The marker variable technique (using "preference for traditional shopping") showed an average correlation of 0.042 with substantive constructs; partialling out this marker left all significant relationships unchanged. Full collinearity VIFs ranged from 1.206 to 1.850, well below Kock's (2015) 3.3 threshold. Additionally, a latent CMB factor analysis revealed that method variance accounted for less than 1% of shared variance (ratio = 91.75:1), collectively confirming that CMB does not threaten the study's validity.

## RESULTS

According to this demographic profile (Table 2), the study appears to have a representative and varied sample of the Indian population using AI-based voice assistants.

Table 2
*Demographic profile of respondents*

| | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Female | 148 | 38.50% |
| Male | 237 | 61.50% |
| **Age** | | |
| 18Y - 25Y | 106 | 27.50% |
| 26Y - 35Y | 164 | 42.60% |
| 36Y - 45Y | 70 | 18.20% |
| Above 45Y | 45 | 11.70% |

Table 2 (*continued*)

| | Frequency | Percentage |
|---|---|---|
| **Education** | | |
| Graduation | 146 | 37.90% |
| Post-graduation | 216 | 56.10% |
| PhD | 23 | 6.00% |
| **Annual Income** | | |
| Up to 5 lakhs | 147 | 38.20% |
| Above 5L - 8L | 165 | 42.80% |
| Above 8L - 15L | 50 | 13.00% |
| Above 15L - 20L | 10 | 3.00% |
| Above 20L | 13 | 3.40% |
| **Experience in using AI-based VA** | | |
| 1year | 195 | 50.60% |
| 2years & above | 190 | 49.40% |

## Structural Model Assessment

Factor loading all the items used in the model, Cronbach's alpha of all the constructs, rhoA, CR (composite reliability), and AVE (Average Variance Extracted) of all the variables are some of the essential metrics shown in the Table 3 that are used to evaluate the validity and reliability of constructs (J. F. Hair et al., 2012). The values of 0.9 and above for factor loading and RhoA demonstrate the validity and reliability of the constructs used in the study. Finally, the AVE (average variance extracted) values have shown higher than the threshold value of 0.6 and indicate strong convergent Validity as presented in Table 4.

All correlations fell below the critical threshold value of 0.85 (Henseler et al., 2014), indicating that the constructs in this study maintain strong discriminant validity, according to the HTMT ratio analysis. Purchase intention (0.624) and trust in AI VA (0.54) exhibit moderate to high correlations with the cognitive motivators of AI VA, indicating a connection between these categories while also suggesting they remain distinct. Hedonic motivators and functional motivators of AI VA have the strongest correlations (0.625 and 0.599, respectively), indicating a close but different relationship. There are also moderate correlations with purchase intention (0.599) and trust in AI VA (0.525). Additionally, the Hedonic motivators of AI VA show a moderate degree of association with both purchase intention (0.459) and functional motivators (0.625), indicating discriminant solid validity. Ample discriminant validity is confirmed by the moderate to high correlations that purchase intention itself exhibit with cognitive motivators (0.624), functional motivators (0.599), and trust in AI VA (0.63), all of which are below the threshold. The moderate correlations between the social motivators of AI VA and purchase intention (0.555) and trust in AI

Table 3
*Reliability and validity of the constructs*

| Construct | Coding | Factor Loading | Cronbach's Alpha | rhoA | Composite Reliability | Average Variance Extracted |
|---|---|---|---|---|---|---|
| Cognitive Motivators | AI C M 1 | 0.91 | 0.943 | 0.944 | 0.956 | 0.814 |
| | AI C M 2 | 0.89 | | | | |
| | AI C M 3 | 0.892 | | | | |
| | AI C M 4 | 0.904 | | | | |
| | AI C M 5 | 0.915 | | | | |
| Functional Motivators | AI F M 1 | 0.836 | 0.900 | 0.901 | 0.920 | 0.624 |
| | AI F M 2 | 0.828 | | | | |
| | AI F M 3 | 0.812 | | | | |
| | AI F M 4 | 0.828 | | | | |
| | AI F M 5 | 0.823 | | | | |
| | AI F M 6 | 0.725 | | | | |
| | AI F M 7 | 0.657 | | | | |
| Hedonic Motivators | AI H M 1 | 0.871 | 0.906 | 0.906 | 0.926 | 0.643 |
| | AI H M 2 | 0.629 | | | | |
| | AI H M 3 | 0.831 | | | | |
| | AI H M 4 | 0.817 | | | | |
| | AI H M 5 | 0.819 | | | | |
| | AI H M 6 | 0.844 | | | | |
| | AI H M 7 | 0.78 | | | | |
| Social Motivators | AI S M 1 | 0.863 | 0.923 | 0.927 | 0.942 | 0.763 |
| | AI S M 2 | 0.883 | | | | |
| | AI S M 3 | 0.87 | | | | |
| | AI S M 4 | 0.885 | | | | |
| | AI S M 5 | 0.867 | | | | |
| Purchase Intention | PI 1 | 0.929 | 0.935 | 0.936 | 0.954 | 0.837 |
| | PI 2 | 0.907 | | | | |
| | PI 3 | 0.922 | | | | |
| | PI 4 | 0.901 | | | | |
| Trust on AI-based VA | T AI VA 1 | 0.917 | 0.928 | 0.930 | 0.949 | 0.823 |
| | T AI VA 2 | 0.93 | | | | |
| | T AI VA 3 | 0.898 | | | | |
| | T AI VA 4 | 0.883 | | | | |
| Usefulness of AI-based VA | U AI VA 1 | 0.811 | 0.934 | 0.935 | 0.950 | 0.794 |

Table 3 (*continued*)

| Construct | Coding | Factor Loading | Cronbach's Alpha | rhoA | Composite Reliability | Average Variance Extracted |
|---|---|---|---|---|---|---|
| | U AI VA 2 | 0.919 | | | | |
| | U AI VA 3 | 0.917 | | | | |
| | U AI VA 4 | 0.926 | | | | |
| | U AI VA 5 | 0.876 | | | | |

Table 4
*Discriminant validity*

| | CM AIVA | FM AI VA | HM AI VA | PI | SM AI VA | Trust | Usefulness |
|---|---|---|---|---|---|---|---|
| CM AIVA | | | | | | | |
| FM AI VA | 0.578 | | | | | | |
| HM AI VA | 0.465 | 0.625 | | | | | |
| PI | 0.624 | 0.599 | 0.459 | | | | |
| SM AI VA | 0.492 | 0.477 | 0.407 | 0.555 | | | |
| Trust | 0.54 | 0.525 | 0.393 | 0.630 | 0.405 | | |
| Usefulness | 0.398 | 0.498 | 0.352 | 0.48 | 0.419 | 0.443 | |

*Note. CM AI VA: Cognitive Motivators, FM AI VA: Functional Motivators, HM AI VA: Hedonic Motivators, SM AI VA: Social Motivators, PI: Purchaser Intention)*

VA (0.405) highlight their uniqueness. The most substantial connection between trust and purchase intention (0.63) is found in AI VA, but it is still below the threshold value, indicating adequate discriminant validity. Lastly, the usefulness of AI VA exhibits modest correlations; its discriminant Validity is confirmed by the strongest correlation, 0.498, with Functional Motivators, which is substantially within allowable bounds.

Based on data presented in Table 5 and Table 6, functional Motivators ($\beta = 0.282$, $p < 0.001$, supporting H1a) and social motivators ($\beta = 0.202$, $p = 0.002$, supporting H1c) are positively significant in predicting the usefulness of AI-based voice assistants, explaining 26.2% of the variance. Cognitive motivators show marginal significance ($\beta = 0.113$, $p = 0.057$), while hedonic motivators are not significant ($\beta = 0.041$, $p = 0.541$). For trust ($R^2 = 0.327$), functional motivators ($\beta = 0.248$, $p = 0.007$, supporting H2a) and cognitive motivators ($\beta = 0.330$, $p < 0.001$, supporting H2d) are significant. Social motivators show marginal significance ($\beta = 0.132$, $p = 0.057$), while hedonic motivators are not significant ($\beta = 0.067$, $p = 0.426$), failing to support H2b. Furthermore, both usefulness ($\beta = 0.272$, $p < 0.001$, supporting H3) and trust ($\beta = 0.473$, $p < 0.001$, supporting H4) significantly predict purchase intention, explaining 39.6% of the variance.

