

CHAPTER I INTRODUCTION

Chapter I explain why this research is important as a starting point for discussing this topic in more depth.

1.1. Research Background

Artificial Intelligence (AI) has emerged as one of the most transformative technological developments of the 21st century, transforming various industries, including healthcare, finance, communication, and education (Russell & Norvig, 2021). AI refers to computer systems designed to simulate human cognitive functions such as learning, reasoning, and problem solving. These systems include various technologies such as machine learning, natural language processing, and deep learning. (Rashid & Kausik, 2024). As a broad and rapidly developing field, AI includes a variety of systems and applications that are gradually expanding their influence into everyday life, making their integration into various professional and academic fields inevitable. In recent years, the integration of AI into the education system has transformed the way students learn, interact with materials, and develop academic competencies, especially in the context of higher education where the need for self-directed and self-regulated learning is a priority. AI technologies have evolved far beyond basic tasks, and now offer intelligent support for learning activities such as real-time feedback, automated assessment, and personalized learning (Khare et al., 2018; Shofiah et al., 2023). As digital education continues to grow, the use of AI technologies is become a normal, with institutions adopting these tools to improve learning effectiveness and student performance (Michel-Villarreal et al., 2023). Especially in countries where English is taught as a foreign language, such as Indonesia, AI tools are seen as a potential balancer to help the gap in language proficiency among students with diverse backgrounds. In addition, understanding of how AI contributes to language development in the context of English as a Foreign Language (EFL) becoming important, especially in supporting complex skills such as academic writing.

Although English is the primary media of academic writing in English Language Education programs, many EFL students still face significant challenges

during the writing process. Unlike native English speakers, EFL learners are required to develop ideas, construct logical arguments, apply appropriate academic vocabulary, and create an accurate text in a language that is not their mother tongue. This multiple challenge often creates a cognitive and linguistic burden that makes academic writing one of the most difficult skills to acquire. As a result, many students spend amount of time for revising drafts, seeking external feedback, and consulting various learning resources to improve the quality of their writing. This phenomenon is becoming even more common in higher education, where academic writing is not only a course requirement but also a basic competency for completing research proposals, undergraduate theses, and other academic assignments.

Historically, even before generative AI became widespread, AI-based technologies such as intelligent tutoring systems and language learning applications like Duolingo had already been used to personalize learning (Yuniar et al., 2025). Over time, these developments laid the groundwork for more advanced and interactive AI applications. For EFL students, however, academic writing remains a significant challenge. It requires the ability to organize ideas coherently, apply correct grammar, and use appropriate academic language, all of which demand high linguistic competence and cognitive effort. In particular, many students in higher education, including those in English education programs, struggle to meet these expectations, which can lead to frustration and poor performance in writing tasks (Al Mahmud, 2023; Nazari et al., 2021). Because writing involves complex processes such as planning, drafting, and revising, quick, specific, and constructive feedback is crucial for student progress. To address this need, educators and learners are increasingly turning to chatbot AI writing assistants that provide real-time grammar correction, vocabulary enhancement, and content organization suggestions (Feng, 2025). Ultimately, such tools not only reduce cognitive load but also foster learner independence by enabling students to revise and improve their texts on their own.

Recently, Chatbot AI has been increasingly used to support academic writing in higher education. These tools, such as ChatGPT, Gemini, and perplexity, are categorized as chatbot AI because they interact with users through natural, conversational dialogue rather than fixed commands or single-function operations.

They combined Natural Language Processing (NLP) and machine learning to provide contextual feedback and language support. Unlike traditional grammar checkers or static writing tools, chatbots are designed to offer interactive and responsive suggestions related to grammar accuracy, sentence fluency, coherence, and overall text organization, making them useful for students in writing essays and academic reports (Allen, 2025; Joshi, 2025). As their use continues to increase in university settings, particularly in language and teacher education programs, it is important to examine how satisfied students are with these tools and how they interact with them in their daily academic activities. Since chatbots communicate through conversations and offer suggestions automatically, students can decide whether to use, adjust, or ignore them. Thus, the benefit of chatbots in learning depends on how actively students respond to the feedback. Therefore, to ensure that Chatbot AI supports learning rather than merely automating writing tasks, students' feedback and experiences should become a central focus of evaluation (Risang, 2023).

In addition, understanding student satisfaction is crucial in this regard, as it reflects the extent to which learning tools meet students' academic expectations, functional needs, and usability standards factors that significantly influence whether the tools will be adopted continuously in the learning process. Importantly, satisfaction is not merely a matter of students feeling happy or entertained; it serves as a meaningful academic construct. Student satisfaction is not limited to enjoyable or approval, but also involves deeper considerations such as perceived usefulness, ease of use, and alignment with learning objectives (Wong & Chapman, 2023; Kanwar & Sanjeeva, 2022). Beyond immediate reactions, satisfaction has been linked to students' acceptance of a technology and their intention to continue using it, and serves as an indicator of whether a learning tool truly meets their learning needs, rather than merely helping them complete assignments. In the context of AI writing assistants, satisfaction may depend on the quality of feedback provided, response speed, and how well the tool helps students improve their writing drafts without overly relying on automation. When students feel that AI tools allow them to write with more confidence, effectiveness, and independence, their satisfaction increases, which ultimately improves their engagement and learning outcomes.

