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ChatGPT to Foster Students' Engagement in Writing Class: An Intervention Study

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Abstract

Enhancing student engagement is essential for improving learning outcomes in English as a Foreign Language (EFL) writing classes. This study investigates the use of Artificial Intelligence (AI), particularly ChatGPT, to foster engagement through personalized feedback, creative expression, and interactive learning. Conducted at an Islamic university in Indonesia with 80 participants, the research employed a quasi-experimental design to assess ChatGPT's impact on behavioral, cognitive, and emotional engagement. Participants were divided into control and experimental groups, with the latter utilizing ChatGPT for brainstorming and instructional support. The results showed significantly higher engagement levels among the experimental group across all dimensions, highlighting ChatGPT's role in creating student-centered environments that enhance traditional teaching methods. By offering real-time, tailored assistance, ChatGPT boosts motivation and deepens cognitive and emotional connections to learning tasks. This study contributes to the growing literature on AI in education by demonstrating ChatGPT's effectiveness in EFL writing instruction and emphasizing the need for innovative, AI-integrated pedagogical approaches to enrich learning experiences. Future research should explore the broader applications of AI in language education, addressing scalability, diverse learner needs, and long-term impacts on academic performance.

Keywords: ChatGPT, student engagement, writing, artificial intelligence

INTRODUCTION

Student engagement is a key determinant of successful learning outcomes, particularly in English as a Foreign Language (EFL) contexts, where students frequently encounter challenges such as low motivation and inconsistent participation, especially in writing tasks (Cheng et al., 2023; Hiver et al., 2024; Yang et al., 2023). Engagement is widely recognized as a multidimensional construct encompassing behavioural, cognitive, and affective dimensions, each contributing uniquely to academic success. Behavioural engagement is reflected in observable actions such as consistent attendance, participation, and effort in learning activities, which are essential for building foundational skills (Fredricks et al., 2004; Reeve & Tseng, 2011). Cognitive engagement pertains to the mental processes and learning

strategies students employ to process, comprehend, and master new material, emphasizing the importance of higher-order thinking and self-regulation (Derakhshan, 2021; Wei, 2023). On the other hand, affective engagement involves emotional responses such as interest, enjoyment, or anxiety, which significantly influence students' motivation and willingness to persist in learning (Reschly & Christenson, 2022; Pekrun et al., 2017). These dimensions interact to create a comprehensive framework for understanding how students engage with instructional environments and achieve learning goals, particularly in the demanding domain of EFL writing (Wang et al., 2023; Zare et al., 2024). Addressing these aspects of engagement is critical, as research consistently highlights their predictive power in determining long-term academic outcomes (Hu & Wang, 2023; Schweder & Raufelder, 2024).

Student engagement has garnered significant attention from researchers due to its critical role in fostering effective classroom learning and its strong predictive relationship with academic success (Cheng et al., 2023; Yang et al., 2023). Highly engaged students demonstrate active involvement, commitment to learning goals, and consistent academic participation, resulting in improved learning outcomes (Hiver et al., 2024). Conceptually, student engagement encompasses affective, cognitive, and behavioural dimensions, each contributing uniquely to the learning process (Reschly & Christenson, 2022). Affective engagement pertains to students' emotional responses, including their attitudes toward assignments, tasks, and interpersonal interactions in the learning environment. Cognitive engagement reflects students' awareness, mental effort, and strategic approaches to fulfilling academic responsibilities. Behavioural engagement focuses on observable actions, such as students' time and effort completing tasks and participating in class activities (Sang & Hiver, 2020).

