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EMOTION REGULATION AS A DEVELOPMENTAL PROCESS IN GENAI-ASSISTED LEARNING: INSIGHTS FROM VIETNAMESE EFL LEARNERS

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Abstract: The rapid integration of generative artificial intelligence (GenAI) tools in language education has introduced new emotional demands for learners, yet little research has examined how students regulate their emotions when learning with these tools. This study investigates emotion regulation strategies among Vietnamese EFL learners in GenAI-assisted environments. Drawing on Gross's (1998, 2015) process model of emotion regulation and Vygotsky's (1994) concept of perezhivanie, it conceptualizes emotion as part of learners' lived and developmental experience rather than a separate affective outcome. A total of 255 undergraduate and graduate students completed an adapted Emotion Regulation Questionnaire (Gross & John, 2003) tailored to GenAI-mediated English learning. Data were analyzed using descriptive statistics, paired-samples t-tests, MANOVA, and Type-III ANOVAs. Learners reported moderate use of both cognitive reappraisal and expressive suppression, with reappraisal slightly more frequent. Year of study was significantly associated with both strategies, first-year students reporting the lowest levels. Region was associated with reappraisal, though without clear pairwise differences. Gender, English major status, proficiency, GenAI use frequency, and IT access were not significant predictors. These findings suggest that emotion regulation is shaped more by academic experience than technology access. The study proposes a developmental–sociocultural model emphasizing emotional literacy through scaffolding, guided reflection, and reappraisal-focused feedback.

Keywords: generative artificial intelligence (GenAI), cognitive reappraisal, emotion regulation, English as a foreign language, Vietnam

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ĐIỀU TIẾT CẢM XÚC NHƯ MỘT QUÁ TRÌNH PHÁT TRIỂN TRONG HỌC TẬP CÓ HỖ TRỢ CỦA GENAI: GÓC NHÌN TỪ NGƯỜI HỌC TIẾNG ANH NHƯ MỘT NGOẠI NGỮ TẠI VIỆT NAM

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Tóm tắt: Sự tích hợp nhanh chóng của các công cụ trí tuệ nhân tạo tạo sinh (GenAI) vào giáo dục ngôn ngữ đã đặt ra những đòi hỏi cảm xúc mới đối với người học, song còn ít nghiên cứu xem xét cách họ điều tiết cảm xúc khi học cùng các công cụ này. Nghiên cứu khảo sát các chiến lược điều tiết cảm xúc của người học tiếng Anh như một ngoại ngữ (EFL) tại Việt Nam trong môi trường có hỗ trợ của GenAI. Dựa trên mô hình quá trình điều tiết cảm xúc của Gross (1998, 2015) và khái niệm *perezhivanie* (thể nghiệm sống mang tính cảm xúc) của Vygotsky (1994), nghiên cứu xem cảm xúc là một thành tố trong trải nghiệm sống và tiến trình phát triển của người học, thay vì một kết quả tách biệt. Tổng cộng 255 sinh viên đại học và sau đại học đã hoàn thành Bảng hỏi điều tiết cảm xúc (Gross & John, 2003) được điều chỉnh cho bối cảnh học tiếng Anh có trung gian GenAI. Dữ liệu được phân tích bằng thống kê mô tả, kiểm định t cho mẫu phụ thuộc, MANOVA và ANOVA Type III. Kết quả cho thấy người học sử dụng cả hai chiến lược tái đánh giá nhận thức và ức chế biểu lộ cảm xúc ở mức trung bình, trong đó, tái đánh giá nhận thức được sử dụng nhiều hơn đôi chút. Biến "năm học" có liên hệ có ý nghĩa với cả hai chiến lược, trong đó, sinh viên năm thứ nhất ở mức thấp nhất. Khu vực địa lý liên hệ với tái đánh giá nhưng không có khác biệt cặp rõ rệt. Giới tính, chuyên ngành, trình độ tiếng Anh, tần suất dùng GenAI và mức tiếp cận công nghệ đều không phải là biến dự báo có ý nghĩa. Những phát hiện gợi ý rằng điều tiết cảm xúc chịu ảnh hưởng từ kinh nghiệm học thuật nhiều hơn điều kiện công nghệ. Nghiên cứu đề xuất mô hình phát triển – văn hóa xã hội, nhấn mạnh việc bồi dưỡng năng lực cảm xúc qua hỗ trợ cảm xúc có định hướng, phản tư có hướng dẫn và phản hồi định hướng tái đánh giá.

