Exploring EFL Teachers' Strategies in Employing AI Chatbots in Writing Instruction to Enhance Student Engagement

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Abstract

Artificial Intelligence (AI) has become a powerful tool in English as a Foreign Language (EFL), offering significant prospects for improving language learning and teaching. Recently, the incorporation of chatbots, one of the advanced AI language models, in EFL writing has garnered interest. This study aims to investigate the use of AI chatbots in EFL writing instruction, driven by their potential to stimulate student engagement across affective, behavioral, and cognitive engagement. The main objective was to evaluate student engagement levels with AI chatbots and assess EFL teachers' strategies for stimulating this engagement. Utilizing a mixed-methods design, the research involved 40 students and two faculty members, employing questionnaires and semi-structured interviews for data collection. Quantitative data was analyzed using SPSS, and qualitative insights were obtained through thematic analysis of interview transcripts. Findings indicate that AI chatbots significantly improve student engagement, evidenced by high affective, behavioral, and cognitive engagement levels. The study identifies three effective strategies teachers use: personalized feedback, gamification, and interactive writing assignments. The research findings show the potential benefits of integrating AI chatbots into EFL writing instruction, facilitating informed decisions to optimize technology usage through understanding student engagement levels and effective teaching strategies, eventually enhancing student learning outcomes.

Keywords: AI chatbots, student engagement, writing instruction

1. Introduction

The ongoing evolution of technology has prompted language teachers to integrate it into their teaching methods. Continually adapting to technological advancements, teachers equip students with vital digital skills and tailor these skills to meet the demands of today's dynamic landscape (Siegle & Hook, 2023; Sutiyono et al., 2022). Language teachers have explored innovative teaching strategies as they strive to foster digital competencies essential for thriving in a technology-centric society (Guo et al., 2022). Amidst these efforts, innovative approaches in language teaching have emerged, promising to revolutionize students' learning experiences. An efficient approach has been leveraging technological advancements to offer personalized language instruction, a strategy that reshapes traditional learning paradigms to suit individual learner needs better (Hastomo et al., 2024). Building on this foundation, integrating AI chatbots into language instruction represents a natural progression in these technological innovations. This strategy continues the personalized learning trend and enhances the interactive elements of language practice, underscoring a sustained commitment to innovative teaching methodologies.

AI chatbots can stimulate student engagement when teachers use the right strategies. To optimize the benefits of AI chatbots as an innovative teaching methodology, it is essential to acknowledge the fundamental role of student engagement. A study has shown consistently shown that actively engaged students are more likely to achieve academic excellence due to improved knowledge retention and deeper learning (Oktarin et al., 2024). The successful incorporation of AI chatbots in language teaching depends on deploying effective teaching strategies tailored to meet each student's unique needs and learning preferences (Waziana et al., 2024). This customization enriches the learning experience and creates a more inclusive educational environment. Educators must skillfully integrate these digital tools with conventional teaching methods, thereby preserving the interpersonal element of teaching and ensuring that the introduction of AI complements rather than replaces traditional educational interactions (Lee et al., 2019). Creating a classroom atmosphere that promotes active participation and critical analysis of AI-generated content can significantly enhance student engagement (Kim & Kim, 2022). This approach not only fosters academic achievement but also equips students with the skills to critically engage with and adapt to emerging technologies, amplifying the educational impact of these innovations (Mageira et al., 2022). Therefore, when teachers employ the right strategies, AI chatbots have the potential to boost student engagement significantly.

Numerous AI chatbot tools have been employed by EFL teachers, leveraging advancements in AI technology, with diverse stakeholders holding varying perspectives on the evolution of AI tools. While some exhibit considerable enthusiasm toward its deployment (Marzuki et al., 2023; Nurchurifiani et al., 2025; Zulianti et al., 2024), others articulate apprehensions regarding its efficacy, application, and the challenge of maintaining academic integrity among student users (Liu et al., 2022). These concerns are particularly pertinent as certain

researchers have articulated that confidence in the author diminishes upon the realization of AI engagement in the writing process. Moreover, the ethical implications of using AI chatbots in educational settings are critical, requiring rigorous ethical validation to prevent potential misuse. This is essential in the pursuit of generating novel scholarly insights and educating prospective professionals (Lund & Wang, 2023). Additionally, the integration of AI also evokes concerns regarding the potential displacement of human labor by technology (Qadir, 2023). To address these issues effectively, EFL teachers must adeptly navigate and redress the concerns above while incorporating AI chatbots into their pedagogical approaches.

