

CHAPTER II

LITERATURE REVIEW

This chapter discusses the theoretical foundations and previous studies related to this research. The discussion covers artificial intelligence, generative artificial intelligence, the use of AI in language learning, writing in EFL learning, feedback in writing, and relevant previous studies. The conceptual framework is also presented to illustrate the relationship between the variables investigated in this study.

A. Theoretical Review

1. Artificial Intelligence

Artificial Intelligence (AI) refers to computer-based systems that are capable of performing tasks that typically require human intelligence, such as problem-solving, pattern recognition, decision-making, and language processing. AI operates through technologies such as machine learning, natural language processing (NLP), and data-driven algorithms that enable systems to analyze large amounts of data and generate responses (Al Shlowiy & Habók, 2024).

AI can be categorized into different types based on its capabilities and functions. One common classification distinguishes between narrow AI (Artificial Narrow Intelligence), which is designed to perform specific tasks, and more advanced forms that simulate broader cognitive functions. In most educational contexts, the AI used belongs to narrow AI, as it is designed to perform particular functions such as language analysis, automated feedback, and learning support.

In addition, AI systems function by learning from large datasets and identifying patterns that allow them to make predictions or generate outputs. Through machine learning processes, AI continuously improves its performance as it processes more data. Natural language processing (NLP), in particular, enables AI systems to understand, interpret, and generate human language, making it highly relevant in language learning contexts. In

educational settings, AI is increasingly used to support teaching and learning processes by providing adaptive learning systems, intelligent tutoring systems, and automated feedback. These technologies allow learners to receive personalized support based on their individual needs, learning pace, and performance. As a result, AI contributes to more flexible and student-centered learning environments.

In language learning, AI plays an important role in assisting learners with various language skills, particularly writing. AI systems can analyze learners' language use, detect patterns of errors, and provide suggestions for improvement in grammar, vocabulary, and sentence structure. As technology continues to develop, AI has become an essential tool in modern education, supporting learner autonomy, promoting self-regulated learning, and enhancing the overall effectiveness of language learning.

2. Generative Artificial Intelligence

Generative Artificial Intelligence (Generative AI) is a branch of artificial intelligence that focuses on generating new content, such as text, based on patterns learned from large datasets. Unlike traditional AI systems that primarily analyze or classify information, generative AI is designed to produce human-like responses using advanced technologies such as large language models (LLMs) and natural language processing (Zhang & Zou, 2024).

Generative AI operates by learning from vast amounts of textual data and identifying linguistic patterns that enable it to generate coherent and contextually appropriate outputs. Through deep learning techniques, these systems are capable of predicting and producing sequences of words that resemble human language. As a result, generative AI is not only able to detect errors but also generate alternative expressions, explanations, and improved versions of learners' texts.

A key distinction between traditional AI and generative AI lies in their functions. While traditional AI focuses on analysis, classification, and rule-based correction, generative AI emphasizes content creation and interactive communication. This makes generative AI more flexible and dynamic, particularly in educational contexts where learners require not only correction but also guidance and explanation.

In the context of language learning, generative AI is particularly relevant because it can generate meaningful and contextually appropriate feedback on learners' writing. These systems can analyze written texts and provide suggestions related to grammar, vocabulary, sentence structure, clarity, and coherence. This capability supports learners in improving both the accuracy and quality of their writing.

Another important characteristic of generative AI is its interactive nature. Learners can engage in dialogue with AI systems, ask questions, request clarification, and explore different ways of expressing their ideas. This interaction supports deeper learning and allows learners to actively participate in the revision process. Consequently, generative AI promotes learner autonomy and encourages self-regulated learning.

Therefore, generative AI has become an important tool in supporting writing development in EFL contexts, as it provides immediate, flexible, and personalized feedback that enhances learners' writing experience.

In addition, generative AI includes various types of tools that are widely used in educational contexts. These include text-based generative AI systems such as ChatGPT and other large language model (LLM) applications that generate written responses, explanations, and feedback. Writing assistance tools that incorporate AI features, such as Grammarly with AI support, can also be categorized as generative AI when they provide contextual suggestions and sentence-level improvements. Furthermore, generative AI also encompasses systems capable of generating images, audio, and multimedia content. However, in the context of this study, the focus is specifically on text-based generative AI that provides feedback in writing activities.

