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A conceptual framework on learner's attitude toward using AI chatbot based on TAM model in English classroom

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Abstract

This paper presents a conceptual framework for investigating students' attitudes toward the use of an AI chatbot in an English classroom. It integrates the foundational constructs of the TAM model, such as perceived usefulness, perceived ease of use, attitude toward use, and behavioral intention to use, within the context of an AI chatbot application used in an English classroom. The framework hypothesizes that students' perceptions of the AI chatbot's usefulness and usability will significantly impact their attitudes toward its incorporation into the English classroom. To validate the framework, empirical data will be collected using surveys and interviews with English language learners from various educational institutions in future studies. The findings can inform the development of strategies and interventions designed to promote positive attitudes and acceptance of AI technology in language education.

Keywords: English Teaching, AI chatbot, TAM model.

INTRODUCTION

In recent years, Artificial Intelligence (AI) integration in various fields, including education, has increased significantly. AI technologies, such as AI applications, have the potential to enhance the learning experience and provide learners with individualized support. However, the successful implementation of AI chatbots in language classrooms is contingent upon gaining an understanding of student's attitudes and perceptions regarding this technology. Using the Technology Acceptance Model (TAM), this paper presents a conceptual framework for investigating students' attitudes toward the use of an AI chatbot in an English classroom.

The Technology Acceptance Model (TAM), proposed by Fred Davis in 1989, is a widely accepted theoretical framework for describing the adoption of technology by users. TAM has been adapted and expanded to comprehend students' adoption of various technologies in educational settings. According to the Technology Acceptance Model (TAM), perceived utility (PU) and perceived ease of use (PEOU) are the two most influential factors in technology adoption. When students perceive technology to be useful and simple to use, they are more likely to develop a positive attitude toward its adoption, resulting in a greater intent to effectively use the technology.

The proposed framework aims to investigate learners' attitudes toward using an AI chatbot in an English classroom and relates these attitudes to the TAM model's foundational constructs: perceived utility, perceived ease of use, attitude toward use, and behavioral intention to use. Incorporating an AI chatbot into language classrooms has the potential to provide students with immediate language support, personalized feedback, and interactive language practice. To ensure the AI chatbot's successful integration into language education, it is crucial to comprehend how students perceive the chatbot's utility and usability.

This study's primary objective is to develop and propose a conceptual framework for investigating students' attitudes toward the use of artificial intelligence in an English classroom. The framework seeks to cast light on the factors influencing the acceptance of AI chatbots in language learning environments by examining the relationships between perceived usefulness, perceived ease of use, attitude toward use, and behavioral intention to use.

LITERATURE REVIEW

Technology Acceptance Model

The Technology Acceptance Model (TAM) was created by Fred Davis and Richard Bagozzi (Davis, 1989; Bagozzi and Warshaw, 1992). The TAM model is generally acknowledged as a reliable and

fundamental model for modeling the adoption of information technology by consumers. The use of information technology for educational purposes via the Internet can be attributed to English learners. According to Legris et al. (2003, as cited in Teo, Su Luan, and Sing, 2008, p. 266), the TAM model has accurately predicted approximately 40% of new system adoption. Figure 1 depicts a representation of the TAM theory.

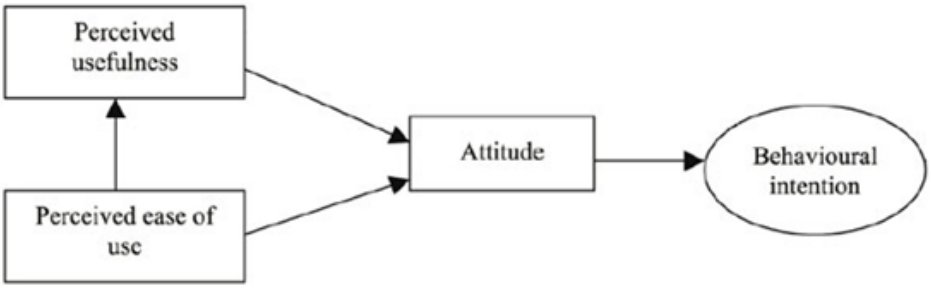

Figure 1: The technology acceptance model (Davis, 1989)

The incorporation of Artificial Intelligence (AI) technologies in education, particularly AI chatbots, has gained increasing attention due to their potential to enhance learning experiences and support students' language learning journeys. Using the Technology Acceptance Model (TAM) as a theoretical framework, the purpose of this literature review is to examine studies that have investigated students' attitudes toward the use of AI chatbots in language classrooms.