In recent years, a growing body of research has focused on integrating AI chatbot technology in teaching writing to EFL students. Scholarly investigations suggest that incorporating AI chatbots can benefit students' writing proficiency (Gayed et al., 2022; Marzuki et al., 2023; Wulyani et al., 2024). A comprehensive literature review has highlighted the agreement that integrating AI chatbots in writing instruction will necessitate substantial adaptations to instructional methodologies due to the challenges and perceived advantages inherent in this technological paradigm shift (Cardon et al., 2023). Simultaneously, another strand of research has explored using AI chatbots and recognition technologies to support EFL writing instruction, aiming to enhance personalization and contextualization within authentic learning contexts (Hwang et al., 2023). Further, empirical evidence shows that students appreciate the feedback provided by AI tools in their writing efforts, indicating a positive reception towards AI chatbots (Chang et al., 2021). However, despite this positive feedback, research into how deeply students engage with these AI chatbots within educational contexts, particularly in writing courses, remains insufficient. Additionally, a method has been devised to effectively and accurately detect AI-generated text through the synergistic integration of transformer learning and stylometric features (Mikros et al., 2023). This highlights the need for further empirical investigation into students' engagement with AI chatbot technology in EFL writing instruction. Consequently, this research aims to clarify the extent of students' engagement in utilizing AI chatbots and assess the efficacy of teachers' strategies in fostering student engagement. To address these research objectives, the following research questions are formulated:

1. What is the level of student engagement with AI chatbots in a writing class?
2. How do the strategies employed by EFL teachers contribute to enhancing student engagement in the utilization of AI chatbots in EFL writing instruction?

Understanding student engagement in utilizing AI chatbot technology is a pivotal inquiry for writing instructors. This investigation sheds light on the current landscape and highlights the necessity of encouraging student interaction with these innovative tools within writing instruction. Therefore, exploring the methodologies employed by writing instructors to strengthen student engagement with AI chatbots emerges as another crucial aspect of this study. By exploring these strategies, writing instructors can gather insights that can potentially drive the widespread adoption of AI chatbots among writing educators, enriching the teaching-learning landscape. This recognition is fundamental for refining the design of AI chatbots and the pedagogical approaches employed, ensuring a comprehensive understanding and appreciation of the possibilities they offer within writing instruction. Through thoroughly examining these research questions, this study endeavors to pave the way for the more effective integration of AI chatbot technology in writing classrooms, fostering enriched learning experiences for students and educators alike.

2. Literature Review

2.1 Teaching Writing Using AI Chatbots

The transformation of writing instruction in the current technological era is inseparable from the rapid advancement of digital tools. Miranty et al. (2023) state that this shift is pushed by the increased integration of digital utilities in the educational domain, effectively transforming traditional pen-and-paper methodologies into more creative and dynamic pedagogical experiences. Sasikumar and Sunil (2023) discuss how *ChatGPT, Google Bard, Microsoft Bing*, and *Perplexity* AI, for instance, are revolutionizing writing instruction. These AI chatbots offer functionalities such as search engines, real-time feedback, and collaborative editing. These features enhance students' writing abilities, as mentioned in the study by Song and Song (2023), and inspire them to engage in critical thinking and independent reasoning. Blending digital tools with traditional writing instruction signals a new era of creativity, collaboration, and critical thinking in education. Thus, there are several advantages to the use of AI chatbots as writing partners.

