

Students' Readiness for Generative Artificial Intelligence in Malay Language Learning: A Survey Study

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ABSTRACT

Generative artificial intelligence (GenAI) creates new opportunities to support language learning, yet its educational use among school students requires readiness that extends beyond access or willingness to use technology. This study examined Form Three students' readiness to use GenAI in Malay language learning across four dimensions: knowledge and skills, use in Malay language learning, critical and ethical readiness, and confidence and acceptance. A cross-sectional survey was conducted with 118 students through a census approach involving the accessible population. Data were collected using the 21-item Students' Readiness for Generative AI in Malay Language Learning Questionnaire (SK-AIGBM), rated on a five-point Likert scale. Descriptive analyses included frequencies, percentages, means, and standard deviations, while internal consistency was assessed using Cronbach's alpha. Overall readiness recorded a mean of 3.759 (SD=.511), with an overall alpha of .939. Critical and Ethical Readiness recorded the highest relative mean (M=3.781, SD=.641), followed by Confidence and Acceptance (M=3.763, SD=.634), Knowledge and Skills (M=3.759, SD=.634), and Use in Malay Language Learning (M=3.731, SD=.652). The highest-scoring item concerned confidence in using GenAI to support Malay language learning (M=3.839), whereas the lowest concerned knowing how to use GenAI specifically for Malay language learning (M=3.678). The narrow spread across dimension means indicates a relatively balanced readiness profile rather than a substantively dominant dimension. The findings suggest that secondary students are generally receptive to GenAI but still require structured pedagogical guidance that connects confidence and awareness with subject-specific application. Malay language pedagogy should therefore emphasise purposeful prompting, verification of generated information, protection of personal data, academic responsibility, and students' continued ownership of linguistic decisions and written work.

Keywords: generative AI; Malay language; secondary school; student readiness; digital pedagogy

INTRODUCTION

The rapid development of generative artificial intelligence (GenAI) has changed how students interact with information and learning tasks. Systems based on large language models do more than deliver content: they can generate text, explain concepts, provide feedback, suggest improvements, and respond interactively to user prompts. These capabilities create new opportunities for education while also requiring students to engage with AI outputs critically and responsibly (Kasneci et al., 2023; Miao & Holmes, 2023; Tlili et al., 2023).

In language education, GenAI is increasingly used for idea generation, writing support, vocabulary exploration, grammar explanation, interactive practice, and feedback on texts. Empirical studies and systematic reviews indicate potential benefits for writing, engagement, and language learning, although these benefits depend on purposeful pedagogical integration and appropriate learner guidance (Kohnke, 2024; Karataş et al., 2024; Li et al., 2025; Lee et al., 2025; Wiboolyasarin et al., 2025).

The educational use of GenAI should not be evaluated solely through access or frequency of use. Students also need to understand the functions and limitations of the technology, construct appropriate prompts, verify the accuracy of responses, compare information with other sources, protect privacy, and maintain academic responsibility. Consequently, readiness for GenAI use is better understood as a multidimensional construct that includes knowledge and skills, learning-related use, critical and ethical considerations, and confidence and acceptance (Ng et al., 2024; Eisenhardt et al., 2025).

Research on AI in Malay language education has progressed from conceptual discussions to empirical investigation. Mohamad Zabhi and Hassan (2025) examined ChatGPT use among 120 Form Two students in the same school context. The present study examines a related school cohort using a different instrument and a distinct construct, namely readiness for broader GenAI use in Malay language learning. The two studies therefore address different research questions and should not be interpreted as duplicate analyses of the same construct.

Accordingly, this study aims to identify students' overall readiness to use GenAI in Malay language learning, examine readiness across the four SK-AIGBM dimensions, and determine which dimension records the highest relative mean score. The study provides a descriptive profile of secondary school students' readiness before GenAI is more extensively integrated as a learning support tool in Malay language education.

LITERATURE REVIEW

Generative AI in Education

Generative AI refers to artificial intelligence systems capable of producing new content in response to user prompts. In education, this capability extends the role of technology from content delivery to dialogue, example generation, feedback, and problem-solving support. However, educational value depends on how learners evaluate, adapt, and responsibly use the generated output rather than merely accepting it as correct (Chan, 2023; Farrokhnia et al., 2024).