(Efendi et al., 2023). Therefore, evaluating satisfaction is not only a measure of system success but also a tool for analyzing the pedagogical relevance of AI in real classroom context. Thus, understanding students' satisfaction has become increasingly important because it provides evidence of whether chatbot AI functions as a pedagogically meaningful learning support rather than merely a technological innovation.

Despite the growing global interest in the use of chatbots AI in academic writing, the research specifically focusing on student satisfaction in using chatbots as writing tools in Indonesian universities is still limited. Previous studies have mainly examined how chatbots such as ChatGPT, Gemini, and similar generative AI systems assist students in improving grammar, generating ideas, and organizing texts (Baidoo Anu et al., 2024; Polakova & Ivenz, 2024). However, most of these studies emphasize effectiveness and performance, while student satisfaction as an important affective and pedagogical factor has not been explored in depth, especially in the context of English language education programs in Indonesia. Especially in English Language Education programs, where students are expected not only to develop language proficiency but also to eventually teach English, understanding their experiences with chatbot ai as a facilitate writing tools becomes increasingly critical. Without such studies, it is difficult to determine whether these tools truly meet the linguistic and pedagogical needs of prospective language educators.

In the context of higher education, the use of chatbot AI is getting more popular among students when working on academic writing assignments. A preliminary interview with eighth semester students in the English Language Education Program at Ganesha University of Education revealed that many students frequently used chatbots ai such as ChatGPT, Gemini, and Perplexity to generate ideas, correct grammar, and refine sentence structure when writing essays, research proposals, or thesis drafts. These tools are often used as writing aids during the drafting and revision stages. These students were chosen because they are in the final stage of their studies and are actively engaged in complex academic writing tasks such as composing research proposals and undergraduate theses. Having completed formal academic writing training, they are in a strong position to

critically evaluate the support provided by chatbot AI. This makes them the most relevant participants for exploring satisfaction with chatbot AI as an assistive writing tool. However, although reliance on chatbot AI is increasing, it remains unclear whether students are satisfied with their use as learning aids for developing writing skills. This situation highlights the importance of researching student satisfaction when using chatbot-based AI in the context of academic writing.

While various generative AI tools are available to assist students in learning, this study focuses on the use of Chatbot AI, such as ChatGPT, Gemini, Perplexity, and similar platforms, rather than a single specific application. This focus is based on the growing use of chatbots in English language learning and the limited number of studies that comprehensively examine students' satisfaction with these tools, particularly in the context of higher education in Indonesia. Although previous studies have widely explored learning outcomes related to AI-assisted writing, most of them emphasize effectiveness and performance rather than satisfaction. The interactive features of chatbots, including contextual feedback and dialog-based responses that allow students to accept, revise, or reject suggestions, make them pedagogically relevant as assistive tools in academic writing. Therefore, a research gap remains in understanding how students use chatbot AI in academic contexts, particularly in relation to their satisfaction and the writing support it provides.

In summary, previous research has shown that AI tools can improve student learning performance by increasing learning effectiveness and providing a more supportive and engaging learning experience. Most of these studies have focused on commonly used AI applications such as ChatGPT, Gemini, and Perplexity, particularly in relation to their role in assisting language writing and learning outcomes. However, empirical research that specifically examines student satisfaction with the use of chatbots as a tool to facilitate writing skill development in English language education is still limited. Furthermore, there is a lack of research examining this issue in the context of higher education in Indonesia, particularly among English Education students at Ganesha University of Education. Therefore, this study aims to fill this gap by investigating student satisfaction in depth regarding the use of chatbots AI in supporting writing skills.

1.2. Problem Identification

Based on the explanation above, recent studies have investigated the use of AI, particularly chatbot AI, in supporting students' writing skills (Laili et al., 2025). Most of these studies predominantly focused on how chatbots facilitate writing processes, such as improving grammar (Baidoo-Anu et al., 2024), generating ideas (Polakova & Ivenz, 2024), organizing paragraphs (Wiboolyasarini et al., 2025), and providing immediate feedback (Louis et al., 2023). Several findings indicate that students with the use of chatbots AI in writing activities, reflecting generally positive experiences and favorable learning experiences in language learning contexts (Yuliyanti et al., 2025). However, these studies mainly emphasize the effectiveness and functional roles of chatbots, while students' satisfaction has not been systematically examined as a central construct and is often treated as a secondary or implicit outcome rather than a primary focus of investigation (Debets et al., 2025).