The chatbot appears to have an advantage as a writing partner compared to human peers. For instance, the chatbot can incorporate various languages into the writing process for EFL students. This feature can give them an advantage over human peers, who generally have similar language proficiency and writing skills (Deiniatur & Cahyono, 2024; Guo et al., 2022). Additionally, the chatbot can provide quick feedback on students' writing during interactions, and it is ready to engage in unlimited exercises beyond time and space. Moreover, compared to actual individuals, the chatbot will likely help students feel less pressure about their performance. When interacting with human peers, students often fear making mistakes and feel less competent (Cahyono & Rahayu, 2020; Kim et al., 2021). In contrast, when practicing with a chatbot, students can develop and organize their ideas at their own pace in a more comfortable environment (Chiu et al., 2023), reducing anxiety and enhancing their enjoyment and motivation during the learning process (Hsu et al., 2023). These advantages may make AI chatbots more accessible and engaging for students, as developing writing skills through such tools can feel comparable to casual conversations with peers..

Prior research has explored the integration of AI chatbots in English writing instruction, driven by their potential to foster student motivation and critical thinking skills in such contexts (Silitonga et al., 2023). Meanwhile, AI chatbot-based instruction reduces students' anxiety about learning English writing as they can learn at their own pace. They can take time to understand concepts, practice writing,

and receive feedback without feeling rushed (Hawanti & Zubaydulloevna, 2023). Another study examined EFL teachers' perspectives on using AI chatbots on student essays, stating that integrating these tools can improve the quality of EFL student writing (Marzuki et al., 2023). On the other hand, Kılıçkaya (2020) explored university students' views on the use of chatbots to assist in writing, finding that they have a positive attitude toward chatbots due to their utility and direct feedback provided. Meanwhile, Chang et al. (2023) investigated educational design principles concerning using AI chatbots to facilitate self-directed learning in the educational sector. Additionally, empirical data suggests that students appreciate the feedback provided by AI tools in their writing efforts, indicating a positive reception towards AI chatbots. Despite the positive feedback, there is a lack of in-depth research into students' interaction with these AI chatbots in educational settings, especially in writing classes. By addressing this gap in research, this research seeks to provide valuable insights into the effectiveness of integrating AI technology in enhancing student learning experiences and outcomes in writing.

2.2 Student Engagement with AI Chatbots

The rapid advancement of language processing technologies and statistical methods has empowered AI chatbots to provide immediate evaluations across various aspects of student academic writing, encompassing grammar, vocabulary, mechanics, content, and coherence. AI chatbots like *ChatGPT*, *Perplexity*, *Humata*, *Bing*, and *Gemini* have gained widespread adoption in higher education due to their capabilities for self-assessment and feedback (Chang et al., 2023), idea generation and brainstorming (Wieland et al., 2022), quick verification and research support (Alkaissi & McFarlane, 2023), and offering numerous revision opportunities with a diverse range of features such as scoring rubrics, writing guides, translation aids, and exemplar essays (Oktarin et al., 2024). Therefore, the complex functionalities and widespread adoption of AI chatbots in higher education underscore their pivotal role in enhancing student writing proficiency.

While there has been some critique of using AI chatbots for writing instruction (Alkaissi & McFarlane, 2023; Oktarin et al., 2024; Waziana et al., 2024; Zou et al., 2023), several recent studies have considered AI chatbots as an addition to teacher-student or student-student interaction rather than a total substitution (Wang et al., 2024; Zou et al., 2023). These studies emphasize the importance of student engagement with AI chatbot feedback during their writing process. For instance, Chang et al. (2023) explored how individual students interacted with feedback from AI chatbots in their academic writing by monitoring revisions made by students across various drafts. Behavioral engagement encompasses the actions taken by students in revising their work based on feedback from AI chatbots, in addition to the amount of time they dedicate to the revision process (Hew et al., 2023). Affective engagement concerns students' emotional and attitudinal responses to AI chatbot feedback (Guo et al., 2023). Cognitive engagement refers to how students respond to AI chatbot feedback through cognitive or metacognitive strategies and revision operations (Iku-Silan et al., 2023). In examining university students interacting with AI chatbot feedback on their writing, Silitonga et al. (2023) discovered that their trust could influence student engagement with AI chatbot in the feedback provided. The study revealed that students tended to adopt proofreading rather than a learning orientation in their engagement with the AI chatbot. The findings of current research can inform educators about the potential benefits associated with integrating AI chatbots into EFL writing instruction. By understanding student engagement levels and effective teaching strategies, they can make informed decisions to optimize the use of technology in writing instruction, enhancing student learning outcomes.

