

The Impact of Chatbots on Reducing Anxiety in English Language Classrooms: Insights from Yogyakarta Students

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ABSTRACT

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Foreign language anxiety remains a persistent affective barrier that can hinder students' engagement and performance in English language classrooms. With the increasing integration of artificial intelligence in education, chatbots have emerged as potential pedagogical tools that can provide low-stakes interaction and emotional support. However, empirical evidence on their effectiveness in reducing anxiety in EFL contexts is still limited. This study investigates the efficacy of a chatbot in reducing anxiety levels among students in an English language classroom. Adopting a mixed-methods design, the study involved 30 undergraduate students over a 16-week semester. Quantitative data were collected using pre- and post-tests based on an adapted version of the Foreign Language Classroom Anxiety Scale (FLCAS). A paired-samples t-test was conducted to measure changes in anxiety levels, while a one-way ANOVA examined differences based on chatbot usage frequency. To complement the quantitative findings, semi-structured interviews were conducted with six participants and were analyzed thematically. A paired-samples t-test revealed a significant reduction in anxiety levels following the integration of the chatbot into classroom activities ($p < .001$). Although a one-way ANOVA showed no significant difference in anxiety reduction across varying levels of chatbot usage frequency ($F(2,27) = 0.303, p = .741$), students' qualitative responses highlighted the chatbot's value in lowering anxiety. Three themes emerged from the interviews, including reduced pressure due to quick responses, enhanced confidence through answer validation, and emotional comfort gained from the chatbot's presence. These findings suggest that chatbots can contribute to a more supportive language learning environment, particularly in addressing anxiety issues in foreign language classrooms.

Keywords: *artificial intelligence; chatbot; English language learning; foreign language classroom anxiety; technology-enhanced language learning*

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INTRODUCTION

English courses are almost always included in university curricula because proficiency in English is considered an essential skill in the current era, especially in the job market. University students, who are in the stage of preparing themselves to enter the workforce, perceive English as crucial for their future, particularly in terms of career prospects (Ball & Edelman, 2018). A study indicates that both employers and students agree on the significant role of English proficiency in employability (Zainuddin, Pillai, Dumanig, & Phillip, 2019), as it is believed to influence job success (Rana & Shaikh, 2024). Furthermore, strong English language skills are vital for career advancement (Hidayat, 2024), as they can expand career options and provide greater job opportunities (Huang & Curle, 2021).

Currently, opportunities to pursue careers abroad are increasingly accessible. To build a career in a foreign country with a different language, students require strong English proficiency. However, they often perceive English as a challenging subject. One contributing factor is psychological barriers, such as anxiety (Amoah & Yeboah, 2021; Octaberlina, Muslimin, & Rofiki, 2022), which stems from the perceptions from others, making mistakes, lack of perception and self-confidence, as well as peer pressure (AbuSahyon et al., 2023; Alrashidi, 2022; Zhang & Lai, 2024). In terms of anxiety inside the English classroom, Horwitz et al. (1986) identified three main components of

this type of anxiety, known as Foreign Language Classroom Anxiety (FLCA), including communication apprehension, test anxiety, and fear of negative evaluation. This anxiety affects students' classroom participation (Nuralieva, Wei, AL-Qadri, Saraa, & Chang, 2024), leading to a decline in their performance and academic achievement (AbuSahyon et al., 2023; Zhang, 2019; Zhao, 2022).

Given the issue of anxiety in English language classrooms, mitigation efforts are crucial to optimize learning. Various effective strategies to reduce anxiety in English classrooms have been demonstrated in studies, one of which is implementing classroom interventions in the form of interaction, both among students and between teachers and students (Toyama & Yamazaki, 2021). Providing feedback is one form of interaction that can be implemented to reduce anxiety in an English language classroom, depending on how it is delivered. Findings from Dobson and Sojisirikul (2023) reveal that feedback which fosters a positive atmosphere, avoids causing embarrassment, and is easily understandable can help reduce students' anxiety in learning English, indicating that to effectively reduce student anxiety, interaction interventions must create a safe and supportive learning environment for them (Zarei, Alibakhshi, & Nezakatgoo, 2024).