Although there are indications that students respond positively to the use of chatbot in writing, existing empirical studies suggest that positive responses do not necessarily reflect a clear or comprehensive understanding of student satisfaction. Feelings such as being helped, enjoying the activity, or feeling confident do not automatically represent a clear level or form of satisfaction. Instead, these responses often reflect immediate emotional reactions that have not been clearly distinguished, either conceptually or empirically, from satisfaction as a multidimensional construct. In addition, previous research rarely investigates which aspects of writing support, such as grammar assistance, idea development, feedback quality, or ease of use, contribute to students' satisfaction (Chairiah et al., 2025). Similarly, a study conducted at a vocational high school in Singaraja found that both teachers and students generally held a positive perception of AI technology as a support for English language learning, although this positive perception did not necessarily reflect a deep or well-articulated understanding of how the technology should be used pedagogically (Purba et al., 2024). As a result, there is still limited understanding of how satisfied students are with the use of chatbot as assistive writing tools and what factors shape this satisfaction, especially in the context of English Education students in Indonesian universities. Therefore, this study

addresses this gap by systematically investigating students' satisfaction with the use of chatbot AI to facilitate academic writing.

Given this gap in the existing literature, a similar phenomenon is currently occurring in the context of specific research in the English Education study program at Ganesha University of Education (Undiksha). Students in this program are intensively involved in complex academic writing tasks, such as compiling research proposals and final theses. Preliminary observations indicated that these students were increasingly using chatbot AI to assist with complex writing processes. However, similar to the gap found in the broader literature, it is not yet known whether the use of these tools results in authentic and deep satisfaction. Therefore, in-depth research is urgently needed to capture the reality of their evaluative experiences when using AI for important academic tasks.

The importance of conducting this research lies in its practical implications for instructional design in higher education. Currently, many educators and lecturers have begun experimenting with or considering the integration of AI tools into specific language teaching fields. Therefore, the comprehensive and in-depth information generated from this research will be a crucial foundation for educators to make pedagogical decisions about whether to adopt, regulate, or limit the integration of AI in their writing classes. Furthermore, the novelty of this study lies in its qualitative approach to evaluating AI tools. While previous studies have focused more on quantitatively measuring the effectiveness of AI, this study offers a new perspective by investigating in depth the reasons behind student satisfaction, specifically by mapping how technical features interact with the psychological and academic needs of Indonesian EFL students. This qualitative and in-depth focus on the reasons behind satisfaction is what distinguishes the present study from prior research.

1.3 Problem Limitation

This study is limited to investigating students' satisfaction with the use of chatbot AI as an assistive tool in academic writing. The participants are restricted to eighth-semester students of the English Education Study Program at the Faculty of Language and Arts, Universitas Pendidikan Ganesha (Undiksha). The study

focuses on students perceived satisfaction, including key aspects such as grammar assistance, idea development, feedback quality, and ease of use, and does not examine improvements in writing performance or other learning outcomes. In addition, this research does not compare different chatbot platforms but explores chatbot AI in general as a writing support tool, in order to obtain an overall understanding of students' satisfaction within the specified academic context.

1.4 Research Question

Based on the research background and problem identification, this study aims to address the following research questions:

1. How satisfied are English Education students with the use of chatbot AI as an assistive tool in academic writing?
2. How do specific aspects of chatbot-based writing support (grammar assistance, idea development, feedback quality, and ease of use) shape English Education students' satisfaction in academic writing?

1.5 Research Objective

The objectives of this study are determined as the following:

1. To explore English Education students' satisfaction with the use of chatbot AI as an assistive tool in academic writing.
2. To explore how specific aspects of chatbot-based writing support (grammar assistance, idea development, feedback quality, and ease of use) influence their satisfaction in academic writing.

1.6 Research Significance

1. Theoretical significance:

This study is expected to enrich theoretical studies on student satisfaction in using Chatbot AI as a writing tool in the context of English language learning.

2. Practical significance:

- a. For Lecturers

This study provides information about students' satisfaction with the use of chatbot AI in academic writing, which can help lecturers integrate AI tools into writing instruction in an appropriate way.

b. For Students

This study helps students understand the benefits and limitations of using chatbot AI in writing and encourages them to use these tools responsibly as learning support.

c. For Future Research

This study can be used as a reference for future research related to the use of chatbot AI in language learning, especially in studies focusing on student satisfaction and writing skills.



CHAPTER II

LITERATURE REVIEW

In chapter II, the researcher examined existing literature on the application of AI technology in education and language learning, it focusing on Chatbot AI as a tool to facilitate students' writing skills. This will provide a strong foundation for further research.

2.1 THEORITICAL REVIEW

2.1.1 AI in Language Learning

Artificial Intelligence (AI) has become an essential component in modern education, especially in the field of language learning. AI powered systems have introduced new modes of teaching feedback, and learner interaction that were previously unachievable through traditional classroom models (Imamguluyev & Hajizade, 2025). Warschauer and Healey (1998) emphasized the transformation of language learning through technology integration, particularly in Computer Assisted Language Learning (CALL). Following the development of CALL, intelligent systems have emerged under the broader category of Intelligent CALL (ICALL), which enables machines to adapt to individual learner needs, simulate human like feedback, and facilitate real time language learning. Levy and Stockwell (2007) elaborate that CALL tools, including AI driven models, provide students with an interactive tool for input and output practice, which is crucial in second language learning. These tools often include features such as error correction, grammar checking, and context vocabulary suggestions. The increasing use of AI based writing assistants reflects a move towards self directed learning, where students can access instant feedback and revise their language use (Aladini et al., 2025). AI technologies not only support students in identifying their mistakes, but also encourage cognitive involvement by fostering self monitoring and reflection. This indicates that AI tools not only function as corrective systems but also as learning facilitators that support deeper cognitive engagement, which is highly relevant in the context of academic writing development among university students.