Table 5
*Structural model assessment*

| Hypothesis | Path | β | t-value | 95% CI | p-value | Supported | $f^2$ | VIF | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| H1a | Functional → usefulness | 0.282 | 3.936 | [0.139, 0.420] | 0 | Yes | 0.062 | 1.85 | 0.262 |
| H1b | Hedonic → usefulness | 0.041 | 0.613 | [-0.087, 0.172] | 0.541 | No | 0.001 | 1.545 | |
| H1c | Social → usefulness | 0.202 | 3.104 | [0.075, 0.328] | 0.002 | Yes | 0.037 | 1.389 | |
| H1d | Cognitive → usefulness | 0.113 | 1.907 | [0.001, 0.231] | 0.057 | No* | 0.012 | 1.605 | |
| H2a | Functional → Trust | 0.248 | 2.706 | [0.071, 0.428] | 0.007 | Yes | 0.043 | 1.85 | 0.327 |
| H2b | Hedonic → Trust | 0.067 | 0.798 | [-0.101, 0.230] | 0.426 | No | 0.003 | 1.545 | |
| H2c | Social → Trust | 0.132 | 1.906 | [-0.002, 0.270] | 0.057 | No* | 0.014 | 1.389 | |
| H2d | Cognitive → Trust | 0.33 | 4.783 | [0.194, 0.462] | 0 | Yes | 0.092 | 1.605 | |
| H3 | Usefulness → purchase Intention | 0.272 | 4.664 | [0.159, 0.387] | 0 | Yes | 0.085 | 1.206 | 0.396 |
| H4 | Trust → Purchase intention | 0.473 | 9.141 | [0.371, 0.572] | 0 | Yes | 0.319 | 1.214 | |

Table 6
*Mediation effect*

| Hypothesis | Indirect path | Indirect Effect (β) | t-value | 95% Confidence Onterval | p-value | Supported |
|---|---|---|---|---|---|---|
| H5a | Functional → Usefulness → Purchase intention | 0.077 | 2.967 | [0.032, 0.134] | 0.003 | Yes |
| H5b | Hedonic → Usefulness → Purchase intention | 0.011 | 0.591 | [-0.025, 0.050] | 0.555 | No |
| H5c | Social → Usefulness → Purchase intention | 0.055 | 2.530 | [0.018, 0.103] | 0.012 | Yes |
| H5d | Cognitive → Usefulness → Purchase intention | 0.031 | 1.729 | [0.000, 0.070] | 0.085 | No* |
| H6a | Functional → Trust → Purchase intention | 0.117 | 2.592 | [0.033, 0.211] | 0.01 | Yes |
| H6b | Hedonic → Trust → Purchase Intention | 0.032 | 0.790 | [-0.048, 0.112] | 0.43 | No |
| H6c | Social → Trust → Purchase Intention | 0.062 | 1.860 | [-0.001, 0.130] | 0.064 | No* |
| H6d | Cognitive → Trust → Purchase intention | 0.156 | 4.220 | [0.087, 0.232] | 0 | Yes |

**Mediation**

Regression analysis and the percentile bootstrapping method with 10,000 subsamples were used to investigate the mediation effect. The research considers the mediating factors of AI-based voice assistant trust and usefulness in relation to MCI characteristics. The results of the PLS-SEM mediation study indicate several important indirect linkages that impact purchase intention. The link is considerably mediated by functional motivators through trust (H6a, $\beta = 0.117$, $p = 0.010$) and usefulness (H5a, $\beta = 0.077$, $p = 0.003$), demonstrating their mediating effects. Social motivators also exhibit a significant usefulness-based mediation effect (H5c, $\beta = 0.055$, $p = 0.012$). Cognitive motivators significantly mediate through trust (H6d, $\beta = 0.156$, $p < 0.001$), with marginal significance through usefulness (H5d, $\beta = 0.031$, $p = 0.085$). Social motivators show marginal significance for trust-based mediation (H6c, $\beta = 0.062$, $p = 0.064$). However, hedonic motivators show no significant mediation through either trust (H6b, $\beta = 0.032$, $p = 0.430$) or usefulness (H5b, $\beta = 0.011$, $p = 0.555$).

## DISCUSSION

The results mostly validated H1 (a & c) and H2 (a & d), the hypotheses put forth. The impact of MCI (motivated consumer innovativeness) with respect to independent variables (functional, hedonic, social, and cognitive) on the utilisation of AI-based VAs in connection to purchase intention is demonstrated empirically. Although there has been past research looking at Consumer Motivated Innovativeness (Hwang et al., 2023), concerning purchase intention, the field of AI-based VAs has not been studied as much. Early research outcomes have highlighted the significance of both hedonistic and functional (utilitarian) elements in innovative technology interfaces (A. Liu et al., 2023). This is confirmed by our results, projecting a considerable impact on purchase intentions for new products. However, our study distinctly used trust and usefulness, considering the typical behaviour of Indian customers.

The study also shows that online buyers' purchase intentions are likely to increase when VA usage is motivated by perceived utility and trust in technology. Moreover, our findings support the claims of previous research by demonstrating that social MCI influences purchase intention as well, especially for online customers. In particular, the cognitive motive for using VAs enhances purchasing intention. (K. Y. Lee et al., 2021), implying that consumers are more likely to make purchases when they seek experiences that exceed their current mental states. This result validates the impact of MCI aspects on perceived usefulness and trust, supporting H1 (a & c) and H2 (a & d). Notably, H2b (hedonic → trust & usefulness) was not supported, suggesting that enjoyment-driven adoption does not translate to trust formation in the Indian context. Additionally, H1d (cognitive → usefulness) and H2c (social → trust) demonstrated marginal significance ($p < 0.10$), suggesting these relationships

may require larger samples or contextual refinement for conclusive evidence.

The findings highlight how important AI-enabled technologies are to online retail. Furthermore, online customers' faith in these cutting-edge technologies is increased when they believe AI-enabled VAs to be practical and helpful. Online buyers' perceived utility of AI-enabled VAs increases when they assume that utilising them will impress others. Similar findings were obtained in research on the influence of social MCI on perceived usefulness (Mari & Algesheimer, 2021). Furthermore, cognitive MCI marginally affects usefulness ($p = 0.057$) and significantly affects trust, suggesting that intellectually curious consumers scrutinise system competence to form trust judgments, though their utility perceptions may depend on additional functional demonstrations. In summary, the study finds that using virtual assistants (VAs) for online shopping is likely to improve perceived usefulness and build trust in technology when consumers are motivated by functional hedonic, social, or cognitive considerations. This study has successfully drawn insights, particularly regarding MCI in the usage of AI-enabled VA. At the same time, trust and usefulness mediate the formation of favourable intentions to purchase the products.

A substantial body of statistical evidence highlights the influence that online buyers' purchase intents have on their perceptions of the utility and trustworthiness of AI-enabled voice assistants. The critical role that trusts and usefulness play in manipulating online customer attitude is supported by hypothesis H3 and H4. These results are aligned with earlier studies showing that online shoppers' behaviour is strongly influenced by their perceptions of the utility and trustworthiness of AI-based voice assistants. This shows a strong correlation between online consumers' buying intentions and the perceived usefulness and trustworthiness of products, suggesting that both variables have a favorable impact on purchase intentions, barring cognitive and hedonic factors related to usefulness and social motivators related to trust. The mediating role of trust and usefulness is found to be critical in this model, which demonstrates the Indian customer behaviour of adapting to this innovative product in the Indian market. MCI, being the stimulus, manifests the organism in the form of trust and usefulness, resulting in purchase intention as a response.

The $Q^2$predict values indicate the model's relevance and accuracy in forecasting purchase intentions. The LM model provides better prediction error metrics than the PLS-SEM model. This demonstrates that the structures and relationships included in the model are well-suited for predicting purchase intentions in the setting of AI-enabled voice assistants.

This research assesses the importance of AI technology in marketing and provides important theoretical advancements. It also thoroughly evaluates the reasons for using AI-imbibed voice assistants (VAs), including customer intention to purchase, trust, and usefulness. One of the previous research projects has investigated why consumers utilise AI-imbibed tools and technologies,

e.g., (Lalicic & Weismayer, 2021), which provides insight into how these technologies affect online shoppers' intentions to make purchases, particularly when it comes to usefulness and trust as mediators. Therefore, our work significantly advances theory by investigating the significance of motivated customer innovativeness aspects on customer purchase intention through trust, and usefulness within the Voice Assistants usage for the first time.