With the advancement of technology, the emergence of ChatGPT in 2022 has opened new possibilities in English

language classroom. Chatbot has the potential to serve as a learning partner for students (Xiao & Zhi, 2023), enabling it to take on the roles of both teacher and peer in providing feedback and supporting the learning process. Chatbot's conversational interface, which mimics real-life interactions, allows it to provide immediate and personalized feedback to students (Al-Khresheh, 2024; Crompton & Burke, 2024; Du & Alm, 2024). As a result, feedback from chatbot can help students avoid embarrassment and create a supportive learning atmosphere. Furthermore, the flexibility offered by chatbot enables it to tailor its responses to the user's proficiency level (Li, Wang, & Bonk, 2024; Xiao & Zhi, 2023), indicating that its feedback can be adapted to ensure comprehensibility for students at all levels.

The feedback generated by the chatbot aligns with the type of feedback identified by Dobson and Sojisirikul (2023) as effective in reducing student anxiety, suggesting that the use of chatbots in English language classrooms has the potential to help reduce student anxiety. Several studies have supported this view, reporting that chatbot-assisted learning environments can reduce students' anxiety (Hawanti & Zubaydullovna, 2023; Khalik, 2025; Wang, Zou, Du, & Wang, 2024). However, other studies have found no significant reduction in anxiety or even reported increased apprehension (Ballıdağ & Aydın, 2025; El Shazly, 2021; Wardat & Akour, 2025). The failure of chatbot to reduce anxiety occurs because it tends to

address only some causes, while the sources of anxiety vary across individuals (Wardat & Akour, 2025). Furthermore, technical problems that occur during the use of chatbot may even increase students' anxiety instead of reducing it. (Ballıdağ & Aydın, 2025). This inconsistent findings suggest that the effectiveness of chatbot use in reducing anxiety remain unclear and may depend on factors such as how frequently students interact with chatbots and how they perceive the chatbot's presence in the learning process. To address this gap, this study seeks to answer the following research questions:

1. Is the use of chatbots in English language classrooms effective in reducing students' anxiety?
2. Does the frequency of chatbot use in English language classrooms significantly affect the reduction of students' anxiety?
3. How do students perceive the chatbot's role in reducing their anxiety in English language classrooms?

This study contributes to the literature on artificial intelligence in education by providing empirical evidence on the affective role of chatbots in English language classrooms, an area that remains underexplored in ELT research. Pedagogically, the findings offer practical insights for English teachers into leveraging chatbot-assisted interaction to alleviate classroom anxiety and foster a more supportive learning environment.

METHOD

This study employed a mixed-method approach, combining quantitative and qualitative methods to examine the effectiveness of chatbot use in reducing student anxiety and to investigate students' perceptions of using the chatbot in an English language classroom. The quantitative aspect measured changes in anxiety level, while the qualitative aspect explored students' subjective experiences on using the chatbot. The integration of both methods aimed to provide a comprehensive understanding of the chatbot's impact on students' anxiety in English language classrooms.

Participants in this study were 30 third-year midwifery students enrolled in a general English course at a private university in D.I. Yogyakarta, Indonesia. The participants were selected through convenience sampling, as they were readily accessible and willing to participate. All participants provided informed consent prior to data collection.

The study was conducted over a full 16-week semester. In the first week, students completed the pre-test FLCAS to measure their initial levels of anxiety in the English language classroom. Over the following fourteen weeks, students were encouraged to use chatbots independently during their English language learning, interacting with the tool to assist their learning. No specific guidelines were provided regarding the frequency and duration of chatbot usage, allowing

students to use the tool as they saw fit. In the sixteenth week, students completed the post-test FLCAS to assess changes in their anxiety levels in the English language classroom and a self-reported chatbot usage questionnaire. Six selected students also participated in interviews to provide qualitative insights into their experiences using chatbot.

Anxiety levels were measured using an adapted version of the FLCAS developed by Horwitz et al. (1986), administered as a pre-test before the intervention and as a post-test afterward. This adapted version retains the original 33 Likert-scale items (1 = strongly disagree, 5 = strongly agree) but has been contextualized for the English language classroom setting and translated into Indonesian to ensure student comprehension. The reliability of the questionnaire was tested using Cronbach's alpha, demonstrating strong internal consistency ($\alpha = 0.855$), aligning with the original scale's validated thresholds. The frequency of students using the chatbot was also measured by a self-report questionnaire to indicate their level of usage (low, moderate, high). To complement the quantitative data, semi-structured interviews were conducted with six students, selected based on their availability and willingness to share their experiences. The interviews focused on students' emotional experiences, perceived support from the chatbot, and overall impact on their anxiety.

Quantitative data were analyzed using JASP software. To assess whether chatbot use had a significant impact on anxiety levels, a paired-samples t-test was performed to compare pre- and post-test FLCAS scores. Moreover, to examine the impact of usage frequency, a one-way analysis of variance (ANOVA) was conducted to compare mean anxiety reduction scores across the three chatbot usage levels. For the qualitative data, interview transcripts were analyzed using thematic analysis, involving systematic coding and identification of recurring themes related to students' perceptions and experiences.