3. Artificial Intelligence in Language Learning

The integration of artificial intelligence in language learning has transformed traditional teaching practices and introduced new opportunities for more flexible and effective learning environments. AI technologies provide opportunities for personalized learning, adaptive feedback, and real-time assistance that can support learners based on their individual needs and learning pace (Al Shlowiy & Habók, 2024).

Building on the development of generative AI, language learning has become more interactive and learner-centered. AI systems are not only capable of analyzing learners' performance but also generating meaningful feedback that helps learners improve their language skills. This makes AI particularly valuable in language learning contexts, where continuous practice and feedback are essential.

In writing activities, AI tools help learners identify errors, improve vocabulary usage, and refine sentence structures. These tools enable learners to revise their writing more effectively and independently. In addition, AI can provide explanations and alternative expressions, which support learners in understanding their mistakes and improving their writing quality.

The availability of AI tools also allows learners to practice writing outside the classroom, which supports self-regulated learning. Learners can access AI anytime and anywhere, enabling them to engage in continuous learning without depending solely on teacher feedback. This flexibility contributes to more autonomous learning behavior and encourages learners to take responsibility for their own progress.

Furthermore, AI contributes to the development of digital literacy and learner autonomy. By interacting with AI tools, learners become more familiar with digital technologies and develop skills necessary for navigating modern learning environments. This aligns with current educational approaches that emphasize technology integration, independent learning, and student-centered instruction.

However, the effectiveness of AI in language learning depends not only on the availability of the technology but also on how learners perceive and use it. Therefore, understanding learners' perceptions becomes important in evaluating the role of AI in supporting writing development.

4. Writing in EFL Learning

Writing is widely recognized as one of the most challenging skills for learners of English as a Foreign Language (EFL). Unlike receptive skills such as listening and reading, writing requires learners to actively produce language in a clear, accurate, and well-organized manner. Learners must demonstrate their ability in grammar, vocabulary, sentence structure, and the logical organization of ideas to convey meaning effectively (Feng et al., 2024).

Writing is also a complex cognitive and metacognitive process that involves several stages, including planning, drafting, revising, and editing. These processes require learners to think critically, organize their ideas systematically, and continuously evaluate their writing. The recursive nature of writing means that learners often move back and forth between these stages rather than following a linear sequence. This requires a high level of linguistic competence and cognitive awareness, which many EFL learners are still developing.

In EFL contexts, learners often face additional challenges due to limited exposure to English in their daily environment. Unlike learners in English-speaking contexts, EFL learners have fewer opportunities to practice writing in authentic situations. This limitation affects their ability to develop fluency, accuracy, and confidence in writing. As a result, learners may struggle with idea development, coherence, and the appropriate use of language.

In addition, writing can cause anxiety among learners because they are often unsure about their language accuracy and the quality of their written work. Mun (2024) states that writing anxiety is a common issue that affects learners' confidence and reduces their willingness to engage in writing tasks. This anxiety may lead learners to avoid writing activities or produce less effective texts.

Therefore, adequate support is needed to help learners improve their writing skills. Providing appropriate guidance, feedback, and learning tools can assist learners in overcoming these challenges. In this context, the integration of technological tools, such as AI-assisted feedback, can play an important role in supporting learners during the writing process, particularly in the stages of revising and editing.

5. The Importance of Feedback in Writing

Feedback plays a crucial role in improving learners' writing because it provides guidance that helps learners identify errors, understand their weaknesses, and enhance the overall quality of their written work. Through feedback, learners are able to recognize gaps between their current performance and the expected standards of writing. According to Nguyen et al. (2024), feedback supports learners in developing their writing skills, promotes self-awareness, and encourages reflection on their learning process.

In the writing process, feedback is particularly important during the revising and editing stages, where learners refine their ideas, correct linguistic errors, and improve the organization of their texts. Effective feedback not only focuses on grammar and mechanics but also addresses higher-level aspects such as clarity, coherence, and idea development. Therefore, feedback serves as both a corrective and developmental tool in writing instruction.