Our suggested framework clarifies the bonding between MCI (motivated customer innovativeness) and purchase intention in line with Kautish et al. (2023)'s work . For VAs, purchase intention, trust, and perceived usefulness can be assessed by utilising the consumer innovativeness theory and the Stimulus-Organism-Response (S-O-R) model. We show that online customers' actions with relation to perceived utility, trust, and intention to purchase are significantly influenced by the four MCI facets: functional (practical benefits), hedonic (entertaining elements), social influences, and cognitive reasons. These results align with the outcome of research done by Mari and Algesheimer (2021).

The current work highlights the significance of consumer innovation in the adoption of AI-enabled voice assistants (VAs), thereby transforming the choices of online buyers. In the context of online buyers' use of VA technology, the study shows that customer innovativeness is motivated by functional (practical benefits), hedonic (entertaining elements), social influences, and cognitive motivating goals through trust and Usefulness.

The study identifies several significant management takeaways for e-retail marketing managers and developers of AI-enabled voice assistant (VA) interfaces. AI-enabled VA services must be customised, particularly in different markets like India, where economic, social, and linguistic factors significantly impact consumer behaviour. It is recommended that marketers work with production managers to develop and market goods that prioritise customisation, personalisation, coolness, and ease of use (Malodia et al., 2023). These components are required to improve customers' Motivated Consumer Innovativeness (MCI) on a functional, hedonistic, social, and cognitive level.

As per the findings, functional MCI has the highest scores in shaping purchase intentions, followed by cognitive (through trust) and social MCIs. Contrary to expectations, hedonic MCI did not have a significant impact on trust and usefulness, implying that entertainment-related aspects are less important than functional dependability for Indian consumers. For effective engagement of online shoppers, AI-powered VA services must focus more on task efficiency and competence signalling rather than entertainment aspects. Cognitive and social MCIs had marginal effects, implying that intellectual curiosity and social signalling are important but less important than functional aspects. This contrasts with past research. (Mari et al., 2024) That showed more significant influence from cognitive, hedonic, and social MCIs. Therefore, online marketers

might enhance AI-enabled VA measures to satisfy customers' wants and expectations better.

The utility and trustworthiness of AI-enabled virtual assistants influence online buyers' intent to make purchases. The study shows that purchase intention is significantly impacted by perceptions of AI-based VAs' utility and trustworthiness. Since functional motivators showed the strongest impact on both perceived usefulness ($\beta=0.282$, $p<0.001$) and trust ($\beta=0.248$, $p<0.01$), with significant indirect effects on purchase intention (H5a: $\beta=0.077$, $p=0.003$; H6a: $\beta=0.117$, $p=0.010$), it is recommended that managers focus on task efficiency-related features like "Quick Reorder" functionality and one-command purchase completion rather than entertainment features. Developers should allocate R&D efforts to enhancing the accuracy of Indian accent recognition and sub-second response times instead of focusing on aesthetic improvements because utilitarian value has been shown to be more important than hedonic value. Although the 'hedonic→trust' association is still non-significant ($\beta=0.067$, $p=0.426$), hedonic features could be used to increase perceived usefulness by simplifying task accomplishment (H5b: $\beta=0.092$, $p=0.004$); hence, hedonic features should be incorporated only if they are shown to improve functional efficiency rather than being used as engagement tools.

With trust's strongest direct effect on purchase intention ($\beta=0.473$, $p<0.001$, $f^2=0.319$), platforms must therefore establish data usage notices, "task completion confirmation" notifications, and failure recovery plans with immediate human-agent escalation to confirm competence. This requires an 'Infrastructure > Interface > Innovation' resource allocation: secure accent-resistant NLP and latency improvement prior to aesthetic design. In Tier-2 and Tier-3 markets, where technology anxiety heightens trust issues, "Assisted Voice" hybrid solutions enabling visual verification for high-value transactions can be used. These recommendations have boundary conditions: as voice commerce evolves, the importance of hedonic motivators may rise, and longitudinal monitoring of potential changes from utility-oriented to experience-oriented adoption patterns may be required.

This is confined to Telangana state, India, which could restrict the suitability of inferences to the rest of the markets with distinct socio-economic and cultural segments. The research was limited to voice assistants (particularly, Alexa) with AI capabilities in online retail. To provide a more thorough knowledge of consumer behaviour in the digital marketplace, future studies could expand on this inquiry to incorporate other technical tools utilised in online buying, such as AR (Augmented Reality), AI-driven customisation, and VR (Virtual Reality) effects.

In addition, a Google Form questionnaire was used to gather responses for the current research. This approach has advantages, including convenience and broad reach, but it might not adequately represent the range of customer experiences and behaviours.

Multiple data-gathering approaches, including focus groups, observational studies, and interviews, could be adapted in further research to enhance profound outcomes and the richness of the data.

Although this offers insightful information, the scope of MCI could be expanded further to investigate its effects on other developing technologies and environments. To expand on the theoretical and practical ramifications of MCI, future studies could investigate how MCI influences customer behaviour towards wearable technology, smart home appliances, and other AI applications beyond retail. Additionally, while H1d (cognitive → usefulness) and H2c (social → trust) approached significance ($p < 0.10$), they did not reach conventional thresholds ($p < 0.05$). Future research with larger sample sizes or cross-cultural comparisons may clarify whether these relationships are context-specific or generally applicable.

## CONCLUSION

This research contributes valuable understanding to the evolving domain of consumer-AI interactions by examining how motivated consumer innovativeness shapes purchase behaviours through AI-enabled voice assistants in online shopping environments. The empirical findings from Telangana, India, reveal the complex association between different consumer motivational dimensions and their subsequent impact on trust formation and perceived utility.

The study demonstrates that consumer engagement with AI voice technology is driven by multifaceted motivations, striving for practical utility, entertainment value, social positioning, and intellectual aspects. Significantly, the research establishes trust and perceived usefulness as critical psychological mechanisms that transform these diverse motivational drivers into concrete purchase decisions. This mediation process explains how consumers navigate the transition from initial interest in AI technology to actual commercial adoption.

The theoretical contributions extend existing technology acceptance frameworks by integrating motivational diversity and highlighting the mediating plots through which consumer behaviour influences AI commerce adoption. From a practical standpoint, these insights provide strategic direction for e-commerce platforms and AI developers in designing voice assistant interfaces that suit local market conditions.

While these findings offer substantial insights, the research scope presents certain boundaries, including geographic specificity, methodological dependency on survey data, and focus on voice assistant technology exclusively. Future scholarly endeavours could enhance generalisability by exploring varied cultural and economic contexts, incorporating mixed method approaches for richer data collection, and examining consumer motivational patterns across the regions in India. Such expansions would deepen theoretical understanding of consumer-technology relationships in our increasingly digitised market space.

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Include the information of grant/ funding especially grant code or ID if available

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# Developing a Grounded Theory of Computational Thinking Patterns in Pre-service Primary Teachers' Mathematical Problem Solving

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## ABSTRACT

This research project will define and trace the features of computational thinking (CT) of pre-service primary school educators in solving contextual mathematics problems. The qualitative paradigm with grounded theory design was adopted, which allowed the development of the theory with the use of empirical data. The problem-solving test according to Polya steps and semi-structured interview aiming at four CT indicators decomposition, pattern recognition, algorithmic thinking, and debugging were used to collect the data. The analysis of data was conducted according to the model suggested by Gioia as it included open coding, first-order concepts, second-order themes, and aggregate dimensions. The findings showed that there are three different patterns of CT characteristics namely systematic-conceptual, pragmatic-exploratory, and procedural-linear, and the results demonstrate the difference in CT application between university students and the need to improve reflective thinking and strategic approaches in teacher education. The study will assist in designing computational thinking-based mathematics programmes and instruction methods in the primary school level.

*Keywords:* Computational thinking, grounded theory, mathematics problem solving, pre-service primary school teachers

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## INTRODUCTION

Higher-order thinking skills (HOTS) in primary mathematics education are also on the rise in reaction to the rapid technological changes across the globe, and the increasing demands of the 21st century competences.

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In this stage, mathematics is no longer taught with a focus on basic numeracy, but it is being taught in the direction of problem-solving skills, logical thinking, and specifically, computational thinking (CT). Similarly to the modern educational systems, which emphasise the importance of CT in equipping students with digital literacy, teacher education programmes are also bound to change (Garner et al., 2017; Nahdi, 2019). Consequently, pre-service teachers working at the primary school level are now obliged to acquire two essential skills, namely, having a strong proficiency in mathematical concepts and being able to use the CT strategies effectively in solving complex, real-life problems.