RESULTS AND DISCUSSION

This study investigated the impact of chatbots' use in reducing students' anxiety in English language classrooms through a mixed-method approach. The study focused on three main research questions: (RQ1) whether the use of chatbots in English classroom effectively reduces students' anxiety, (RQ2) whether the frequency of chatbot use significantly affects the degree of anxiety reduction in English language classroom and (RQ3) how students perceive the chatbot's role in reducing their anxiety in English language classroom.

Reduction of Anxiety through Chatbot Use

To address the first research question, a paired-samples t-test was conducted to compare students' anxiety levels in English

language classrooms before and after the intervention of chatbot. Table 1 provides the descriptive statistics results of students' FLCAS scores in pre-test and post-test, including the sample size, mean reduction in students' FLCAS scores, standard deviation, standard error, and coefficient of variation.

Table 1. The descriptive statistics of students' mean FLCAS scores in pre-test and post-test

	N	Mean	SD	SE	Coefficient of variation
FLCAS Pre-test	30	102.733	16.515	3.015	0.161
FLCAS Post-test	30	93.067	18.381	3.356	0.198

As shown in the table, the students' mean FLCAS score in the post-test ($M = 93.067$, $SD = 18.361$) was lower than in the pre-test ($M = 102.733$, $SD = 16.515$). These results indicate a reduction in students' anxiety in English language classrooms after the chatbot intervention. To statistically examine whether this reduction was significant, a paired-samples t-test was performed to compare the mean anxiety levels before and after the intervention.

Prior to conducting the paired-samples t-test, the normality assumption was checked using the Shapiro-Wilk test. The results, as shown in Table 2, indicate that the differences between pre-test and post-test FLCAS scores were normally distributed ($W = 0.940$, $p = 0.088$), fulfilling the assumption required for the parametric paired-samples t-test.

Table 2. The normality test with Shapiro-Wilk

			W	p
FLCAS Pre-test	-	FLCAS Post-test	0.940	0.088

The results of the paired-samples t-test are presented in Table 3. As can be seen in the table, the paired-samples t-test results show a p-value of less than 0.001. This result indicates a statistically significant difference between the students' mean FLCAS scores in the pre-test and post-test, suggesting that the chatbot intervention led to a significant reduction in students' anxiety levels in the English language classroom.

Table 3. The paired-samples t-test of FLCAS score in pre-test and post-test

Measure 1		Measure 2	t	df	p
FLCAS Pre-test	-	FLCAS Post-test	4.222	29	< 0.001

This result supports earlier studies suggesting that chatbot use can reduce students' anxiety in learning English (Khalik, 2025; Wang et al., 2024; Zheng, 2024). Interacting with chatbots during English classroom learning appears to provide students with a sense of calmness. Chatbots' high flexibility and personalization allow students to feel more secure in learning English. For instance, students can take their time to understand the chatbot's feedback without feeling rushed, engage in interactive learning with the chatbot, and avoid the fear of judgment (Hawanti & Zubaydulloevna, 2023; Muthmainnah, 2024; Wiyaka, Silitonga, Sunardi, & Pramudi, 2024). The assistance offered by chatbots creates a supportive

learning atmosphere, thereby contributing to reduced student anxiety levels.

However, the current finding contradict previous study who found that the use of chatbots in foreign language classrooms had no impact on reducing students anxiety (Ballıdağ & Aydın, 2025; El Shazly, 2021). The different outcomes may be due to the narrower focus of those studies, which examined chatbot use specifically in speaking task, which is a domain often associated with high stress. In contrast, this study explored overall anxiety in English classrooms, which encompass broader aspects. This suggest that the effectiveness of chatbots in reducing anxiety may vary depending on the language skill targeted.

Impact of Chatbot Usage Frequency on Anxiety Reduction

To answer the second research question, which examined whether the frequency of chatbot use significantly affects the degree of anxiety reduction, a one-way ANOVA was performed. Table 4 presents the descriptive statistics results of the reduction in students' FLCAS scores based on their chatbot usage frequency (low, moderate, high), including the sample size, mean reduction in students' FLCAS scores, standard deviation, standard error, and coefficient of variation.

