

CHAPTER I

INTRODUCTION

This chapter presents the background of the study, problem identification, limitations of the problem, statement of the problem, objective, and significance of the research, theoretical and practical significance, definition of key terms, and publication target.

1.1 Background

Advancements of technology in the 21st century enabled students globally to immerse themselves in a learning environment that promoted collaboration, critical thinking, and diligence. Advancements and developments that occurred inside the scope of education could be highly attributed to these technological advancements; not only did they present swift changes in the technical landscape of education through the implementation of these technological advancements, but they also promoted fundamental changes in the way students learned. This was an age when education relied less on fact-based and information-based education styles, but rather was more driven towards arming students to brace and embrace technological leaps and the gaps in between (Padmadewi dkk., 2021). Technology, more specifically Artificial Intelligence (AI), managed to rewrite and restructure the traditional notion of education and presented a significant and complex task for students and educators to fulfil (Santosa dan Wahyuni, 2024). No segment of education was overlooked or untouched by the reach of technology and AI, including language learning (Ratminingsih dkk., 2021).

According to the *Panduan Penggunaan Kecerdasan Buatan Generatif (Gen AI) dalam Pembelajaran Pendidikan Tinggi (2024)*, *Teknologi Kecerdasan Buatan Generatif (Generative AI/Gen AI)* was a new form of generative technology that could be used to, as the name suggested, generate, alter, understand, and synthesize content and/or ideas. AI itself referred to machine- simulated processes designed to produce outputs that normally required human input and mimic human analyses and approaches to thinking as accurately as a machine could reproduce. This process relied heavily on algorithmically-driven models, which were then given input sourced from mass databases that enabled computers to produce outputs akin to human- made ones through said algorithm. Recent advancements in electronics and computing hardware enabled significant leaps in the development of AI, facilitating faster computational power, greater data storage and memory capacity, and the creation of new algorithmic approaches such as deep learning (Chan dan Colloton, 2024). AI also represented an invisible force for most people as it encompassed a wide range of concepts and was often technically complex, making the determination of causality inherently difficult. However, it might have been more constructive to begin by comparing AI with the workings of the human brain (Clark, 2024).

The advancement of AI had a significant impact across various sectors, including education. During the Fourth Industrial Revolution, learning— particularly English Language Learning (ELL) inadvertently leveraged the role of technology and digitalization across nearly all aspects of education (Santosa, 2022). At that time, English Language Teaching (ELT) advanced rapidly through the

creation and utilization of innovative technologies, including AI (Renandya and Widodo, 2016). ELT proved to be particularly practical for educators, especially in enhancing students' writing skills (Hawanti and Zubaydullovna, 2023), and its practicality was believed to be further leveraged through AI usage (Yiling et al., 2025). Where AI-based technologies fit within the context of ELT was through common applications such as Google Translate, Text-to-Speech (TTS), educational platforms like Duolingo and chatbots, or specified learning environments such as Cognitive Immersive Language Learning Environments/CILLE (Divekar et al., 2021) provided learners with various tools that emulated human intelligence and strengthened language acquisition (Abu Sahyon et al., 2024).

AI also offered new opportunities to enhance students' learning experiences. One of the most prominent functions of AI was its use of natural language processing (NLP) technologies, which enabled AI systems to better understand and respond to human language (Sain and Sain, 2024). This capability opened possibilities for more personalized and adaptive approaches to English language teaching and learning (Kusuma, 2024). Enhancing learning achievement and ensuring equitable access to relevant education became global priorities across both developed and developing nations. These objectives gained heightened importance in that era, characterized by technology-driven approaches to personalized learning (Srinivasan, 2022).

Another significant sector influenced by macro-level AI development was the evolving role of the teacher. Once regarded as the primary source of knowledge, educators increasingly transitioned into roles as facilitators and coaches, driven by

the growing integration of digital technologies and artificial intelligence in education (Yim and Su, 2024). This reality emphasized that learning extended beyond the boundaries of the classroom, advocating for a seamless continuum between formal and informal learning environments. Srinivasan (2022) and, by extension, de la Vall and Araya (2023), Yim and Su (2024) anticipated several transformative forces shaping the future of education namely, the digital age, social learning, and technological advancement the impact of which remained profoundly relevant in that educational landscape, and all interlinked with advancements in the scope of AI.

