

CHAPTER 2

LITERATURE REVIEW

This chapter is organized into two primary elements, which serve as the foundation for this research. The first section focuses on the TPACK framework, which serves as the study's conceptual framework. The second section explores at relevant research on AI integration in ELT.

A. Conceptual Framework of the Study: TPACK Framework

Mishra and Koehler (2006) established the TPACK framework, which serves as the foundation for research into effective technology integration in the classroom. This paradigm emphasizes the interface of three knowledge domains: technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). In ELT, TPACK is used to investigate how technology might be integrated into lesson planning and instructional practices. The technological, pedagogical, and content knowledge (TPACK) paradigm may define the knowledge necessary by teachers to integrate AI-based tools into education (Fertier et al., 2020).

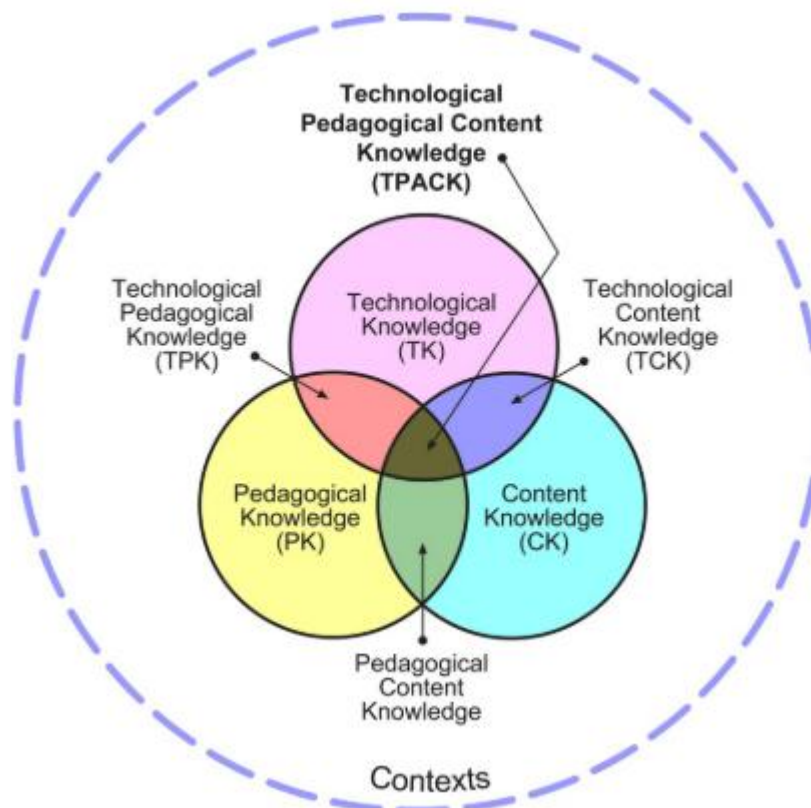


Figure 2. 1 The TPACK framework

Source: Koehler et al. (2009)

In the context of ELT, these areas are related to establishing an awareness of how English language teachers can enhance subject teaching and learning in ELT by implementing technology (such as AI) (Koehler et al., 2009) as follows.

1. Technological Knowledge (TK) is the ability of English language teachers to understand, apply, and adapt to technology within various contexts.
2. Pedagogical Knowledge (PK) refers to English language teachers' thorough understanding of teaching and learning processes, strategies, and techniques.
3. Content Knowledge (CK) refers to the depth of understanding that English language teachers have regarding the subject matter they are

teaching for effective instruction and facilitating student understanding.

In the context of AI implementation in ELT, various strategies can be employed by teachers to maximize technology integration. These strategies are classified based on the language skills of reading, writing, and speaking, and organized based on the TPACK framework.

Table 2. 1 TPACK Matrix for AI Implementation in Teaching Reading

TK	PK	CK	Reference
Duolingo, Khan Academy	Independent and adaptive reading practice	Vocabulary, text comprehension.	(Mamoon & Arif, 2024)
AI-based multimedia textbook	Interactive teaching materials	Grammar and meaning in context	

Table 2.1 shows how AI can be integrated in teaching reading, particularly in supporting extensive reading, by organizing and facilitating adaptive independent reading practice using apps such as Duolingo and Khan Academy, and by incorporating interactive multimedia teaching materials to support students' reading comprehension.

