CHAPTER 2
LITERATURE REVIEW

This section covers the theoretical framework and the relevant studies that explain some theories and relevant research findings as the foundations of this study carried out.

2.1 Theoretical Framework

2.1.1   Technology Integration into Language Learning

Technology integration is defined in terms of how teachers use technology to perform familiar activities more effectively and how this usage can reshape these activities (Hennessy et al., 2005). Technology has always played a significant role in the educational setting. It is a crucial component of the teaching profession since teachers can use it to help students learn. Due to its importance, integrating technology into the curriculum is quite needed to make the teaching and learning process effective and efficient (Eady & Lockyer, 2013; Pujasari & Ruslan, 2021). Another study stated that technology use has a significant potential to alter current language education practices and students can take the opportunity to have access to resources (Gilakjani & Rahimy, 2020).

Gilakjani and Rahimy (2020) emphasized that through using technology, learners can control their own learning process and have access to much information over which their teachers cannot control. Technology has an important role in promoting activities for learners and has a significant effect on teachers' teaching methods and help learners learn on their interest. Nevertheless, the use of technology modifies students' attitudes towards learning and boosts their self-esteem (Zhu, 2019). Students also grow more independent, and teachers believe that they should encourage and assist their students in acting and thinking for themselves. Technology has caused a shift in teaching approaches from being teacher-centered to being learner-centered. Teachers should act as guides and facilitators for their students' learning. This is a very helpful way that students can learn more (Riasati et al., 2012).

Baytak et al., (2011) carried out research on the role of technology in language learning. The findings showed that incorporating technology into the classroom enhanced student learning. Students claimed that using technology in the classroom increases their learning and makes it more fun. Additionally, students reported that technology enhances and personalizes their learning experiences. The usage of technology improves students' motivation, social relationships, learning, and engagement. Learning or acquiring a second language is an effortful and deliberate process where sustained engagement is indispensable (Hiver et al., 2021). Learners must diligently and persistently practice and apply the target language (Mercer, 2019) using technology (Kramsch, 2014).

Technology integration into language learning provides learners with access to a wealth of online resources and language learning platforms. Digital tools and applications facilitate autonomous language learning, allowing learners to tailor their experiences to their unique needs and interests (Reinders, 2012). In embracing technology, students should be able to take control of their learning journey, promoting a sense of autonomy and responsibility. (Hossain, 2024). It also examines how technology facilitates language practice, cultural exchange, and personalized learning experiences (Reinders, 2012)

Digital technology offers opportunities to enrich course materials with cultural content from around the world (Kramsch, 2014) and enable learners to explore different cultural perspectives and practices in an immersive manner and provides learners with the flexibility to explore different contexts, promoting a self-directed and personalized learning journey (Hossain, 2024). The integration of technology into language teaching offers numerous possibilities for enhancing language learning experiences.

2.1.2 Technology Acceptance Model

Technology Acceptance Model (TAM) is a widely used framework for understanding how users come to accept and use technology. It is specifically designed to predict and explain user behavior regarding technology adoption and utilization. TAM assumes that perceived ease of use (PEOU) and perceived usefulness (PU) are the primary factors influencing an individual's decision to use

a technology. It was designed specifically to explain computer usage behavior, focusing on two key constructs:

Table 1. Technology Acceptance Model (Davis, 1989)

Indicator	Definition
Perceived Usefulness (PU)	The degree to which a person believes that using a particular system would enhance their job performance.
Perceived Ease of Use (PEOU)	The degree to which a person believes that using a particular system would be free of effort.

TAM has been empirically validated across numerous studies and diverse technological contexts. The grand theory (Davis, 1989) provided empirical support for TAM, demonstrating that PU and PEOU were strong predictors of system use among employees using a word processing program. Over the years, researchers have extended and modified TAM to better capture the complexities of technology adoption.