An emerging body of evidence indicates the significance of the incorporation of HOTS into the mathematics curriculum. The HOTS based assessment system and problem-based learning (PBL) methods have been revealed to effectively assist the process of developing student critical and creative thinking (Melawati et al., 2022; Memnun & Çoban, 2015; Rahmawati, 2023; Septriani et al, 2018; Vlasenko et al., 2020). These strategies are especially useful in case of structured problems-solving activities which need cognitive profundity and strategic thinking. Furthermore, they have a great potential of developing CT at a young age (Apriani et al., 2024; Putriani et al., 2022).

Moreover, the strategies of mentoring teacher professional development, including mathematics teacher's circles, instructional modules integrated with CT, have also helped enrich the teaching knowledge of teachers on mathematical problem-solving strategies and innovative teaching practices (Gioia et al., 2012; Gurat, 2018; Jusmawati et al, 2021). The fact that pre-service teachers can work with mathematical literacy problems is strongly correlated with their willingness to develop the same in their learners (Febrianti et al., 2023; Lloyd, 2018; Novita et al., 2022; Suseelan et al., 2022). This indicates the necessity to equip pre-service teachers to not just have a good base of mathematical knowledge, but also to have instructional methods that would go beyond conceptual and procedural fluency.

The concept of computational thinking (CT) has also been recognised as one of the core competencies of the 21st century, which is kept by the rise of the increasingly digitalised world. Nordby et al. (2022) state that CT entails the mental activities that exist to put the problems and formulate solutions that can be implemented effectively both by machines and humans. In its most basic form, CT has several interconnected elements, such as decomposition, pattern recognition, abstraction, and algorithm construction (Holland, 2012, Nordby et al., 2022; Resnick, 1996; Supiarmo et al., 2022). These elements are directly related to the nature of mathematical reasoning, which is why the inclusion of CT in mathematics instruction is not merely a rational move, but one that would provide value to students in their learning processes (Nordby et al., 2022).

It is against this background that exploratory research was carried out in the study aimed at exploring the manifestations of CT in the mathematical reasoning of

pre-service primary school's teachers. The researchers used a contextual problem as a food delivery task whereby the participants were requested to calculate the quickest delivery path using a scaled map. The given assignment demanded that the participants should separate the problem into smaller segments including the identification of location points, obligatory stops and potential routes, the identification of spatial patterns and the creation of an effective delivery route. As shown in Figure 1, the participants were tasked with converting scaled distances to actual distances in order to calculate the best route. These exercises represent major aspects of CT implemented in a real-world scenario (Ninnuan & Wongsaphan, 2022; Pradana, 2024; Salsabila et al., 2024; Sumartini, 2018).

The research results showed that there were several different problem-solving strategies and that there are procedural strategies that rely on linear calculations, but as well as conceptual ones that are based on the contextual understanding and estimation. This difference shows that there are varying inclinations in the use of CT, and it is imperative to comprehend the way pre-service teachers internalise CT.

Such results also attract a gap in the current literature. Despite the extensive research on the topic of student learning and higher education based on CT, there are only a few studies that specifically investigate the manifestations of CT in the problem-solving process of pre-service teachers, especially in the field of mathematics education (Yadav et al., 2014; Yadav et al., 2016; Yadav & Chakraborty, 2023; Zhang et al., 2024). Such a loophole is alarming since considering the strategic role that pre-service teachers can assume when introducing CT to learners.

It has also been found out that to successfully incorporate CT into math curriculum, the pre-service teachers must not only be familiar with the elements of CT, but also how the elements relate to mathematics pedagogy (Albayrak, 2021; Angraini et al., 2024; Kang et al., 2022; Maharani et al., 2023). Without this knowledge, any attempts to implement

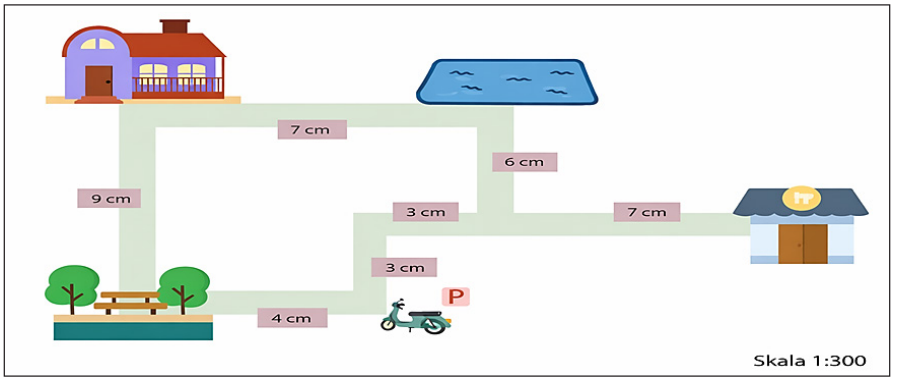



*Figure 1.* Test item: Online driver and Scaled Distance Conversion

CT in the classroom activity run the risk of losing its unity and efficiency.

To address this requirement, the current research will map and investigate the computational thinking patterns of pre-service primary school teachers using a qualitative method. Using the grounded theory methodology, the study does not have an established theoretical framework; rather, it permits categories and concepts to emerge throughout the problem-solving process by participants. This method is especially appropriate to the development of new theoretical proposals based on the empirical experience, and this is particularly relevant to such unexplored areas as CT in teacher education.

The paper aims at developing a preliminary conceptual framework that will describe the way of pre-service primary school teachers exhibit CT in solving mathematical problems. It is hoped that the results will be used in shaping teacher education curricula and the instructional design by providing deeper understanding of how the CT skills can be effectively fostered in mathematics learning and how the CT patterns of the pre-service primary teachers are manifested in their contextualised mathematics problem solving process.

This study offers a novel contribution by systematically mapping computational thinking (CT) patterns of pre-service primary school teachers during contextual mathematical problem-solving using a grounded theory approach. Unlike prior studies that predominantly employ quantitative measurements of CT skills or focus on student populations, this research develops an empirically grounded typology of CT thinking patterns systematic conceptual, pragmatic exploratory, and procedural linear based on authentic problem-solving processes. This typology extends existing CT frameworks by elucidating how CT indicators interact dynamically during problem solving in teacher education contexts.

## LITERATURE REVIEW

### 21st Century Mathematics Education and the Role of Computational Thinking

The 21st century mathematics requires more than simple numeracy. It has been directed to the creation of Higher-Order Thinking Skills (HOTS), which comprise problem-solving, logical reasoning, and creativity (Bachman & Liu, 2015; Nahdi, 2019). Computational thinking (CT) can be discussed as one of the methods which best endorse this educational change the possibility to think in a systematic and algorithmic way in solving complex tasks (Grover & Pea, 2013). CT is commonly perceived to be very consistent with the aims of the modern curricula, because it makes the learners see the patterns, filter the relevant information, and create logical and step-by-step solutions (Angraini et al., 2024; Nordby et al., 2022).

According to the pedagogical content knowledge model (Shulman, 1986), the teacher should not just master mathematical concepts, but he or she should also know how to teach the mathematical concepts in

a meaningful way. Thus, it is necessary to integrate the idea of CT in teacher teaching. Grover and Pea (2013) and Yadav et al. (2014) stress that CT should be a definite part of teacher education programmes to ensure that pre-service teachers can instil this mode of thinking in learning throughout the curriculum in a contextualised way.

## Computational Thinking in the Mathematical Problem-solving Process

The Polya problem-solving model is particularly well suited to support the development of Computational Thinking (CT) because its sequential stages closely align with the core CT components of decomposition, pattern recognition, algorithmic thinking, and debugging. In the problem comprehension stage, learners decompose complex problems into smaller, manageable components, which reflects the decomposition process in CT. During the planning phase, students engage in pattern recognition by identifying relationships, similarities, and constraints within the problem structure. The execution stage corresponds to algorithmic thinking, as learners design and implement step-by-step solution procedures. Finally, the evaluation stage explicitly supports debugging, where students review their solutions, identify errors, and refine their strategies.

Empirical studies have demonstrated that classroom implementations integrating Polya's model with CT principles enhance students' strategic and reflective thinking in mathematics. For example, Maharani et al. (2019) reported that students who solved contextual mathematical problems using Polya-based CT activities showed improved ability in algorithm design and solution optimisation. Similarly, Gunadi et al. (2023) found that inquiry-based mathematics instruction grounded in Polya's problem-solving stages facilitated students' use of decomposition and error-checking strategies, leading to more efficient and accurate problem-solving outcomes. These classroom-based findings support the suitability of the Polya model as a pedagogical framework for fostering computational thinking within mathematics education, particularly in teacher preparation contexts.