Perceived Usefulness and Ease of Use in Technology Acceptance

The Technology Acceptance Model (TAM) proposed by Davis (1989) has been extensively adopted to explain the acceptance of technology by users in a variety of contexts, including education. According to the Technology Acceptance Model (TAM), perceived usefulness (PU) and perceived ease of use (PEOU) are two key factors that substantially influence users' adoption intentions. In the context of educational technology, Venkatesh et al. (2003) discovered that students' perceptions of a technology's utility have a direct impact on their attitudes toward its adoption, whereas their perceptions of the technology's usability influence their intention to use it effectively.

AI Chatbots in Language Learning

In language learning environments, AI chatbots have demonstrated promising results, providing students with immediate language support and interactive language practice. Sun et al. (2008) conducted an empirical study and determined that the successful implementation of e-learning technologies, such as chatbots, is contingent on the contentment of the learners with the technology. Chai and Hong (2020) conducted a systematic review of AI chatbots in education and emphasized the need to comprehend students' attitudes and acceptance of these technologies for effective integration.

Students Attitudes Toward AI Chatbots in Language Classrooms

In Language Classrooms, regarding Students' Attitudes Towards AI Chatbots, Lai and Wang (2017) conducted a meta-analysis of empirical findings related to the Technology Acceptance Model in order to comprehend the attitudes of language students toward AI chatbots. Their analysis revealed that students' perceptions of technology's utility have a significant impact on their attitudes toward its implementation in educational settings.

In recent years, the integration of Artificial Intelligence (AI) technology, specifically AI chatbots, into language education has emerged as a transformative trend (Ramayah, 2003). The rapid development of technology has significantly increased the educational potential and profitability of institutions around the world, compelling language learners to carefully consider quality, reputation, and user experiences when selecting language learning tools. Davis (1989) identifies perceived usefulness (PU) as a crucial indicator of the effectiveness of technology in facilitating language acquisition. It reflects the perceptions of English language learners regarding the advantages of using AI chatbots in the classroom (Teck, 2002). According to studies (McCoy et al., 2007), PU significantly affects learners' intentions to use technology effectively for language acquisition. Learners are more likely to select technology-enhanced English learning platforms if they believe doing so will provide

them with substantial value and benefits (Ha & Stoel, 2009). In addition, PU has a significant positive effect on learners' attitudes toward the use of AI chatbots in language education, resulting in a greater intention to adopt and engage with the technology (Davis, 1989; Tella & Olasina, 2014).

The Technology Acceptance Model (TAM) proposed by Davis (1989) includes **perceived ease of use (PEU)** as a crucial factor. It refers to learners' perceptions of the amount of effort required to use a specific system. Moon & Kim (2001), Aladwani (2002), and Gefen et al. (2003) have shown that PEU has a significant impact on learners' attitudes and intentions to use technology for language acquisition. When AI chatbot applications are user-friendly and align with learners' routines and preferences, they are more likely to be chosen as the preferred medium for learning English. As supported by the research of Ramayah and Ignatius (2005), the usability of an AI chatbot application for language learning has a significant impact on learners' attitudes and their intentions to continue using the application.

Caroll (1988) defines **perceived enjoyment** as the degree of pleasure experienced when using electronic equipment for various tasks without confronting any problems. Davis et al. (1992) identified perceived delight as one of the internal motivations that encourage technology usage. It connotes the delight and contentment of users when utilizing AI chatbots for language acquisition. It has been discovered that perceived enjoyment influences perceived usefulness via perceived simplicity of use (Venkatesh, 2000; Teo & Noyes, 2011). Therefore, it is a factor that influences the perceived usefulness of AI chatbots for language acquisition.

Gefen et al. (2003) elaborate on the importance of **trust** in the context of the Technology Acceptance Model (TAM) applied to the digital environment. In an online environment where tangible factors are limited, trust is crucial in motivating language learners to use chatbots powered by artificial intelligence (Chen, 2007). Several studies (Zhang & Li, 2002; Wang & Emurian, 2005) highlight the significance of trust in online language learning environments. Higher levels of trust are associated with a greater likelihood of English language learners taking action and interacting with AI chatbots. Multiple studies have demonstrated that trust has a significant positive effect on **perceived usefulness** (Hallegatte & Nantel, 2006; Chen & Barnes, 2007; Zhou, 2011).

Electronic word of mouth (e-WOM) has emerged as a major factor influencing the intentions and attitudes of learners toward AI chatbot applications. Positive e-WOM, such as reviews, feedback, and discussions on forums and social networks, can influence the attitudes and intentions of language learners to use AI chatbots for language learning (Cheung & Thadani, 2009; Zhang et al., 2010). According to studies (Hsu, Lin, & Chiang, 2013; Mehrad & Mohammadi, 2017), e-WOM influences positively the attitudes of language learners using AI chatbots (Hsu, Lin, & Chiang, 2013; Mehrad & Mohammadi, 2017).