Ng et al. (2024) developed the AI Literacy Questionnaire using affective, behavioural, cognitive, and ethical dimensions, building on broader conceptual work on AI literacy (Ng et al., 2021). Other research has distinguished self-reported AI literacy from objective or performance-based assessment (Jin et al., 2025; Zhong & Liu, 2024). This distinction is important because self-report questionnaire scores are more appropriately interpreted as perceived readiness or perceived capability rather than direct evidence of objective AI competence. Related scholarship also emphasises that responsible educational use must account for academic integrity, human judgement, and the limitations of generated content (Chan, 2023; Grassini, 2023).

Generative AI in Language Learning

The language-learning literature shows that GenAI can function as an idea generator, feedback source, tutor, interaction partner, and editing assistant. Studies in second and foreign language learning report potential benefits for writing, grammar, vocabulary, and motivation, including AI-supported corpus learning and writing processes (Karataş et al., 2024; Kohnke, 2024; Lu, 2025; Woo et al., 2024). Nevertheless, these benefits coexist with concerns about overreliance, factual inaccuracies, academic integrity, and reduced critical engagement when learners use AI outputs without sufficient evaluation (Johnston et al., 2024).

Systematic reviews of GenAI in language learning reveal rapid growth in empirical work but continued concentration in higher education and English-language contexts (Lee et al., 2025; Li et al., 2025; Wiboolyasarini et al., 2025). School-level research and research involving languages other than English remain comparatively underrepresented. In Malay language learning, questions of linguistic accuracy, contextual appropriateness, register, sentence structure, and communicative purpose make learner readiness particularly important.

Student Readiness and the Malay Language Education Gap

Readiness to use GenAI can be understood as a condition in which students possess basic knowledge,

willingness to use the technology for learning, critical and ethical awareness, and confidence to engage with it in a controlled manner. Eisenhardt et al. (2025) showed that GenAI readiness may include understanding, awareness of limitations, sufficient knowledge for study, access, prompt ability, and prior experience. This supports a multidimensional approach rather than treating readiness as a single behavioural indicator.

Within Malay language education, Azmi and Wan Mohammad (2026) examined gifted students' acceptance of ChatGPT for Malay grammar learning, focusing on knowledge, ease of use, and usefulness. Malaysian studies have also addressed Malay language teachers' readiness for AI implementation, GenAI in Malay language assessment, GenAI supported communication, and ethical implications among secondary-school learners (Mohd Rani et al., 2025; Noor et al., 2025; Osaman & Mohd Matore, 2025; Syuk Man et al., 2025). More broadly, recent K–12 and secondary-school research has highlighted both the educational potential of GenAI and the need to distinguish perceived readiness from demonstrated competence (Alfarwan, 2025; Doan et al., 2026; Zhong & Liu, 2024). A recent IJRISS study of Malaysian secondary students also confirms active research interest in GenAI acceptance at school level (Noh et al., 2026). However, empirical evidence profiling secondary-school students' GenAI readiness specifically for Malay language learning across knowledge and skills, learning use, critical and ethical considerations, and confidence and acceptance remains limited. The present study addresses this specific gap.

METHODOLOGY

Research Design

This study employed a quantitative approach using a cross-sectional survey design. A descriptive design was selected because the purpose was to profile students' readiness to use GenAI in Malay language learning during a single data-collection period. The study did not manipulate variables or test causal effects; therefore, the findings are interpreted within descriptive boundaries.

Population and Participants

A census approach was used for the accessible Form Three cohort, and 118 complete responses were included in the analysis. The students were from the same secondary-school cohort associated with an earlier co-authored ChatGPT study by the present author, which reported 120 participants. The present analysis uses a different instrument and examines a distinct construct, namely readiness for broader GenAI use in Malay language learning. The present dataset contains 118 complete responses, compared with 120 participants reported in the earlier study. Because respondent-level records were not matched across the two analyses, the difference in sample size is not interpreted as individual attrition, and no individual-level change or longitudinal effect is claimed.

Research Instrument

Data were collected using the Students' Readiness for Generative AI in Malay Language Learning Questionnaire (SK-AIGBM). The instrument comprised respondent profile information and 21 items rated on a five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree. The items represented four dimensions: Knowledge and Skills (5 items), Use in Malay Language Learning (5 items), Critical and Ethical Readiness (6 items), and Confidence and Acceptance (5 items).

SK-AIGBM was developed through a literature-informed synthesis of work on AI literacy, GenAI readiness, language-learning applications, and responsible use (Doan et al., 2026; Gümüş & Kara, 2025; Ng et al., 2024; Rahimi & Sevilla-Pavón, 2024). The resulting items were contextualised for Malay language learning rather than treated as a direct reproduction of any existing scale. No formal content-validity coefficient is reported because a completed independent expert-validation dataset was not available for the present manuscript. Accordingly, the psychometric evidence reported here is limited to internal consistency within the analysed sample.