In language learning, AI contributes to the development of student independence by allowing them to better control their learning process (Mohebbi,

2025). Through continuous access to feedback and language support, students are no longer completely dependent on teachers for correction and evaluation. According to Rui et al. (2024), self directed learning encourages students to actively monitor their progress and make independent decisions about their learning strategies. AI tools support this process by providing instant feedback on student input, allowing them to revise and improve their writing in a more reflective manner. This continuous interaction helps students develop confidence and responsibility in using the target language. Moreover, Timilehin (2025) explored the role of intelligent personal assistants and chatbots AI in promoting natural language interaction. These technologies utilize Natural Language Processing (NLP) to interpret user input and generate appropriate responses, simulating accurate communication. In the context of education, these tools have been used to support speaking, reading, and especially writing tasks. The AI feedback provided by these tools from basic grammar corrections to more advanced discourse level suggestions that can support students in developing linguistic accuracy and coherence (Khan, 2024). Zawacki-Richter et al. (2019) also emphasize that AI enables a more personalized learning experience by customizing content delivery based on user performance, motivation, and preferences.

Furthermore, AI based writing tools support the writing process by assisting students at different stages of writing, including planning, drafting, revising, and editing. Writing is widely recognized as a complex skill that requires linguistic knowledge, organization, and critical thinking. Wulandari (2022) states that effective writing development requires meaningful feedback that helps students understand both their strengths and weaknesses. Again, AI powered chatbots and writing assistants provide real time feedback related to grammar, vocabulary use, sentence structure, and coherence (Zhai, 2022). This type of feedback allows students to immediately apply corrections, which can improve writing quality and reduce anxiety related to making errors.

In addition to cognitive and linguistic support, Chatbots AI also influence affective factors such as motivation and satisfaction. Student satisfaction reflects students' perceptions of usefulness, ease of use, and overall learning experience when using a particular technology (Ubaidillah et al., 2020). Previous studies

indicate that when students perceive AI tools as helpful and easy to use, they are more likely to engage actively and consistently in learning activities (Al Hawamleh, 2023; Zhai et al., 2024). In the context of writing instruction, satisfaction is an important factor because positive learning experiences can encourage students to use chatbots more effectively and responsibly. Therefore, investigating student satisfaction is essential to understand how chatbots facilitate the development of writing skills among English education students in higher education.

2.1.2 Student Satisfaction

Student satisfaction plays an important role in evaluating the effectiveness of educational tools, especially for those involving technology. In general, satisfaction refers to how well the learning experience meets what students expect and need (Oliver, 1980). In the case of digital learning platforms, satisfaction includes not only whether the tool is useful and easy to use, but also how enjoyable or rewarding it is during the learning process (Seo et al., 2021). Exploring student satisfaction helps educators and researchers to assess if tools like Chatbot AI actually support student learning and motivate them to continue using it. In technology enhanced learning, student satisfaction is closely linked to students' engagement and learning outcomes. When students feel satisfied with a learning technology, they are more likely to participate actively, explore its features, and integrate it into their learning routines (Alwi et al., 2025). Previous studies indicate that students who are satisfied with digital tools tend to show higher motivation and persistence in completing learning tasks than those who feel frustrated or dissatisfied (Wigati et al., 2025). Therefore, satisfaction functions as an important indicator of both the effectiveness and acceptance of educational technology.

One of the commonly used theoretical models to study satisfaction in technology use is the Technology Acceptance Model (TAM), introduced by Davis (1989). This model suggests that two main factors, namely perceived usefulness and perceived ease of use, make the user's attitude towards a tool. Specifically, in the context of Chatbot AI for academic writing, perceived usefulness refers to the extent to which students believe that using Chatbot AI will enhance their writing performance, such as improving grammar accuracy, generating better ideas, or

structuring their arguments more effectively. For instance, if a Chatbot AI provides accurate and contextually relevant grammar corrections, students are likely to perceive it as highly useful (Waziana et al., 2024). Conversely, perceived ease of use relates to the degree to which students believe that using Chatbot AI is free of effort, such as having an intuitive interface, easy-to-understand prompts, and quick response times. In a mixed-methods study of EFL students using AI-based applications, meaningful and mindful learning were found to significantly predict students' depth of engagement with the material, whereas the enjoyment of using the tool alone did not translate into deeper learning outcomes (Santosa et al., 2026). A Chatbot AI that is complex to navigate or requires intricate prompting might be perceived as less easy to use, regardless of its potential usefulness. If students believe that Chatbot AI makes their writing better and is easy to use, they will tend to feel satisfied with the tool. TAM has been widely applied in many studies related to educational software, including grammar checking and AI-based writing applications.

