

**The Impact of Generative AI in Reducing Foreign Language Anxiety and Enhancing
Enjoyment in EFL Learners**

Telal Khalid

Qatari Ministry of Education and Higher Education

Ali Ahmed Suleiman

Islamic University of Minnesota

Abstract

This study examines how frequently EFL students use GenAI tools in language learning and assesses their levels of anxiety, stress, and fear. It also explores the role of GenAI in reducing foreign language anxiety and increasing enjoyment among learners. The participants were 293 EFL students aged 12–15 enrolled in preparatory school, with data analysed using SPSS and JASP. The findings indicate that GenAI is underused, resulting in a "usage gap" that highlights broader challenges in technological adoption, including disparities between available technology and its classroom implementation. Students may also misunderstand GenAI's capabilities or be unaware of its potential for language acquisition. Professional development focused on practical AI applications in EFL contexts could better prepare teachers to support student engagement. When actively used, GenAI provides a judgement-free practice environment that helps reduce language anxiety. The study's key finding is a strong correlation between GenAI use, decreased anxiety, and improved learner satisfaction.

Keywords: EFL learners, Generative AI, language Anxiety, Language enjoyment

Introduction

Improving EFL instruction using artificial intelligence (AI) is a hot topic in the field of education. By leveraging AI's deep learning and natural language processing capabilities, EFL classrooms are becoming more interactive and engaging places for students to learn the language. Studies have shown that AI could change the way English as foreign language (EFL) classrooms work by

making lessons more personalized for each student (Fathi et al.). Researchers have found that when students use AI, it makes them feel better about the English language (Chen), which makes them more invested in learning and produces better results (Guan et al.; Huang et al.). Incorporating and integrating AI technology into EFL education could enhance teaching methodologies, given AI's demonstrated benefits in establishing innovative learning dynamics and interactions. But it's never straightforward to incorporate innovation into old processes. Teachers of English as a foreign language are wary of artificial intelligence (AI), according to earlier studies. One issue is that they are worried they don't have the technical pedagogical knowledge to comprehend how AI is being integrated into English as a foreign language class (Ong and Annamalai). In response to these concerns, and in light of new research from motivational and perceptual studies showing that human presence is crucial in computer-assisted language learning (Rahimi et al.), academics have started to push for a more comprehensive use of AI in the classroom, where AI is seen more as an ally than a competitor, and where human interactions are preserved, valued, and strategically combined with AI tools to create a balanced, effective learning environment.

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According to research, emotional factors such as engagement, motivation, and well-being are critical for successful language learning (Li et al.; Oxford; Yin et al.). Emotionally engaged students are more likely to persevere through challenging tasks, employ effective learning strategies, and achieve higher levels of competency (Huo; MacIntyre et al.; Printer). Although GenAI's increasing use in education has concentrated on cognitive and technical benefits, little research has been completed on its impact on emotional dimensions ((Chen et al.; Moskowitz). Defining the emotional elements of learning is difficult due to the complex interplay of fluid factors; yet, educational research commonly analyses emotions through categories such as motivation, engagement, and well-being (Dewaele).

Integrating GenAI offers a unique opportunity to examine the interaction between technological innovation and emotional components, which are still crucial to learning. For example, while GenAI systems can automate boring chores, lowering stress for teachers and students, they can also cause anxiety in learners who are unfamiliar with the technology (Kohnke). Similarly, educators may struggle to strike a balance between the efficiency of automation and the necessity to foster emotional connections in the classroom (Moorhouse). These emotional and psychological

characteristics have a significant impact on students' motivation and engagement, highlighting the importance of understanding how GenAI supports the affective dimensions of learning.

Anxiety has long been a popular topic of study in the fields of applied and educational linguistics, drawing attention from researchers, language instructors, and students (Horwitz; Koteková). Anxieties about speaking or failing an exam in a foreign language are categorised into three main types (Horwitz et al.). Aydın states that students experience communication anxiety when they lack the necessary skills to effectively express their developed thoughts and ideas. Additionally, a person may experience test anxiety if they are worried about doing poorly on an exam. Thirdly, being afraid of people's bad opinions stems from an underlying concern about one's "incapacity to make a proper social impression" (p. 630). It should be emphasized that these concepts are not constitutive of foreign language anxiety but rather are associated with it (Horwitz).

Perceived positive outcomes associated with one's achievements and interpersonal interactions are associated with enjoying a foreign language, according to Guo et al.. Students who are looking to learn for fun have a sense of agency when they achieve their goals and see the outcomes as related to themselves. We can presume that students in foreign language classes are more motivated when they enjoy themselves, since enjoyment may be foundational to cognitive processes that are important for learning generally and for learning a foreign language specifically, such as improved attention, memory, and problem-solving (Oades-Sese and Lewis). The desire to keep enjoyable experience reflects the motivating side of enjoyment, which motivates learners to act and encourages them to learn additional foreign languages (Ismail and Alharkan).

Statement of the Problem

Foreign language anxiety is a significant psychological factor in learning English as a foreign language. Anxiety manifests as reluctance to participate, avoidance of speaking opportunities, and worries about making grammatical errors, pronunciation mistakes, or appearing incompetent in front of teachers and peers. High anxiety levels correlate strongly with decreased enjoyment of language learning, leading to lower engagement, reduced persistence, and ultimately poor learning outcomes. Additionally, students are unable to manage stress associated with language learning and harbor fears of being corrected in front of others, which consequently leads to the complete absence of enjoyment when learning the foreign language.

Despite the growing integration of GenAI tools in language education, there remains limited empirical investigation into how these technologies influence foreign language anxiety and

enjoyment among EFL learners. While GenAI tools offer personalized, judgment-free practice environments that may alleviate anxiety-inducing factors, their actual impact on learners' emotional experiences requires systematic examination. Understanding the frequency of GenAI tools usage, the challenges students face without such tools, and their affective responses to using these technologies is essential for optimizing AI-enhanced language instruction.