Internal Consistency

Internal consistency analysis produced an overall Cronbach's alpha coefficient of 0.939. Alpha coefficients were 0.893 for Knowledge and Skills, 0.899 for Use in Malay Language Learning, 0.919 for Critical and Ethical Readiness, and 0.893 for Confidence and Acceptance. These coefficients indicate strong internal consistency for the analysed responses. Cronbach's alpha is reported as evidence of internal consistency and is not interpreted as evidence of full construct validity.

Data Collection and Analysis

The questionnaire was administered to the accessible Form Three cohort, and 118 complete responses were included in the analysis. Descriptive analysis comprised frequencies and percentages for respondent profiles, together with means and standard deviations for individual items, dimensions, and the overall readiness score. The four dimensions were ranked by mean score only to describe their relative position. Because the differences between dimension means were small, the study does not interpret the highest-ranked dimension as substantively dominant. No inferential comparison between dimensions was conducted; therefore, dimension rankings are descriptive and should not be interpreted as statistically significant differences.

Ethical Considerations

Before data collection, the study received approval from the school administration committee. Participation proceeded only after parental consent and student assent had been obtained. Students took part voluntarily and could withdraw from the study at any stage. The research recorded no information that could personally identify individual participants, and all collected data were confined to academic research use.

RESULTS

Participant Profile and GenAI Use

A total of 118 Form Three students participated in the study. As shown in Table 1, female students constituted 55.9% (n=66) of the sample, while male students accounted for 44.1% (n=52). Most participants, 83.9% (n=99), reported previous use of GenAI, whereas 16.1% (n=19) had never used it. Patterns of use were nevertheless varied: 23.7% used GenAI rarely, 21.2% used it two to three times a week, another 21.2% used it daily, and 17.8% used it once a week. Thus, although prior exposure to GenAI was widespread, the frequency data show that regular use was not uniform across the cohort. This variation is important because readiness in the present study should be interpreted as a self-reported disposition within a group possessing different levels of prior GenAI experience.

Table 1. Participant profile and GenAI use

	Category	n	%
Gender	Male	52	44.1
	Female	66	55.9
Previous GenAI use	Yes	99	83.9
	No	19	16.1
Frequency	Rarely	28	23.7
	2–3 times a week	25	21.2
	Daily	25	21.2
	Once a week	21	17.8
	Never	19	16.1

Reliability and Readiness by Dimension

Table 2 shows that all four readiness dimensions demonstrated strong internal consistency, with Cronbach's alpha coefficients ranging from .893 to .919. Critical and Ethical Readiness recorded the highest reliability

coefficient ($\alpha=.919$), while the 21-item scale produced an overall alpha of .939, indicating strong internal consistency for the present sample. The overall readiness mean was 3.759 ($SD=.511$). Dimension means were closely clustered between 3.731 and 3.781, suggesting that students reported broadly comparable levels of readiness across knowledge and skills, use in Malay language learning, critical and ethical readiness, and confidence and acceptance. Accordingly, the findings do not point to a sharply differentiated readiness profile at the dimensional level.

Table 2. Reliability and dimension scores of SK-AIGBM

Dimension	Items	Mean	SD	Alpha
Knowledge and Skills	5	3.759	0.634	0.893
Use in Malay Language Learning	5	3.731	0.652	0.899
Critical and Ethical Readiness	6	3.781	0.641	0.919
Confidence and Acceptance	5	3.763	0.634	0.893
Overall	21	3.759	0.511	0.939

Item Analysis

Table 3 provides a more detailed view of the 21 readiness indicators. Item E2, which concerns confidence in using GenAI to support Malay language learning, recorded the highest mean ($M=3.839$, $SD=.728$). This was followed closely by B5, concerning the ability to modify a prompt when the initial response is unsatisfactory ($M=3.822$, $SD=.791$), and D3, concerning awareness that GenAI may generate incorrect or misleading information ($M=3.805$, $SD=.819$). In contrast, B3, which measures students' perceived knowledge of how to use GenAI specifically for Malay language learning, recorded the lowest mean ($M=3.678$, $SD=.783$), while E4, readiness to use GenAI when permitted, was also comparatively lower ($M=3.695$, $SD=.768$). Nevertheless, the difference between the highest and lowest item means was only .161. The item-level pattern therefore suggests relatively balanced readiness, while also indicating that confidence and awareness may be slightly more established than students' perceived ability to translate GenAI use into subject-specific learning practices.