Lastly, as a segue to a sector in language learning salient to this research, AI itself served as an effective medium for developing the writing skills of English language learners, particularly using tools such as Gencraft and ChatGPT, which showed significant improvement in students' written outputs (Pratama & Hastuti, 2024). AI technologies played a crucial role in enhancing writing proficiency in the English language learning. For instance, AI-supported writing applications such as Wordtune and Grammarly, as well as other AI-based digital writing assistants, were found to contribute to the improvement of students' writing skills (Mahmud, 2023).

However, AI also inevitably presented potential risks and challenges when implemented improperly. To ensure that generative AI (Gen AI) technologies were used wisely and optimally in educational contexts, these risks had to be clearly understood so that users could harness the potential of Gen AI while minimizing possible adverse outcomes. For instance, Özer (2024) expressed challenges related to educational AI usage in the manners and the extent to which AI systems were

used; relying heavily or being dependent on these systems as opposed to utilizing AI as support systems could impact students' development negatively, in a sense that these students might not perform to their maximum given the practical benefits of utilizing AI (Kasneci et al., 2023). Risks were also present for the educators themselves, as forms of evaluations such as exams prepared by these systems might not fully meet learning objectives and could lead to learning outcome deficiencies (Al-Worafi et al., 2023; Kasneci et al., 2023). Issues regarding equality (and inequality) in accessing AI systems were also regarded as one of the foremost risks of AI usage in educational landscapes, as inequalities in access would lead to only a segment of society being able to take advantage of these systems (Grassini, 2023; Özer, 2024), thus proper understanding and independence from AI were still required (Smyrniou et al., 2023). Arguments could also be made in the context of data privacy and online safety regarding the data shared with AI (Owan et al., 2023), among others.

Within the context of language learning, there were four fundamental skills: listening, speaking, reading, and writing. Among these, these receptive and productive skills—particularly writing—played a crucial role in contributing to overall English language competence (Shobikah, 2020). Learners of English as a second or foreign language had to acquire specific competencies to use the language effectively, especially within a globalized context such as Indonesia. One of the key challenges in English language proficiency, particularly in writing, was that students often struggled to integrate essential linguistic components—such as syntax, vocabulary, and grammar—into their written work. This difficulty was

further compounded by the dual necessity of developing both written and spoken communication skills to achieve communicative competence. Suwastini and Dwiyantri (2021) emphasized that writing was a highly important skill to teach, as it fostered creative thinking and enhanced vocabulary acquisition.

Writing, as one of the four core language skills alongside listening, speaking, and reading, occupied a higher level within the linguistic hierarchy; it developed only after learners had acquired sufficient foundational knowledge from the preceding levels. This hierarchical nature explained why writing was often regarded as a secondary skill globally. While the public might have viewed it as less essential, the academic and educated community valued writing as a distinctive marker of intellectual and scholarly excellence (Gautam, 2019). In the context of learning, writing was a complex process involving multiple stages to produce coherent and meaningful text. To improve students' writing abilities, instruction had to be well-structured, supported by organized input, and enhanced through effective learning activities (Wahyuni & Santosa, 2023). Many students encountered challenges when developing writing proficiency in English. One of the primary difficulties lay in the inherent complexity of writing in a second or foreign language, which required coherence and accuracy in expressing ideas, opinions, emotions, or experiences through well-structured sentences, clauses, phrases, and paragraphs while adhering to grammatical conventions. These challenges underscored the need for tailored teaching techniques and strategies to help students overcome such barriers and enhance their writing competence.

As explained above, there were many forms of artificial intelligence; however, this study focused on Gemini, a Google product that integrated both language and visual models to generate responses through multimodal artificial intelligence. Gemini, the latest multimodal artificial intelligence (AI) tool, launched on December 06, 2023, was a Google DeepMind AI model with Visual Language Model (VLM) technology that directly competed with OpenAI's ChatGPT, GPT-4, and GPT-4 with vision (Coles, 2023; Perera and Lankathilaka, 2023). This tool was helpful for tackling problems and tasks related to reinforcement learning, deep learning, and digital education. Its interdisciplinary use helped integrate AI tools across different fields for future technology integration, collaboration, and innovation, particularly for researchers, educators, and digital content creators. Gemini also excelled in facilitating end-to-end task automation with seamless integration into services such as Google Suite and provided faster information processing due to its native connection with Google Search capabilities and advanced data analytics (Imran and Almusharraf, 2024). Moreover, Gemini demonstrated strong performance in coding and translation tasks and was effective in high-level project management, including the integration of client-provided datasets (Eka, 2024). Its application in ELT could be in the form of interactive and personalized learning experiences for students, either as a supplement or an alternative in contexts where teachers faced challenges related to limited resources or internet connectivity. The tool could provide textual explanations, create exercises, and respond to students' questions in real time, serving as a valuable complement to traditional teaching methods (Santosa, 2024).