However, traditional feedback provided by teachers is often limited due to practical constraints such as large class sizes, limited instructional time, and heavy workloads. As a result, teachers may not be able to provide detailed, individualized, and timely feedback to all students. Delayed feedback can reduce its effectiveness, as learners may lose engagement with their writing or forget their initial ideas during the drafting process.

These limitations create a need for alternative feedback sources that are more efficient, accessible, and immediate. In this context, AI-assisted feedback has emerged as a potential solution. AI-assisted feedback provides instant and consistent responses, allowing learners to revise their writing more effectively and continuously. Unlike traditional feedback, which depends on teacher availability, AI-based feedback can be accessed anytime, supporting learners in engaging in independent and self-regulated learning.

Therefore, the integration of AI-assisted feedback in writing activities offers new possibilities for enhancing the feedback process. It complements teacher feedback by providing additional support, particularly in situations where learners require immediate guidance during writing.

B. AI-Assisted Feedback in Writing

AI-assisted feedback refers to feedback generated by artificial intelligence systems to support learners in improving their writing. This type of feedback includes various aspects such as grammar correction, vocabulary suggestions, sentence restructuring, and improvements in clarity, coherence, and overall organization of ideas. By analyzing learners' written texts, AI systems are able to detect linguistic patterns and provide suggestions that help enhance the quality of writing.

In the writing process, AI-assisted feedback plays an important role particularly during the revising and editing stages. It allows learners to identify errors more efficiently and make immediate improvements to their texts. In addition, AI-assisted feedback not only provides corrections but may also offer explanations and alternative expressions, which help learners understand their mistakes and develop their writing skills more effectively.

AI-assisted feedback offers several advantages. One of the main benefits is immediacy, as learners can receive instant feedback without delay. This enables learners to revise their writing continuously and maintain engagement in the writing process. Another advantage is accessibility, as AI tools can be used anytime and anywhere, allowing learners to practice independently outside the classroom. Furthermore, AI-assisted feedback provides consistent responses and supports self-regulated learning by encouraging learners to take control of their own writing development (Song & Song, 2023).

Previous studies also highlight the positive impact of AI-assisted feedback on learners' affective aspects. Rizqy and Farida (2023) found that AI-assisted feedback can increase learners' confidence and motivation in writing, as it reduces anxiety and provides supportive guidance. These findings indicate that AI-assisted feedback contributes not only to cognitive improvement but also to learners' emotional engagement.

However, despite these advantages, AI-assisted feedback also has several limitations. One major limitation is its inability to fully understand context, deeper meaning, or cultural nuances in writing. As a result, some suggestions may be grammatically correct but not contextually appropriate. In addition, AI systems may occasionally produce inaccurate or misleading feedback.

Another limitation is the potential for overreliance, where learners depend too much on AI tools and do not develop their own critical thinking and self-editing skills. Therefore, learners need to evaluate AI-generated feedback critically rather than accepting it automatically. For this reason, AI-assisted feedback should be used as a complementary tool that supports, rather than replaces, teacher feedback in writing instruction.

C. Previous Study

Research on AI-assisted feedback in writing has increased significantly in recent years, reflecting the growing integration of artificial intelligence in language learning. Many studies have explored the role of AI in improving writing performance, revision processes, and learner engagement.

Feng et al. (2024) investigated the use of AI-assisted feedback in EFL writing and found that AI significantly improves learners' grammar accuracy and sentence structure. The study showed that learners were able to identify and correct their errors more efficiently when using AI tools. However, the focus of the study was mainly on writing performance, and it did not explore learners' perceptions in depth.

Similarly, Mun (2024) examined students' experiences with AI-based feedback in academic writing. The findings revealed that learners benefited from the immediacy of AI feedback, which allowed them to revise their writing more frequently without waiting for teacher responses. Students reported increased awareness of their linguistic errors. Nevertheless, the study emphasized writing improvement and did not analyze learners' perceptions as a central variable.

Nguyen et al. (2024) conducted a study comparing teacher feedback and AI-assisted feedback in writing instruction. The results indicated that AI can effectively complement teacher feedback, especially in providing consistent and timely support. The study highlighted the usefulness of AI in reducing teachers' workload and supporting learners with lower proficiency levels. However, the research focused more on effectiveness rather than how learners perceive and respond to AI-assisted feedback.