Research Objectives

This study aims to:

1. Investigate the students' frequency use of GenAI tools when learning and practicing English.
2. Examine the levels of anxiety, stress, and fears students experience when practicing the English language.
3. Explore the role of GenAI in reducing foreign language anxiety among EFL learners.
4. Assess the impact of GenAI tools on enhancing students' enjoyment and confidence when practicing English.

Research Questions

The following research questions guide this investigation:

RQ1: How frequently do students use GenAI tools when learning English?

RQ2: What challenges do students face when they practice English without GenAI tools?

RQ3: What are students' reactions towards using GenAI tools when practicing English?

Research Hypotheses

Based on the research objectives and questions, the following hypotheses are proposed:

H1: Students demonstrate low to moderate frequency in their use of GenAI tools for practicing the English language.

H2: GenAI educational tools significantly reduce students' anxiety and fears when practicing English.

H3: GenAI tools enhance students' confidence and enjoyment when practicing the English language.

These hypotheses will be tested through empirical data collection and analysis to determine the relationship between GenAI tool usage and the affective dimensions of foreign language learning, specifically anxiety reduction and enjoyment enhancement among EFL learners.

Literature Review

Generative AI in Education

Intelligent tutoring systems, adaptive learning platforms, chatbots, and natural language processing applications are among the GenAI solutions that can help with language instruction (Huang et al.). These technologies aim to offer interactive and engaging experiences that cater to individual learners' needs and preferences, making education more accessible to all (Unesco). The landscape of English language learning has shifted with the introduction of applications such as ChatGPT, which is powered by advanced LLMs (Moorhouse). These systems use novel ways to simulate human interaction and give precise, context-sensitive responses to user input (Goodfellow et al.). As a result, they can provide more engaging and inspiring learning experiences by providing immediate, personalized feedback and assistance (Dewaele et al.; Zawacki-Richter et al.).

Emotional engagement

Engagement is commonly classified as cognitive, behavioural, or emotional (Fredricks et al.). While cognitive and behavioural components have received extensive investigation, Recent years have seen a rise in interest in learners' emotional engagement as a result of significant research tying it to learning. Emotional engagement, also known as affective engagement, describes positive emotional responses to tasks, teachers, peers, and the environment (Bond and Bedenlier; Hiver et al.). It is characterized by enjoyment, enthusiasm, satisfaction, a sense of belonging, and a drive to learn (Bond and Bedenlier; Hiver et al.). Emotional disengagement is described as a loss of interest and refusal to exert physical and mental effort toward a specific goal.

Influences of AI on Students' Anxiety Reduction & Enhancing Motivation

The presence of algorithmic biases in AI systems might create issues that lead to unequal learning chances, emphasizing the importance of inclusivity and fairness in their design and implementation in educational settings (Rusmiyanto et al.). Furthermore, creating an environment that encourages open dialogue about students' experiences with AI technologies can improve their understanding and acceptance, which can reduce anxiety and boost motivation by allowing for the identification of potential problems and real-time adjustments to better meet students' needs. Continuing collaboration among educators, technologists, and educational researchers is critical in developing AI tools that not only improve language learning but also prioritize students' psychological well-being (Pedro et al.), ensuring that their implementation promotes a balanced educational experience that reduces anxiety while increasing motivation.

According to research, AI tools such as speaking assistants and apps like ChatGPT improve foreign language enjoyment (FLE) and desire to communicate (WTC) while decreasing foreign language anxiety (FLA) among learners. For example, one study discovered that applying AI enhanced students' interest and involvement, particularly in writing and vocabulary development. However, the growth of AI fear caused by concerns about job replacement and technology use may have a detrimental impact on students' behavioural intents to utilise AI tools. Despite these obstacles, the overall trend is that when used successfully, AI can create a more personalised and engaging learning environment, increase motivation and decreasing anxiety. To maximise the benefits of AI in language teaching, educators should overcome AI-related fear through supportive interventions (Syifaiddin and Yuliansyah).

Methodology

Research Design

This study employed a quantitative research design to examine the impact of generative AI on reducing foreign language anxiety and increasing enjoyment among English as a Foreign Language (EFL) learners. A cross-sectional survey collected self-reported data from participants, enabling analysis of the relationships between AI usage frequency, anxiety reduction, and enjoyment enhancement. The design was descriptive and correlational, focusing on perceptions and experiences rather than experimental manipulation, to provide insights into how generative AI tools affect affective factors in language learning.

Population and Sampling

The target population consisted of EFL students aged 12–15 years enrolled in preparatory schools in Doha, Qatar, where English is taught as a foreign language. Convenience sampling was used to recruit participants from Khalid bin Ahmed Preparatory School, representing diversity in grade levels and English learning experience.

Sample Population

The accessible population for this study consisted of EFL learners from Grades 7, 8, and 9 at Khalid bin Ahmed Preparatory School in Doha, Qatar, who met the inclusion criteria and were available for participation during the data collection period in December 2025. A total of 293 students participated in the study, distributed across three grade levels: Grade 7 ($n = 156$, 53.2%), Grade 8 ($n = 59$, 20.1%), and Grade 9 ($n = 78$, 26.6%).

Sample Size Achievement

The sample size achieved of 293 participants exceeded the minimum requirement of 84 participants, as determined using Cohen's (1988) guidelines for correlational studies examining medium effect sizes ($r = 0.30$) with a significance level of $\alpha = 0.05$ and statistical power of 0.80. This large sample provided robust statistical power (> 0.99) for detecting the observed large effect sizes and allowed for adequate subgroup analyses across grade levels and AI usage patterns.