Venkatesh and Davis (2000), refined the original Technology Acceptance Model (TAM) by introducing TAM2, which incorporated additional factors influencing perceived usefulness (PU) and perceived ease of use (PEOU). TAM2 added two main categories of determinants which are social influence processes and cognitive instrumental processes. Social influence processes include subjective norm, voluntariness, and image. Cognitive instrumental processes include job relevance, output quality and result demonstrability.

Furthermore Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT), which integrated TAM with other models to provide a comprehensive framework for understanding technology acceptance. UTAUT introduced four key constructs, which are performance expectancy, effort expectancy, social influence, and facilitating conditions, which together predict behavioral intention and usage behavior. This model was validated

across multiple organizational settings, showing that these constructs explain a substantial portion of the variance in user intentions and behavior.

The Technology Acceptance Model by Davis (1989) has significantly contributed to the understanding of technology adoption. Its core constructs, perceived usefulness and perceived ease of use, remain central to numerous studies and practical applications. Research has consistently found that PU and PEOU significantly predict user acceptance of various technologies, such as software applications, online services, mobile technologies, and e-learning platforms (Supriyono et. al., 2024). TAM has been widely applied and validated in various studies to understand the acceptance and use of different technologies, making it one of the most influential models in the field of information systems.

TAM (Davis, 1989) provides a foundational framework for understanding user acceptance of technology. Its core constructs—perceived usefulness (PU) and perceived ease of use (PEOU)—are fundamental to any technology adoption, making it a significant model that can be applied to various technologies, including the latest advancements. Dwivedi et al., (2019) conducted study about the emerging technologies such as AI, IoT, and blockchain with TAM to understand how users perceive the usefulness and ease of use of these technologies. TAM also relevant with the other study which aims in assessing influence of relation between variables in technology-mediated English learning environment. (Supriyono et al., 2024) Therefore, TAM (Davis, 1989) is used as its relevancy with the context of this research.

2.1.3 Artificial Intelligence

Artificial intelligence (AI) refers to the development of computer systems that can perform tasks that would typically require human intelligence. Kumar (2013) defines artificial intelligence as the intelligence which is created by human beings by applying various scientific and engineering techniques. It involves many human mental activities, such as writing computer programs, doing mathematics, engaging in common sense reasoning, understanding language, and even driving an automobile (Nilsson, 1998). Furthermore, McCarthy (2019) states that artificial

intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs.

Artificial Intelligence plays a significant role in language learning by offering innovative tools and approaches that enhance the learning experience. AI can provide personalized learning experiences tailored to individual learners' needs, abilities, and preferences. Through machine learning algorithms, AI systems can analyze learners' performance, track progress, and recommend targeted learning materials, exercises, or activities to address specific areas for improvement (Kumar, 2013). The role of AI in language learning continues to evolve as technology advances. It has the potential to provide personalized, adaptive, and engaging language learning experiences, offering learners greater autonomy, interactivity, and support (Kim et al., 2021).

AI systems employ various techniques and technologies to mimic human intelligence. These may include machine learning, natural language processing, computer vision, neural networks, and expert systems. Machine learning, in particular, plays a vital role in AI by enabling systems to learn from data and improve their performance over time without being explicitly programmed. Artificial intelligence also allows a person to converse with machines, computers or robots. In the education context, the significant growth of artificial intelligence and other technology, together provide opportunities for student centered pedagogy, and also contribute to the development of technology in educational context. (Godwin-Jones, 2011).

AI has become one of the technologies widely used to facilitate learning. One emerging AI is artificial intelligence chatbot, a computer program that simulates "human language with the aid of a text-based dialogue system" using natural language processing (Zumstein & Hundertmark, 2017). An AI dialogue system is an interactive system designed to converse with humans in a coherent and natural manner (Zhai & Wibowo, 2022). These dialogue systems, which can be voice-based or text-based, use technologies like natural language processing, machine learning, and deep learning to interpret and respond to human inputs

(Alsadoon, 2021). Its capabilities have piqued interest, showcasing the potential of AI in conversational contexts (Liu et al., 2021).

