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Educational Chatbots in Language Teaching and Learning at Malaysian Universities

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Abstract
Artificial intelligence is reshaping higher education, with chatbots increasingly explored as virtual assistants for language learning. This study investigates Malaysian students' awareness, usage, and expectations of chatbots in tertiary education. A survey of 101 students from Klang Valley institutions across disciplines such as Teaching English as a Second Language (TESL), nursing, business, and engineering was conducted. Findings show that although awareness of chatbots is high, their actual use for language learning remains limited. Nevertheless, students strongly expressed interest in using chatbots for grammar, pronunciation, vocabulary, and conversational practice. The study suggests that integrating chatbots could promote learner autonomy, instant feedback, and student-centred pedagogy.

Keywords: chatbots; language learning; artificial intelligence; higher education

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1.0 Introduction

Language learning is an essential component of higher education, particularly in multilingual cultures such as Malaysia, where English functions as a second language and a critical skill for employability. This statement is supported by Ne'matullah et al. (2023), who state that "speaking English effectively has emerged as a desirable talent that can greatly improve job seekers' employability. Employers acknowledge candidates who can clearly express themselves in English during job interviews, recognising the necessity of successful communication and cross-cultural teamwork" (p. 168). Despite this importance, language learning remains challenging for many undergraduates, as it requires regular practice, immediate feedback, and ongoing exposure to authentic communication. From a curriculum and science education perspective, similar challenges are observed across Southeast Asia and globally. In particular, these challenges are evident in distance learning, where digital tools such as chatbots may help address classroom limitations. Within the constraints of university classrooms—such as limited contact hours, large enrolments, and diverse proficiency levels—opportunities for personalised practice are often restricted. To address these issues, educators have increasingly turned to digital technologies that provide flexible, student-centred support. Among these, chatbots have emerged as promising tools for language learning. Despite their

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growing adoption, several challenges hinder the seamless integration of chatbots in higher education. From a technical standpoint, unstable internet connectivity, limited device accessibility, and software glitches can reduce usability, especially in low-resource or rural learning environments (Shah et al., 2025; Chi, 2024). Pedagogically, many instructors remain uncertain about how to align chatbot-biased interactions with curriculum outcomes, assessment rubrics, and effective feedback cycles (Hmoud et al., 2024). These barriers highlight the need for a more nuanced understanding of how students perceive and expect chatbots to function effectively within their learning ecosystem. Mohd Salim et al. (2025) assert that, "chatbots have emerged as having unparalleled capabilities in providing instant feedback, holding contextual conversations, and personalising learning experiences in real time" (p. 234). Additionally, they can encourage repetitive practice without the fear of judgment, reducing anxiety and enhancing motivation (Shah et al., 2020). Hence, this exploratory study aims to examine students' awareness, use, and expectations regarding chatbots for language learning in Malaysian universities. The objectives are threefold: (i) to assess students' awareness of chatbots, (ii) to explore their current usage for language practice, and (iii) to outline expectations for future incorporation into higher education. This study addresses key points that enrich the conversation surrounding AI in education, especially chatbots, and provides practical insights for educators and institutions seeking to improve language instruction through innovative, student-focused technologies.

2.0 Literature Review

This literature review focuses on three main areas relevant to the study: chatbots in language learning, learners' perceptions and acceptance of chatbots, and the Malaysian higher education context. Together, these areas provide a foundation for understanding the potential and challenges of deploying chatbots as virtual assistants in language education.