Sampling Technique

Convenience sampling was employed due to practical constraints, with all eligible students from Grades 7-9 invited to participate. While this approach limited randomization, the large sample size and representation across grade levels enhanced the study's internal validity and allowed for meaningful comparisons across demographic subgroups.

Instruments

Data was collected using a structured questionnaire comprising four sections. Section A gathered demographic and background information, including grade level, gender, years of learning English, self-rated English proficiency, and prior use of generative AI tools for English learning. Section B measured the frequency of AI use with five items assessing how often participants engaged with AI for various English learning activities. Section C focused on foreign language anxiety reduction, using five items to examine feelings of nervousness, anxiety, and comfort when using AI tools. Section D evaluated AI's influence on learning enjoyment through five items measuring motivation, enjoyment, and engagement with English learning activities.

The questionnaire was based on established scales, including Horwitz et al. Foreign Language Classroom Anxiety Scale (FLCAS) for anxiety items and Dewaele and MacIntyre's (2014) Foreign Language Enjoyment Scale (FLE) for enjoyment items, with modifications to reflect AI-specific contexts. All items were assessed on a 5-point Likert scale, with 1 indicating strong disagreement and 5 indicating strong agreement. Reliability tests revealed strong internal consistency, with Cronbach's alpha coefficients of 0.89 for AI usage, 0.92 for anxiety reduction, and 0.91 for enjoyment ratings.

Data Collection Procedures

The survey was administered online using Google Forms to ensure accessibility and anonymity. Participants were recruited through direct coordination with the school administration and English language teachers at Khalid bin Ahmed Preparatory School. Informed consent was obtained from parents or guardians, and student assent was secured at the beginning of the survey,

which outlined the study's purpose, voluntary participation, confidentiality, and the right to withdraw. Data collection took place over a three-week period in December 2025. The survey was available in English, as all participants were EFL learners with sufficient English proficiency to understand the questionnaire items.

Data Analysis

Data was analysed using SPSS and JASP statistical packages. Descriptive statistics (means, standard deviations, frequencies, medians) were calculated to summarise participant demographics, AI usage patterns, anxiety reduction, and enjoyment levels. Distribution normality was assessed using the Shapiro-Wilk test, which indicated non-normal distributions for all continuous variables ($p < 0.001$), justifying the use of non-parametric statistical tests.

One-sample t-tests were used to compare mean scores against the neutral midpoint (3.0) for hypothesis testing. Mann-Whitney U tests compared AI users and non-users on anxiety reduction and enjoyment scores. Kruskal-Wallis H tests examined differences across grade levels. Spearman's rank correlation coefficients assessed relationships between AI usage frequency, anxiety reduction, and enjoyment. Effect sizes were calculated using Cohen's d for group comparisons and R^2 for correlations. Statistical significance was set at $\alpha = 0.05$ (two-tailed), with 95% confidence intervals reported for all estimates.

Ethical Considerations

Khalid bin Ahmed Preparatory School administration in Doha, Qatar, gave its approval for the study, which complied with ethical standards. Prior to participation, student and parental consent were acquired. Data from participants was anonymized, safely stored, and utilized exclusively for study. Students were made aware that participation was completely voluntary and that they could leave at any moment without incurring any fees. All participants received information about language learning support resources, and there were few possible risks, such as recalling anxiety experiences.

Results

This section contains complete statistical findings from a survey of 293 English as a Foreign Language (EFL) students in Grades 7–9. The results are organised according to the three research hypotheses, examining AI usage frequency, anxiety reduction, and enjoyment enhancement in English language learning.

4.1 Participant Demographics and Sample Characteristics

The study successfully recruited 293 EFL learners from Khalid bin Ahmed Preparatory School in Doha, Qatar. Table 1 shows the distribution of participants across grade levels and their GenAI adoption patterns. The sample consisted predominantly of Grade 7 students (n = 156, 53.2%), followed by Grade 9 (n = 78, 26.6%) and Grade 8 (n = 59, 20.1%). Notably, 177 participants (60.4%) reported having used GenAI tools for English learning, while 116 participants (39.6%) had not engaged with such technologies.

Table 1

Sample Distribution and GenAI Adoption by Grade Level

Grade Level	N	Percentage	AI Adoption Rate
Grade 7	156	53.2%	55.8% (87/156)
Grade 8	59	20.1%	62.7% (37/59)
Grade 9	78	26.6%	67.9% (53/78)
Total	293	100%	60.4% (177/293)

An interesting pattern emerged in AI adoption rates across grade levels. Although most of the sample was from Grade 7, adoption rates increased progressively with grade level: 55.8% in Grade 7, 62.7% in Grade 8, and 67.9% in Grade 9. This trend suggests that older students may have greater exposure to or interest in GenAI technologies for language learning, potentially reflecting increased technological literacy or academic maturity.

4.2 Hypothesis 1: GenAI Usage Frequency Among EFL Learners

The first hypothesis (H1) proposed that students demonstrate low to moderate frequency in their use of GenAI tools for practising the English language. This hypothesis was tested using descriptive statistics and a one-sample t-test comparing the mean usage score against the neutral midpoint of 3.0 on the 5-point Likert scale.

Table 2

Descriptive Statistics for GenAI Usage Frequency

Measure	Value	95% CI	Interpretation
Mean Usage Score	2.70	[2.57, 2.83]	Between Rarely-Sometimes
Standard Deviation	1.10	—	Moderate variability
Median	2.80	—	Below neutral point

Mode	3.00	—	Sometimes
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The results strongly support H1. The mean usage score of 2.70 (SD = 1.10) was significantly below the neutral midpoint of 3.0, as confirmed by a one-sample t-test ($t(292) = -4.716$, $p < 0.001$, Cohen's $d = -0.27$). The 95% confidence interval [2.57, 2.83] does not include the neutral point, further confirming that students' overall usage frequency is statistically lower than moderate. This finding indicates that, on average, students use GenAI tools between 'rarely' and 'sometimes' for English language practice. Table 3 presents the breakdown of usage frequency across different learning activities, revealing nuanced patterns in how students engage with GenAI tools.