3. Method

3.1 Research Design

This study employed a mixed-methods approach. According to Creswell (2012), a mixed-methods research strategy involves gathering, analyzing, and integrating quantitative and qualitative data within a single study to understand a research question comprehensively. Integrating quantitative and qualitative methods allows for a more detailed exploration of complex aspects and relationships within the social and human domains. In this study, a mixed-methods approach is anticipated to quantitatively assess student engagement with AI chatbots in a writing class and qualitatively explore EFL teachers' strategies in stimulating student engagement in using AI chatbots.

3.2 Participants

The research encompassed 40 EFL students and two South Sumatera and Lampung University faculty members. The participant size was determined by the limited availability of EFL learners and instructors who had direct experience with AI chatbots in writing instruction at the time of data collection. The 40 learners represented the total number of students enrolled in two courses where AI chatbots were systematically implemented, and the two faculty members were the sole instructors piloting this approach, making their perspectives critical to understanding pedagogical strategies. While small, this sample allowed for a focused qualitative exploration of engagement dynamics, aligning with the study's exploratory aim to identify preliminary trends rather than generalize outcomes. Detailed demographic data of the participants can be found in Table 1.

Table 1. Participants demographic information

Participants	Number	Gender	Range of Age
Students	35	Female	19-21
	5	Male	19-21
Faculty Members	2	Female	30-35

A purposive sampling approach was employed for participant selection, driven by specific criteria. Regarding students, the criteria encompass enrollment in the English Language Education program, completion of at least one semester involving technology-enhanced learning, proficiency in English to engage with AI chatbots, readiness to invest time in research sessions, and current enrollment in a writing

course. As for faculty members, eligibility was defined by possession of a minimum Master's degree in English education or a related field, a teaching tenure of at least two years in English language education, familiarity with technology integration in education, active involvement in curriculum development or instructional design in English education, a willingness to contribute insights and teaching strategies related to AI chatbots in education, and currently teaching a writing course. Maintaining ethical integrity was important in conducting research involving human subjects. Thus, in this investigation, priority was given to obtaining informed consent, protecting participants' confidentiality and privacy, and carefully assessing the potential advantages of the research.

3.3 Instruments

The tools utilized in this study employed various data collection approaches to ensure a systematic analysis. Both a questionnaire and a semi-structured interview served as the research instruments. The researchers created an online questionnaire to answer the first research question. They utilized the SESQ (Students' Engagement in Schools Questionnaire) developed by Hart et al. (2011). The SESQ included 109 items aimed at thoroughly evaluating students' engagement. The researchers condensed the number of items to align with the study's objectives and context. This questionnaire began with a brief introduction and a consent form to participate in the survey, followed by some demographic questions about age and gender. One of the researchers administered a pilot test to 10 undergraduate students enrolled at a private university in Bandar Lampung. A questionnaire was distributed to evaluate participants' ability to complete them efficiently. The questionnaire was considered reliable when the reliability coefficient was 0 to 1 (Tavakol & Dennick, 2011). Table 2 presents the Cronbach's Alpha results for the questionnaire employing a five-point Likert Scale. Face validity was also achieved by presenting the instruments and the study concept to experts in the field of the English language, incorporating their feedback.

Table 2. Reliability scores

Category	Items	Cronbach's alpha
Affective engagement	8	0.916
Behavioral engagement	8	0.852
Cognitive engagement	8	0.801

A semi-structured interview was conducted to gather qualitative insights into exploring EFL teachers' strategies for stimulating student engagement in using AI chatbots. The researchers reached out to EFL teachers whose students served as participants. Interview questions were constructed based on affective, behavioral, and cognitive engagement indicators, with adjustments to ensure relevance. Conducted via *Zoom* conference, each interview session lasted approximately 10 minutes and was facilitated in a supportive atmosphere to encourage participants to feel at ease. With participants' consent, the interviews were recorded for reference

3.4 Data Analysis

The questionnaire data underwent analysis using SPSS IBM 26, where each component's mean and standard deviation from EFL students were compared. The researchers established interpretation criteria to derive meaningful insights, considering the number of statements within each questionnaire component and the number of respondents. This facilitated the calculation of interpretation intervals for each component. The interpretation criteria are outlined in Table 3.