## Pre-service Teachers Readiness in Implementing CT

One of the aspects, that would make the process of implementing the approach in mathematics teaching effective, is the readiness of pre-service primary school teachers to implement CT. This training will include the comprehension of the concept of CT, the experience in the pedagogical process, and the self-efficacy of its application in the classroom (Butler and Leahy, 2020; Yadav et al., 2016). Research shows that the incorporation of CT in teacher education curriculum will raise cognitive and affective readiness of pre-service teachers (Caskurlu et al., 2021; Kang et al., 2023).

School experiences of professional placement are also important in preparing this readiness. Pre-service teachers will have their preparedness to implement CT

in the real classroom enhanced by being encouraged to use inquiry-based methods and be reflective by field mentors (Poulton & Golledge, 2024). Moreover, the simulation through technology enables the pre-service teachers to model CT in contextualised and complex problem-solving situations (Butler & Leahy, 2020).

### Conceptual Relationship between CT, Problem-solving, and Professional Development

CT is the transition between conceptual learning of mathematics and its use in the teaching practice. With CT implemented as a part of teacher training, pre-service teachers not only get the opportunity to think mathematically but can also choose adaptive and transformative teaching strategies (Navarro & de Sousa, 2023). Angraini and Abdurrahman (2024) highlight that contextualised problem-solving tasks and curriculum development with the help of technologies can be rather effective in enhancing the CT readiness of pre-service teachers.

CT has demonstrated empirically to enhance student achievement in mathematics. Yadav et al. (2016) discovered that students that had been taught using a CT-based method had a higher comprehension of the concepts compared to the control group. This brings out the fact that the knowledge, and implementation of CT by teachers directly affect the quality of student learning outcomes.

Lastly, the incorporation of CT into mathematics instruction is supported in a constructive and stimulating manner through constructivist strategy and gamification (Angraini et al., 2024; Soboleva et al., 2021). Pre-service teachers who are trained under these frames will prove to be better placed to mentor the students to think in the 21st century skills.

## METHODOLOGY

This study employed a qualitative research design using a grounded theory approach to explore and conceptualise patterns of computational thinking (CT) demonstrated by pre-service primary school teachers in solving contextual mathematics problems. Grounded theory was selected because the aim of this research was not to test or confirm an existing theoretical framework, but to generate an empirically grounded conceptual understanding of how CT manifests through participants' problem-solving processes.

Computational thinking represents a complex, process-oriented construct that is often embedded in cognitive actions such as problem decomposition, strategy selection, algorithmic sequencing, and reflective evaluation. These dimensions are not directly observable through outcome-based assessments alone. Grounded theory is therefore methodologically appropriate, as it enables theoretical categories to emerge inductively from participants' actions, explanations, and reflections during problem-solving activities through systematic coding and constant comparative analysis (Charmaz, 2014; Glaser & Strauss, 1967).

The analytic procedures of open coding, axial coding, and selective coding

were used to identify recurring problem-solving actions and reasoning strategies, which were subsequently conceptualised into higher-order categories representing distinct computational thinking patterns. This approach ensures a strong alignment between the empirical data, the analytical process, and the theoretical constructs under investigation, allowing the resulting framework to remain closely grounded in participants' authentic cognitive experiences.

**Location and Research Subject**

The research was carried out in Primary School Teacher Education (PGSD) programme (Figure 2). The study participants were chosen using the purposive sampling technique depending on various factors: they had to be seventh-semester students having taken up courses in Fundamental Concepts of Mathematics and Models of Mathematics Instruction in primary schools, had been taught problem-solving and CT, and were willing to participate throughout the research process. The selection of participants with different academic backgrounds was to investigate a broad spectrum of CT features in the solving of mathematical problems with the Polya problem solving framework.

Two kinds of instruments were used in this study. The former was a CT-based problem-solving test, which was aimed at testing the skills of students in solving problems through a computational thinking model, which follows the stages of problem-solving, as proposed by Polya. All the items in the test were associated with four stages (understanding the problem, identifying the important information, and finding the focus of the problem; planning an answer, and designing strategies and procedures; carrying out the plan and implementing the selected procedures; and evaluating the outcome, checking the correctness, and completeness of the solution).

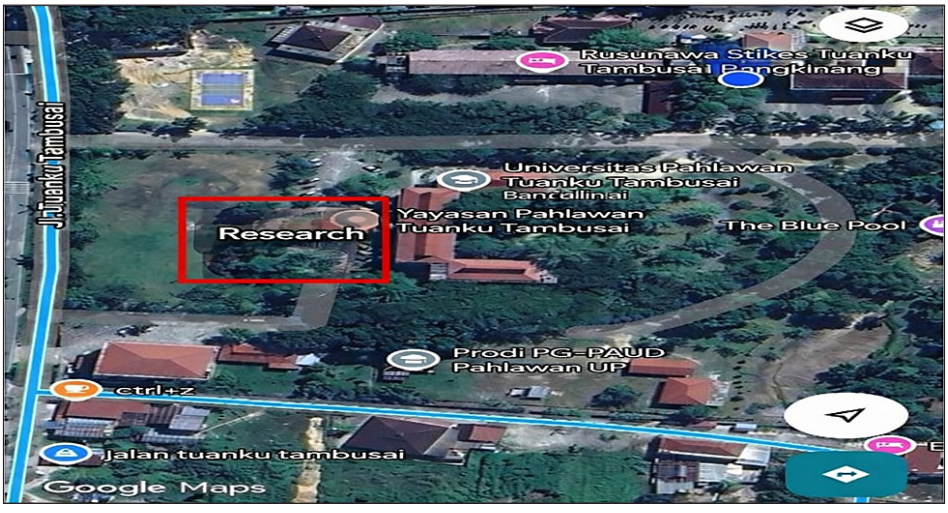



*Figure 2.* Map location research

The second tool was a semi-structured interview guide, which was to investigate the thought of reflection that students underwent when utilising CT steps in solving problems. The interviews also centred on the main aspects of CT including decomposition, pattern recognition, abstraction, and algorithm design, and in addition they centred on the methods used by the students in making their decisions and it is also about how they evaluated their solutions.

The research process started with the students who qualified the set criteria to take part in the study being chosen. Then the participants involved were requested to solve a problem on their own. During this, the researcher followed and made notes of the strategies employed by every student. The semi-structured interviews were held after the test, to investigate the thinking and strategies behind every step that they used to solve the problem. Lastly, data triangulation was enhanced by collecting and analysing the written responses and the transcripts of interviews made by the students.

Data analysis was done according to the method suggested by Gioia et al. (2012), which involves several steps. The initial concepts were discovered by first analysing interview transcripts and problem-solving responses using open coding. These ideas were further classified into first-order categories with similar meaning. In the second step, second-order themes were formulated that are more abstract to interrelate the first-order categories. Lastly, such themes were condensed into aggregate dimensions that formed the basis of formulating grounded theory. This procedure enabled the researcher to develop a holistic picture of the nature of CT among the students in the context of solving mathematical problems.

To make the data credible, both methodological and source triangulation was used in this study. The triangulation was done through the combination of problem-solving tests, the reflective interviews, and observations. Besides this, the accuracy of data interpretation was checked with the help of member checking and peer discussions. Such measures contributed to the reduction of researcher bias and the fact that the developed theory like the realities of the field.

## RESULTS

This section will present the research results of the nature of CT exhibited by the pre-service primary school teachers (PGSD students) to resolve mathematical problems in the Polya problem-solving framework. The problem-solving test which was used to collect data was aimed at investigating four primary CT indicators decomposition, pattern recognition, algorithm design, and error checking (debugging).

The sample comprised 150 final year students who had gone through course work that concerned mathematics education and computational thinking. The analysis of the data was based upon three-stage coding including open coding, axial coding, and selective coding. This was done to determine the degree to which the participants were interacting with the CT indicators when solving mathematical problems.

The qualitative analysis revealed differences in the degree of participants' engagement across each CT indicator. In the first stage, all participants were coded. Subsequently, an in-depth analysis was conducted on the first ten participants, who were selected to represent the broader population, in order to provide a more detailed description of the identified CT patterns, as presented in Table 2. The overall distribution of engagement across the four CT indicators is presented in Table 1. As shown in Table 1, decomposition had the highest number of engagements (142), followed by pattern recognition (130), algorithm design (125), and debugging (113). Furthermore, the total number of participants who demonstrated characteristics associated with each CT indicator is displayed in Table 3. As indicated in Table 3, decomposition was demonstrated by 136 participants, algorithm design by 128 participants, pattern recognition by 120 participants, and debugging by 97 participants.