Attitude, as defined by Fishbein's theory of reasoned action (TRA), refers to learners' positive or negative feelings toward using AI chatbot applications for language learning and is a predictor of their intention to adopt and engage with the technology (Ajzen & Fishbein, 1980; Kim et al., 2009). In the context of technology adoption, an individual's attitude reflects their evaluations and recognition of AI chatbot applications (Davis, 1989). Cognitive belief structures have a significant impact on learners' decision-making processes (Lee & Green, 1991; Netemeyer & Bearden, 1992) and are the primary determinant of learners' attitudes toward AI chatbots. Understanding the attitudes of language learners is essential for anticipating their intentions and behavior regarding the use of AI chatbots for language learning (Kim & Hunter, 1993).

In addition, recent studies have investigated the factors that influence language students' attitudes toward the use of chatbots powered by artificial intelligence. Liang et al. (2021) investigated the effect of prior technology experience on the perceived utility and usability of artificial intelligence chatbots in an English classroom. Learners with greater technology experience perceived AI chatbots as more useful and simpler to use, resulting in more favorable attitudes toward their adoption.

Zhang et al. (2022) investigated the role of individual differences, such as language proficiency and digital literacy, in shaping students' attitudes toward the integration of AI chatbots in the language classroom. The findings revealed that learners with higher language proficiency and digital literacy were more likely to perceive AI chatbots as beneficial and simple to use, resulting in more positive attitudes and a greater intent to use.

These recent studies provide valuable insights into the complex factors that influence learners' attitudes toward using AI chatbots in language classrooms, further validating the proposed conceptual framework based on the Technology Acceptance Model (TAM) for examining learners' attitudes toward AI chatbot adoption in English language learning.

METHODS

The methodology for the paper aims to propose a theoretical framework for investigating learners' attitudes toward using AI chatbots in English language classrooms. The methodology focuses on conceptualizing the framework based on the Technology Acceptance Model (TAM).

Theoretical Framework Construction

Review of the Literature: Conduct a comprehensive review of the literature in order to identify studies pertinent to AI chatbots in language education, the TAM model, perceived utility, perceived ease of use, perceived enjoyment, trust, electronic word of mouth, and learners' attitudes. Synthesize and analyze the findings of the literature in order to identify the main factors influencing the attitudes of English language learners toward the use of AI chatbots in the classroom.

Conceptual Mapping: Develop a conceptual framework that integrates the key factors identified in the TAM model and their relationships in order to investigate learners' attitudes toward AI chatbot adoption in language education, based on the insights garnered from the literature review.

Framework Modification: Refine the proposed framework based on expert input and discussions with language educators and AI and technology integration experts. Ensure the framework is consistent with the current understanding of AI chatbot adoption and the applicability of the TAM model in language learning contexts.

FINDINGS AND DISCUSSION

A Proposed Framework

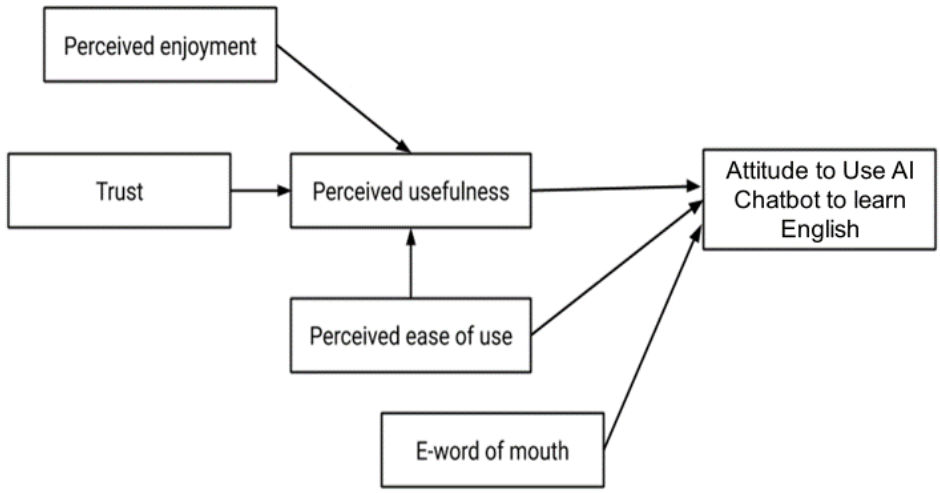

Figure 2: The proposed framework

Based on the extensive literature review and conceptual mapping, we propose a theoretical framework to investigate the attitudes of English language learners toward the use of AI chatbots in the classroom. The framework is based on the Technology Acceptance Model (TAM) and incorporates important factors that influence the perceptions and intentions of language learners regarding the adoption of AI chatbots.