2.1 Chatbots in Language Learning

Chatbots are rapidly gaining acceptance as effective supplementary agents in second-language acquisition pedagogy. The emerging literature documents that their integration into interactive and gamified tasks significantly enhances both lexical and syntactic competence in English as a Second and Foreign Language cohorts (Mohd Salim et al., 2025). Their cross-sectional study, involving undergraduate participants at different proficiency levels, found that learners who engaged in chatbot-mediated interactions demonstrated higher vocabulary accuracy and syntactic awareness than those using conventional learning approaches. Shah et al. (2025) noted that these effects were influenced by task complexity and the extent of learner engagement, underscoring the need to examine contextual and motivational factors in chatbot-assisted instruction. Crucially, the instantaneous, tailored corrective input offered by a chatbots-supported learning environment is associated with improved academic outcomes and reduced psychosocial strain (Shah et al., 2020). Recent investigations involving cohorts at Universiti Teknologi MARA (UiTM), Malaysia, and Universitas Dinamika (UD), Indonesia, lend further empirical support to this body of work. Researchers implemented LexiBot, a deliberately engineered dialogue system that guides learners in disambiguating contextual cues and deriving the meanings of previously unknown lexical items from authentic English texts. The collected evaluation indices disclose a statistically significant impact: 81.5% of UD and 54.5% of UiTM participants accorded LexiBot an unequivocal favourable response, identifying enhanced engagement as the principal benefit (Shah et al., 2025). Such findings substantiate the accelerating scholarly accord that artificial intelligence artefacts are poised to revise entrenched paradigms of language instruction. Gutiérrez (2023) further argues that the calculated use of conversational agents in language acquisition contexts provides robust evidence that these technologies can re-architect pedagogical paradigms, thereby elevating learner involvement, intensifying contextual understanding, and promoting autonomous language engagement.

2.2 Learners' Perceptions and Acceptance of Chatbots

Empirical evidence shows that perceived utility and ease of use are primary predictors of students' propensity to employ these agents (Huang et al., 2021; Shah et al., 2025). Shah et al. (2025) elaborate that "the utility of chatbots is not defined purely by information provision but by content integration within the operational teaching frameworks and the level of digitisation preparedness educational institutions possess" (p.17). This implies that students' evaluation of chatbots is tied to institutional and pedagogical maturity. Learners are more inclined to sustained interaction when chatbots are embedded in instructional routines rather than provided as peripheral supplements.

Technology acceptance frameworks specify that perceptions are mediated by digital literacy, prior exposure, and sociocultural vantage points (Gatenet et al., 2024). Evidence shows that positive acceptance can lead to prolonged use and improved outcomes. Students with a stronger command of digital devices tend to regard chatbots as relevant, whereas those less proficient or used to instructor-centred paradigms are more skeptical. The adoption of chatbots operates as a reciprocal mechanism: learner perceptions shape motivation and engagement, while institutional embedment and faculty endorsement are equally decisive. This symbiotic dynamic is especially salient in Malaysia, where the pace of digital transformation varies across institutions and where preparedness among students and academics is uneven, conditioning the trajectory of pedagogical innovation.

2.3 The Malaysian Higher Education Context

The Ministry of Higher Education (MOHE) of Malaysia has positioned digital transformation as a central pillar of its higher education system, guided by the Malaysian Education Blueprint 2015–2025. Shift 9: Globalised Online Learning advocates the strategic use of technology to widen access and refine pedagogy (MOHE, 2015). In line with this, the Higher Education Digitalisation Plan (HEDP) outlines coordinated governance enhancement, infrastructure development, and the cultivation of digital proficiency for faculty and students (MOHE, 2021). The Politeknik Digital Agenda 2023–2027 represents a mechanism to accelerate adoption within polytechnic

and Technical and Vocational Education and Training (TVET). It envisions systematic re-engineering of TVET programmes with futures-encoded curricula, leveraging modalities such as the metaverse, future TVET classrooms, augmented reality (AR), and virtual reality (VR) (MOHE, 2023). Parallel to this, the MOHE–Malaysia Digital Economy Corporation (MDEC) partnership has established the AI Faculty at Universiti Teknologi Malaysia (UTM) and inaugurated the Premier Digital Tech Institution (PDTI) Tech Club, designed to strengthen competencies in AI, cloud computing, and related digital domains through collaboration with global technology leaders (MDEC, 2024). Comparable strategies are observable across Southeast Asia and globally. In Indonesia, Universitas Terbuka has prioritised digitalisation and technology-enhanced learning, not only in language instruction but also in science and curriculum development (Kusmawan, 2024; Masbukhin & Kusmawan, 2025). Despite these systemic initiatives, research on chatbots in Malaysian higher education remains scarce (Shah et al., 2025). While studies on e-learning, blended learning, and learning management systems are extensive, investigations of AI-driven conversational agents in language acquisition remain limited (Ji et al., 2022; Cao & Phongsatha, 2025).