Extensive research has established the behavioural, cognitive, and affective dimensions of student engagement as critical determinants of language learning outcomes, making them central topics in second language acquisition studies (Derakhshan, 2021; Hu & Wang, 2023; Zare et al., 2024). Researchers in English as a Foreign Language (EFL) contexts have extensively explored factors influencing these dimensions, examining how individual characteristics like self-efficacy and persistence contribute to active learning involvement (Al-Obaydi et al., 2023; Wang, 2023). Additionally, studies have investigated interpersonal dynamics, such as teacher-student rapport, motivational strategies, and supportive classroom interactions, which play significant roles in fostering engagement (Derakhshan, 2021; Zare & Derakhshan, 2024). These inquiries have focused on understanding and enhancing behavioral participation, cognitive investment, and affective responses to create engaging and inclusive learning environments. By addressing these dimensions, EFL researchers have provided valuable pedagogical insights into designing effective instructional strategies that optimize students' engagement and, in turn, their academic success. This body of work collectively underscores the multifaceted nature of engagement and its vital role in advancing effective language learning and teaching practices.

Despite extensive research emphasizing the critical role of behavioral, cognitive, and affective dimensions of student engagement in language learning outcomes, significant gaps remain in the literature. Prior studies have established these dimensions as vital to academic success, prompting researchers in second language acquisition to investigate their determinants and pedagogical implications (Derakhshan, 2021; Hu & Wang, 2023; Zare et

al., 2024). However, much of this research has focused on individual factors, such as personality traits and motivation, and interpersonal factors, including teacher-student rapport and classroom dynamics (Al-Obaydi et al., 2023; Wang, 2023). While these studies have deepened our understanding of engagement, they have largely overlooked the transformative potential of educational technologies, particularly tools driven by artificial intelligence (AI). Additionally, the existing body of work predominantly explores engagement within traditional classroom settings, leaving a critical gap in understanding how innovative AI-driven tools can foster engagement in modern learning environments.

This study addresses these gaps by investigating the integration of ChatGPT, an advanced AI-powered chatbot, into English as a Foreign Language (EFL) writing instruction. Unlike previous research that primarily examines writing performance, this study explores ChatGPT's influence on behavioural, cognitive, and affective dimensions of student engagement, offering a more holistic understanding of its pedagogical potential. ChatGPT's ability to provide personalized feedback, interactive learning opportunities, and linguistic support positions it as a transformative tool for addressing engagement challenges in EFL contexts. By situating ChatGPT within the framework of engagement theory, this study contributes to the growing body of literature on AI in education while providing actionable insights into how such tools can foster personalized and engaging learning experiences. This novel approach highlights the study's relevance and significance in leveraging AI technologies to enhance engagement and outcomes in contemporary language education.

Building on these advantages, this study investigates the impact of integrating ChatGPT on the behavioural, cognitive, and affective dimensions of student engagement within EFL writing classes. By examining ChatGPT's potential as a transformative educational tool, this research seeks to uncover its effectiveness in fostering meaningful engagement and enhancing learning outcomes. Additionally, the study aims to provide actionable insights into modern pedagogical practices, offering guidance on how AI-driven technologies can be seamlessly incorporated into language education to create more interactive, personalized, and dynamic learning environments.

METHOD

This study utilized a quasi-experimental design, widely recognized for its effectiveness in assessing causal relationships in educational contexts where randomization is not feasible (Janssen & Kollar, 2021). The primary objective was to evaluate the impact of integrating ChatGPT on EFL students' engagement in a writing class. Participants consisted of 80 undergraduate students aged 20–21, recruited from an Islamic university in Indonesia. The students were divided into two groups: an experimental group (n = 40) and a control group (n = 40). The experimental group received writing instruction incorporating ChatGPT as a brainstorming and instructional tool, while the control group followed conventional writing instruction without using AI tools.

In the first meeting, participants completed a pre-test questionnaire to establish baseline engagement levels and received an overview of the course materials. The main instructional phase, spanning six sessions (meetings 2–7), involved essay writing practice tailored to each group's instructional strategies. The experimental group was trained in using ChatGPT for generating ideas, enhancing coherence, and receiving immediate feedback, aligning with research emphasizing the role of technology in fostering engagement

and interactivity (Chiu et al., 2023; Rad et al., 2023). The control group relied on traditional teaching methods supplemented by internet-based brainstorming activities. Both groups completed the 8-week intervention, with the final session dedicated to a post-test questionnaire.