The conceptual framework proposed comprises of the following key elements: Perceived Usefulness (PU): This factor reflects the perceptions of English language learners regarding the benefits and efficacy of using AI chatbots in the classroom. Davis (1989) and Tella & Olasina (2014) have demonstrated that PU significantly influences the attitudes and intentions of technology consumers. Similarly, we hypothesize that learners' perceptions of the utility of AI chatbots will affect their attitudes and intentions regarding the adoption of this technology for language learning.

Perceived Ease of Use (PEU): PEU refers to learners' beliefs about the simplicity and ease of using AI chatbots for language learning. Gefen et al. (2003) and Ramayah & Ignatius (2005) demonstrated that PEU plays a significant role in influencing users' attitudes and behavioral intentions regarding technology adoption. In our conceptual framework, we hypothesize that students' perceptions of the convenience of using AI chatbots will influence their attitudes and intentions regarding the use of this technology in the language classroom.

Perceived Enjoyment: This factor captures the learners' sentiments of pleasure and contentment when utilizing AI chatbots for language learning. According to Carroll (1988) and Venkatesh (2000), perceived enjoyment is an important driver of technology adoption. We include perceived enjoyment in the framework because we believe that the positive experiences and enjoyment that learners have when interacting with AI chatbots will affect their attitudes and intentions to continue using this technology.

Trust is the confidence and conviction that language learners have in the dependability and credibility of AI chatbots as language-learning instruments. Chen (2007) and Wang & Emurian (2005) have previously highlighted the importance of trust in encouraging users to implement new digital tools. In our framework, we hypothesize that learners' trust in AI chatbots will influence their attitudes and intentions regarding the integration of this technology into their language-learning journey.

Electronic Word of Mouth (e-WOM): e-WOM represents the influence of reviews, feedback, and recommendations from other users on the attitudes of learners toward the adoption of AI chatbots. Zhang et al. (2010) and Mehrad & Mohammadi (2017) have demonstrated that e-WOM affects the attitudes and intentions of technology consumers. Therefore, we hypothesize that positive e-WOM regarding AI chatbots will influence the attitudes and intentions of language learners to utilize this technology.

Attitude refers to students' overall evaluations and sentiments regarding the use of AI chatbots in the language classroom. According to Fishbein's theory of reasoned action (TRA) (Ajzen & Fishbein, 1980; Kim et al., 2009), users' intentions and behavior are largely determined by their attitudes. In our framework, we hypothesize that the attitudes of language learners toward the adoption of AI chatbots will influence their intentions to use this technology for language learning.

Discussion

The proposed framework provides a comprehensive comprehension of the factors that influence English language students' attitudes toward the use of AI chatbots in the classroom. Drawing from the Technology Acceptance Model (TAM) and pertinent studies on technology adoption, the framework incorporates key elements that influence the perceptions and intentions of learners regarding AI chatbot integration.

Perceived usefulness (PU) is a crucial factor in influencing the attitudes and intentions of language learners regarding the use of AI chatbots for language learning. When language learners perceive AI chatbots as advantageous and effective instruments for language acquisition, they are more likely to have positive attitudes and a greater intention to engage with this technology.

The ease of use (PEU) of AI chatbots significantly influences the attitudes and intentions of learners. The learner's willingness to implement and continue using this technology in the English classroom will be influenced by the chatbot applications' perceived ease of use and intuitiveness.

Moreover, learners' feelings of enjoyment and satisfaction (perceived enjoyment) when interacting with AI chatbots can positively impact their attitudes and intentions toward this technology. A favorable experience with AI chatbots can encourage learners to employ them for language study.

Trust in AI chatbots as dependable and credible language-learning instruments is a crucial factor influencing the attitudes and intentions of language learners. In order to increase the approval and use of AI chatbots by language students, it is essential to foster learners' trust.

Moreover, electronic word of mouth (e-WOM), such as positive reviews and recommendations from other users, can influence the attitudes and intentions of learners regarding the adoption of AI chatbots. Positive e-WOM can establish a favorable perception of AI chatbots, encouraging language learners to consider employing this technology.

The attitudes of English language learners toward the use of AI chatbots in the classroom have a significant impact on their intentions to incorporate this technology into their learning journey. The proposed framework provides a comprehensive foundation for understanding the attitudes of language

learners and can guide the development of strategies and interventions to promote positive attitudes and the adoption of AI chatbots in language education.