Table 2. 2 TPACK Matrix for AI Implementation in Teaching Writing

TK	PK	CK	Reference
Use of adaptive learning tools (Duolingo, Khan Academy)	Writing exercises according to the student's level	Sentence structure, grammar, and vocabulary usage in writing	(Mamoon & Arif, 2024)
Use of AI in project-based	Directing students to compose texts	Text genre, context-	

TK	PK	CK	Reference
learning (Task-Based Learning)	through collaborative and creative tasks	appropriate content	

Table 2.2 illustrates how AI can be used to design writing exercises appropriate to students' ability levels, as well as manage project-based writing tasks that encourage collaboration and creativity. These activities aim to develop students' paragraph writing skills, particularly in organizing ideas and producing writing with appropriate structure and meaningful content.

Table 2. 3 TPACK Matrix for AI Implementation in Teaching Speaking

TK	PK	CK	Reference
Duolingo (speech feedback)	Independent speaking practice	Pronunciation, intonation	
AI-based pronunciation assistance tool (Elsa Speak, Rosetta Stone, etc)	Direct correction when speaking	Oral pronunciation and clarity	(Mamoon & Arif, 2024)

Table 2.3 emphasizes how AI tools to provide real-time pronunciation feedback, particularly targeting students' pronunciation accuracy through apps such as Elsa Speak, which helps improve students' pronunciation, intonation, and speech intelligibility essential for effective speaking in direct communication during lessons.

This study employs the TPACK framework to explore the various types of AI technologies used in ELT, as well as the benefits and

drawbacks of AI integration used by student teachers after completing their teaching practice. Using TPACK revealed how AI can enhance or even destroy ELT when investigated employing the TPACK framework.

Technology, pedagogy, and content knowledge offer English teachers a framework for effective teaching and learning (Drajati et al., 2018). This integration is crucial because it helps teachers control the difficulty of integrating technological resources with pedagogical techniques to enhance teaching language. Tseng et al. (2022) Burhan emphasized that the TPACK framework allows teachers to adapt their teaching approaches to the constantly shifting technological landscape, providing that language learners benefit from a more dynamic and collaborative learning experience. Therefore, this paradigm not only guides effective technology integration, but also supports student-centered and responsive learning environments.

TPACK has been implemented globally in Europe, the United States, and Asia as a key framework for technology integration in education. In Europe, the use of TPACK is focused on increasing the competencies teachers in dealing with the problems of 21st-century learning. Tondeur et al. (2017) emphasized the significance of implementing a validated tool to assess pre-service teachers' ICT competencies in countries such as Belgium and Norway. Teachers' ability to use technology effectively to assist learning and instructional design was an example of such technologies. In addition, Chai et al. (2013) also noted that TPACK is not only a globally conceptual framework, but it has also been adapted in several European nations to improve technology integration in accordance with curriculum and local practices. This adaptation helps teachers gain confidence and professional competence in managing technology both pedagogically and culturally.

In the United States, TPACK has become a key foundation for technology-based education reform. Mishra and Koehler (2006), as the initial initiators of the TPACK framework, explained that the integration

of these three aspects of knowledge is crucial for teachers to effectively navigate the complexities of digital learning. In addition, Harris et al. (2009) argued that teachers trained in the TPACK model have a greater ability to develop technology-based learning activities that are relevant to the curriculum and the requirements of their students. Furthermore, Voithofer and Nelson (2021) emphasized that teacher educators in the United States frequently employ TPACK-based approaches into their preparation activities to help teachers' future technology integration capabilities. Furthermore, national regulations such as the ISTE (International Society for Technology in Education) guidelines stimulate the development and deployment of TPACK, encouraging professionalism and ethics in the use of technology for education.

The application of the TPACK framework in educational contexts has been growing across several Asian countries, particularly in Taiwan, South Korea, and Indonesia. Research by Cheng (2017) in Taiwan, language teachers have begun to systematically integrate TPACK into technology-based education. Meanwhile, in South Korea, the TPACK model is employed in e-learning and blended learning-based teacher training as a solution to solving digital learning difficulties (Chai et al., 2019). In Indonesia, although still in the adaptation stage, this model is starting to be used to improve teachers' digital literacy through TPACK-based training. According to Drajiati et al. (2018), who studied English language instructors in Indonesia, TPACK development in connection with multimodal literacy helps teachers successfully incorporate a variety of technological tools into language classes. Celik (2023) demonstrates the increasing significance of TPACK in improving educators' capacity to successfully integrate technology, while Sanusi et al. (2024) emphasize how significant it is in the context of English language learning context.