Another theory that is relevant is Bhattacharjee (2001) Expectation Confirmation Theory (ECT), which focuses on users' experiences after they have used a tool. According to this theory, people are satisfied when what they expect from a product, matches or even exceeds its actual performance. In the context of Chatbot AI for academic writing, students might initially expect it to provide instant feedback, generate comprehensive outlines, or even correct complex stylistic errors. Satisfaction arises when the actual performance of the Chatbot AI, such as its ability to deliver precise vocabulary suggestions or coherent sentence structures, meets or surpasses these initial expectations (Zhang et al., 2026). Conversely, if the Chatbot AI frequently produces 'hallucinations' (inaccurate information) or fails to understand nuanced academic contexts, students expectations may be disconfirmed, leading to dissatisfaction (Giray et al., 2026). Thus, in learning contexts, students are more likely to feel satisfied when a technology meets their expectations in terms of functionality, accuracy, and learning support (Alwi et al., 2025). For example, if students expect Chatbots AI to help them write more clearly or avoid grammar mistakes, and it succeeds in doing that, they are likely to feel satisfied and continue using it in the future. This confirmation process also influences their intention to

continue using the technology in the future, making satisfaction a key factor in sustained technology use.

In the context of educational technology, TAM and ECT are often used together to provide a more comprehensive understanding of student satisfaction. While TAM explains satisfaction based on students' initial perceptions of usefulness and ease of use, ECT emphasizes how the actual learning experience shapes satisfaction after repeated use (Tawafak, 2026). This combination allows researchers to analyze both students' expectations before using the chatbot AI and their evaluation after experiencing the writing support provided by the chatbot. Previous studies have shown that when perceived usefulness and ease of use are confirmed through positive learning outcomes, students tend to report higher satisfaction and a stronger intention to continue using the technology for academic purposes (Denovan & Marsasi, 2025). In addition, DeLone and McLean's (2003) User Satisfaction Theory offers another perspective by breaking down satisfaction into various aspects of a system's success, such as the quality of the information provided (Information Quality), how reliable or responsive the system is (System Quality), and the support users receive while using it (Service Quality). When applied to AI Chatbots, Information Quality relates to the accuracy, relevance, and completeness of the content, feedback, or suggestions generated by the AI, such as the accuracy of grammar corrections or the appropriateness of vocabulary suggestions for academic discourse. System Quality refers to the technical characteristics of the AI Chatbot, including its reliability, response speed, availability, and ease of access. A system that is prone to errors, slow to respond, or frequently unavailable will negatively impact student satisfaction. Although Service Quality traditionally may refer to human support, in the context of AI, it can be interpreted as the overall user experience and the AI's responsiveness to user needs, including its ability to adapt to different writing styles or provide clear explanations for its suggestions.

When applied to Chatbot AI, this could involve how accurate the grammar corrections are, how quickly the system responds, or whether the system offers guidance for new users. Because writing involves complex thinking and

organization, tools that can provide consistent, high-quality assistance are more likely to satisfy students and help boost their confidence in writing English (Zahari et al., 2025). In the context of writing instruction, satisfaction becomes particularly important because writing is a complex and cognitively demanding skill (T.Kellogg, 2020). Thus, Silitonga et al. (2025) state that tools that can support idea development, language accuracy, and revision processes can reduce students' anxiety and increase their confidence in writing in English. When students perceive Chatbot AI tools as supportive and reliable, they are more likely to evaluate their learning experience positively. Therefore, examining student satisfaction provides valuable insights into how chatbot technologies facilitate writing skills among English education students in higher education.

2.1.3 Chatbot AI as an Assistive Writing Tool

The integration of AI into modern classroom has highlighted a significant revolution in educational practice, particularly in the context of language learning. The emergence of AI in education has changed the way students construct and write academically. Chatbot AI, as an emerging AI writing tool, offering various features such as grammar correction, coherence enhancement, vocabulary suggestions, and writing style improvement (Aydin et al., 2025). Its functionality places it in the wider category of assistive writing technology designed to support students in composing more accurate and complex texts. One of the supporting theories is the Cognitive Load Theory, Sweller et al. (2019) states that students have limited cognitive capacity, and instructional tools should be designed to reduce unnecessary cognitive load while increasing the necessary need for learning. Chatbot AI can support this process by handling basic writing tasks, such as grammar and language use, allowing students to focus more on higher level skills like developing ideas and organizing their writing. Therefore, this tool can simplify the writing process and improve learner efficiency, especially for beginner or EFL writers who often struggle with language accuracy.

Additionally, Self-Regulated Learning Theory by Panadero (2017) emphasizes students' ability to plan, monitor, and evaluate the learning process on

their own. Writing tools like Chatbot AI help students learn independently by giving quick and personal feedback, so they can review their writing and fix mistakes repeatedly. Recent studies have shown that AI-supported feedback tools can positively influence writing motivation, autonomy, and metacognitive awareness (Yeung, 2025). From the perspective of Sociocultural Theory (Vygotsky, 1978), learning is done through tools and social interaction. Chatbot AI functions as a learning support tool that assists students within their Zone of Proximal Development (ZPD) by providing real time guidance during the learning process. This is in line with current research showing that AI writing assistants can serve as digital collaborators, offering contextualized assistance that is responsive to individual learner needs (Lai et al., 2022).