Table 1. Research Procedure

Meeting	Experimental Group	Control Group
1st Meeting	Distributing pre-questionnaire	Distributing pre-questionnaire
	Teaching writing using ChatGPT for students' brainstorming session	Teaching writing using a conventional approach in ELT context without the aid of ChatGPT (students can access the information on the internet for brainstorming)
Meetings 2–7	Writing practice	Writing practice
8th Meeting	Distributing post-test questionnaire	Distributing post-test questionnaire

To assess student engagement, the study employed the Student Engagement Scale developed by Reeve and Tseng (2011), which has been validated in diverse educational settings. This scale comprises 22 close-ended items that evaluate behavioural, cognitive, and affective engagement using a five-point Likert scale. To ensure linguistic and cultural appropriateness, the questionnaire was translated into Bahasa Indonesia, the participants' native language, and back-translated to maintain content validity, as Sousa and Rojjanasrirat (2011) recommended. Reliability analysis confirmed the instrument's robustness, with a Cronbach's Alpha value of 0.87, indicating high internal consistency (Taber, 2018). The quasi-experimental approach, coupled with validated instruments and a controlled intervention, ensures the methodological rigour of this study, providing valuable insights into the role of AI technologies in enhancing engagement in EFL writing contexts.

FINDINGS

Behavioural Engagement

The analysis revealed a statistically significant difference in behavioral engagement between the experimental and control groups, as presented in Table 2 ($F = 10.725$, $p < 0.05$). Post-test results indicate that students in the experimental group, who utilized ChatGPT as part of their writing instruction, demonstrated notably higher levels of behavioral engagement ($M = 4.45$, $SD = 0.413$) compared to those in the control group ($M = 4.225$, $SD = 0.413$). These findings suggest that integrating ChatGPT as an instructional tool effectively enhanced students' active participation, sustained effort, and overall involvement in learning activities. The interactive and responsive nature of ChatGPT likely contributed to this increase by fostering a more engaging and dynamic learning environment, where students were motivated to remain consistently engaged with their tasks.

Table 2. The ANCOVA results of behavioral engagement

Behavioural Engagement	Pre		Post		MS	F	Sig.
	Mean	Std. Deviation	Mean	Std. Deviation			
Control	3.655	0.29	4.225	0.413	2.014	10.725	0.002
Experiment	3.675	0.271	4.45	0.502			

Affective Engagement

The results for affective engagement revealed a statistically significant difference between the experimental and control groups, as shown in Table 3 ($F = 10.167$, $p < 0.05$). Post-test scores indicate that students in the experimental group who utilized ChatGPT achieved substantially higher levels of affective engagement ($M = 4.431$, $SD = 0.449$) compared to their peers in the control group ($M = 4.213$, $SD = 0.361$). These findings suggest that incorporating ChatGPT into instructional practices positively influenced students' emotional responses to learning tasks. By providing personalized feedback and interactive support, ChatGPT likely fostered greater interest, enjoyment, and motivation, creating a more emotionally supportive learning environment that encouraged sustained engagement and enthusiasm for writing activities.

Table 3. The ANCOVA results of affective engagement

Emotional Engagement	Pre		Post		MS	F	Sig.
	Mean	Std. Deviation	Mean	Std. Deviation			
Control	3.644	0.288	4.213	0.361	1.51	10.167	0.002
Experiment	3.706	0.282	4.431	0.449			

Cognitive Engagement

Table 4 highlights a statistically significant difference in cognitive engagement between the experimental and control groups ($F = 6.328$, $p < 0.05$). The experimental group, which integrated ChatGPT into their writing instruction, achieved a higher post-test mean score ($M = 4.206$, $SD = 0.404$) than the control group ($M = 4.027$, $SD = 0.287$). These results suggest that ChatGPT significantly enhanced cognitive engagement by fostering critical thinking and providing personalized learning experiences. The tool's ability to deliver immediate, tailored feedback likely empowered students to process better, analyze, and apply knowledge, enabling a deeper connection with the learning material. This aligns with the role of adaptive technologies in promoting higher-order thinking and sustained cognitive effort in educational settings.