Table 4. The descriptive statistics of students' reduction of FLCAS scores based on chatbot usage frequency

Frequency	N	Mean	SD	SE	Coefficient of variation
Low Usage	12	8.500	14.036	4.052	1.651
Moderate Usage	13	11.6922	13.092	3.631	1.120
High Usage	5	7.200	7.694	3.441	1.069

It can be seen from the data in the table that the moderate usage group reported the highest mean reduction in FLCAS score ($M = 11.692$, $SD = 13.092$), followed by the low ($M = 8.500$, $SD = 14.036$) and high ($M = 7.200$, $SD = 7.694$) usage group. To determine whether these differences in anxiety levels were statistically significant, a one-way ANOVA was conducted to compare the means across the three groups.

Prior to performing the one-way ANOVA, the assumptions of normality and homogeneity of variance were examined. The Shapiro-Wilk test results indicated acceptable normality for Low Usage ($W = 0.903$, $p = 0.171$) and High Usage groups ($W = 0.829$, $p = 0.137$), while the Moderate Usage group showed marginal deviation ($W = 0.860$, $p = 0.038$). Levene's test confirmed variance homogeneity ($F = 0.284$, $p = 0.755$). With equal group sizes ($n = 30$) and ANOVA's robustness to minor normality violations, parametric testing was deemed appropriate. The complete assumption test results are summarized in Table 5 and Table 6.

Table 5. The normality test with Shapiro-Wilk based on chatbot usage frequency

		Frequency Group	W	P
FLCAS Pre-test	FLCAS Post-test	Low Usage	0.903	0.171
		Moderate Group	0.860	0.038
		High Usage	0.829	0.137

Table 6. The homogeneity with Levene's based on chatbot usage frequency

F	df1	df2	P
0.284	2	27	0.755

The results of the one-way ANOVA are summarized in Table 7. From the table it can be seen that there is no statistically significant difference in the mean reduction of students' FLCAS scores based on their frequency of chatbot usage, $F(2, 27) = 0.303$, $p = 0.741$. This indicates that how frequently students use the chatbot does not have a meaningful impact on the extent of their anxiety reduction in the English language classroom.

Table 7. The one-way ANOVA comparing students' reduction of FLCAS scores based on chatbot usage frequency

Cases	Sum of Squares	df	Mean Square	F	p
Frequency	100.097	2	50.049	0.303	0.741
Residuals	4460.569	27	165.206		

Based on this finding, although students experienced a reduction in anxiety levels after using the chatbot, the frequency of use itself may not be the primary determining factor in the reduction of student anxiety. Other factors, such as the quality and purpose of use, may play a more influential role. For instance, a chatbot capable of providing contextually appropriate responses to students' immediate needs may be sufficient to instill

a sense of calm, without requiring repeated use. This finding aligns with a study by Bao (2019), which revealed that even short-term exposure (4 weeks) to chatbot technology can lead to a reduction in foreign language anxiety. Furthermore, research by Ma et al. (2022), in a broader context of technology use, found that the duration of students' technology usage did not significantly alter how the technology affected their anxiety. Therefore, why and how the chatbot is used appears to be more essential than how often it is used in relation to reducing students' anxiety levels.

However, the relatively small sample size of the high-usage group may also limit the statistical power of the analysis. Future research with a larger and more balanced sample could provide deeper insights into usage patterns and the emotional consequences of chatbot interactions.

Students' Perceptions of the Chatbot's Role in Reducing Anxiety

The third research question explored student's perceptions of the chatbot's role in reducing anxiety. Through a thematic analysis of interviews from six students, three primary themes emerged: (1) pressure reduction through quick responses, (2) increased confidence through answer verification, and (3) the chatbot as a social support figure.

Theme 1: Pressure-Reducing Quick Response

The first theme that emerged was the pressure-reducing effect of chatbot quick

responses. Several students highlighted that chatbot's ability to provide quick answers during classroom tasks helped them feel less pressure, especially when they were pointed to answer questions. One student shared:

"Using ChatGPT reduces my anxiety when I'm called on to answer a question because I can quickly get an answer, and the answer is definitely correct."

Similarly, another student who used a different type of chatbot commented:

"When allowed to use apps like this (Meta AI) in class, I feel calmer because I can get answers more quickly than if I had to search the internet."

These responses highlight how the quick and reliable assistance provided by chatbots helps reduce the pressure faced by students, especially in high time pressure situations such as being called on to answer questions directly. By reducing students' pressure with the help of chatbots, their anxiety levels will also decrease. This finding aligns with prior studies, which identified a positive correlation between time pressure and anxiety (Tsybulsky & Raievska, 2024; Weng, Zheng, & Dong, 2022), meaning that as the feeling of time pressure decreases, the level of anxiety also tends to decrease.