In addition, Holstein and Alevan (2022) propose a learning framework showing that AI can improve learning by adjusting instruction in real time according to students' behavior and learning results. In writing activities, this adaptive support allows chatbots AI to respond to learners' specific difficulties, such as recurring grammatical errors or weaknesses in sentence organization, thereby providing more relevant assistance during the writing process (Ahmed et al., 2025). As a result, students may experience more personalized learning support that aligns with their individual needs and proficiency levels. Thus, chatbots AI serve not only as correction tools but also as writing assistants that interact with the cognitive, metacognitive, and sociocultural aspects that are crucial in the learning process (Cui et al., 2025). When students perceive this adaptive assistance as helpful and responsive, it can positively shape their learning experience and satisfaction by making the writing process feel more guided and manageable. To understand how this tool influences student satisfaction, an exploration of how this theoretical perspective intersects with students' experience is needed, especially in the context of English language education.

Although, the integration of Chatbot AI in language learning can be theoretically explained through multiple complementary frameworks, including Cognitive Load Theory (Sweller et al., 2019), Self-Regulated Learning Theory (Panadero, 2017), Sociocultural Theory (Vygotsky, 1978), and constructivist

learning theory (Jonassen, 1999). These perspectives suggest that Chatbot AI can reduce unnecessary cognitive load, support learner autonomy, and provide instructional scaffolding within students' Zone of Proximal Development. By offering real time feedback and personalized assistance, Chatbot AI functions as a supportive learning tool that enhances students' writing processes rather than replacing teacher guidance. Therefore, understanding these theoretical foundations is essential for examining student satisfaction, as students' perceptions of usefulness, support, and learning effectiveness are shaped by how well the technology aligns with their cognitive, metacognitive, and social learning needs in English language education.

To further elaborate on these connections, the specific features of Chatbot AI, such as grammar correction, vocabulary suggestions, and coherence enhancement, directly contribute to the perceived usefulness (TAM) by offering tangible benefits that improve writing quality. For instance, a Chatbot AI that can accurately identify and suggest corrections for complex grammatical errors or provide contextually appropriate vocabulary options can significantly reduce the cognitive burden on students, allowing them to focus on higher-order writing skills. This reduction in cognitive load, as posited by Sweller et al. (2019), enhances the efficiency of the writing process, thereby increasing the perceived utility of the tool. Furthermore, the interactive nature of Chatbot AI, which allows students to receive instant feedback and revise their work repeatedly, aligns with the principles of Self-Regulated Learning Theory (Panadero, 2017) by fostering learner autonomy and metacognitive awareness. When students perceive that the Chatbot AI empowers them to monitor and evaluate their own learning progress, their perceived ease of use (TAM) is also likely to increase, as the tool facilitates a more independent and manageable learning experience.

Moreover, the ability of Chatbot AI to provide real-time guidance within a student's Zone of Proximal Development (Vygotsky, 1978) directly impacts expectation confirmation (ECT). If students expect personalized and adaptive support, and the Chatbot AI delivers this by adjusting its feedback to their specific needs, their initial expectations are confirmed or even surpassed, leading to higher

satisfaction. Conversely, if the Chatbot AI provides generic or unhelpful suggestions, it can lead to disconfirmation of expectations and dissatisfaction. From the perspective of the DeLone & McLean Model, the Information Quality of Chatbot AI is paramount; the accuracy and relevance of its suggestions directly influence student satisfaction. Similarly, the System Quality, encompassing the speed and reliability of the Chatbot AI's responses, plays a crucial role in shaping the user experience and overall satisfaction. A fast and stable system enhances the perceived ease of use and contributes to a positive expectation confirmation.

In summary, the integration of AI into language learning has opened a new opportunity to improve students' writing skills through interactive and adaptive support systems. The use of chatbots AI is supported by various theoretical perspectives, including Cognitive Load Theory, Self-Regulated Learning Theory, and Sociocultural Theory, which highlight the role of AI in reducing cognitive load, fostering learner autonomy, and providing step-by-step learning support. Additionally, theories of student satisfaction such as the Technology Acceptance Model (TAM), Expectation-Confirmation Theory (ECT), and User Satisfaction Theory emphasize that students' perceptions of usefulness, ease of use, and learning experiences play a crucial role in determining their acceptance of the technology. Therefore, understanding these theories is important for studying how chatbots AI support writing development and how students evaluate their learning experiences when using these tools.

2.2 EMPIRICAL REVIEW

The rapid development in the adoption of chatbots AI to support language learning, particularly in writing skills, has been the main focus of various recent studies. These tools offer instant feedback, grammar correction, vocabulary suggestions, and content quality improvements that contribute significantly to students' writing skills. For example, Ratminingsih et al. (2025) revealed that students experienced a positive level of satisfaction with the use of QuillBot, as it helped reduce grammatical errors, improve the quality of paraphrasing, avoid plagiarism, and increase confidence and motivation in academic writing. In the context of higher education, Santosa (2025) shows that AI supported online learning

is considered beneficial in supporting students' English language learning, especially in providing instant feedback, facilitating practice activities, and improving learning efficiency. This contributes to students' positive perceptions of AI integration in the learning process.