Table 3

GenAI Usage Frequency by Activity Type

Activity	Mean	SD	Mode
Help me learn English	2.62	1.31	Sometimes (3)
Vocabulary/Grammar practice	2.71	1.42	Never (1)
Speaking/Conversation practice	2.52	1.41	Never (1)
When unsure about something	2.98	1.54	Always (5)
Outside school activities	2.56	1.45	Never (1)

Activity-specific analysis reveals significant variations. The highest usage occurred when students were uncertain about something ($M = 2.98$, $SD = 1.54$), approaching the neutral midpoint and showing the greatest variability (mode = Always). This suggests that GenAI functions primarily as an on-demand reference tool rather than a structured learning companion. In contrast, speaking and conversation practice showed the lowest usage ($M = 2.52$, $SD = 1.41$, mode = Never), indicating that students are less likely to use GenAI for developing productive oral skills. A critical finding emerged when comparing AI users ($n = 177$) with non-users ($n = 116$), as shown in Table 4.

Table 4

Comparison of Usage Frequency: AI Users vs. Non-Users

Group	n	Mean	SD	Median	95% CI
AI Users	177	3.08	0.99	3.20	[2.93, 3.23]
Non-Users	116	2.11	1.03	2.00	[1.92, 2.30]

Difference	—	0.97	—	1.20	—
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Statistical testing confirmed highly significant differences between groups (Mann-Whitney $U = 15,435.5$, $p < 0.001$), with a large effect size (Cohen's $d = 0.89$). Among students who have adopted GenAI tools, usage frequency is moderate ($M = 3.08$, above the neutral midpoint), while non-users show minimal engagement ($M = 2.11$). This division reveals a 'usage gap' – a substantial portion of the student population (39.6%) has not engaged with GenAI technologies at all, thereby missing potential learning benefits.

4.3 Hypothesis 2: GenAI's Role in Reducing Foreign Language Anxiety

The second hypothesis (H2) proposed that GenAI educational tools significantly reduce students' anxiety and fears when practicing English. Testing this hypothesis yielded mixed results depending on the analytical approach used.

Table 5

Overall Anxiety Reduction Statistics

Measure	Value	95% CI	Interpretation
Mean Anxiety Reduction	2.90	[2.78, 3.02]	Neutral
Standard Deviation	1.07	—	Moderate variability
Median	3.00	—	At neutral point
t-statistic	-1.664	—	—
p-value	0.097	—	Not significant

When examining the entire sample population ($N = 293$), the mean anxiety reduction score was 2.90 ($SD = 1.07$), which did not differ significantly from the neutral midpoint of 3.0 ($t(292) = -1.664$, $p = 0.097$). The 95% confidence interval [2.78, 3.02] includes the neutral point, indicating that across all students – including both users and non-users of GenAI – there is no clear consensus on anxiety reduction benefits. This finding does not support H2 when considering the overall population. However, a more detailed examination of anxiety components reveals meaningful patterns across specific dimensions of language anxiety, as shown in Table 6.

Table 6

Anxiety Reduction Components and Agreement Levels

Component	Mean	SD	% Agree
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Feel less nervous using AI	2.82	1.35	31.1%
Less anxious vs. classmates	2.73	1.39	30.7%
Provides safe practice space	3.06	1.36	38.2%
Helps me relax when practicing	2.99	1.40	36.2%
Overall anxiety reduction	2.88	1.34	34.1%

Among the anxiety dimensions, 'provides a safe practice space' received the highest rating ($M = 3.06$, 38.2% agreement), slightly above the neutral point, suggesting that students who use GenAI value its non-judgmental environment. The perception that GenAI 'helps me relax when Practising' was close to neutral ($M = 2.99$, 36.2% agreement). However, direct anxiety reduction items – feeling less nervous ($M = 2.82$, 31.1%) and less anxious compared to Practising with classmates ($M = 2.73$, 30.7%)—scored below the midpoint, indicating more ambivalent responses. A critical insight emerged when results were disaggregated by actual GenAI usage. Table 7 presents the stark contrast between AI users and non-users.

Table 7

Anxiety Reduction: AI Users vs. Non-Users

Group	n	Mean	SD	95% CI	Cohen's d
AI Users	177	3.26	0.96	[3.12, 3.41]	—
Non-Users	116	2.34	1.00	[2.15, 2.52]	—
Difference	—	0.92	—	[0.74, 1.10]	0.94
Statistical Test	Mann-Whitney U = 15,267.5				

$p < 0.001^{***}$

This comparison reveals profound and statistically significant differences. AI users reported substantially greater anxiety reduction ($M = 3.26$, $SD = 0.96$) than non-users ($M = 2.34$, $SD = 1.00$), with a mean difference of 0.92 points on the 5-point scale. The Mann-Whitney U test confirmed these differences were highly significant ($U = 15,267.5$, $p < 0.001$), and the effect size was large (Cohen's $d = 0.94$), exceeding Cohen's threshold for practical significance ($d \geq 0.8$). This represents a meaningful real-world impact: AI users' scores shifted from below neutral (disagree) to above neutral (agree), indicating that GenAI tools do reduce anxiety, but primarily for students

who actively engage with them. The 95% confidence intervals for the two groups do not overlap, further confirming the robustness of this finding.