Table 3. Interpretation criteria

Mean Range	Criteria
4.3 - 5.0	Very High
3.5 – 4.2	High
2.7 – 3.4	Moderate
1.9 – 2.6	Low
1.0 – 1.8	Very Low

The researchers utilized thematic analysis outlined by Braun et al. (2014) to analyze qualitative data. This approach involved three phases of coding and the progression of themes. Each audio recording's transcript was initially examined to discern how EFL educators enhance student engagement in EFL writing instruction by integrating AI chatbots. Themes were then synthesized from the transcription findings in the subsequent coding phase. Thorough discussions among researchers ensured the reliability and precision of the results. In the final coding stage, the researchers assessed the strategies perceived by EFL teachers.

4. Results and Discussion

4.1 The Level of Student Engagement with AI Chatbots in A Writing Class

Initially, this study aimed to evaluate the extent of student engagement with AI chatbots in a writing class. Researchers employed a quantitative instrument such as a five-point Likert Scale questionnaire to accomplish this objective. Subsequently, they conducted data processing and analysis using SPSS version 26. Interpretation criteria were devised to extract meaningful conclusions from the data by computing the cumulative score of each category and determining the mean and standard deviation scores for each. The outcome of this computation is presented in Table 4.

Table 4. The level of student engagement with AI chatbots in a writing class

No.	Statement	Total Respondents	Mean	SD	Criteria
Affective Engagement					
1	The AI chatbot helped me feel more confident about my writing abilities.	40	3.97	0.82	High
2	Interacting with the AI chatbot made writing assignments more enjoyable for me.	40	3.83	0.77	High
3	I felt motivated to use the AI chatbot to improve my writing skills.	40	3.93	0.73	High
4	Using the AI chatbot increased my interest in writing.	40	3.94	0.79	High
5	The AI chatbot provided helpful feedback that positively impacted my attitude towards writing.	40	3.82	0.79	High
6	I felt supported in my writing efforts when using the AI chatbot.	40	3.95	0.81	High
7	The AI chatbot helped me feel more connected to the writing process.	40	3.92	0.72	High
8	I believe that using the AI chatbot improved my attitude towards writing.	40	3.82	0.76	High
Behavioral Engagement					
9	I regularly interacted with the AI chatbot during writing assignments.	40	3.84	0.80	High
10	I actively sought feedback from the AI chatbot to improve my writing.	40	3.87	0.72	High
11	Using the AI chatbot encouraged me to revise and edit my writing more frequently.	40	3.88	0.77	High
12	I spent significant time engaging with the AI chatbot during writing tasks.	40	3.90	0.72	High
13	The AI chatbot helped me stay focused on my writing goals.	40	3.89	0.74	High
14	I experimented with different writing techniques based on recommendations from the AI chatbot.	40	3.86	0.79	High
15	The AI chatbot motivated me to explore new ideas and topics in my writing.	40	3.94	0.81	High
16	Using the AI chatbot encouraged me to set and achieve writing goals.	40	3.97	0.86	High
Cognitive Engagement					
17	Interacting with the AI chatbot helped me understand key writing concepts better.	40	4.03	0.71	High
18	The feedback provided by the AI chatbot helped me identify areas for improvement in my writing.	40	4.03	0.71	High
19	Using the AI chatbot increased my awareness of writing strategies and techniques.	40	3.98	0.72	High
20	The AI chatbot challenged me to think critically when approaching writing tasks.	40	3.94	0.73	High
21	Interacting with the AI chatbot improved my ability to articulate ideas effectively in writing.	40	3.97	0.82	High
22	I felt that the AI chatbot enhanced my writing skills.	40	3.83	0.77	High
23	The AI chatbot helped me better understand grammar and punctuation rules.	40	3.93	0.73	High
24	Using the AI chatbot expanded my vocabulary and word choice in writing.	40	3.94	0.79	High