Although, technical effectiveness has been proven, student satisfaction has emerged as a crucial indicator in evaluating the acceptance of educational technology. Idkhan and Ma (2023) state that satisfaction is not only seen as a reaction to the technical quality of the system, but also as a reflection of how well the technology supports the learning process and academic goals. For example, Kanwar and Sanjeeva (2022) found that a clear interface design and personalized learning experiences contribute significantly to satisfaction levels among higher education students. Similarly, Wong and Chapman (2023) show that interactions between students and instructors and platform responsiveness are key factors that influence satisfaction in online learning environments. Collectively, these studies highlight the need for educational technology to align with user expectations in order to encourage engagement and positive learning experiences.

Student satisfaction is also greatly influenced by emotional and psychological factors, including self-confidence, independence, and reduced anxiety. According to Kartini and Ganesha (2025) In a study on ChatGPT adoption among English language learners, students' acceptance of the tool was closely tied to how enjoyable they found the experience, with positive and enjoyable interactions reinforcing their willingness to keep integrating ChatGPT into their academic work. Zhai (2022) observed that students who used ChatGPT felt more assisted in their learning, especially when working on writing assignments independently. Zamzam Bibi (2024) also reported that students felt AI writing assistants helped reduce writing anxiety and increased confidence, especially in the context of a second language. Villarreal (2023) added that generative AI tools foster a sense of collaboration between students and the system, creating a learning environment that many students find less intimidating. This insight was also shared by Khare et al. (2018), who suggested that institutions should adopt AI tools in a way that supports, rather than replaces, educational goals.

To investigate this type of satisfaction more deeply, recent findings indicate that students' positive perceptions are greatly influenced by the psychological safety provided by these tools. Pratiwi and Yulia (2025) highlight that EFL students report high levels of satisfaction not only because of technical assistance, but because AI tools create a non-judgmental environment, which significantly increases confidence and reduces anxiety typically related to high-stakes writing tasks. This is in line with the findings of Abdullayeva and Musayeva (2023), who observed that although students were highly satisfied with the quick feedback and idea assistance offered by chatbots such as ChatGPT, their satisfaction was mainly related to the tools' ability to encourage independent learning. A systematic literature review adopting the PRISMA framework found that Gemini, a generative AI tool increasingly used by EFL students, offers advantages such as real-time feedback, language support, and increased learner autonomy, while also presenting challenges related to the accuracy and reliability of the information it generates (Purnama et al., 2025). In another hand, A mixed-methods study involving university students and lecturers in North Bali found that although students reported only mild anxiety when using AI-assisted tools in online English learning, this anxiety was more pronounced during assessment situations and was linked to factors such as connectivity issues and limited familiarity with the technology (Santosa, 2025). However, this satisfaction is often accompanied by an awareness of the potential for over-reliance, indicating that student satisfaction is a complex and mutually beneficial state, not simple acceptance.

In conclusion, although previous studies by Ratminingsih et al. (2025) and Santosa (2025) have confirmed generally positive levels of satisfaction, and recent research by Pratiwi and Yulia (2025) has begun to touch on psychological benefits, most of these findings rely on perception surveys or general academic contexts. There is still a lack of in-depth qualitative research that specifically reveals how Indonesian EFL students respond to this satisfaction under the high pressure of academic writing. As a result, previous studies have not fully described the complex nature of satisfaction, which includes both reliance on technology and feelings of caution as part of students' real experiences, rather than merely as a measurable outcome.

Regarding specific writing support, Al Mahmud (2023), who researched the use of Wordtune by EFL students and found that AI support significantly improved sentence clarity and writing fluency. Furthermore, Polakova and Ivenz (2024) observed that feedback from ChatGPT significantly improved coherence and organization in EFL students' academic writing. The effectiveness of AI tools in supporting academic writing is also consistent with their impact on cognitive load and learning outcomes. Feng (2025) compared AI-assisted learning strategies with traditional strategies and revealed that students assisted by AI experienced lower cognitive load, allowing them to focus more on information relevant to the task. Furthermore, research by Chen and Gong (2025) on second language learners illustrates that AI-based writing assistance can improve grammatical accuracy and idea development. These empirical findings highlight the pedagogical value of AI integration in writing instruction, especially for EFL students who often require individualized feedback.

In more specific context, student satisfaction in using technology is often assessed through the dimensions of perceived usefulness and perceived ease of use. Research conducted by Louis et al. (2023) found that perceived usefulness and ease of use have a significant positive effect on student satisfaction, indicating that students tend to feel more satisfied when learning technology is useful and easy to operate. Similar findings were reported by Sustaningrum and Haldaka (2025), who found that students generally reported positive levels of satisfaction with the use of AI for academic purposes because they considered AI tools to help improve learning efficiency, task completion, and overall academic performance. Additionally, Lubis et al. (2024) specifically researched Perplexity AI and reported that most students of English as a foreign language (EFL) consider this tool to be highly effective in optimizing time use and increasing writing productivity. Their findings highlight that the tool's ability to facilitate knowledge discovery and provide easy-to-understand explanations enables students to simplify their writing process, thereby creating a more motivated and productive academic environment. Furthermore, Triwayatno et al. (2025) reported that students feel more satisfied when AI tools help them generate ideas, improve sentence structure, and correct grammatical errors. Supporting this, Barrot (2025) highlights Gemini's specific

utility in overcoming writer's block by not only generating research topics and theoretical frameworks but also by creating structured outlines, which significantly streamlines the drafting phase for research students. This shows that satisfaction is closely related to the perception of the contribution of these tools to students' academic performance.