Table 1
*Coding distribution of 150 pre-service teachers displaying CT indicator for all participants*

| CT Indicator | Number of Engagements |
|---|---|
| Decomposition | 142 |
| Pattern Recognition | 130 |
| Algorithm Design | 125 |
| Debugging | 113 |

Table 3
*Total number of participants who demonstrated characteristics of each CT indicator*

| CT Indicator | Number of Participants |
|---|---|
| Decomposition | 136 |
| Pattern Recognition | 120 |
| Algorithm Design | 128 |
| Debugging | 97 |

In the decomposition sub-aspect, most of the pre-service primary school teachers displayed much strength in the aspect of decomposing problems that are complex to complex structure of solutions. This was reflected in the way they indicated all the checkpoints (nodes) of the problem,

Table 2
*Distribution of the first 10 pre-service teachers*

| No. | Decomposition Pattern | Recognition | Algorithm Design | Debugging |
|---|---|---|---|---|
| 1 | 3 | 2 | 3 | 1 |
| 2 | 2 | 2 | 3 | 2 |
| 3 | 4 | 3 | 4 | 2 |
| 4 | 3 | 2 | 3 | 1 |
| 5 | 3 | 2 | 2 | 2 |
| 6 | 2 | 1 | 2 | 1 |
| 7 | 3 | 2 | 3 | 2 |
| 8 | 4 | 3 | 4 | 2 |
| 9 | 2 | 1 | 2 | 1 |
| 10 | 3 | 2 | 3 | 2 |

beginning with the starting point (A) to the endpoint (G). Considering the case of one student, he said: *"First, I marked all the points from A to G, then I looked at which routes could be taken. I also checked which ones couldn't be used because they had a no-entry sign"* (Participant 07).

In addition, students were able to classify existing information, such as the distances between nodes, which were expressed using indirect mathematical forms, for instance, square root notation like $\sqrt{27}$, basic operations such as $4 \times (16 \div 2)$, or percentages like $20\% \times 60$. One participant described this process by stating: *"I noticed some of the distances were written with roots or percentages, so I calculated each one first to find out the actual lengths"* (Participant 12).

Furthermore, the students were also able to break down longer routes into manageable combinations of smaller segments. Among the routes they proposed were A–B–C–E–F–G, A–G, and A–D–E–F–G. This indicates an understanding of how to construct solutions from smaller and discrete components. One of the participants said: "*I started by listing several possible paths from A to G, for example, going through B or directly to G, and then I calculated which one was the shortest"* (Participant 21).

Some students even identified critical elements on the task map, such as restricted paths and letter markers on stones at each node, which they used to systematically organise information. One of them noted: *"At each point, I made small notes like the distance and whether it could be passed or not, so I wouldn't get confused when adding them up"* (Participant 03).

This decomposition strategy proved to be effective in helping students narrow down alternative solution and simplify total distance calculations. One student described their approach to streamlining the route selection process: *"Instead of trying every route, I picked the one that seemed to have the fewest points first, because it was more likely to be shorter"* (Participant 16).

Overall, the decomposition skills demonstrated by the pre-service primary school teachers in solving contextual mathematical problems reflected a strong conceptual understanding, both in recognising problem structures and in deriving more efficient solution strategies.

Pattern recognition is a critical aspect of computational thinking as it enables pre-service teachers to identify hidden structures or recurring elements within a problem. In this study, many students showed the ability to recognise patterns in distance labels, particularly those presented in indirect mathematical forms such as square roots, percentages, or mixed operations. One of the participants reflected: *"I first looked at all the numbers some used roots, some used percentages, then I converted them into ordinary numbers. For example, $\sqrt{27}$ is about 5 point something, and 20 percent of 60 is 12"* (Participant 14).

This excerpt illustrates the students' ability to simplify mathematical expressions into more concrete numerical values. This skill is crucial as it facilitates the comparison between possible routes and serves as a foundation for identifying patterns of efficiency.

In addition, students demonstrated the ability to recognise structural features of the routes presented in the visual map. Most participants were able to identify point G as the end destination and understood that certain symbols (such as prohibition signs) indicated impassable routes. *"I first marked the final point, which is G. Then I crossed out all the paths with prohibition signs. So, I only looked for the ones I could still use"* (Participant 06).

This statement shows that the participant was able to categorise visual information based on certain characteristics such as recognising valid and invalid patterns in the route selection process. Such ability shortens the exploration process and eliminates irrelevant options.

However, not all students were able to recognise patterns of efficiency. Some attempted to calculate the distance of every possible route without filtering them based on indicators such as relatively large or small numerical values, which led them to choose longer routes without considering efficiency from the beginning. *"I just tried all the routes first. The numbers were confusing, some were big, some were small, but I couldn't immediately tell which was shorter"* (Participant 17).

This response suggests that some students still faced challenges with pattern abstraction, which is drawing general rules or trends from the available numerical data. This limitation affected the efficiency of their problem-solving strategies.

In contrast, students with stronger skills were able to quickly simplify the given values and construct a comparison scale between possible routes. This allowed them to identify shorter paths with greater ease. *"If I see that the distances are small, it probably means that route is shorter. So, when I see large numbers, like 106, I avoid them straight away"* (Participant 10).

This planning represents an ability to make decision on a pattern-oriented elimination whereby the respondents judged route values by mathematical patterns and number logics instead of by visual sequence only.

Overall, the aspect of pattern recognition in the given study suggests that most of the students could have read and interpreted the numerical as well as the visual form of the problem. Despite the different degree of analysis and effectiveness of the applied strategies, the skill to identify the symbolic and spatial patterns proved to be one of the major strengths in resolving contextual mathematical problems in a successful manner.

In this area of algorithm design, pre-service primary school teachers were found to be different in their capability to create methodical steps in determining the shortest and longest paths of point A to G. It is a practice of a systematic use of computational thinking, especially in the field of algorithm design, which focuses on the rational and effective order of solution steps.

One of the strategies employed by students was to outline route options in the form of tables or lists of combinations. This served as the foundation for calculating

distances and selecting the optimal solution. Participant 9 said *"I created a table of all routes from A to G, then calculated the distances one by one. If any route already looked too long, I immediately eliminated it from my options"* (Participant 09).

Such a reaction suggests that the participant noted the necessity to organise tracks and create a rational process, not only to visit all tracks but also to use preliminary methods of elimination. This kind of mentality is efficient in thinking and value-based decision making.

But elimination was not the main strategy used by all students. Some took a brute force approach and tried all the possible paths between the starting point and the end point to come up with what they thought was the most correct solution. Participant 4 said *"I explored every possible route from A to G and calculated each total distance. It was a bit exhausting, but I wanted to be sure I found both the shortest and longest paths"* (Participant 04).

This strategy represents the exhaustivity of the search of the entire solution space of the students, although it is not yet the most efficient. Early mastery of algorithm design, but not optimised in strategy, is usually signalled using brute-force methods.

The other major move taken by students was to expression mathematical formulas like a root, percentage, or compound operations to simplified numerical values and then continue with calculations. *"I converted the distances with roots and percentages into ordinary numbers first, so it would be easier to add them later"* (Participant 18).

This quote indicates the realisation that, in terms of designing algorithms, pre-processing is crucial to make information simple to provide a reliable assessment. This is one of the major aspects of good problem representation. In addition, reflective thinking was also reflected by students in choosing the strategies of problem-solving considering the extreme values of some routes. *"If the route goes through F, it seems longer because the value from E to F is already high. So, I tried looking at the ones that go through B or D first"* (Participant 13).

This is a demonstration of the application of heuristic judgement where the students determined the probable events by relying on initial indications and then did a complete calculation. It implies that the focus is on a transition between the purely exploratory processes to the more selective and strategic thinking. Lastly, there were students who could develop a full algorithm to completion by using a logical step by logical step sequence. *"First, I identified the points, then I calculated all the distances. After that, I worked out all the combinations from A to G. I put everything in order"* (Participant 20).

This quote is an example of how a student can develop an algorithm as an integrated process, therefore demonstrating the skills in sequencing in computational thinking. A characteristic feature of good algorithm design is the systematic organisation of steps. In general, the results concerning the design of the algorithm suggest that most of the students were able

to arrange the logical steps to complete mathematical tasks. Although there was variation as far as efficiency and strategy was concerned, the overall trend is students could think procedurally and systematically handle information to arrive at a solution.

The process of determining and rectifying mistakes during or after problem solving, the debugging stage, showed that the pre-service primary school teachers had significant differences in their capability. It is the level of metacognitive awareness of the students, especially their ability to notice logical inconsistencies in their work.