Table 3. Item analysis of SK-AIGBM

Code	Statement	Mean	SD
B1	I understand the basic meaning of generative AI.	3.78	0.694
B2	I know that generative AI has limitations and can produce inaccurate information.	3.746	0.764
B3	I know how to use generative AI to support Malay language learning.	3.678	0.783
B4	I can write clear instructions or prompts to obtain an appropriate response.	3.771	0.756
B5	I can modify a prompt when a generative AI response does not meet my needs.	3.822	0.791
C1	I am ready to use generative AI to help me understand Malay language learning materials.	3.729	0.759
C2	I am ready to use generative AI to generate ideas before writing.	3.72	0.805
C3	I am ready to use generative AI to improve my Malay vocabulary.	3.771	0.767
C4	I am ready to use generative AI to help me understand Malay grammar.	3.703	0.788
C5	I am ready to use generative AI to obtain suggestions for improving Malay writing.	3.729	0.747
D1	I will check the accuracy of information provided by generative AI before using it.	3.788	0.714
D2	I will compare information from generative AI with other reliable sources.	3.78	0.73
D3	I am aware that generative AI responses may contain incorrect or misleading information.	3.805	0.819
D4	I will not directly copy generative AI answers and submit them as my own work.	3.763	0.747
D5	I will use generative AI responsibly when completing Malay language assignments.	3.771	0.778
D6	I will be careful not to share personal information when using generative AI.	3.78	0.764

E1	I am confident that I can learn to use generative AI well.	3.763	0.803
E2	I am confident that I can use generative AI to support Malay language learning.	3.839	0.728
E3	I am interested in learning how to use generative AI more effectively.	3.737	0.733
E4	I am ready to use generative AI in Malay language learning when its use is permitted.	3.695	0.768
E5	I am ready to continue using generative AI as a learning support tool in Malay language learning.	3.78	0.753

Relative Ranking of Readiness Dimensions

Table 4. Relative ranking of readiness dimensions

Rank	Dimension	Mean	SD
1	Critical and Ethical Readiness	3.781	0.641
2	Confidence and Acceptance	3.763	0.634
3	Knowledge and Skills	3.759	0.634
4	Use in Malay Language Learning	3.731	0.652

As summarised in Table 4, Critical and Ethical Readiness ranked first ($M=3.781$, $SD=.641$), followed by Confidence and Acceptance ($M=3.763$, $SD=.634$), Knowledge and Skills ($M=3.759$, $SD=.634$), and Use in Malay Language Learning ($M=3.731$, $SD=.652$). The ordering suggests that students were marginally more ready to approach GenAI critically and responsibly than to apply it directly to Malay language learning tasks. However, the difference between the highest and lowest dimension means was only .050. The ranking must therefore be interpreted as a descriptive ordering rather than evidence that one dimension is substantively or statistically dominant. More importantly, the narrow spread reinforces the overall pattern in Table 2: readiness appears multidimensional but relatively even across the four measured areas.

DISCUSSION

Overall Readiness for GenAI in Malay Language Learning

The findings indicate that students demonstrated a positive level of readiness to use GenAI in Malay language learning. The overall mean of 3.759 and the narrow range of dimension means suggest that readiness was distributed relatively evenly across the four dimensions rather than concentrated in a single aspect. Knowledge, learning-related use, critical and ethical considerations, and confidence and acceptance therefore appear to operate as complementary components of perceived readiness.

This pattern is consistent with the view that engagement with AI is multidimensional. Ng et al. (2024) emphasised affective, behavioural, cognitive, and ethical elements, while GenAI-readiness research has also incorporated understanding, limitations, prompting ability, and prior experience. Nevertheless, the present self-report scores should not be equated with objectively demonstrated AI literacy or performance.

Critical and Ethical Readiness

Critical and Ethical Readiness recorded the highest relative mean. Items in this dimension addressed verification of information, comparison with other sources, awareness of potentially inaccurate responses, avoidance of direct copying, responsible use, and protection of personal information. The result suggests that students reported awareness of responsible-use principles alongside their willingness to use GenAI.

In language learning, AI responses must be evaluated not only for factual accuracy but also for linguistic accuracy, register, contextual appropriateness, and communicative purpose. Teachers should therefore connect AI use with processes of checking, comparing, and justifying language choices rather than positioning generated output as an unquestioned final answer.