3.0 Research Methodology

This study employed a cross-sectional mixed-methods design that combined structured surveys and semi-structured interviews. The cross-sectional nature of the study lies in its focus on capturing participants' existing attitudes, experiences, and perceptions at a single point in time. This design was selected because it enables efficient data collection across multiple disciplines and academic levels while providing a foundation for identifying trends and relationships that can inform subsequent longitudinal or intervention-based research. It is particularly suitable for emerging areas of educational technology, where baseline understanding is required before more complex experimental or longitudinal studies can be conducted (Abunda, 2020). The survey provided quantitative evidence on students' knowledge, engagement, and perceived utility. At the same time, the interviews offered qualitative insights into learner autonomy, motivation, and perceived challenges, which are often overlooked in survey data. A purposive sample of 101 students from various Malaysian institutions participated, representing diploma, bachelor's, and master's programmes in nursing, accounting, TESL, applied linguistics, engineering, and media studies. Survey data were collected via Google Forms and analysed in Microsoft Excel, which is compatible with mobile devices, making it ideal for reaching students across campuses. Interview transcripts were examined using Braun and Clarke's (2006) thematic analysis, following the six phases of familiarisation, coding, theme development, review, definition, and reporting. Inductive codes were generated, and themes were organised around usability, engagement, and learning outcomes, providing a structured yet interpretative account of student experiences with chatbots.

3.1 Limitations

This study has several limitations. Although 101 participants from Malaysian institutions participated, the sample is relatively small compared to the broader tertiary population, limiting generalisability. Reliance on self-reported surveys may have introduced response bias, as students could have overstated or understated engagement and chatbot effectiveness. Some also faced unstable internet connections, which disrupted usage and shaped perceptions. Interviews with only a few volunteers offered practical but limited perspectives across institutions. Nevertheless, the study provides valuable exploratory evidence and highlights the need for larger-scale research across diverse contexts and disciplines.

4.0 Findings

This section presents findings aligned with the three articulated research objectives. The analysis begins by detailing participants' awareness of and familiarity with conversational agents. Particular attention is given to the level of knowledge students reported and their general attitudes toward such technologies. The second objective is addressed by examining current deployments of chatbots for language acquisition. The role of these tools, as articulated by students, is evaluated in terms of their influence on vocabulary, grammar, and pronunciation conventions. The final objective is fulfilled by registering participants' anticipations regarding the prospective incorporation of chatbot technology into higher education contexts. The response set elucidates students' perceptions of the adequacy, desirability, and potential modalities for integrating the tools into teaching and learning environments.

4.1 Demographic Profile of Respondents

In this research, 101 students completed the questionnaires, and their demographic information is shown in Table 1 below.

Table 1. Demographic profile of respondents (n=101)

Category	Number of respondents	Percentage (%)
Public Universities	59	58.4
Private Universities	42	41.6
Total	101	100

Of 101 respondents, 59 (58.4%) were from public universities and 42 (41.6%) from private universities.

Table 2. Programs Represented (n=101)

Category	Number of respondents	Percentage (%)
Public Universities		
Nursing	11	10.9
Accounting	13	12.9
TESL	12	11.9
Applied Linguistics	8	7.9
Engineering	9	8.9
Media studies	6	5.9
Private Universities		
Nursing	8	7.9
Accounting	9	8.9
TESL	8	7.9
Applied Linguistics	5	5.0
Engineering	6	5.9
Media Studies	6	5.9

Respondents were enrolled in various programmes, including nursing, accounting, TESL, applied linguistics, engineering, and media studies, reflecting the interdisciplinary relevance of chatbot deployment in education.

4.2 Research Objective 1: Students' Awareness of Chatbots

The first objective assesses students' familiarity with chatbots and general awareness of chatbot functions. This section included recognising chatbots' ability to simulate human-like interaction and their perceived usefulness.