As presented in Table 4, the research findings revealed student engagement in using AI chatbots for EFL writing instruction (N = 40). This research divided the evaluation into three critical aspects: affective, behavioral, and cognitive engagement. The participants' engagement in using AI chatbots for EFL writing instruction was described by examining these aspects. The first aspect, affective engagement, included five indicators. The mean scores for this aspect showed that students had a high level of affective engagement. The second aspect, behavioral engagement, consisted of eight indicators, and the findings indicated that students exhibited a high level of behavioral engagement. The third aspect, cognitive engagement, also had eight indicators, revealing a high level of cognitive engagement among the students. Therefore, the study found that the students' engagement level in using AI chatbots for EFL writing instruction was high across affective, behavioral, and cognitive engagement

Previous studies have echoed these findings, indicating that EFL students demonstrated high affective, behavioral, and cognitive engagement levels when using AI chatbots for EFL writing instruction. According to Shikun et al. (2024), using AI chatbots boosted students' affective engagement in their writing skills because these tools created a non-judgmental and unbiased environment. This safe space encouraged students to experiment more freely with their writing, potentially reducing anxiety and fostering greater confidence compared to interactions with human tutors. Similarly, Daeun (2021) found that using AI chatbots significantly influenced behavioral engagement in EFL writing instruction. For example, students often spent extended periods interacting with AI chatbots, which provided on-demand assistance. Whether students were completing assignments late at night or seeking immediate clarification on a concept, the 24/7 availability of AI chatbots was particularly appealing. Furthermore, Nguyen et al. (2024) reported that AI chatbots significantly enhanced cognitive engagement in EFL writing instruction by providing detailed text analyses superior to human review under time constraints. They identified simple grammatical errors and addressed complex issues like sentence structure, coherence, and style, fostering deeper cognitive processing and learning among students.

4.2 EFL Teachers' Strategies for Stimulating Student Engagement through The Use of AI Chatbots in EFL Writing Instruction

The thematic analysis served as a mechanism for researchers to explore recurring patterns within the collected data. Researchers could structure them into a thematic framework by systematically cataloging these patterns using coded data. During the interviews, a dominant theme surfaced, with participants consistently discussing their strategy to boost student engagement using AI chatbots for EFL writing instruction. The following sub-themes, which relate to the methods used by EFL teachers, were identified and written in Figure 1.

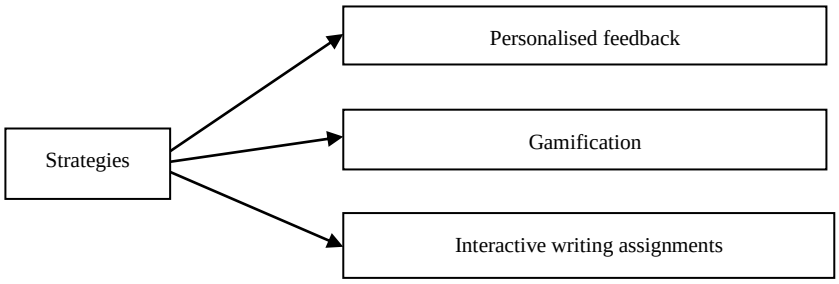

Figure 1. The strategy of EFL teachers to stimulate student engagement

One strategy for stimulating student engagement was implementing personalized feedback. This strategy was obtained after researchers carried out a thematic analysis. Respondent 1 supported this argument by responding in the quote below.