Từ khoá: trí tuệ nhân tạo tạo sinh, tái đánh giá nhận thức, điều tiết cảm xúc, tiếng Anh như một ngoại ngữ (EFL), Việt Nam

1. Introduction

The rapid advancement of artificial intelligence (AI) in education has reshaped how learners access and interact with knowledge, particularly in the field of language learning. Generative AI (GenAI) tools, such as ChatGPT, Gemini and Microsoft Copilot, offer the potential for personalized support, conversational practice, and access to authentic language resources, thus enhancing learning opportunities when effectively integrated into instruction (Ma & Liu, 2024; Yang & Li, 2024). However, while the pedagogical applications of GenAI are increasingly documented, considerably less attention has been paid to their emotional impact, specifically, how learners manage their emotions while interacting with GenAI in language learning contexts.

Emotion regulation, broadly defined as the processes through which individuals influence the onset, experience, and expression of their emotions, plays a crucial role in learners' capacity to sustain engagement, persist through challenges, and achieve success in language learning. Within Gross's (1998, 2015) process model, emotion regulation strategies, including cognitive reappraisal (i.e., reinterpreting a situation to alter its emotional impact) and expressive suppression (i.e., inhibiting outward emotional displays), help learners cope with frustration, anxiety, and disengagement, which are common in second language acquisition (Alrabai, 2022). In GenAI-assisted language learning, these strategies may become even more important: interacting with GenAI-generated feedback or complex language tasks can provoke uncertainty, challenge learners' confidence, and require emotional resilience to sustain engagement. Recent evidence further suggests that AI-mediated L2 education may introduce socio-emotional risks, such as classroom anxiety and stress, reduced autonomy, weakened teacher–student interaction, and diminished creativity and criticality (Sun et al., 2025), which highlights the importance of understanding how learners regulate emotions when engaging with GenAI-supported language learning.

The Vietnamese context provides a particularly salient lens for examining these dynamics. Vietnam's rapid digital transformation in higher education has facilitated growing integration of interactive learning technologies into language classrooms. Simultaneously, its collectivist cultural orientation, where emotional expression tends to be moderated in public and academic settings, renders strategies such as expressive suppression especially relevant. Additionally, prevailing exam-oriented practices and structured instructional traditions in some educational settings may limit opportunities for learners to develop flexible reappraisal strategies when engaging with adaptive GenAI tools. These sociocultural and pedagogical features make Vietnam an informative context for investigating how emotion regulation functions in GenAI-supported English as a foreign language (EFL) learning.

Although prior research has highlighted the importance of emotion regulation in educational contexts (e.g., Namaziandost & Rezai, 2024), its role in GenAI-assisted language learning remains insufficiently explored. Understanding how learners regulate their emotions in this emerging environment is essential for several reasons. It provides insight into how affective factors interact with technology use, informs the design of pedagogical interventions to support emotional resilience, and helps educators anticipate challenges learners may face when adopting GenAI tools. Moreover, it highlights how contextual and individual differences, such as cultural norms or academic experience, shape the emotional dimension of GenAI-mediated language learning.

To address this gap, the present study investigates the emotion regulation strategies of Vietnamese undergraduate and graduate EFL learners across multiple universities and regions. Guided by Gross's (1998, 2015) model of emotion regulation and informed by contextual considerations, it addresses two research questions (RQs):

RQ1. To what extent do Vietnamese EFL learners employ emotion regulation strategies, particularly cognitive reappraisal and expressive suppression, when engaging with GenAI tools such as ChatGPT?

RQ2. How do background variables, including gender, geographical region, year of study, English major status, English proficiency, GenAI use frequency, and access to IT resources, relate to the use of these emotion regulation strategies?