Table 3: Awareness of chatbots

Category	Number of respondents	Percentage (%)
Strongly disagree	2	2
Disagree	8	7.9
Neutral	15	14.9
Agree	50	49.5
Strongly agree	26	25.7
Total	101	100

As shown in Table 4.2, almost three-quarters of respondents reported being aware of chatbots, with 49.5% (n=50) agreeing and 27.5% (n=26) strongly agreeing that they were familiar with their functions. Only a small proportion expressed disagreement (9.9%, n=10). This table indicates that most students are already aware of chatbots and understand their capacity to interact in human-like ways.

4.3 Research Objective 3: Use of Chatbots in Language Learning

The second objective explored the extent to which students use chatbots in language learning activities, such as grammar, vocabulary, and pronunciation practice.

Table 3: Use of Chatbots in Language Learning

Category	Number of respondents	Percentage (%)
Strongly disagree	5	5
Disagree	10	9.9
Neutral	20	19.8
Agree	40	39.6
Strongly agree	26	25.7
Total	101	100

As presented in Table 4.3, 39.6% (n=40) agreed and 25.7% (n=26) strongly agreed that they used chatbots for language capacity. Only 14.9% expressed disagreement. The finding suggests that while chatbot integration is still emerging, many students already use it as a supportive tool in their language learning.

4.4 Research Objective 3: Expectations for Future Incorporation

The third objective was addressed through qualitative data, which were analysed using Braun and Clarke's (2006) six-phase thematic analysis. This section is based on interviews conducted with five (5) students from both public and private universities. The interview focused on their perspectives regarding the potential role of chatbots.

Figure 1: Expectation for Future Incorporation

Three key themes emerged: support for lecturers, enhanced engagement, and personalised learning.

Many participants highlighted the pedagogical benefits of chatbots, particularly their ability to deliver immediate corrective feedback and foster interactive learning. One student remarked, *"When the chatbot replies instantly, I feel more motivated to practise. It keeps me engaged in a way that textbooks cannot"* (Respondent 1). Students also noted that chatbots sustain attention beyond the classroom by enabling conversational practice after school hours, extending their learning trajectory. Personalised learning emerged as another key theme. Learners valued the flexibility to access chatbots anytime and tailor practice to their needs. Respondent 2 explained, *"I like practising at my own pace, especially with pronunciation. I do not feel embarrassed repeating words many times with a chatbot."* Similarly, Respondent 3 likened the experience to tutoring, describing how chatbots provide vocabulary drills adapted to individual weaknesses. Students also viewed chatbots as supportive tools that complement, rather than replace, lecturers. They suggested that chatbots could manage routine tasks, allowing educators to focus on complex topics. One student said, *"The chatbot can help us revise simple grammar rules, so the lecturer has more time to explain harder parts"* (Respondent 4). Nonetheless, concerns about overreliance were raised, with Respondent 5 cautioning, *"Chatbots are helpful, but they cannot give detailed explanations like a lecturer can."*

5.0 Discussion

The results of this study validate the potential of chatbots as supportive tools in language learning within Malaysian higher education; however, they also reveal nuances that warrant closer examination. As previously stated, students' high awareness levels and positive expectations suggest that chatbots fulfil fundamental criteria for usability in education. However, the conversations must move beyond these early successes to consider deeper pedagogical and contextual issues. The findings regarding students' awareness and perceptions confirm earlier studies that emphasised the perceived usefulness and ease of use as drivers of acceptance (Huang et al., 2021; Shah et al., 2025). However, variations in actual usage demonstrate that awareness alone does not guarantee consistent application. This idea resonates with Gatenet et al. (2024), who argued that digital literacy, cultural background, and previous experiences strongly influence how learners accept and sustain using chatbots. Some students incorporated chatbots independently, while others remained neutral or disengaged, highlighting the importance of institutional integration and lecturer support as emphasised by Shah et al. (2025). Incorporating conversational agents within the study mirrors concurrent advancements in science education. As Kusmawan (2024) illustrates, scalable online practicums offer expanded exposure to authentic scientific process, showcasing the ability of digital infrastructures, chatbots included, to mediate flexible, cross-disciplinary pursuits beyond traditional language curricula. Present data reveal divergent trajectories concerning engagement and learner autonomy: a subset of subjects welcomed chatbot mediation as a tool for personalised exploration. Another comparatively conservative subset exhibited pronounced reluctance to navigate semi-autonomous study modes. Similar reluctance has been encountered within the scientific setting; contextual studies demonstrate that the intersection of digital technology with project-based inquiry, for instance, has catalysed deeper conceptual assimilation in notoriously refractory topics such as chemistry (Masbukhin & Kusmawan, 2025). The correspondence between language and science contexts suggests that, when pedagogically calibrated, conversational agents possess the latent capacity to elevate learner engagement within language acquisition and across scientific and academic domains.