Several studies explored the use of Gemini in ELT and ELL. For instance, Neupane et al. (2025) stipulated that Gemini had the potential to stimulate conversational practices, imparting students with interactive platforms to foster their language skills; however, its effectiveness and efficacy depended hugely on the teachers' skill and aptitude to develop resources and learning materials that were linear to their curriculum, and raised ethical concerns, especially in regards to data privacy. Esfandiari & Ghamari (2025) also explored the roles of Gemini in ELT contexts through a systematic review and found benefits in using large language models (LLMs) to teach English. Ng et al. (2025) found that Gemini AI had a positive influence on the writing skills and motivation of English as a Foreign Language (EFL) learners. Similarly, Nguyen (2024) identified Gemini AI as a potential tool for English language instruction, while Luat et al. (2025) demonstrated its applicability for formative assessment in academic writing. Although evidence suggested that Gemini could be effectively integrated into classroom learning, many teachers and students still lacked adequate understanding and preparedness to utilize artificial intelligence technologies effectively.

In response to the potential negative impacts of artificial intelligence (AI) mentioned above, it was essential to ensure readiness for its use in education. AI Readiness referred to the level of understanding and preparedness that educators and learners possessed to effectively engage with AI technologies. According to Luckin et al. (2022), AI Readiness referred to the transition that educators and learners had to undergo—from having little to no knowledge about AI or its implications to being able to discuss and understand what AI could do at a non-

technical level. One of the key concepts of AI Readiness was the understanding that human intelligence was complex, nuanced, and deeply subjective. Therefore, developing AI Readiness among teachers and students was crucial for fostering ethical awareness and responsible use of AI in classroom settings.

The research was conducted at SMA Negeri 1 Seririt, located in Seririt, Buleleng Regency. This institution was dedicated to improving the quality of education within its region. The study involved four classes and employed an experimental research design, with the sample comprising Grade 10 students as the research population. The choice to focus on the senior high school level was particularly important, as it provided insights into how AI tools like Gemini could be integrated into English language teaching to enhance writing skills while also evaluating students' readiness to use AI technologies.

Furthermore, this study sought to systematically assess the level of AI readiness among teachers and to identify the range of factors that contributed to or hindered such readiness within the educational context. Understanding these factors was essential for determining the extent to which educators were prepared to integrate AI technologies into pedagogical practices, both conceptually and practically. Building upon a growing body of prior research that evidenced the positive impact of AI-based tools on the enhancement of students' writing proficiency, the present study advanced this scholarly inquiry by introducing Gemini, a recently developed multimodal AI system that integrated both linguistic and visual processing capabilities. In this research, Gemini was employed as an instructional strategy within Grade 10 English language classes at SMA Negeri 1

Seririt, serving as an innovative pedagogical instrument aimed at fostering students' writing competence while simultaneously cultivating teachers' and students' readiness to engage meaningfully with AI-driven educational technologies.

Through this study, it was expected that Gemini would enhance students' writing skills and foster independent learning through AI-supported feedback and interaction. Moreover, this study assessed both students' preparedness to engage with AI and the degree of AI readiness among teachers, including the factors that contributed to their readiness. Therefore, the present study was titled "*The Effect of Teachers' and Students' AI Readiness and Writing Skill Development Through the Use of Gemini in Grade 10 English Classrooms At Sma Negeri 1 Seririt.*"

1.2 Problems Identification

Based on the above explanation, several problems in the field of study can be identified. First, the challenges of 21st century education in technological transformation. Technological developments with the emergence of Artificial Intelligence (AI) have changed the way of learning and teaching, presenting both opportunities and challenges in classroom learning. Second, problems in English writing skills. Writing skills are an important aspect of English learning, but many students still face difficulties in constructing sentences, using correct grammar, and organizing ideas well. Lastly, the integration and readiness to use AI in learning. Although AI tools such as Grammarly, Wordtune, ChatGPT, and Gemini have the potential to improve writing skills through instant feedback, there are still risks such as excessive dependence. Therefore, the readiness of teachers and students to understand and utilize AI technology ethically and effectively still needs to be

developed, especially since research related to the use of Gemini in writing learning at the high school level in Indonesia is still limited.