Theme 2: Confidence through Answer Checking

The second theme was the role of chatbot in checking their answers. Some students used the chatbot to check their grammar, vocabulary, or pronunciation before sharing responses in class. This gave them a sense of assurance and boosted their confidence. As one student explained:

"I was already not confident in my English skills, so when I wanted to answer, I felt insecure and afraid that the answer would be wrong or even silly. So I use ChatGPT to be more confident with my answers."

Another student mentioned utilizing voice features:

"Sometimes I use the voice feature to make sure I know how to say it."

The feedback provided by chatbots serves as a means for students to check their answers, offering them a sense of assurance that positively impacts their confidence in sharing their works. This confidence plays a crucial role in reducing communication apprehension and fear of negative evaluation (Cong & Li, 2022; Sebastian, Latheef, Kurian, Thomas, & Joseph, 2022), which are the main components of foreign language classroom anxiety according to Horwitz et al. (1986). Thus, the increase of students' self-confidence can reduce their anxiety. This finding is consistent with previous study by Huang (2014), who concluded that students' self-confidence can lower their anxiety levels. A similar

finding is reinforced by Inada (2017), who reported the influence of students' self-confidence on their anxiety levels.

Theme 3: Chatbot as A Social Support

The third theme described chatbot as a dependable companion, something students could rely on during learning, reflecting the role of chatbot as a form of social support. The presence of chatbot was reassuring for some students, offering a sense of calm as they engaged with English language learning. One student shared:

"ChatGPT made me feel calmer because I felt like I had someone to rely on besides my friends."

This response indicates the existence of a para-social relationship between the student and the chatbot, where the student feels social support in the form of emotional comfort from a non-human source. Students' perception of chatbot as a dependable companion highlights the social support that chatbot provided during English language learning. The feeling of having an additional support system, beyond peers or teachers, suggests that the presence of a chatbot can reduce anxiety. This finding is in line with a previous study who found a negative correlation between social support and anxiety (Liu, Chang, Wang, & Raja, 2024), meaning that as the level of social support a person receives increases, their level of anxiety tends to decrease, and vice versa. It is also supported by a previous study which

stated that when students feel supported, they are more likely to develop a positive self-image and belief in their language abilities, which can mitigate anxiety (Teng, 2024).

Overall, the findings of this study suggest that chatbots may serve as effective tools in reducing students' anxiety in English language classrooms, particularly when used meaningfully rather than frequently. Although the frequency of chatbot use did not significantly influence the reduction of anxiety, students' perceptions appear to highlight the emotional and cognitive support provided by chatbots as playing a central role in their learning experience. Students generally perceived chatbots not only as sources of quick and reliable information but also as tools that enhanced their confidence and offered emotional reassurance during classroom interactions. These findings emphasize the importance of integrating chatbots into language learning in ways that are intentional and student-centered, which may promote both academic performance and emotional well-being. Teachers are encouraged to explore chatbot integration not merely as a technological innovation but as a supportive element within a comprehensive strategy for reducing anxiety in language learning environments.

CONCLUSION

This study explored the effectiveness of chatbots in reducing students' anxiety in English language classrooms through a

mixed-method approach. The quantitative findings indicated a statistically significant reduction in students' anxiety levels after the integration of chatbot, demonstrating that chatbot-supported learning can serve as an effective strategy for managing classroom anxiety. However, further analysis showed that the frequency of chatbot use did not significantly influence anxiety reduction. This suggests that the quality and purpose of interaction with the chatbot may be more essential than the quantity of use. The qualitative findings provided valuable insights into students' perceptions and experiences. Students reported that chatbots offered quick and reliable assistance during classroom tasks, helped them verify their answer, and served as a social support which provided emotional comfort. These responses reflect the complex and diverse role of chatbots in language learning, extending beyond their cognitive function to provide emotional reassurance and a sense of companionship. This aligns with theoretical perspectives that emphasize the importance of affective support in second language acquisition. Future research could build on these findings by investigating the long-term effects of chatbot integration, comparing the effectiveness of different learning models that incorporate chatbots, or examining their application in diverse educational contexts.

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AUTHORS' CONTRIBUTION STATEMENT

Both authors played different role in completing this article. MF was primarily responsible for the study design, quantitative data collection and analysis and initial manuscript preparation. SA prepared research instruments, performed qualitative data collection and analysis, and critically proofread the manuscript. Both authors reviewed and approved the final version of the manuscript.

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