2.1.4 Chatbot-Assisted Language Learning

The history of chatbots began with the program ELIZA written by Joseph Weizenbaum in the early 1960's. ELIZA was a computer program designed to interact with someone typing in English. The first chatbot application gave the appearance of understanding and authentic interaction, but relied on keywords and phrases to which it had programmed responses and it could not really understand the conversation taking place but could appear very human-like (Weizenbaum, 1966). After many decades, chatbots develop and several chatbots have emerged, such as ChatGPT, Bard, Character AI, and others.

In language learning, chatbots act to assist and carry on a conversation with a human being, which is a potentially valuable resource for EFL learners. Zumstein and Hundertmark (2017) defines chatbot as a computer program that simulates human language with the aid of a text-based dialogue system using natural language processing. It acts to interact with learners using natural language for daily language practice answering language learning questions and conducting assessment and providing feedback (Fryer et al., 2019). Furthermore, Grudin and Jaques (2019) also states that chatbots are either embedded in webpages or instant messaging applications where both affordances provide easy online excess to learners for learning, practicing and improving English language proficiency. Therefore, by utilizing chatbots, learners will engage in dialogues with it, improving their fluency, comprehension, and conversational abilities.

A shift from traditional classroom setting to chatbot-assisted language learning involves individual behavioral intention in accepting technology. Studies recognize that a well-designed chatbot can promote learning more autonomously (V'azquez-Cano et al., 2021), provide intelligent teaching assistants and assist teachers in their teaching (Smutny & Schreiberova, 2020). Studies reported that researchers, practitioners, or learners use Chatbots as effective tools to be conversational partners (Fryer et al., 2019), provide content to learners

(Cunningham-Nelson et al., 2019), allow learners to revisit their learning resources, role play, native speaking environment opportunity to practice, and feedback (Ayedoun et al., 2019; Divekar et al., 2018; Smith & Evans, 2018).

Evidence as the result of chatbot-assisted language learning implemented in the classroom gives significant influence on academic achievement. Results demonstrated that students who interacted with the chatbot performed better academically compared to those who interacted with the course instructor and improve English proficiency (Grudin & Jacques, 2019) since chatbot potentially encourage learners for practicing language (Ayedoun et al., 2019), developing learning skills through group activities, and delivering appropriate content (Li et al., 2019). The use of Chatbots for language learning underpins the constructivist learning theory in which learners can take control of their learning process and construct their own knowledge through dialogues and interactions.

2.1.5 Character AI

Character AI is an artificial intelligence chatbot application that was co-founded by Noam Shazeer and Daniel De Freitas in 2021. Both founders have a strong background in artificial intelligence and have previously worked at Google, contributing significantly to the development of AI technologies. Their contributions to the development of scalable and efficient AI models have enabled Character AI to deliver dynamic and engaging conversational experiences. The foundational technologies used in Character AI include advancements in NLP, deep learning, and AI-driven user interaction. Character AI aims to revolutionize the way people interact with machines by making AI more personable and relatable. Its goal is to create AI characters that can serve as companions, tutors, or assistants, and to bring life the science-fiction dream of open-ended conversations and collaborations with computers to provide practical value in everyday activities (Welcome to Character Book!, n.d.).
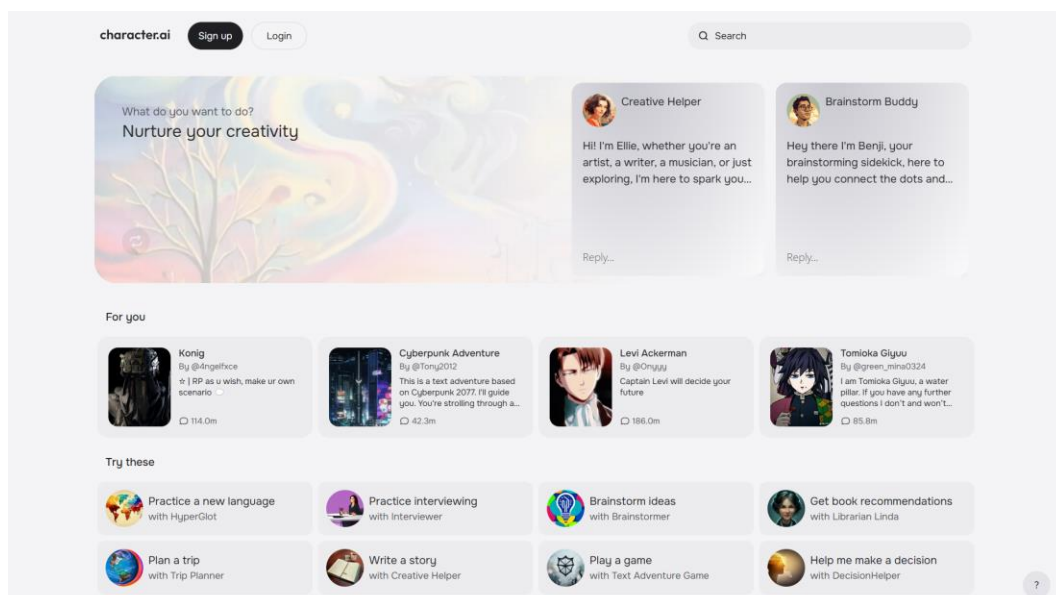
Figure 1. Character AI Homepage