In the Indonesian context, Rizqy and Farida (2023) explored the use of AI-based tools in writing activities. Their study found that AI-assisted feedback increased students' motivation and confidence, as it helped reduce anxiety related to writing tasks. Students felt more comfortable revising their work using AI tools. Despite these findings, the study did not examine perception using specific theoretical dimensions such as perceived usefulness and ease of use.

Furthermore, Song and Song (2023) investigated the impact of AI-assisted tools on students' writing behavior. The study showed that AI supports self-directed learning and encourages students to engage more actively in the revision process. Learners were able to revise their writing more independently and develop better writing habits. However, similar to other studies, perception was not the main focus and was only discussed as a supporting finding.

Overall, these previous studies indicate that AI-assisted feedback has positive effects on writing development, including improvements in accuracy, revision behavior, motivation, and learner autonomy. However, most existing research primarily focuses on writing performance and effectiveness, rather than examining learners' perceptions in a structured and comprehensive way.

Therefore, this study aims to fill this gap by focusing specifically on EFL learners' perceptions toward generative AI-assisted feedback in writing activities. Unlike previous studies, this research examines learners' perceptions through key dimensions, namely perceived usefulness, perceived ease of use, and motivational impact. By doing so, this study provides a more comprehensive understanding of how learners evaluate and experience AI-assisted feedback in writing contexts.

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In relation to technology acceptance, several studies suggest that learners' perceptions play a crucial role in determining the effectiveness of AI integration in learning contexts. This aligns with the Technology Acceptance Model (TAM) proposed by Fred D. Davis (1989), which emphasizes that perceived usefulness and perceived ease of use influence users' acceptance of technology. However, previous studies on AI-assisted feedback have not extensively examined these dimensions specifically in the context of writing activities.

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D. Conceptual Framework

This study is grounded in the Technology Acceptance Model (TAM) proposed by Fred D. Davis (1989), which explains that users' acceptance of technology is influenced by two main factors: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which individuals believe that using a particular technology enhances their performance, while perceived ease of use refers to the degree to which individuals believe that using the technology requires minimal effort.

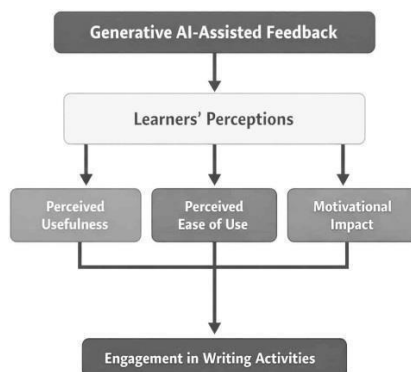
In the context of this study, generative AI-assisted feedback is considered as the technological tool that supports learners in writing activities. Learners interact with this technology and form perceptions based on their experiences. These perceptions are reflected in three main dimensions: perceived usefulness, perceived ease of use, and motivational impact.

Perceived usefulness refers to learners' beliefs about how generative AI-assisted feedback helps improve their writing quality, including grammar accuracy, clarity, and organization. Perceived ease of use refers to learners' perceptions of how easy it is to use AI tools, understand the feedback provided, and apply the suggestions in their writing. Meanwhile, motivational impact represents learners' affective responses, such as increased confidence, reduced anxiety, and greater willingness to engage in writing activities.

These three dimensions are interconnected and influence learners' overall engagement in writing activities. When learners perceive AI-assisted feedback as useful and easy to use, they are more likely to feel motivated and actively engage in revising and improving their writing. Conversely, negative perceptions may reduce learners' willingness to use AI tools effectively.

Therefore, this study examines how learners perceive generative AI-assisted feedback through these dimensions in order to understand its role in supporting writing development.

Conceptual Framework Diagram



Tabel 2. 1 Framework of Thought

Variable	Dimension	Description
Generative AI-Assisted Feedback	-	AI tool used to provide feedback in writing
Learners' Perceptions	Perceived Usefulness	Belief that AI improves writing quality
	Perceived Ease of Use	Perception of ease in using AI tools
	Motivational Impact	Effect on confidence and motivation
Outcome's	Writing Engagement	Learners' involvement in writing activities

Based on Table 2.1, the conceptual framework of this study illustrates the relationship between generative AI-assisted feedback and learners' perceptions in writing activities. The framework shows that generative AI-assisted feedback functions as the main technological tool that supports learners during the writing process.

