

CHAPTER I

INTRODUCTION

A. Background of Research

The rapid advancement of digital technology has transformed various aspects of human life, including the field of education. In the era of Society 5.0, technology is expected to support human activities through innovations such as Artificial Intelligence (AI), the Internet of Things (IoT), big data, and cloud computing. Within the educational sector, these technological developments have encouraged schools to adopt more adaptive, flexible, and technology-oriented learning approaches. Consequently, teachers are required not only to master subject content but also to develop digital literacy and technological competencies that enable them to respond effectively to the demands of twenty-first-century education. Despite the growing integration of technology in education, challenges related to digital literacy and teacher preparedness remain significant concerns in many educational contexts (UNESCO, 2023). The successful adoption of emerging technologies also depends largely on teachers' ability to adapt to technological change and develop relevant competencies for digital learning environments (Ayanwale et al., 2022). Therefore, teachers' readiness to adapt to technological innovation has become a crucial factor in determining the success of educational transformation (Granström & Oppi, 2025).

The advent of artificial intelligence (AI) constitutes an essential technological development in modern education. Artificial intelligence is defined as a computer system capable of completing the tasks that would otherwise require human intelligence, which includes processing languages, solving problems, generating content, and making decisions. Recently, the availability of different technologies of AI has been improved by programs such as ChatGPT, Grammarly AI, Canva Magic Design, Gemini, and others using AI for educational purposes. Integration of AI into the educational sector opens up a wide range of opportunities to improve teaching and learning techniques, provide personalized learning, and make educational decisions more effective (Ouyang & Jiao, 2021). Additionally, the creation of generative AI tools expands the use of AI in education by helping

teachers create learning materials, give feedbacks, and interact with students (Kasneci & others, 2023). According to current research, the implementation of AI in educational environment can foster pedagogical innovations, but proper digital competence and responsible usage of AI should be ensured by the teachers (Chiu, Xia, et al., 2023).

Regarding the field of English Language Teaching (ELT), there exist several benefits of the application of artificial intelligence (AI) in relation to improving the quality of both teaching and learning. The use of AI-based software helps teachers to prepare materials, create classroom exercises, provide automatic feedback, as well as to develop more engaging multimedia resources. For students, AI helps in acquiring languages through writing help, speaking practice, grammar corrections, vocabulary building, and personalization of the learning process. Several empirical studies show that the implementation of technologies based on AI is helpful in creating adaptive learning environments where individual feedback can be provided in response to the particular needs of the students in language development (Zawacki-Richter et al., 2019). In addition, the application of generative AI in education creates additional opportunities for language learning through interactive communication, content creation, and learning assistance (Tlili et al., 2023). Furthermore, AI can be used in teaching in order to provide help in designing more flexible learning environments and experience (Crompton & Burke, 2023).

Even in the case of increased use of artificial intelligence technologies, their implementation is largely dependent on teachers. Teachers are still key players in the process of education and play a crucial part in the technology integration into educational activities. Along with the subject knowledge, teachers should have digital literacy, technology competence, pedagogical competence, and an ability to evaluate the appropriateness of using artificial intelligence technologies for educational purposes. The use of artificial intelligence can help teachers plan lessons, develop learning materials, and conduct adaptive teaching (Kasneci & others, 2023). However, the potential of AI technologies cannot be fully achieved without teachers' confidence, competence, and ability to adopt these technologies (Scherer et al., 2019). Thus, teacher readiness and competence are seen as crucial factors of implementing AI technologies in education (Nazaretsky et al., 2022).

In practice, the integration of AI in education is often accompanied by various challenges. Some teachers still experience difficulties in understanding AI concepts, selecting appropriate AI tools, and integrating technology into their pedagogical practices. Disparities in digital literacy, limited access to professional development programs, inadequate technological infrastructure, and insufficient institutional support continue to hinder technology adoption in schools ((Granström & Oppi, 2025). In addition, teachers' confidence, knowledge, and access to AI-related training have been found to significantly influence their readiness to adopt and utilize AI technologies in educational environments (Ayanwale et al., 2022). These conditions suggest that AI integration requires more than technological availability; it also requires teacher readiness in terms of knowledge, attitudes, confidence, and pedagogical competence (Guan et al., 2025). Consequently, investigating teachers' readiness toward AI integration has become increasingly important in contemporary educational research.