> *"I use AI chatbots to provide immediate, personalized feedback on students' writing. This approach helps students understand their mistakes and learn how to correct them in real time, which keeps them engaged and motivated to improve their writing skills.*"

According to the answer from respondent 1, she deployed personalized feedback as a vital method to improve student engagement. This approach entailed the utilization of AI chatbots to deliver prompt and personalized feedback to students' written submissions. When a student uploaded an essay or paragraph, the AI chatbot examined the material to assess its grammar, vocabulary, coherence, and general organization. Subsequently, it delivered precise feedback regarding faults and proposed enhancements and even furnished instances of accurate utilization. This prompt feedback assisted students in identifying their errors and comprehending how to rectify them, thereby enhancing the efficiency of the learning process. The individualized nature of the feedback ensured that students received coaching customized to their specific requirements and levels of proficiency, greatly boosting their motivation and engagement. Through ongoing engagement with the AI chatbot, students saw their advancement over a period of time, thereby fostering a greater inclination to engage in writing tasks actively. In general, customized feedback enhanced the learning process by making it more self-motivated and focused on the individual student.

Studies on individualized feedback in educational environments yielded diverse outcomes. However, there was widespread agreement regarding its advantages for student engagement. Prior research showed that customized feedback had a notable impact on student performance and motivation by accommodating their specific learning requirements and offering explicit, practical guidance. Hew et al. (2023) claimed that providing prompt and detailed feedback could improve learning outcomes by aiding students in comprehending their errors and identifying ways to optimize their performance. This was consistent with the beneficial influence of customized feedback provided by AI chatbots in writing classes. Nevertheless, certain studies indicated that the efficacy of individualized feedback might rely on the student's baseline proficiency and the intricacy of the assignment. For instance, Waziana et al. (2024) discovered that although personalized feedback was typically advantageous, its effectiveness could differ depending on the manner in which it was conveyed and the student's capacity to implement the input. Although there were subtle differences, most studies indicated that personalized feedback with AI chatbots could greatly improve student engagement and learning results.

EFL teachers designed gamified writing tasks with the help of AI chatbots to enhance student engagement. This approach was the second strategy identified in the current study. Respondent 2 added another statement that supported this finding.

> *"I designed gamified writing tasks with the help of AI chatbots, where students earned points or badges for completing exercises and achieving milestones. This strategy added a fun and competitive element to learning, which could significantly stimulate student engagement and willingness to practice writing."*

Based on the interview results, designing gamified writing tasks with the help of AI chatbots significantly stimulated students' engagement. In this study, an EFL teacher employed AI chatbots to create writing assignments that were designed like games. In these assignments, students could earn points, badges, or levels as they completed exercises and achieved important goals. For example, a chatbot might have prompted students to compose a narrative within a specific word constraint and allocated points based on ingenuity, grammar, and vocabulary utilization. As students amassed points, they could unlock additional challenges or obtain virtual rewards. By adopting a competitive and enjoyable approach, student motivation was greatly enhanced, as it turned the monotonous chore of writing exercises into a thrilling activity. Gamification fostered increased student participation and consistency by using their motivation to attain higher marks or receive prizes. Through the integration of game mechanics and educational content, teachers established a highly immersive and captivating learning environment that effectively catered to students' inherent and external motivations.

Extensive studies have been conducted on the efficacy of gamification in education, with numerous scholars emphasizing its favorable influence on student engagement and motivation. Bitrián et al. (2021) discovered that the implementation of gamification could enhance user engagement by increasing the enjoyment and rewards associated with tasks. This discovery provided evidence for the effectiveness of incorporating gamification into EFL writing instruction. This strategy involved the utilization of AI chatbots to establish a learning

environment that was simultaneously fun and competitive. Alsawaier (2018) conducted a study that demonstrated the positive influence of gamification on student motivation and engagement. This was particularly accurate when the game features were skillfully created and connected to instructional goals. Nevertheless, certain research identified disadvantages, such as the danger of overemphasis on external rewards, which could gradually disintegrate internal motivation (Muravsky & Muravskaia, 2024). Notwithstanding these issues, the general agreement in the research was that gamification, when handled carefully, could greatly improve student engagement and learning results, which corresponded to the reported advantages in EFL writing instruction utilizing AI chatbots.

The final strategy for stimulating students' engagement is to provide interactive writing assignments. The researchers discovered this strategy through thematic analysis. Respondent 1 supported this finding with a similar idea, as stated in the text below.