Learners interact with this technology and form perceptions based on their experiences. These perceptions are categorized into three main dimensions, namely perceived usefulness, perceived ease of use, and motivational impact. Each dimension represents a different aspect of how learners evaluate the use of generative AI-assisted feedback.

Perceived usefulness reflects learners' beliefs about the extent to which generative AI-assisted feedback helps improve their writing performance. This includes improvements in grammar, vocabulary, clarity, and organization of ideas. When learners perceive the feedback as useful, they are more likely to rely on it and incorporate it into their writing process.

Perceived ease of use refers to how easily learners can use AI tools and understand the feedback provided. This includes the accessibility of the tools, the clarity of the feedback, and the effort required to apply the suggestions. If learners find the technology easy to use, they are more likely to adopt it in their learning activities.

Motivational impact represents learners' affective responses toward the use of generative AI-assisted feedback. This includes increased confidence, reduced anxiety, and greater interest in writing. When learners feel motivated, they are more willing to engage in writing tasks and actively revise their work.

These three dimensions collectively influence learners' engagement in writing activities. When learners perceive generative AI-assisted feedback as useful and easy to use, they tend to develop positive motivation, which leads to higher engagement in writing. Therefore, this framework highlights the importance of learners' perceptions in determining the effectiveness of generative AI-assisted feedback in supporting writing development.

E. Summary of Chapter

This chapter has presented the theoretical foundations underlying the study, beginning with the concept of artificial intelligence (AI) as a technological system capable of performing tasks that typically require human intelligence. The discussion highlights how AI operates through machine learning and natural language processing to analyze language and generate responses. In educational contexts, AI has become increasingly important as it supports adaptive learning, personalized instruction, and automated feedback. The chapter also explains that most AI applications used in education fall under narrow AI, which is designed to perform specific tasks such as language analysis and feedback provision.

The discussion is further narrowed to generative artificial intelligence (Generative AI), which represents a more advanced form of AI capable of producing human-like text based on learned patterns from large datasets. Unlike traditional AI, generative AI is not limited to analyzing or correcting language but can also generate explanations, alternative expressions, and contextually appropriate feedback. This makes generative AI particularly relevant in language learning, especially in writing activities where learners require continuous and interactive support. The interactive nature of generative AI allows learners to engage actively with feedback, thereby promoting deeper understanding and more meaningful learning experiences.

Furthermore, the chapter explains the role of artificial intelligence in language learning, emphasizing its contribution to personalized learning, real-time feedback, and learner autonomy. AI enables learners to practice independently beyond the classroom and supports self-regulated learning by providing continuous assistance. This is particularly important in EFL contexts, where learners often face limited exposure to English. The discussion then focuses on writing as a complex skill that involves multiple cognitive processes such as planning, drafting, revising, and editing. Writing difficulties, including linguistic challenges and writing anxiety, highlight the need for effective support systems to assist learners in improving their writing performance.

In relation to writing development, the importance of feedback is emphasized as a key component in helping learners improve their writing quality. Feedback allows learners to identify errors, reflect on their performance, and make necessary revisions. However, traditional teacher feedback is often limited due to time constraints and large class sizes. As a result, AI-assisted feedback emerges as an alternative solution that provides immediate, consistent, and accessible support. The chapter explains that AI-assisted feedback offers several advantages, including instant responses, increased accessibility, and support for independent learning, while also acknowledging its limitations, such as lack of contextual understanding and potential overreliance by learners.

Finally, this chapter reviews previous studies that demonstrate the positive impact of AI-assisted feedback on writing performance, motivation, and learner autonomy. However, it also identifies a research gap, as most studies focus on writing outcomes rather than learners' perceptions. To address this gap, this study adopts the Technology Acceptance Model (TAM) proposed by Davis (1989) as its theoretical foundation. TAM explains that perceived usefulness and perceived ease of use influence users' acceptance of technology. In this study, these dimensions, along with motivational impact, are used to examine learners' perceptions of generative AI-assisted feedback in writing activities. Therefore, this chapter provides a comprehensive theoretical basis that supports the investigation of learners' perceptions in the context of AI-assisted writing.