Teacher readiness has now emerged as one of the most significant issues in assessing the effectiveness of the integration of Artificial Intelligence (AI) in educational contexts. Teacher readiness involves teachers' knowledge, technological skills, pedagogical competence, attitude, and confidence regarding the use of AI in teaching and learning (Ng et al., 2021). It also pertains to teachers' understanding of AI application, its educational potentiality, and integration of new technologies in the classroom based on proper pedagogical considerations (Miao & Holmes, 2021). Teachers who possess high levels of digital and AI literacy are much likely to be confident about adopting AI technologies and experimenting with innovative ideas (Long & Magerko, 2020). Otherwise, lack of technological knowledge and proper preparation can limit the effective implementation of AI in education. Hence, analyzing teacher readiness is crucial since the success of AI integration will not only depend on the presence of technology but also on teachers' readiness for using those technologies properly.

However, as more interest arises in the use of Artificial Intelligence (AI) in education, many researchers have been keen on examining teachers' readiness to implement AI in teaching and learning. Prior studies have looked at teachers' perceptions of AI, AI literacy among teachers, and skills necessary for integrating

AI in education (Ng et al., 2021). Additionally, there has been research focusing on professional development and policy as enablers of building teachers' necessary knowledge and skills for implementing AI in schools responsibly (Miao & Holmes, 2021). Furthermore, there have been studies showing the influence of several factors on teachers' readiness to implement AI in education such as technological competence, pedagogical knowledge, organizational support, and AI training (Zawacki-Richter et al., 2019). Despite these studies giving a comprehensive view of AI integration in education, more research needs to be conducted on teachers' readiness to implement AI in specific educational settings, particularly in English language teaching.

In addition to the above-mentioned contextual differences, another important research gap can be observed. The current research on AI in education has mostly been centered around the perceptions, attitudes, and acceptance of Artificial Intelligence (AI) among teachers (Yue et al., 2024). Furthermore, there is a lack of comprehensive studies that consider teachers' readiness to implement AI in their instructional practices, especially in relation to their pedagogical competence and AI literacy (Yue et al., 2024). Moreover, despite the increase in research on AI implementation in educational settings in general or higher education in particular, the attention paid to AI implementation in English language teaching in secondary schools is not sufficient (Ozdemir & Mede, 2024). Finally, even though the number of empirical studies on AI implementation in English language teaching keeps increasing, the evidence available from Indonesia in particular, where this phenomenon is observed in senior high schools, is still scarce (Priantini et al., 2024).

What makes this research unique is its approach to teachers who teach English at the senior high school level in Bandung, in which teachers' readiness to integrate AI technology is highlighted rather than their attitude or perception towards AI. In fact, UNESCO (2023) states that in order to effectively integrate AI technology, teachers should have relevant knowledge and competencies. Thus, this research explores readiness of the teachers in terms of their cognitive, affective, and psychomotor readiness and challenges that come along in integrating AI technology into teaching English language. Moorhouse et al. (2023) claim that teacher

readiness is one of the crucial elements for implementing AI in language education. This research also provides empirical data from Indonesia, taking into consideration the gap in studies related to this problem (Du et al., 2024).

Bandung region constitutes an appropriate location for this study since digital transformation and usage of AI-powered educational technology are becoming common in schools (UNESCO, 2023). Based on the preliminary observation and interviews conducted with several English teachers in Bandung, it was found that there exist differences between the level of awareness of AI such as ChatGPT, Grammarly AI, and Canva AI among teachers. Some teachers claimed that they use AI in order to assist lesson planning, instructional material preparation, and even classroom activities. In turn, other teachers admitted their lack of familiarity with AI technologies due to insufficient training with it.

Thus, one may conclude that teachers show different levels of readiness towards implementing AI into the process of English language teaching. The differences in teachers' readiness could be determined by various factors such as AI literacy, access to professional development programs, prior experiences in using educational technologies, and institutional support (Du et al., 2024). Moreover, recent research indicates that teachers' readiness and AI competencies are the strongest predictors of success in implementing AI into educational practice (Kohnke et al., 2024). Otherwise, without sufficient readiness, AI will only make things more complicated instead of being a useful instructional tool.