Character AI represents a powerful tool in English language learning. Character AI offers a range of features designed to create engaging, interactive, and educational experiences. The AI technology used can maintain context over multiple turns in a conversation, allowing for more coherent and relevant dialogues. Users can interact with pre-built characters or create their own, customizing personality traits and dialogue styles. They can also participate in role-playing exercises that simulate real-life situations and engage with artificial intelligence character in interactive stories. Therefore, Character AI has its features that are designed to make language learning more engaging, effective, and accessible, providing a valuable tool for learners of all ages and proficiency levels.

2.2 Study of the Relevant Research

First, a study conducted by Haristiani and Rifai (2021), investigated the role of chatbot to provide teachers with an alternative autonomous learning medium. This study aimed to use a chatbot-based Japanese grammar learning application namely Gengobot as an autonomous Japanese learning medium. This study applied Analysis, Design, Development, Implementation, and Evaluation (ADDIE) instructional design model. It was carried out in Indonesian University majoring Japanese language education, consisting of 50 participants. The participant of the

study conducted in pre-experimental method and Likert scale questionnaire. The finding shows that Gengobot as a chatbot-based Japanese grammar learning medium is an interesting and innovative medium to support Japanese autonomous learning because learners can decide how they learn using this application to improve their Japanese grammar skills. In addition, Gengobot is a chatbot-based learning medium that is more interactive than other Mobile based media, which makes learners more interested in using Gengobot as a Japanese grammar learning medium. However, Gengobot still needs further development such as adding advanced grammar content, adding Japanese pronunciation features, and more.

Second, a study conducted by Hakim and Rima (2022), investigated AI chatbot as a tool to practice and improve students' English proficiency. This study aimed to seek the best chatbot application to improve students' communication skills in English. This study applied a descriptive method to describe the process of learning English with chatbots and to determine student perceptions of the use of these chatbots in improving their communication skills in English. It was carried out in the PKh Department for the 2020/2021 academic year. The finding shows that the most preferred Chatbots is "ANDY" which have much positive perception and no negative perception while the Least favorite chatbots is "ELIZA".

Third, a study conducted by Huang, et al., (2022), investigated the usefulness of AI chatbot assisted language learning due to their ability to converse with students using natural language. This study aims to discover the possible technological, pedagogical, and social affordances enabled by chatbots in language learning. This study applied a grounded theory approach to search systematic literature review and identified 25 empirical studies that examined the use of chatbots in language learning. The findings of this research revealed three technological affordances: timeliness, ease of use, and personalization; and five pedagogical uses: as interlocutors, as simulations, for transmission, as helplines, and for recommendations. Chatbots appeared to encourage students' social presence by affective, open, and coherent communication. Several challenges in using chatbots were identified: technological limitations, the novelty effect, and cognitive load.