Several students showed high levels of detection and correction of errors. They recalculated their calculations particularly when the final outcomes seemed unrealistic or contrasted with their previous estimates. *"At first, I got 140, but it seemed too long, so I went back to check the root and percentage calculations. It turned out that I miscalculated 20% × 60"* (Participant 08).

This reaction shows the capacity of the student to think critically about an irrational outcome and a desire to go back. The reflection of this type is also one of the most important components of debugging within the framework of computational thinking.

Alternatively, a few students were more proactive, and they would check the values of symbolic mathematical components like square roots and percentages before going to the next step. This implies making sure that errors do not occur in the first place. *"Before I added everything up, I made sure I knew the exact value of √27. If I wasn't sure, I used a calculator just to be certain"* (Participant 11).

Nonetheless, all students did not exhibit the competence of this step. Others did the job without reviewing their work and thus ended up making mistakes that went unnoticed and most of the time were those involving simple conversions or omission. *"I thought the result was correct because I followed all the steps. But when the lecturer checked it, the distance was too much because I forgot to count one of the paths"* (Participant 19).

It seemed that students in this group were following a procedure and a mechanical method without reflecting and evaluating finally. This implies that there is a weakness in metacognitive awareness that is essential in the learning process using CT. According to the open and axial coding done in the process of data analysis based on the grounded theory, three primary categories of the characteristics of the computational thinking were observed among the pre-service teachers and they were seen as:

Students in this category demonstrated a high level of proficiency across all CT indicators: decomposition, pattern recognition, algorithm design, and debugging. They were able to construct strategies based on the structure of the problem, filter options early in the process, and systematically verify their results. *"I started by analysing all the possible routes, then ordered them based on their lengths. If any of the calculations seemed off, I checked them again until, I was sure"* (Participant 02) as shown in Figure 3.

From the analysis of one of the research participants, it appears that pre-service

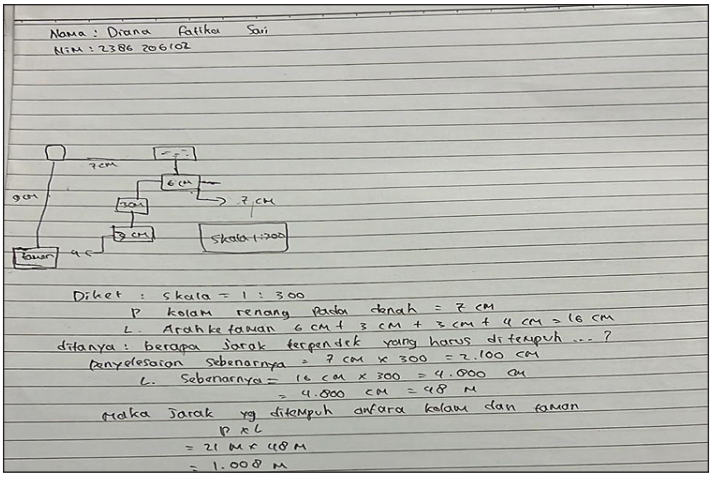



*Figure 3.* Work sample from participant 2

teachers showed a systematic–conceptual pattern of thinking, characterised by reflective, efficient, and comprehensive problem-solving, supported by a strong understanding of the task structure. The participant employed map visualisation, logically compared alternative routes, and applied CT principles effectively, making them a representative example of a pre-service teacher well-prepared to integrate CT into classroom practice.

This group showed reasonably strong abilities in decomposition and algorithm design but demonstrated inconsistencies in pattern recognition and debugging. They explored various alternative solutions, though their approach was not always effective in filtering options or correcting errors. *"I created a few different routes and tried them one by one. If one seemed too long, I moved on to another. But sometimes I forgot to double-check the results"* (Participant 13) as shown in Figure 4.

The pragmatic-exploratory thinking pattern was observed in one of the participants through his problem-solving approach. Although the pre-service teacher could develop systematic steps, the process was mostly a trial-and-error one. The participant has not screened route choices effectively at the beginning and was not very reflective or evaluative of the result. This implies that there should be increased metacognitive awareness and problem-solving strategies.

Pre-service teachers in this category tended to follow procedural steps without developing exploratory strategies. Their focus was on completing the task using methods previously taught, with minimal reflection or evaluation of the process. *"I just followed the steps like we were taught. From A to G, I just calculated directly, I didn't think about other ways"* (Participant 20) as shown in Figure 5.

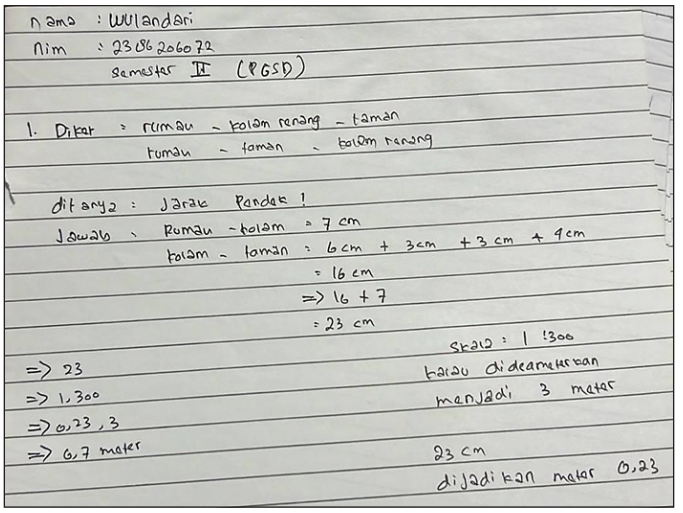



*Figure 4.* Work sample from participant 13

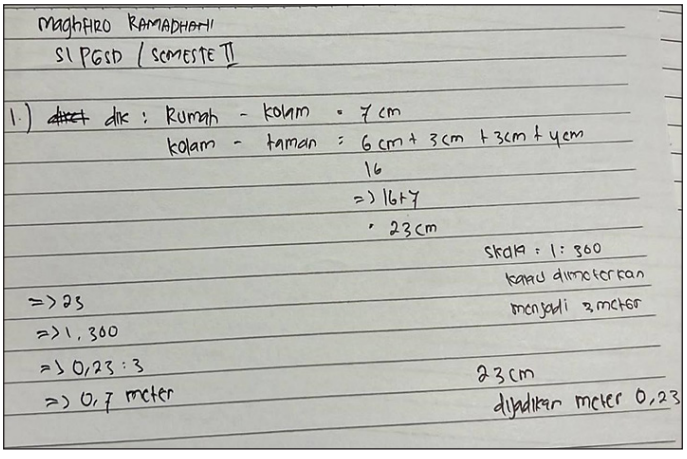



*Figure 5.* Work sample from participant 20

All these three types represent a continuum of computational thinking styles with one end being conceptual and reflective to the other one being more procedural and mechanical. The results are important in informing the pedagogical interventions in teacher education. They emphasise the need to train more pre-service teachers into becoming strategic thinkers who approach mathematical problem-solving thinking adaptively and reflectively.

One of the interviewees demonstrated procedural linear type of thinking with an inclination towards finding mechanical solutions to problems without reflective and optimisation strategies. The participant used

the simplest procedures and did not strive to assess the efficiency of the route or debug, which indicates that the participant did not apply the most sophisticated computational thinking to the problem-solving process.

## DISCUSSION

Theoretically, this study contributes to the growing literature on computational thinking by advancing an empirically derived model that conceptualises CT as a continuum of thinking patterns rather than a set of isolated skills. While previous studies have operationalised CT primarily through discrete indicators, the present findings demonstrate how these indicators co-occur and interact within authentic mathematical problem-solving activities. This grounded typology provides a nuanced theoretical lens for understanding CT development in pre-service teachers.

The results of this research show that pre-service primary school teachers have different degrees of capability in implementing the concept of computational thinking (CT) to the contextual mathematical problems. The strategies used by the participants were found to have all four CT indicators, decomposition, pattern recognition, algorithm design, and debugging, with varying levels of proficiency (Kannadass et al., 2023; Yadav et al., 2016). These findings point to the multiplicity of methods used and emphasise the importance of enhancing every aspect of CT in teacher preparation programmes.

Among the four indicators that have been observed, decay stood out the most. Most students could reduce complex issues into smaller and manageable sections. This observation is consistent with the studies that have proposed decomposition to be a core component of computational thinking, which allows a person to build solutions based on simpler parts and justify statements in the existing literature (Nordby et al., 2022; Yadav et al., 2016). This skill not only benefits students in solving problems, but it also demonstrates the mastery of the Polya mathematical problem-solving model, especially the stage of cognising the problem (Angraini et al., 2024).