Learners described chatbots as applicable for practising vocabulary, grammar, and pronunciation, but also noted limitations in interactivity and depth of explanation. This information echoes the point made by Gutiérrez (2023) that while chatbots have the potential to transform learning, their impact depends on their ability to provide more meaningful and engaging interaction. As Salim et al. (2025) argued, including interactive and game-like features is crucial to sustaining learner motivation and enhancing vocabulary acquisition. These findings must also be interpreted within the context of Malaysian higher education. The national digitalisation agenda, as outlined in the Malaysian Education Blueprint 2015–2025 (MOHE, 2015), the Higher Education Digitalisation Plan (MOHE, 2021), and the Poli Digital Agenda 2023–2027 (MOHE, 2023), clearly demonstrates the government's intention to leverage technology for educational transformation. Likewise, collaborations such as MDEC's AI Faculty and PDTI Tech Club initiatives (MDEC, 2024) illustrate systemic support for digital learning. However, empirical research on chatbot adoption in Malaysia remains limited, and infrastructural challenges, such as connectivity and uneven readiness across institutions, pose barriers to implementation (Shah et al., 2025). These contextual challenges confirm Ji et al. (2022) and Cao & Phongsatha's (2025) observation that AI integration is only effective when institutions adequately embed it into their pedagogical frameworks.

Comparable developments are seen globally. In Europe, Cislowska and Peña-Acuña (2024) reported that students welcomed chatbots for practising speaking and writing but emphasised the need for natural interaction and well-integrated design within classroom

routines. Similarly, a global review by Gökçearslan, Tosun, and Erdemir (2024) found that while chatbots increase motivation, their success is limited by digital literacy gaps, unreliable connectivity, and insufficient institutional support in many non-Western contexts. These findings mirror Malaysia's situation, where enthusiasm coexists with uneven readiness.

6.0 Conclusion and Recommendations

This study demonstrates that AI chatbots can enhance language learning in Malaysian higher education. Students showed strong awareness and generally positive expectations, suggesting that chatbots could be integrated into blended and online contexts with minimal resistance. At the same time, usage patterns revealed important differences in learner autonomy and engagement. While some students actively adopted chatbots as independent study aids, others relied on structured support, indicating that design and implementation must be flexible enough to suit varying levels of confidence and learning styles. Chatbots should incorporate adaptive features that tailor interaction to individual learners to optimise effectiveness. For instance, exploratory prompts may suit confident learners, while scaffolded tasks with guided feedback better support those needing structure. To counter disengagement, interactive elements such as progress tracking, storytelling, or rewards could sustain motivation. Equally important is providing deeper explanations of correct and incorrect responses, helping students develop metacognitive awareness and long-term retention. Educators can further enhance outcomes by embedding chatbot use into lesson plans. Chatbots could function as pre-class preparation, post-class reinforcement, or companions in large or asynchronous classes. Future research should broaden the focus beyond vocabulary to include grammar, writing, and speaking, while longitudinal studies are needed to assess sustained motivational and linguistic impacts.

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Paper Contribution to the Related Field of Study

This study contributes to the field of chatbot-assisted learning by providing empirical insights into students' awareness, usage, and expectations of chatbots in Malaysian higher education. By examining responses from learners across public and private universities, the research expands current understanding of how chatbots are perceived and adopted within a localised educational setting. In doing so, it highlights both the opportunities and challenges of integrating chatbots into language learning. Additionally, the study reinforces the role of chatbots as supportive and accessible tools that can enrich autonomous learning while complementing lecturer-led instruction.

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