4.4 Hypothesis 3: GenAI's Impact on Learning Enjoyment and Confidence

The third hypothesis (H3) proposed that GenAI tools enhance students' confidence and enjoyment when practicing English language. As with H2, the results for H3 showed a nuanced pattern depending on whether the overall population or specific user groups were examined.

Table 8
Overall Enjoyment Enhancement Statistics

Measure	Value	95% CI	Interpretation
Mean Enjoyment Score	3.05	[2.92, 3.17]	Neutral
Standard Deviation	1.10	—	Moderate variability
Median	3.00	—	At neutral point
t-statistic	0.799	—	—
p-value	0.425	—	Not significant

The overall population mean for enjoyment was 3.05 (SD = 1.10), which did not significantly differ from the neutral midpoint ($t(292) = 0.799$, $p = 0.425$). The 95% confidence interval [2.92, 3.17] includes the neutral point of 3.0, indicating no clear population-wide consensus on enjoyment enhancement. This finding, consistent with H2, initially suggests limited support for H3 when all students are considered together. Examining specific enjoyment components, as presented in Table 9, reveals differential impacts across motivational and affective dimensions.

Table 9
Enjoyment Components Ranked by Agreement

Component	Mean	SD	% Agree	Rank
Makes activities fun	3.50	1.21	38.2%	1
Feel more motivated	3.46	1.30	35.8%	2
Enjoy practicing more	3.40	1.26	31.7%	3

Try new vocabulary / expressions	3.13	1.41	41.0%	4
Look forward to lessons	2.84	1.42	30.7%	5

The highest-rated enjoyment dimension was 'makes English activities more fun' ($M = 3.50$, $SD = 1.21$, 38.2% agreement), indicating that GenAI adds playfulness or engagement to language learning tasks. Close behind us were feeling more motivated ($M = 3.46$, 35.8%) and enjoying more practice ($M = 3.40$, 31.7%). Interestingly, students' willingness to try new vocabulary and expressions scored $M = 3.13$, despite having the highest agreement percentage (41.0%), suggesting that while fewer students rated this highly, those who did expressed strong confidence. The lowest score was for 'looking forward to English lessons' ($M = 2.84$, 30.7%), which remained below the neutral point, indicating that GenAI may enhance specific activities but does not necessarily transform students' anticipation of formal classroom instruction. As with anxiety reduction, the most compelling evidence emerged from comparing AI users with non-users, as presented in Table 10.

Table 10

Enjoyment Enhancement: AI Users vs. Non-Users

Group	n	Mean	SD	95% CI	Cohen's d
AI Users	177	3.38	1.01	[3.23, 3.53]	—
Non-Users	116	2.55	1.05	[2.36, 2.75]	—
Difference	—	0.82	—	[0.63, 1.02]	0.80
Statistical Test	Mann-Whitney U = 14,507.5				

$p < 0.001^{***}$

AI users reported significantly higher enjoyment and confidence ($M = 3.38$, $SD = 1.01$) than non-users ($M = 2.55$, $SD = 1.05$), with a mean difference of 0.82 points. The Mann-Whitney U test confirmed highly significant differences ($U = 14,507.5$, $p < 0.001$), with a large effect size (Cohen's $d = 0.80$) exceeding the threshold for strong practical significance. This 0.82-point difference marks a meaningful shift from slight disagreement to moderate agreement on the Likert scale, indicating that GenAI substantially enhances learners' affective experiences when they actively engage with these tools. The non-overlapping 95% confidence intervals further support the robustness of this finding.

4.5 Interrelationships Among GenAI Usage, Anxiety, and Enjoyment

To examine how GenAI usage, anxiety reduction, and enjoyment enhancement are related, Spearman's rank correlation coefficients were calculated. Table 11 shows the correlation matrix for these three key variables.

Table 11

Spearman Correlation Matrix: Usage, Anxiety Reduction, and Enjoyment

Variables	Usage	Anxiety Reduction	Enjoyment
Usage Frequency	1.000	0.639***	0.574***
Anxiety Reduction	0.639***	1.000	0.748***
Enjoyment Enhancement	0.574***	0.748***	1.000

Note: *** $p < 0.001$

All correlations were positive, statistically significant ($p < 0.001$), and substantial, indicating meaningful relationships among these variables. The correlation between AI usage frequency and anxiety reduction was strong ($\rho = 0.639$), accounting for approximately 40.8% of the variance ($R^2 = 0.408$). This indicates that students who use GenAI more frequently tend to experience greater anxiety reduction. Similarly, AI usage frequency and enjoyment enhancement showed a moderate-to-strong positive correlation ($\rho = 0.574$, $R^2 = 0.329$), explaining nearly one-third of the variance in enjoyment.

Most notably, the correlation between anxiety reduction and enjoyment was very strong ($\rho = 0.748$, $R^2 = 0.560$), indicating that 56% of the variance in enjoyment is shared with anxiety reduction. Table 12 summarises these relationships and their effect size interpretations.

Table 12

Correlation Coefficients with Variance Explained

Relationship	ρ (rho)	R^2	Interpretation
Usage $\times$ Anxiety Reduction	0.639***	0.408	Strong positive
Usage $\times$ Enjoyment	0.574***	0.329	Moderate-strong positive

Anxiety Reduction × Enjoyment	0.748***	0.560	Very strong positive
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Note: *** $p < 0.001$

These correlation patterns suggest a potential virtuous cycle: increased GenAI usage leads to reduced anxiety, which in turn enhances enjoyment and may motivate further use. The particularly strong link between anxiety reduction and enjoyment indicates that these affective benefits are not independent but are deeply interconnected dimensions of the language learning experience.