By answering these questions, this study seeks to advance understanding of the affective dimensions of GenAI-assisted language learning. Its findings contribute by (a) revealing how

learners manage emotions in technology-mediated language learning, (b) highlighting the influence of sociocultural and developmental factors on these strategies, and (c) providing practical implications for designing pedagogical support that helps learners adapt emotionally and engage productively with GenAI tools in EFL contexts.

2. Literature Review

2.1. Emotions in Language Learning

Language learning is not only a cognitive process but also an emotional one. From a Vygotskian perspective, emotions are integral to an individual's developmental experience, conceptualized as *perezhivanie*, commonly defined as the unity of emotion and cognition through which learners perceive, interpret, and engage with their environment (Vygotsky, 1994). Emotions therefore shape how learners engage with GenAI tools, tasks, and social interactions within their learning environment.

Empirical research consistently demonstrates that emotions play a pivotal role in second language learning: positive emotions such as enjoyment broaden attention and enhance engagement, whereas negative emotions such as anxiety may impede performance but, when effectively regulated, can also stimulate persistence and sustained effort (Alrabai, 2022; Saito et al., 2025). In technology-supported settings, digital language learning has been shown to enhance autonomy and motivation, yet it may also evoke confusion when guidance is insufficient (Stockwell & Reinders, 2019). Likewise, teacher and peer support also play influential roles in shaping learners' emotional responses in online learning environments (e.g., Liu & Zhou, 2024). These findings suggest that emotional experiences in language learning are not inherent to the technology itself but are mediated by the surrounding social and instructional conditions.

While emotions influence learning, how learners manage these emotions is equally important. Gross's (1998, 2015) process model of emotion regulation (ER) identifies two key groups of emotion regulation strategies: (a) cognitive reappraisal, which involves reinterpreting a situation to change its emotional impact, and (b) expressive suppression, which involves inhibiting emotional expressions without reducing emotional intensity (Gross & John, 2003). Reappraisal is generally associated with adaptive outcomes such as greater engagement and motivation, whereas suppression often relates to reduced positive affect (Nolen-Hoeksema & Aldao, 2011).

However, these associations are not uniform across cultures. In collectivist societies such as Vietnam, suppression may function as a socially adaptive strategy that supports interpersonal harmony rather than signifying avoidance or disengagement (Ho et al., 2022; Matsumoto et al., 2008). This cultural dimension resonates with Vygotsky's (1994) view that emotions, as integral components of *perezhivanie*, are socially and historically mediated.

In EFL education, several studies have linked ER strategies to meaningful learning outcomes. Alqarni (2024) examined the relationships among emotion regulation strategies, foreign language enjoyment (FLE), perceived academic stress (PAS), and EFL proficiency among Saudi undergraduates using partial least squares structural equation modelling approach (PLS-SEM). The findings showed that while emotion regulation strategies did not directly predict language proficiency, they exerted indirect effects through FLE and PAS. Specifically, cognitive reappraisal was associated with higher levels of both enjoyment and stress, whereas expressive suppression predicted lower stress without reducing enjoyment, underscoring the nuanced and context-dependent role of emotion regulation in shaping language learning outcomes. By the same token, Zhang et al. (2024) investigated the mediating role of emotion

regulation strategies in the relationship between perceived teacher and peer support and EFL learning engagement among Chinese high school students. Using structural equation modeling, the study found that cognitive reappraisal significantly mediated the positive effects of both teacher and peer support on engagement, whereas expressive suppression played a more limited and context-specific role, mediating only the negative association between peer support and behavioral engagement. These findings underscore the pivotal but differentiated role of emotion regulation strategies in shaping engagement in EFL learning.

2.2. Emotions and Emotion Regulation in GenAI-Mediated Language Learning

GenAI tools such as ChatGPT have introduced new affective dynamics into language learning. Unlike traditional technology, GenAI offers interactive, human-like responses, creating emotionally rich learning encounters. Hoang (2026) reported that learners experienced both enjoyment and frustration when engaging with ChatGPT; importantly, frustration sometimes drove deeper exploration, consistent with the notion of *perezhivanie* as a developmental filter that turns emotionally charged events into opportunities for growth. Yang and Zhao (2024) similarly found that GenAI-assisted learning environments evoked mixed emotions, satisfaction, curiosity, confusion, and anxiety, highlighting that GenAI-mediated learning is affectively complex rather than uniformly positive or negative.