Table 4. The ANCOVA results of cognitive engagement

Cognitive Engagement	Pre		Post		MS	F	Sig.
	Mean	Std. Deviation	Mean	Std. Deviation			
Control	3.55	0.265	4.027	0.287	0.726	6.328	0.014
Experiment	3.605	0.282	4.206	0.404			

DISCUSSION

Integrating artificial intelligence (AI) tools, particularly ChatGPT, into English as a Foreign Language (EFL) writing instruction has substantially enhanced student engagement across behavioural, cognitive, and affective dimensions. These findings contribute to the growing body of research that underscores AI technologies' transformative potential in reshaping traditional pedagogical practices and fostering more dynamic, learner-centred environments (Chiu et al., 2023; Bachiri et al., 2023; Wei, 2023).

Behavioural engagement, characterized by students' active participation and sustained effort in learning activities, was significantly higher among those utilizing ChatGPT than traditional instructional methods. This finding aligns with existing research suggesting that interactive technologies can cultivate more engaging and responsive learning environments, motivating students to dedicate greater time and effort to their academic tasks (Rad et al., 2023; Bakare & Jatto, 2023). ChatGPT's capacity to deliver immediate and personalized feedback likely catalyzed this heightened engagement, alleviating the challenges associated with writing tasks and fostering a sense of achievement. Furthermore, the adaptive nature of ChatGPT, combined with its user-friendly interface, likely contributed to sustaining students' attention and promoting consistent involvement in the learning process. This observation is supported by recent studies highlighting the role of AI tools in enhancing active learning experiences by providing tailored support and maintaining learner engagement over time (Barrot, 2023; Nepal & Rogerson, 2020). These findings underscore the transformative potential of AI-driven tools in reimagining traditional pedagogical approaches and fostering a more dynamic and inclusive educational environment.

Cognitive engagement, encompassing critical thinking, problem-solving, and sustained mental effort, exhibited a significant improvement in the experimental group, highlighting the impact of ChatGPT on deeper cognitive processing. These findings are consistent with prior research indicating that AI-powered platforms enhance cognitive engagement by scaffolding complex learning tasks and adapting to individual learner needs (Wei, 2023; Chiu et al., 2023). ChatGPT's ability to provide contextualized responses and generate tailored prompts likely played a pivotal role in helping students refine their writing techniques and develop a more organized understanding of essay composition. This personalized interaction encouraged learners to actively engage with the content, promoting meaningful cognitive connections and application of knowledge. Moreover, recent studies underscore the role of AI tools in fostering higher-order thinking, enabling learners to evaluate, synthesize, and apply concepts in real-time learning scenarios (Barrot, 2023; Lee & Kwon, 2024). By reducing cognitive load and providing immediate, targeted feedback, ChatGPT supports a more focused and strategic approach to learning, ensuring that students remain

cognitively invested in their tasks. These results reinforce the potential of AI-driven tools to transform traditional learning environments into interactive, cognitively stimulating spaces that empower learners to achieve higher levels of academic success.

Affective engagement, which encompasses students' emotional responses such as motivation, enjoyment, and satisfaction, was significantly enhanced through the integration of ChatGPT. The AI tool's personalized interactions and constructive feedback likely reduced the anxiety commonly associated with writing tasks, fostering a sense of emotional comfort and greater investment in the learning process. The novelty of using AI tools may have further contributed to sparking curiosity and enthusiasm, making writing activities more enjoyable and engaging. These findings align with research emphasizing the critical role of positive emotions in learning environments, which boost motivation, persistence, and overall academic performance (Pekrun et al., 2017; Hawanti & Zubaydulloevna, 2023).