It is thus timely and necessary to examine the English teachers' readiness in AI integration within senior high school English classes in Bandung. The evaluation of teachers' readiness for AI integration is able to provide useful data about the existing situations in schools, as well as identifying any needs which should be addressed (Ayanwale et al., 2022). It is hoped that the results of this study would be helpful to design proper training programs and educational policy to facilitate AI integration (Guan et al., 2025). Ultimately, it is expected that this study would be helpful in improving the quality of English teaching and facilitating educational technology integration in the digital era (Wang et al., 2023). It is hoped that this study will provide empirical data regarding English teachers' readiness for AI integration within high school English classes in Bandung

B. Problem Statement

In the context of English language teaching, the development of Artificial Intelligence (AI) provides opportunities for teachers to create learning processes that are more dynamic and responsive to students' needs. However, the integration of AI into educational practices is not solely determined by the availability of technological tools but also by teachers' readiness as the primary users of the technology. Such readiness includes digital literacy, understanding of AI concepts, pedagogical competencies, and the ability to align technology with instructional objectives (Ayanwale et al., 2022). Furthermore, teacher readiness is closely related to their perceptions of the benefits of AI and their capacity to integrate technological innovations appropriately into the teaching and learning process (Granström & Oppi, 2025).

Despite the potential of AI to support educational practices, English teachers continue to encounter several challenges in its implementation. First, there are variations in digital literacy levels among teachers, resulting in unequal abilities to understand and utilize AI effectively (Ayanwale et al., 2022). Second, some teachers experience uncertainty regarding the effective and responsible use of AI in educational settings due to concerns about ethical issues, information accuracy, and appropriate pedagogical implementation (Guan et al., 2025). Third, the limited availability of formal training programs on the use of AI in classroom settings has left many teachers insufficiently prepared to integrate the technology effectively into English language instruction (Granström & Oppi, 2025).

Based on these issues, the research questions of this study are formulated as follows:

1. What is the level of English teachers' readiness toward the integration of Artificial Intelligence (AI) in senior high school English classes in the Bandung region?
2. What are the dimensions of teacher readiness that most strongly support the integration of Artificial Intelligence (AI) in English language teaching?
3. What challenges do English teachers face in preparing for the integration of Artificial Intelligence (AI) in classroom instruction?

C. Research Objectives

The primary objective of this study is to investigate the readiness of English teachers for the integration of Artificial Intelligence (AI) in English language teaching at senior high schools in the Bandung region. Specifically, this study seeks to:

1. To identify the level of English teachers' readiness toward the integration of Artificial Intelligence (AI) in senior high school English classes in the Bandung region.
2. To analyze the dimensions of teacher readiness that most strongly support and least support the integration of Artificial Intelligence (AI) in English language teaching.
3. To identify the challenges faced by English teachers in preparing for the integration of Artificial Intelligence (AI) in classroom instruction.

D. Benefits of Research

1. Theoretical Significance

This study contributes to the advancement of technology enhanced learning, particularly in the context of integrating Artificial Intelligence (AI) into English language teaching. The findings are expected to enrich the existing body of literature on teachers' readiness for AI integration in English as a Foreign Language (EFL) instruction, especially within the senior high school context, which remains relatively underexplored in previous research. Furthermore, this study contributes to a deeper understanding of teacher readiness for AI integration by examining digital literacy, cognitive readiness, affective readiness, psychomotor readiness, and the challenges associated with AI integration in English language teaching. The findings are expected to provide empirical evidence regarding the current level of teacher readiness and identify the factors that support or hinder the effective implementation of AI in educational settings. The findings are also expected to provide empirical evidence regarding how teacher readiness influences the effectiveness of AI integration in English language education. Therefore, this study may serve as a valuable reference

for the development of more adaptive, contextualized, and technology-oriented instructional models in the digital era.

2. Practical Significance

a) For Teachers

This study provides information and references for English teachers regarding their readiness to integrate Artificial Intelligence (AI) into English language teaching. In addition, the findings may help teachers better understand the importance of digital literacy, pedagogical readiness, and the effective use of AI technologies in supporting the teaching and learning process. The study is also expected to encourage teachers to develop more innovative, interactive, and technology-enhanced instructional strategies.

b) For Students

This study is expected to have an indirect impact on improving students' learning experiences through the integration of AI into English language instruction. With better teacher readiness in utilizing AI technologies, students are expected to experience more interactive, adaptive, and engaging learning environments that support the development of their English language proficiency.

c) For Schools

This study may serve as a consideration for schools in evaluating teachers' readiness for the integration of Artificial Intelligence (AI) into instructional practices. Furthermore, the findings can assist schools in designing professional development programs, technological support systems, and educational policies that align with teachers' needs in the era of digital learning.

d) For Future Researchers

This study may serve as a reference for future researchers interested in investigating Artificial Intelligence (AI) in the field of education, particularly in English language teaching. In addition, it opens opportunities for further research on other aspects of AI

integration, such as students' perceptions of AI, the effectiveness of AI-assisted learning, teachers' digital competencies, and the development of AI-based instructional models across different educational contexts.