This skill in decomposition implies that students have learned constructivist-oriented learning processes, in which knowledge is gained and arranged based on tangible experiences (Angraini et al., 2024). This is most vital in primary education where the teachers need to have the capacity of presenting mathematical problems in a conceptual and visual manner that is comprehensible. Pre-service teachers with high levels of decomposition would also be in a better position to simplify and present mathematical problems of the complex nature in an easy way that would be comprehended by their students (Albayrak, 2021; Mohmad and Maat, 2024).

Pattern recognition indicator was observed to develop among some of the participants in this study. Such students were also able to determine recurring mathematical concepts like square roots, percentage operations, and prohibition symbols to the task map. Nevertheless, even with this development, some participants could not simplify mathematical expressions

even at the beginning of the process, which led to inefficient strategies. This observation points to the deficiency in abstract and symbolical reasoning in the students (Andrian et al., 2021; Kang et al., 2022).

The literature has indicated that pattern recognition within the CT helps to solve problems more efficiently because it will allow the elimination of suboptimal solutions at the initial stage (Kang et al., 2022). Pattern-recognition skill enables the students to select shorter and more efficient methods in resolving problems. Regrettably, the students who are not used to simplifying the value will choose longer defining paths of solutions, which insinuates that the process of recognising the patterns is not an automatic process in the thinking yet (Yokuş & Kahramanoğlu, 2022).

This aligns with the studies that highlight the relevance of pattern recognition in mathematics learning and CT, wherein organised and efficient thinking is the main factor in solving problem-related issues (Y. Li et al., 2020). In this regard, learners who can successfully use pattern recognition have a higher probability to become faster and more accurate in solving mathematical problems contributing to the formation of the critical thinking skills (Diantary & Akbar, 2022).

In general, although one might see a certain level of achievement in the field of pattern recognition, such crucial skills as simplifying mathematical problems should be enhanced. This skill will not only help the students in their academic activities but will also equip them to be pre-service teachers (Fauzi et al., 2022).

The indicator of the algorithm design was strongly observed in students who systematised their solution. They showed abilities in planning routes sequentially, calculating values, and finding the best solutions. Such a strategy represents a logical sequencing and structured thinking, both of which are basic elements of computational thinking (Supiarmo et al., 2022).

Practically, the students that tried all possible paths and compared the distance were more likely to adopt a brute-force solution. There were however other students who showed that they could use the early elimination techniques, such as automatically shunning routes with greater weights. The skill signifies an increasing ability to optimise solution strategies that is needed in creating effective algorithms and finding solutions efficiently (Esteve-mon et al., 2020; Kumala et al., 2023).

Not every student, however, could use effective algorithmic techniques. Most of them were going by visually logical courses without making comparisons of the sum values of the available possibilities. This shows that there is a knowledge and practice gap in algorithmic concepts of students that is a worthwhile observation in the development of CT-based pedagogical curriculum in teacher education (Maharani et al., 2019; Kumala et al., 2023). This gap could be overcome by paying more attention to teaching algorithm design, including using optimisation methods.

As an illustration, past research found out that students critical and systematic thinking is improved when they are exposed to the use of CT in mathematics classes (Maharani et al., 2019). This is in line with requirement of training pre-service teachers to implement CT principles in the instructional practice (Kumala et al., 2023). In this way, a curriculum development that combines an algorithm design can provide a great advantage to pre-service teachers, not only prepare them to provide more effective problem-solving strategies (Andrian et al., 2021; Rosali & Suryadi, 2021).

The debugging indicator demonstrated extremely high diversities among the students. Students who possessed better metacognitive awareness demonstrated those skills as they had the ability to check the results again; they could name the errors in calculations and correct the mistakes. Otherwise, other people passed verification without undergoing it, and simple conversion errors were not noticed. These results highlight the significance of the facilitation of problem-solving with metacognition, reflective, and affective aspects of CT learning.

Q. Li et al. (2023) explain that acquisition of the skills in CT should not only be based on the technical knowledge, but also the reflective and affective support. Whereas technical skills are associated with the ability to comprehend procedures and algorithms, reflective components like the ability to realise mistakes and re-enter that step plays an important role in more profound and transformational learning. When students form a habit of checking their work, they are usually in a better position to teach the problem-solving because they have internalised the successful processes of problem-solving and can comfortably re-teach the processes effectively.

The significance of metacognitive facets of CT learning as they discovered that reflective practice should be incorporated in instruction to increase the willingness of students to use knowledge in practice. Learning the reasons why errors are made as well as the ways that it is possible to correct errors not only enhances the ability to solve problems but also creates the attitude of being critical of the way students thought.

The results of the current research found that there were three major thinking patterns that occur among students within the framework of computational thinking (CT), and they may be presented in the following way:

**Systematic–Conceptual (Strategic Planner)**

Students in this category showed extensive knowledge in the structure of mathematical problems. Their reflective and efficient approaches allowed them to develop solutions which means that they had high CT skills. All these features cause them to serve as the best illustrations of pre-service teachers who can apply CT in their instruction. It has been argued that students who think strategically are better placed to deal with complex problems and their instructional advice can contribute to the development of the critical and analytical

approach to problems among the students (Y. Li et al., 2020). Moreover, their capacity to create problem-based learning can be critical in equipping the students to handle the current day challenges (Y. Li et al., 2020).

**Pragmatic–Exploratory**

This type had satisfactory skills in decomposition and algorithm design but mostly they used a trial-and-error approach. Their verification and pattern recognition were found to be weak, yet they could often reach solutions. The results are consistent with the researchers who claim that reflective strategies must be encouraged among pragmatic learners (Sercenia & Prudente, 2023). The lack of verification capability also reveals the necessity to empower the metacognitive power of such group that is identified as an indispensable part of successful problem-solving (Bellon and Fias, 2019; Manan et al., 2024).

**Procedural–Linear (Linear Executor)**

In this type of students were more inclined towards problems solving by strictly adhering to the set steps without paying attention to the efficiency or thinking about the consequences. Their orientation to logical yet strict procedures implies that they require better strategic knowledge and development of meta-cognition. Metacognitive skills are also important to know and practice to change the linear methods of students to more dynamic and efficient ways of solving problems (Zhang et al., 2024).

These results show that the effective implementation of CT in teacher education relies largely on the design of curriculum that facilitates the acquisition of critical thinking, reflection, and metacognition. In this regard, the teacher education programmes must include more problem-based learning chances that openly incorporate CT principles (Manan et al., 2024; Yurt, 2022). With the help of such a combination, pre-service teachers not only should be knowledgeable in theoretical frameworks but also should also implement them in practice and be able to help their future students develop CT skills (Smith and Mancy, 2018).

Metacognition according to Flavell (Manan et al., 2024) develops the awareness about how students think so that they can assess and re-assess their approaches to solving problems. This is especially significant with mathematics education, as an aptitude to reflect on problem-solving strategies may contribute greatly to the learning outcomes (Ajisuksmo & Saputri, 2017). As such, it is very important to establish the learning atmosphere which will help to develop metacognitive skills allowing learners to effectively solve mathematical problems and teach them in an encouraging manner.

To sum up, the current research confirms the necessity of the CT in the process of educating teachers as well as the necessity of the immediate development of the curriculum that will help to foster the development of the three thinking patterns identified during the research.

Decision-makers in educational institutions should consider the results of this analysis and improve the quality of pre-service teacher training by applying innovative and responsive learning methods to respond to the needs of modern education.

## CONCLUSION

Practically, the identified CT patterns have direct implications for teacher education curriculum design. Teacher education programmes should move beyond procedural exposure to CT concepts and intentionally scaffold reflective and metacognitive practices, particularly for pre-service teachers exhibiting pragmatic-exploratory and procedural-linear patterns. Structured problem-based learning, explicit debugging activities, and reflective prompts aligned with Polya's problem-solving stages are recommended to foster more systematic-conceptual CT development.

This paper exhibits that the specific inclusion of the CT methodologies within the teacher training curriculum, especially mathematics problem solving units, is necessary. It is also necessary to strengthen metacognitive abilities with the help of training based on reflections, implementation of new teaching methods like problem-based learning. Besides, the criticise diagnostic tool to periodically measure the CT skills of the students and the enhancement of the symbolic and numerical literacy are a tactical move in ensuring that pre-service teachers learn to think systematically, efficiently and reflectively during the learning process.

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