4.6 Grade-Level Differences in GenAI Usage and Affective Outcomes

To determine whether grade level influences GenAI usage patterns and affective outcomes, Kruskal-Wallis H tests were conducted across Grades 7, 8, and 9. Table 13 presents the descriptive statistics by grade level.

Table 13

GenAI Usage and Affective Outcomes by Grade Level

Grade Level	N	Usage Mean	Anxiety Mean	Enjoyment Mean
Grade 7	156	2.55	2.83	3.02
Grade 8	59	2.72	2.84	2.97
Grade 9	78	2.96	3.07	3.18

Grade 9 students demonstrated the highest mean scores across all three variables: usage ($M = 2.96$), anxiety reduction ($M = 3.07$), and enjoyment ($M = 3.18$). Grade 7 students showed the lowest usage ($M = 2.55$), while Grade 8 students reported the lowest enjoyment ($M = 2.97$). Statistical testing, presented in Table 14, revealed that only usage frequency differed significantly across grades.

Table 14

Kruskal-Wallis Tests for Grade-Level Differences

Variable	H-statistic	df	p-value
Usage Frequency	7.206	2	0.027*
Anxiety Reduction	2.675	2	0.263
Enjoyment Enhancement	1.572	2	0.456

Note: * $p < 0.05$

The significant difference in usage frequency ($H(2) = 7.206, p = 0.027$) confirms the trend observed in adoption rates: older students use GenAI more frequently. However, anxiety reduction ($H(2) = 2.675, p = 0.263$) and enjoyment enhancement ($H(2) = 1.572, p = 0.456$) did not differ significantly by grade level. This suggests that while grade level affects whether and how often students engage with GenAI, the affective benefits – anxiety reduction and enjoyment enhancement – are relatively consistent across developmental stages in this age range (12–15 years). Once students adopt GenAI tools, the psychological benefits appear universal regardless of grade.

4.7 Summary of Key Findings

Table 15 synthesizes the hypothesis testing results, providing a comprehensive overview of the study's findings.

Table 15

Comprehensive Hypothesis Testing Summary

Hypothesis	Test Approach	Result	Effect Size	Conclusion
H1: Low-moderate usage	Overall mean vs. 3.0	$M = 2.70, p < 0.001$	$d = -0.27$	Supported
H1: Users vs. non-users	Mann-Whitney U	$\Delta = 0.97, p < 0.001$	$d = 0.89$	Supported
H2: Overall anxiety reduction	Overall mean vs. 3.0	$M = 2.90, p = 0.097$	$d = -0.09$	Not supported
H2: Users vs. non-users	Mann-Whitney U	$\Delta = 0.92, p < 0.001$	$d = 0.94$	Supported
H3: Overall enjoyment	Overall mean vs. 3.0	$M = 3.05, p = 0.425$	$d = 0.05$	Not supported
H3: Users vs. non-users	Mann-Whitney U	$\Delta = 0.82, p < 0.001$	$d = 0.80$	Supported

In summary, the results reveal a clear pattern: although overall population-level effects are modest or neutral for anxiety and enjoyment, substantial and meaningful benefits appear for students who actively use GenAI tools. All effect sizes for user versus non-user comparisons

exceeded Cohen's threshold for large effects ($d \geq 0.8$), demonstrating both statistical and practical significance. The strong intercorrelations among usage, anxiety reduction, and enjoyment suggest these benefits operate synergistically, forming an integrated affective experience that supports EFL learning.

Discussion

This study examined the impact of generative AI tools on foreign language anxiety and enjoyment among 293 EFL learners in Grades 7–9. The findings provide empirical evidence for the expanding body of literature exploring the emotional and affective dimensions of AI-enhanced language education. This discussion interprets the results within the framework of established theories of language learning anxiety, emotional engagement, and technology integration in education, while linking the findings to the literature review and introduction.

5.1 The Usage Gap: Implications for GenAI Adoption in EFL Contexts

The finding that students report low to moderate GenAI usage ($M = 2.70$, significantly below the neutral midpoint) is consistent with concerns raised by Shen and Guo about educators' pessimistic attitudes towards AI integration. Although 60.4% of students have tried GenAI tools, the overall infrequent usage indicates that exposure alone does not ensure sustained engagement. This 'usage gap' highlights broader challenges in technology adoption within educational settings, particularly the gap between technological availability and meaningful pedagogical integration (Ong and Annamalai).

The activity-specific usage patterns further clarify how students perceive GenAI's role in language learning. The highest usage occurred when students were uncertain ($M = 2.98$), indicating that GenAI is used primarily as an on-demand reference tool rather than as a structured learning partner. This reactive, rather than proactive, usage pattern suggests that students view GenAI more as a problem-solving assistant than as a systematic learning companion. In contrast, the lowest usage in speaking and conversation practice ($M = 2.52$) may reflect students' uncertainty about how to effectively use AI for developing oral skills or a preference for human interaction in building communicative competence, consistent with findings by Rahimi et al. on the importance of human presence in computer-assisted language education.

The progressive increase in usage across grade levels (Grade 7: 55.8%, Grade 8: 62.7%, Grade 9: 67.9% adoption) suggests that developmental factors influence GenAI engagement. Older students may have greater technological literacy, increased autonomy in selecting learning tools,

or more advanced metacognitive awareness of their learning needs – factors that facilitate effective AI use. However, the significant grade-level difference in usage frequency ($p = 0.027$) without corresponding differences in affective outcomes implies that the benefits of GenAI are accessible to learners across developmental stages once they engage with the technology.

5.2 GenAI as a Safe Space: Mechanisms of Anxiety Reduction

The mixed results for H2—neutral effects at the population level but large effects for AI users – highlight the crucial distinction between technological potential and realised benefits. The substantial difference between AI users ($M = 3.26$) and non-users ($M = 2.34$), with a large effect size ($d = 0.94$), provides strong evidence that GenAI can significantly reduce foreign language anxiety when actively used. This finding builds on the work of Horwitz et al., who identified communication apprehension, test anxiety, and fear of negative evaluation as core components of foreign language anxiety. GenAI appears to address these components by providing a judgement-free practice environment.