In conclusion, TPACK provides an important framework for the integration of technology, pedagogy, and content in ELT. Although the TPACK framework was developed for professional teachers, several

studies have successfully adapted it to assess the readiness of student teachers to integrate technology into the learning process (Ayanwale et al., 2024; Chai et al., 2013). Therefore, in order to shape better teaching practices in the future, research on the types of AI, potentials, and drawbacks of integrating AI in ELT is important, particularly from the perspectives of student teachers.

B. Studies of Relevant Research: AI in ELT

AI is an area of computer science that focuses on building machines that can perform tasks like pattern recognition, problem solving, and learning that would typically require human intelligence (Nilsson, 2009). The term "Artificial Intelligence" was first used at a conference in Dartmouth in 1956, which marking the beginning of significant research on the topic (McCarthy et al., 2006). As technology advances, AI evolves from simple systems based on rules to complicated machine learning and artificial neural network applications (Goodfellow et al., 2016). With these developments, artificial intelligence can now process information more like a human thought process. This advancement shows that AI has developed into a system that can imitate human thought, expanding its potential in a variety of fields, including education.

AI has brought significant transformation to education by providing more personalized and adaptive learning, as well as supporting more efficient administrative management (Holmes et al., 2019). The use of AI in education allows for a learning system that can customize materials and learning pace based on each student's needs (Luckin & Holmes, 2016). Furthermore, AI contributes to the analysis of learning data to offer deeper understandings of the efficacy of instructional strategies and student learning outcomes (Zawacki-Richter et al., 2019). This demonstrates how AI can be used as both an enabling technology and an analytical tool to help make more focused educational decisions,

especially when it comes to identifying the unique learning needs of each student.

AI has been used in ELT to enhance language proficiency through a variety of technologies, including interactive chatbots, automatic writing evaluation, and pronunciation training. Makwana (2025) stated that students can independently enhance their writing structure and grammar usage with the aid of AI-based automatic feedback systems. Additionally, an AI-based pronunciation training system has been created to offer audio-visual feedback based on the particular mistakes made by students (Bu et al., 2021). In addition, the AI-based chatbot has been demonstrated that the AI-based chatbot can improve student engagement through interactive and adaptive conversation while automatically correcting students' linguistic mistakes as they understand (Li et al., 2022). The application of these technologies shows that AI can offer a more responsive and interesting learning environment than was previously achievable with conventional learning methodologies.

The integration of AI has both potential and drawbacks. A study by Hockly (2023) investigated the use of AI in ELT, highlighting the good, bad, and ugly of integrating AI tools. This study describes the effects of AI-based tools on ELT teaching and learning, including chatbots, machine translation, and automated feedback systems. According to the study, AI tools can improve personalized learning experiences by customizing lessons to meet the needs of each individual student, efficiently assist students with less fluent language skills by using chatbots for live language practice, and support programs that put the needs of students first, particularly in post-pandemic learning environments. In support of this perspective, Benvenuti et al. (2023) observed that AI can improve problem-solving, creativity, and critical thinking. Additionally, Labadze et al. (2023) explained how AI chatbots improve personalized learning experiences and help teachers save time. In addition to providing live

language practice for students with lower language proficiency, this also helps teachers save time by using AI chatbot assistance.

The systematic review conducted by Sharadgah and Sa'di (2022) on AI in ELT highlights significant progress in this area. In terms of optimizing English proficiency, translation, assessment, recognition, attitude, satisfaction, etc., they highlight the bright future of AI in ELT and offer beneficial outcomes. A comprehensive examination of the literature, which demonstrates the benefits of integrating AI into ELT, provides support to this optimism. Furthermore, even though this study highlights the potential advantages of AI, it also emphasizes the need for more research. According to the authors, it is critical to have a greater understanding of the long-term effects and best practices for successful implementation in the context of ELT.

The disadvantages of using AI in language learning tools were discussed by (Val & Araya 2023). Lack of human interaction, difficulties replicating contextual and cultural nuances of language, reliance on large amounts of data for training, limited comprehension or production of distinctive or creative language, and limited error detection are some of these. Similarly, Hockly (2023) found that attention literacy and AI can help minimize digital distractions, even though current AI applications are still largely "weak" (usually performing a small number of tasks in a particular domain fairly well). These observations draw attention to the difficulties and complexities involved in incorporating AI into language instruction.

The studies discussed are relevant to this research because they focus on the potential and drawbacks of using AI in ELT. Relevant to the focus of this research is understanding how student teachers utilize different types of AI tools to improve teaching and learning processes. In addition, the drawbacks faced in the use of AI, such as the limitations of human interaction and the difficulty of understanding cultural context, are

also in line with the aim of this study to identify the drawbacks faced by student teachers in teaching practices using AI.