> *"I recognize the significance of interactive writing tasks in fostering student engagement, especially when utilizing AI chatbots for writing instruction."*

Respondent 1 highlighted the importance of interactive writing assignments in stimulating student engagement in writing instruction. This approach involved students participating in writing exercises that were specifically created to encourage active engagement and prompt timely reactions. In this study, an EFL teacher employed an AI chatbot to stimulate students with imaginative writing ideas. The use of interactivity in the writing process enhanced its enthusiasm and engagement, as students were provided with beneficial feature and could make necessary adjustments to their writing. AI chatbots could replicate authentic writing situations, including composing emails, reports, or blog posts. This feature enabled students to enhance their writing skills by practicing in circumstances that were directly applicable to their daily experiences. Teachers enhanced the learning experience by incorporating interactive writing exercises, which helped to solve the monotony associated with standard writing tasks. This strategy also enabled students to engage in more regular writing practice and receive quick assistance, thereby boosting their confidence and motivation to participate.

Studies on interactive learning techniques, such as interactive writing activities, typically confirmed their efficacy in improving student engagement and academic achievements. Research indicated that interactive learning environments had the potential to facilitate more profound cognitive engagement and enhance the retention of knowledge. Ullah and Anwar (2020) discovered that incorporating interactive activities into the classroom setting could greatly enhance student engagement and comprehension of the subject matter. This discovery aligned with the documented advantages of employing AI chatbots in EFL instruction for interactive writing exercises, wherein students engaged actively in writing assignments and promptly received feedback. Furthermore, a study conducted by Hobert et al. (2023) highlighted that interactive learning might result in superior learning outcomes compared to passive learning approaches. Nevertheless, it was crucial to acknowledge that the efficacy of interactive exercises might differ based on their design and implementation. For instance, interactions that were poorly structured or lacked sufficient feedback might fail to provide the desired levels of engagement and learning outcomes. Although there were difficulties, most research affirmed that interactive writing activities, particularly when guided by AI technology, could greatly raise student engagement and develop writing skills in EFL settings (Guo et al., 2022; Sasikumar & Sunil, 2023).

5. Conclusion

This study examined the level of student engagement with AI chatbots in a writing class, evaluating affective, behavioral, and cognitive engagement. The results showed that students exhibited high engagement levels across these three domains. Additionally, the study found that AI chatbots significantly boosted student engagement in affective, behavioral, and cognitive areas, enhancing motivation, participation, and writing skills. The research also explored how EFL teachers stimulated student engagement with AI chatbots. Using thematic analysis, the researchers identified three key strategies: personalized feedback, gamification, and interactive writing assignments.

This current study is significant to English teachers and stakeholders in Indonesia in understanding the potential benefits of integrating AI chatbots into EFL writing instruction. The findings provide insights into practical strategies that can be employed to enhance student engagement and improve writing outcomes. By adopting these three strategies, educators can create a more interactive and supportive learning environment for the students. This study has some limitations. The sample size of 40 students may not represent the global diversity of EFL learners. Self-reported data from Likert Scale questionnaires could result in biased outcomes due to possible overestimations of student engagement. The focus on a single educational context may limit the applicability of the findings to other settings. Future research should address these limitations by including a more extensive and diverse sample across various educational environments. Longitudinal studies are suggested to evaluate the long-term impact of AI chatbots on student engagement. Exploring how AI chatbots can enhance other language learning areas like speaking and listening could offer valuable insights into their broader utility in EFL teaching, helping to better align AI technologies with the needs of learners and educators.

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Authors' contributions

Tommy Hastomo was responsible for the grand design of the study and major content revision under the guidance of Prof. Utami Widiati, Francisca Maria Ivone, Ph.D., and Evynurul Laily Zen, Ph.D. He was responsible for the appropriateness of the grand design of the

research. Andini Septama Sari drafted the improvements to the manuscript production. Andianto was responsible for proofreading and revising the mechanics of writing. All authors approved the final manuscript during the stages of submission and revision through peer review

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