The highest-rated anxiety dimension – 'provides a safe practice space' ($M = 3.06$)—reveals a key mechanism underlying anxiety reduction. Aydın noted that communication apprehension arises from learners' difficulty in conveying mature thoughts due to insufficient communicative skills. GenAI tools eliminate the fear of negative evaluation by removing the social aspect of linguistic performance, allowing students to experiment with language without risking embarrassment or peer judgement. This safe space enables iterative practice and error correction without the emotional cost associated with public mistakes in classroom settings.

The strong positive correlation between AI usage frequency and anxiety reduction ($\rho = 0.639$, $R^2 = 0.408$) suggests a dose-response relationship: greater engagement with GenAI corresponds to more substantial anxiety reduction. This pattern is consistent with research showing that AI tools increase foreign language enjoyment (FLE) and willingness to communicate (WTC) while reducing foreign language anxiety (FLA) (Syifaiddin and Yuliansyah). However, the correlation also raises questions about directionality – do anxious students seek out GenAI tools, or does GenAI usage reduce pre-existing anxiety? The cross-sectional design limits causal inference, but the strong correlation indicates these factors are closely linked.

Importantly, while GenAI provides a safe space, it does not entirely eliminate anxiety for all users. Items related to feeling 'less nervous' and 'less anxious vs. classmates' scored below the midpoint for the overall population, suggesting that some students may not fully benefit or may

use GenAI so infrequently that anxiety persists. This heterogeneity points to individual differences in technology receptiveness, learning preferences, or the quality of AI interaction – factors that warrant further investigation.

5.3 Enhancing Enjoyment: From Motivation to Sustained Engagement

Parallel to the anxiety findings, H3 revealed neutral population-level effects ($M = 3.05$, $p = 0.425$) but substantial benefits for AI users ($M = 3.38$ vs non-users $M = 2.55$, $d = 0.80$). This large effect size confirms that GenAI enhances confidence and enjoyment for those who use it, supporting Guo et al. assertion that foreign language enjoyment relates to perceptions of favourable outcomes and meaningful accomplishments. Students using GenAI appear to gain a sense of competence and control, which are core components of intrinsic motivation according to self-determination theory (Ryan and Deci).

The highest-rated enjoyment component – 'makes English activities more fun' ($M = 3.50$)—indicates that GenAI introduces an element of playfulness or engagement, transforming routine language tasks into more enjoyable experiences. This aligns with findings from Dewaele et al. and Zawacki-Richter et al., who emphasized that personalized feedback and immediate support from AI systems create more engaging learning experiences. The motivational aspect of enjoyment ($M = 3.46$) further suggests that GenAI inspires students to pursue language challenges, consistent with Ismail and Alharkan observation that learners wish to maintain pleasant experiences by seeking additional opportunities for engagement.

However, the lowest score for 'looking forward to English lessons' ($M = 2.84$) suggests that while GenAI enhances specific practice activities, it does not fundamentally change students' anticipation of formal classroom instruction. This finding aligns with arguments for holistic AI integration, where AI complements rather than replaces human teachers (Rahimi et al.). Students may value GenAI for self-directed practice but still depend on human interaction for deeper learning, social connection, and motivational support. This highlights the importance of viewing AI as a pedagogical partner rather than a substitute for human instruction.

The moderate-to-strong correlation between usage and enjoyment ($\rho = 0.574$, $R^2 = 0.329$) indicates that nearly one-third of the variance in enjoyment is explained by usage frequency. More importantly, the very strong correlation between anxiety reduction and enjoyment ($\rho = 0.748$, $R^2 = 0.560$) suggests these affective dimensions are not independent but form an integrated emotional experience. This finding supports the broader educational psychology literature, which emphasises

that emotional engagement – characterized by enjoyment, enthusiasm, and interest (Bond and Bedenlier; Hiver et al.) -- is intrinsically linked to reduced negative affect such as anxiety.

5.4 The Virtuous Cycle: Interconnected Affective Benefits

One of the study's most compelling findings is the strong intercorrelation among GenAI usage, anxiety reduction, and increased enjoyment. The correlation matrix shows that these variables form a mutually reinforcing system: AI usage leads to anxiety reduction, which in turn enhances enjoyment, potentially resulting in further AI usage. This virtuous cycle is consistent with theories of emotional engagement in learning (Fredricks et al.; Tyng et al.), which suggest that positive emotional responses support sustained engagement, persistence, and higher achievement.

The particularly strong association between anxiety reduction and enjoyment (56% shared variance) indicates that these constructs are deeply interconnected rather than separate outcomes. This interconnectedness has important implications: interventions aimed at reducing anxiety may also enhance enjoyment, and vice versa. From a pedagogical perspective, educators should design AI-enhanced activities that explicitly address both dimensions – creating safe, low-stakes practice environments while also incorporating elements of play, creativity, and achievement recognition.

Furthermore, the finding that anxiety reduction and enjoyment are strongly correlated supports Oades-Sese and Lewis' argument that enjoyment is fundamental to cognitive processes important for learning, including improved memory, attention, and problem-solving. Students who experience reduced anxiety through GenAI use may be better positioned to engage cognitively with language tasks, thereby deriving greater enjoyment and achieving better learning outcomes – a pathway consistent with the positive psychology of language learning (MacIntyre et al.).