In addition to functional aspects, feedback quality has also been consistently identified in empirical studies as a key factor influencing student satisfaction with the use of chatbots AI. Several studies suggest that students report higher satisfaction when automated feedback is considered accurate, timely, and relevant to their writing tasks. For example, Tran (2025) found that students who received detailed and actionable feedback from AI writing systems showed greater confidence in revising their work and evaluated their learning experience more positively. Similarly, Bae and Jung (2024) reported that personalized feedback based on students' writing needs can increase their engagement and satisfaction levels. In contrast, Brandmo and Gamlem (2025) found that when feedback was perceived as unclear or inconsistent, students reported lower satisfaction levels and showed reluctance to rely on the technology.

Despite many positive findings, several studies highlight the complexity and challenges in user interactions. Baidoo-Anu et al. (2024) explored students' perspectives on generative AI in higher education and found that while many students appreciated responsive feedback, concerns about dependability and authenticity of information also arose. In other hand, Kusuma et al. (2024) reported that, in a phenomenological study involving eight prospective English as a Foreign Language (EFL) teachers, participants used ChatGPT for various purposes during their teaching practicum. While they acknowledged concerns about the accuracy of the information generated by the tool, they generally viewed ChatGPT as a valuable resource that supported their professional development. Reinforces this concern specifically regarding Gemini, warning that the tool may produce factual errors or "hallucinations," such as generating non-existent references. This necessitates that students exercise critical vigilance and cross-reference information to safeguard academic integrity. Kim et al. (2025) highlight the role of users in interacting with tools such as ChatGPT, showing that students who use AI tools reflectively, rather

than passively, demonstrate better learning and more optimal writing development. These findings indicate that satisfaction and effectiveness depend not only on the sophistication of the tool, but also on how students are involved in the process. In addition, institutional factors also play an important role; Shofiah et al. (2023) emphasize that institutional preparation and faculty support influence students' overall experience with Chatbot AI platforms.

In summary, although studies such as Triwayatno et al. (2025) and Tran (2025) identify specific features such as grammar correction and feedback quality as determinants of satisfaction, they mainly focus on functional effectiveness or “does it work?” rather than users' subjective evaluation of these features. There is limited research that specifically explores how technical aspects such as grammar, ideas, feedback, and ease of use interact to influence the overall satisfaction of English language education students in Indonesia. Therefore, this study aims to fill this gap by systematically investigating not only whether these features are used, but also how they qualitatively influence student satisfaction in academic writing.

2.3 Conceptual Framework

This study explores student satisfaction as a subjective and multidimensional experience that is constructed through students' interaction with chatbot AI in academic writing. Consistent with the interpretive and constructivist orientation of qualitative case study design (Merriam & Tisdell, 2015), satisfaction is not treated here as a fixed outcome to be measured or as a variable whose relationship with another variable is to be tested. Instead, it is understood as a meaning that students actively attach to their writing experiences, shaped by how well chatbot AI aligns with their academic needs, expectations, and ways of working. The focus of inquiry is therefore not whether chatbot AI causes satisfaction, but how students perceive, evaluate, and make sense of their satisfaction when using chatbot AI to support academic writing.

To interpret these experiences, this study draws on three theoretical perspectives, which are used as sensitizing concepts (Bowen, 2006) rather than as predictive models. Sensitizing concepts provide the researcher with a general frame

of reference and a set of interpretive lenses through which the data can be examined, while still allowing themes to be developed in close engagement with participants' own accounts.

The first perspective is the Technology Acceptance Model (Davis, 1989), which highlights perceived usefulness and perceived ease of use as central to how users relate to a technology. In this study, these ideas help interpret why students describe chatbot AI as helpful and convenient, and how perceived benefits and simplicity of use feature in their evaluative accounts. The second perspective is the Expectation-Confirmation Theory (Bhattacharjee, 2001), which draws attention to the relationship between what users expect from a tool and what they actually experience. This lens helps interpret how students' satisfaction shifts when chatbot AI meets, exceeds, or falls short of their expectations, particularly in relation to the accuracy and relevance of its responses. The third perspective is the DeLone and McLean (2003) user satisfaction model, which foregrounds information quality, system quality, and service quality. This lens helps interpret how students appraise the accuracy of AI suggestions, the speed and accessibility of the tool, and its responsiveness to their writing needs.

Taken together, these perspectives do not function as a causal framework in which the use of chatbot AI produces a fixed level of satisfaction. Rather, they orient the analysis toward the different dimensions through which students construct and articulate their satisfaction. Student satisfaction in this study is thus explored through students' perceptions of usefulness, ease of use, feedback quality, expectation confirmation, and the extent to which chatbot AI supports their academic writing, while remaining open to additional dimensions of meaning that emerge from the participants' own experiences.