Furthermore, ChatGPT's ability to provide immediate clarification of doubts and tailored guidance likely minimized frustration, which often hinders emotional engagement. This aligns with evidence suggesting that supportive learning tools enhance emotional resilience by creating a more adaptive and responsive educational experience (Chen et al., 2020; Ellis, 2008). By fostering an emotionally supportive environment, ChatGPT improved students' enjoyment of writing tasks and encouraged them to approach challenges confidently, contributing to sustained affective engagement throughout the instructional period. This highlights the potential of AI tools to play a transformative role in nurturing emotional connections to learning, particularly in contexts where students face significant challenges, such as EFL writing.

In contrast, students in the control group, who engaged with traditional teacher-led instruction supplemented by internet-based brainstorming, showed only marginal improvements in engagement. This disparity underscores the inherent limitations of conventional teaching methods in catering to the diverse needs of learners. Traditional approaches often prioritize standardized instruction over adaptability, which can lead to disengagement, particularly among students with varying skill levels, learning styles, and motivational factors (Schweder & Raufelder, 2024; Reinders & White, 2016). The lack of personalized feedback and interactive elements in these methods may fail to capture students' attention or sustain their involvement, especially in tasks as complex as writing.

These findings highlight the necessity for innovative instructional strategies that leverage adaptive technologies to create more inclusive and engaging learning environments. ChatGPT-supported methods demonstrate significant potential in addressing this gap by offering tailored feedback, real-time support, and interactive learning experiences. Such AI-powered tools adapt to individual learners' needs, making them more effective at fostering engagement compared to the uniformity of traditional approaches. This suggests that integrating tools like ChatGPT into instructional design is not merely a technological enhancement but a pedagogical necessity for meeting the evolving demands of modern education.

The broader implications of these findings emphasize the potential of AI tools like ChatGPT to enhance student engagement and improve learning outcomes across disciplines. However, successful implementation demands thoughtful integration within pedagogical frameworks and adequate teacher training. Professional development initiatives must prioritize equipping educators with the technical and pedagogical skills necessary to

leverage AI tools effectively, ensuring that technology complements rather than replaces traditional teaching methods (Lee & Kwon, 2024; Phuong et al., 2021). Moreover, addressing potential challenges, such as the risk of over-reliance on AI and occasional inaccuracies in content or cultural sensitivity, is essential for sustaining the long-term benefits of these tools (Reinders & White, 2016; Chen et al., 2020).

This study demonstrates the significant role of ChatGPT in enhancing behavioural, cognitive, and affective engagement among EFL students in writing courses. ChatGPT offers a robust solution to some of the persistent challenges in EFL education by fostering active participation, deeper cognitive involvement, and positive emotional responses. Future research should explore the long-term effects of AI-assisted learning, investigate its application across various educational contexts, and identify best practices for integrating AI tools into instructional strategies. These efforts will ensure that technological innovations continue to align with pedagogical objectives, creating inclusive, engaging, and effective learning experiences for all students.

CONCLUSION

This study illustrates the substantial positive impact of integrating ChatGPT on EFL students' engagement in writing courses. The findings highlight the potential of ChatGPT to enhance behavioural, cognitive, and affective engagement, thereby revolutionizing the field of language education. As teachers face the challenges of teaching in an increasingly digital environment, the insights derived from this research can guide the creation of innovative instructional practices that promote deeper engagement and improved learning outcomes for EFL students. Incorporating ChatGPT in writing class represents a passing trend and a transformative opportunity to enrich the learning experience and empower students in their academic pursuits.

Additionally, future studies could build upon this work by exploring topics such as the role of ChatGPT in collaborative writing tasks, its application in other language skills like speaking and listening, and its integration in blended or fully online learning environments. Furthermore, investigating the scalability and cost-effectiveness of ChatGPT in under-resourced educational contexts would provide valuable insights into how AI can bridge educational gaps globally. These avenues can deepen our understanding of the transformative potential of AI in academia and contribute to shaping equitable and inclusive educational practices

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