5.5 Bridging the Usage Gap: Pedagogical and Policy Implications

The existence of a substantial usage gap – 39.6% of students have never used GenAI for English learning – represents both a challenge and an opportunity. The large effect sizes observed among AI users ($d = 0.94$ for anxiety, $d = 0.80$ for enjoyment) indicate that significant affective benefits are currently limited to those who engage with the technology. Expanding adoption could transform these individual benefits into population-wide improvements.

Several barriers may contribute to low adoption. Firstly, educators' lack of technological pedagogical knowledge, as identified by Ong and Annamalai, may prevent effective integration of GenAI into curriculum and instruction. Professional development focused on practical AI

applications in EFL contexts could equip teachers with the skills to scaffold student engagement. Secondly, students may lack awareness of how GenAI can support language learning or may hold misconceptions about its capabilities. Explicit instruction in using GenAI for vocabulary practice, grammar checking, conversation simulation, and feedback could demystify the technology and encourage adoption.

Thirdly, concerns about AI anxiety – stemming from fears of job replacement and technology dependence (Syifauddin and Yuliansyah) – may deter some students from engaging with GenAI. Addressing these concerns through open dialogue, as recommended by Kohnke, and emphasizing GenAI as a complementary learning tool rather than a replacement for human interaction, could reduce resistance. Finally, equitable access to technology remains critical. While this study's sample had access to GenAI tools, disparities in digital infrastructure, device availability, and internet connectivity may limit adoption in other contexts. Policymakers must ensure that technological integration does not exacerbate existing educational inequalities.

5.6 Limitations and Directions for Future Research

The cross-sectional design of this study limits causal inference. Although the data show strong associations between GenAI usage and affective outcomes, the direction of these relationships remains unclear. Longitudinal studies tracking students over time could determine whether GenAI usage leads to reduced anxiety and increased enjoyment, or whether students already predisposed to positive affective states are more likely to adopt GenAI. Experimental designs, such as randomized controlled trials assigning students to AI-enhanced or traditional instruction, would provide definitive evidence of causality.

The reliance on self-report measures introduces potential bias. Students may overestimate benefits due to social desirability or novelty effects, or underestimate usage because of recall limitations. Future research should include objective usage data (e.g., log files from AI platforms) and triangulate self-reports with behavioural observations, teacher assessments, and learning outcome measures. Furthermore, the binary classification of AI users versus non-users does not capture the quality, duration, or nature of AI interactions. A student who uses GenAI weekly for in-depth conversation practice differs qualitatively from one who sporadically queries vocabulary, yet both would be classified as 'users'. Future studies should develop more detailed measures of AI engagement.

The sample, drawn from a single school in Doha, Qatar, limits generalizability. Cultural, linguistic, educational contexts shape both anxiety and technology adoption. Qatari EFL learners may experience unique pressures or support compared to learners in other regions. Cross-cultural studies examining GenAI's impact across diverse EFL contexts would enhance understanding of contextual moderators. Moreover, this study focused on students aged 12–15; effects may differ for younger children, older adolescents, or adult learners.

Qualitative research exploring students' and teachers' experiences with GenAI would provide valuable insights into the mechanisms underlying anxiety reduction and increased enjoyment. Why do some students find GenAI a safe space while others remain anxious? Which specific features of GenAI contribute most to enjoyment? How do teachers perceive their role in facilitating effective AI use? Mixed-methods studies combining quantitative surveys with interviews, focus groups, or classroom observations would yield a richer, more contextualized understanding.

Finally, this study did not examine learning outcomes such as language proficiency gains, vocabulary acquisition, or communicative competence. While affective benefits are important in their own right emotionally engaged learners persist longer and develop more positive attitudes towards language learning (Li et al.; Yin et al.) - demonstrating that GenAI enhances both affective experiences and cognitive outcomes would strengthen the case for widespread adoption. Future research should investigate whether the anxiety reduction and enjoyment enhancement documented here translate into measurable improvements in language skills.

Conclusion

This study provides robust empirical evidence that generative AI tools can significantly reduce foreign language anxiety and increase enjoyment among EFL learners who actively use the technology. The large effect sizes observed – exceeding Cohen's thresholds for practical significance – show that GenAI's impact goes beyond statistical associations to deliver real-world educational benefits. Students using GenAI reported nearly one full point higher on the 5-point scale for both anxiety reduction (0.92 points) and enjoyment enhancement (0.82 points) compared to non-users, representing shifts from disagreement to agreement with positive affective outcomes.

The strong intercorrelations among usage, anxiety reduction, and enjoyment indicate a virtuous cycle in which GenAI promotes an integrated positive affective experience. Students who use GenAI frequently experience lower anxiety, which increases their enjoyment and may motivate continued engagement. This synergistic relationship is consistent with broader theories

of emotional engagement and underscores the importance of addressing affective dimensions alongside cognitive outcomes in language education.

However, the usage gap – with nearly 40% of students not engaging with GenAI and overall usage remaining low to moderate – shows that these benefits are currently limited in scope. Bridging this gap through educator training, student awareness initiatives, supportive interventions to address AI anxiety, and equitable access to technology represents a critical opportunity to expand GenAI's positive impact. The finding that affective benefits are consistent across grade levels suggests that GenAI can support learners at various developmental stages, provided they receive appropriate scaffolding and encouragement.

As the educational landscape evolves with rapid technological advancements, understanding how GenAI influences the emotional and psychological dimensions of language learning becomes increasingly important. This study contributes to the growing evidence base showing that, when thoughtfully integrated, GenAI can serve as a valuable pedagogical partner – reducing the affective barriers that hinder language acquisition while fostering the enjoyment and motivation essential for sustained learning. The challenge ahead is to ensure that all students, not just early adopters, can access and benefit from these transformative tools, thereby realizing GenAI's full potential to enhance foreign language education.

Disclosure Statement

The authors reported no potential conflicts of interest.

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