Limitations

While the proposed conceptual framework provides valuable insights into the attitudes of English language learners toward the use of AI chatbots in the classroom, it is essential to acknowledge certain limitations that may affect the generalizability and interpretation of the findings.

Regarding the Theoretical Structure, the proposed framework is predicated predominantly on the Technology Acceptance Model (TAM) and related research. While TAM has been extensively used in various contexts of technological adoption, it may not adequately capture the complexity and uniqueness of language learners' attitudes toward AI chatbots. To gain a deeper understanding of this phenomenon, additional theoretical models or perspectives could be explored.

On the other hand, another limitation was the Absence of Empirical Data. The proposed framework is solely theoretical, with no empirical data gathered to validate its relationships and assumptions. Consequently, the actual intensity and significance of the relationships between the identified factors have not been examined. The proposed framework requires empirical investigations involving data collection from language learners to provide empirical evidence.

Despite these limitations, the proposed conceptual framework provides a valuable starting point for investigating English language learners' attitudes toward AI chatbot adoption. Future research can expand on this framework by incorporating empirical data and resolving contextual nuances in order to provide a more comprehensive understanding of AI chatbot integration in language education.

CONCLUSION

Based on the Technology Acceptance Model (TAM), this conference paper presents a conceptual framework for investigating English language learners' attitudes toward the use of AI chatbots in the classroom. Through an exhaustive literature review and conceptual mapping, we have proposed a theoretical framework that integrates key factors that influence the perceptions and intentions of language learners regarding the adoption of AI chatbots for language learning.

The proposed framework includes essential elements such as perceived usefulness, perceived simplicity of use, perceived enjoyment, trust, electronic word of mouth (e-WOM), and attitude. These factors influence the attitudes and intentions of English language learners regarding the use of AI chatbots in the classroom.

Perceived usefulness (PU) has been identified as a crucial determinant of the attitudes and intentions of language learners to use technology. When language learners perceive AI chatbots as useful and efficient tools, they are more likely to have positive attitudes and a higher intention to utilize this technology in their language learning journey.

Perceived ease of use (PEU) significantly influences the attitudes and intentions of learners. The perceived simplicity and friendliness of AI chatbot applications will influence the likelihood that language students will adopt and continue to use this technology.

Moreover, the enjoyment and gratification (perceived enjoyment) that learners experience when interacting with AI chatbots can have a positive effect on their attitudes and intentions. A favorable experience with AI chatbots increases the likelihood that language learners will employ them for language-learning purposes.

Trust in AI chatbots as dependable and credible language-learning aids is an additional factor that significantly influences the attitudes and intentions of language learners. In order to increase acceptability and usage of AI chatbots by language students, it is essential to foster learners' trust.

In addition, electronic word of mouth (e-WOM), such as positive evaluations and recommendations from other users, can influence the attitudes and intentions of learners regarding the adoption of AI chatbots. Positive e-WOM can establish a favorable perception of AI chatbots, encouraging language learners to consider employing this technology.

The attitudes of English language learners toward the use of AI chatbots in the classroom have a significant impact on their intentions to incorporate this technology into their learning journey. The proposed framework provides a comprehensive foundation for understanding the attitudes of language learners and can guide the development of strategies and interventions to promote positive attitudes and the adoption of AI chatbots in language education.

IMPLICATIONS FOR PRACTICE AND FUTURE RESEARCH

The proposed framework has implications for language educators and policymakers in a practical sense. Educators can design more effective and learner-centered language learning environments if they comprehend the factors influencing students' attitudes toward AI chatbot adoption. Educators can enhance the language-learning experience by leveraging the framework's identified positive factors to increase students' adoption and engagement with AI chatbots.

To validate the proposed framework through empirical studies and data acquisition, additional research is required. Researchers will be able to evaluate the relationships between the identified factors and language learners' attitudes toward AI chatbots by conducting surveys and interviews with language learners from various educational settings. In addition, longitudinal studies can assess the long-term effects of AI chatbot integration on the attitudes and language proficiency of learners.

In conclusion, the proposed framework provides a valuable theoretical foundation for future research on the incorporation of AI chatbots in language education. It provides insight into the factors that influence the attitudes of language learners and a strategy for promoting the adoption of AI technology in language classrooms.

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APPENDIX

Explanation of Symbols

ATT: Attitude toward Using
PEN: Perceived Enjoyment
PEU: Perceived Ease of Use
PU: Perceived Usefulness
TAM: Technology Acceptance Model
TRU: Trust
WOM: Word-of-Mouth