1.3 Research Limitation

This research focused on analyzing the relationship between AI readiness, writing skills, and the use of Gemini AI, specifically examining both teacher and student AI readiness. Additionally, the study explored the direction and strength of the relationships between AI readiness, writing skills, and the integration of Gemini in the classroom. The study took place among 10th-grade students and English teachers at SMA Negeri 1 Seririt in Buleleng, Bali.

1.4 Research Questions

In line with problem identification, the research questions are formulated as follows:

1. Does Gemini have a simultaneous interaction effect on the AI readiness and writing skills of 10th-grade students in English classes at SMA Negeri 1 Seririt?
2. What is the AI readiness level of English teachers at SMA Negeri 1 Seririt in supporting 10th-grade students' writing skills?
3. What are the contribution factors English teachers' AI readiness in supporting 10th-grade students' writing skills at SMA Negeri 1 Seririt?

1.5 Research Objectives

Based on the problems mentioned previously, the research objectives can be divided into general objectives and specific objectives that could be formulated as follows:

- a. General Objective

In general, this study aimed to investigate the implementation of Gemini towards writing skills and AI Readiness in the 10th-grade students of SMA Negeri 1 Seririt.

b. Specific Objectives

1. To investigate whether Gemini has a simultaneous interaction effect on the AI readiness and writing skills of 10th-grade students in English classes at SMA Negeri 1 Seririt.
2. To investigate the AI readiness level of English teachers at SMA Negeri 1 Seririt in supporting 10th-grade students' writing skills.
3. To identify the factors that influence English teachers' AI readiness in supporting 10th-grade students' writing skills at SMA Negeri 1 Seririt.

1.6 Research Significance

This research makes a significant contribution to artificial intelligence, Gemini AI, writing skills, and AI readiness. There are two significances of study: theoretical and practical significance. It can be explained below:

1.6.1 Theoretical Significance

This study provided theoretical insights into the integration of artificial intelligence (AI) in English language learning, particularly by exploring the AI readiness of teachers and students, as well as its role in improving students' writing skills through the use of Gemini.

1.6.2 Practical Significance

1. For EFL students

This study had significant practical for EFL (English as a Foreign Language) students, particularly in improving their writing skills. One of the main findings of this study was that the integration of Gemini AI helped students improve their writing skills by providing direct feedback and suggestions, which encouraged them to become more engaged in writing tasks. With the support of AI tools, students had the opportunity to practice writing in a more structured and efficient manner, which improved their overall language skills.

Furthermore, this study emphasized the importance of AI readiness in enabling students to confidently use new technologies, such as Gemini, to improve their learning outcomes. AI readiness referred to students' ability to understand, use, and interact with AI tools effectively. By fostering AI readiness, this study provided students with the opportunity not only to improve their writing skills, but also to prepare for future encounters with AI technology, which was increasingly becoming an important part of academic and professional environments.

2. For English Teachers

For English teachers, this research offered practical insights into how AI could be used to make language teaching more engaging and effective. By integrating Gemini AI into their teaching, teachers created an interactive learning environment that motivated students and kept them interested. AI-based tools such as Gemini enabled teachers to provide quick and personalized feedback, which was essential for improving writing skills. This capability transformed the writing process from

a passive activity into an active learning experience where students continuously received suggestions for improving content, grammar, structure, and vocabulary.

Moreover, this research also encouraged AI readiness among teachers. AI-ready teachers were more likely to adapt and integrate AI tools into their teaching methods effectively, making their lessons more interactive and aligned with modern educational technology. Teachers modified existing teaching strategies to incorporate technology in ways that increased student engagement and proficiency, ensuring that AI became a valuable component of language teaching.

3. For Future researchers

For future researchers, this study paved the way for further exploration in the field of AI and writing skills. The findings of this study served as a basis for those interested in examining the relationship between AI tools, such as Gemini, and language development, particularly in writing. Subsequent research expanded on this study by exploring the long-term effects of AI-assisted writing instruction, comparing different AI platforms and their impact on writing skills, and investigating how AI readiness affected the overall learning experience.

Additionally, subsequent researchers focused on AI readiness as a critical component of integrating AI into educational settings. Understanding how students and teachers perceived and interacted with AI tools provided valuable insights into how to prepare educators and learners for the ever-evolving digital landscape. Further studies also examined how AI tools such as Gemini were used in various educational contexts, including different languages, skill levels, and age groups, to determine their broader application and effectiveness in language learning.