Knowledge and Skills, Confidence and Acceptance

Knowledge and Skills recorded a mean of 3.759. Item B3 was the lowest-scoring item overall, indicating that general awareness of GenAI does not necessarily translate into specific knowledge of how to use it to support Malay language learning. This distinction is pedagogically important because effective educational use requires both technical familiarity and task-specific understanding.

Confidence and Acceptance recorded a mean of 3.763. Item E2 was the highest-scoring item overall, indicating students' confidence that GenAI can support Malay language learning. This positive confidence should nevertheless be interpreted as perceived readiness rather than demonstrated competence. Guided practice remains important to ensure that confidence is accompanied by accurate, critical, and responsible use.

Use of GenAI in Malay Language Learning

Use in Malay Language Learning recorded the lowest relative dimension mean, although the difference from the other dimensions was small. The items covered understanding learning materials, idea generation before writing, vocabulary development, grammar, and improvement of Malay writing. The pattern indicates that students were generally receptive to these uses but that pedagogical integration may still require explicit modelling and task guidance.

Meaningful integration should begin with the learning purpose. In writing activities, GenAI can be used to generate ideas, develop outlines, and provide suggestions on drafts, while students remain responsible for evaluating, selecting, revising, and justifying the language used. In grammar and vocabulary learning, AI-generated explanations should be checked against authoritative sources and teacher guidance.

Pedagogical Implications

The findings support a purpose-oriented view of readiness. Three considerations should operate together: the language-learning objective, critical evaluation of generated content, and responsibility for its use. This orientation positions GenAI as a support for learning processes rather than as a substitute for students' own linguistic reasoning and authorship.

At school level, acceptance of GenAI should be accompanied by explicit understanding of technological limitations. Activities that require students to compare AI responses with textbooks, dictionaries, authoritative sources, or their own writing may encourage more reflective use and align GenAI with the development of language judgement rather than passive answer retrieval.

Distinction from the 2025 Study

The present findings should be interpreted as a distinct readiness analysis rather than a replication or a longitudinal effect estimate of the earlier ChatGPT publication. The earlier article examined students' perceptions of ChatGPT in Malay language learning, whereas the present study examines readiness for broader GenAI use through four dimensions measured with SK-AIGBM. The construct, instrument, research objectives, and analytical focus are therefore different, although the studies involve the same school context and a related student cohort.

LIMITATIONS

The cross-sectional design does not permit causal conclusions. The self-report instrument measures perceived readiness rather than objectively demonstrated competence. The study is also limited to one school context. Cronbach's alpha provides evidence of internal consistency for the analysed responses but does not by itself establish the full validity of the instrument. Future studies should incorporate independent content validation, broader samples, performance-based measures, and longitudinal or comparative designs where appropriate.

A further limitation is the continuity of the school cohort with the author's 2025 co-authored study. This continuity is disclosed to distinguish the present construct and dataset from the earlier publication. The absence

of respondent-level matching means that the reduction from 120 to 118 participants cannot be analysed as attrition at the individual level.

CONCLUSION

The study shows that Form Three students demonstrated positive and relatively balanced readiness to use GenAI in Malay language learning. Critical and Ethical Readiness recorded the highest relative mean, whereas Use in Malay Language Learning recorded the lowest relative mean; however, the difference between these dimensions was small. The findings support the view that readiness involves more than willingness to use technology and includes knowledge, task-related use, critical and ethical judgement, and confidence. For Malay language education, GenAI should therefore be integrated through structured tasks that require students to evaluate, verify, and refine generated language rather than accept AI output uncritically.

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No specific funding was reported for the data collection analysed in this manuscript.

Conflict of Interest

The author declares no known conflict of interest related to the preparation of this manuscript.

Ethics Statement

The research was authorised by the school administration committee before data collection commenced. Parental consent and student assent were secured for participation. Students participated voluntarily, retained the right to withdraw at any point, and were not asked to provide personally identifiable information. The resulting data were used exclusively for academic research purposes.

Data Availability Statement

The participant-level dataset is not publicly available because it contains research responses from school students. Aggregated descriptive results supporting the findings are reported in the manuscript. Any data-sharing request would require consideration of participant protection and applicable institutional requirements.

Author Contribution

MOHD ZIKRI IHSAN MOHAMAD ZABHI: Conceptualization, instrument development, data analysis, original draft preparation, review and editing.

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