However, while these studies describe emotional outcomes, they appear inadequate in explaining how learners regulate these emotions. This omission is significant because, without effective ER strategies, emotions such as frustration risk becoming barriers rather than drivers of engagement. Luo and Zou (2024) found that enjoyment in ChatGPT-supported learning was linked to the satisfaction of psychological needs but did not investigate the regulatory mechanisms underlying this relationship. Similarly, Bin-Hady et al. (2024) emphasized the role of GenAI in fostering social-emotional learning but did not address specific strategies like reappraisal or suppression. These gaps suggest a need to move beyond documenting emotions toward examining how learners actively manage them in GenAI-assisted contexts.

2.3. Theoretical Framework: A Developmental–Sociocultural Account of Emotion Regulation in GenAI-Assisted EFL Learning

Emotion regulation has increasingly been recognized as an important dimension of learning, as it may shape how students interpret emotional experiences, respond to challenges, and maintain engagement in academic tasks. Gross's (1998, 2015) process model of emotion regulation provides a useful framework for examining how learners regulate emotional responses in academic contexts, including how emotions emerge, are experienced, and are expressed. The model identifies five stages of emotion regulation. First, situation selection involves proactively shaping one's environment, such as an EFL learner choosing to use a GenAI tool like ChatGPT to reduce anxiety before starting a challenging writing task. Second, situation modification refers to altering features of the learning context, for example, refining GenAI prompts to make tasks clearer and more manageable. Third, attentional deployment involves directing focus toward helpful aspects of a situation, such as concentrating on constructive GenAI feedback while disregarding confusing outputs. Fourth, cognitive change, closely associated with cognitive reappraisal, entails reframing emotionally charged situations, for instance, viewing GenAI-generated corrections as opportunities for growth rather than evidence of inadequacy. Finally, response modulation, where expressive suppression is most relevant, involves regulating outward emotional displays, such as concealing frustration while continuing to work productively with the task.

While Gross's model (2015) explains how emotions can be regulated, it does not fully address why learners may differ in their reliance on particular emotion regulation strategies and emotional outcomes. To bridge this gap, this study draws on Vygotsky's (1994) concept of *perezhivanie*, which captures the unity of the individual and environment in lived experience. *Perezhivanie* is not merely an emotional reaction to contextual stimuli but the unit of analysis through which the social situation of development is refracted in the individual (Vygotsky, 1994). It functions as a mediating prism through which environmental conditions are refracted by a learner's personal characteristics, such as prior experiences, digital literacy, and emotional dispositions, resulting in unique interpretations and regulatory responses (Cong-Lem & Daneshfar, 2024; Vygotsky, 1994). From this perspective, two learners interacting with the same GenAI tool may still respond differently during a language learning task. For instance, when receiving corrective feedback on an English writing task, one learner may engage in cognitive reappraisal by interpreting the feedback as useful guidance for improving accuracy and expression. Another learner may experience the same feedback as discouraging but conceal frustration and continue working, relying more on expressive suppression. These different responses suggest that learners' emotional regulation is shaped not only by the GenAI tool itself but also by their prior learning experiences, confidence, and culturally informed ways of responding to feedback.

This integrated model explains how learners' emotional adaptation unfolds in GenAI-mediated language learning. *Perezhivanie* serves as a developmental prism through which contextual factors (e.g., academic year, geographical region, frequency of GenAI use) interact with personal characteristics (e.g., prior experience, digital literacy, emotional dispositions). This interaction shapes how learners move through Gross's (2015) five stages of emotion regulation and influences their reliance on the two primary strategies: cognitive reappraisal (primarily at attentional deployment and cognitive change) and expressive suppression (primarily at response modulation). Through this process, learners' encounters with GenAI tools become not only moments of immediate emotion regulation but also opportunities for longer-term developmental adaptation in EFL learning.

By integrating Gross's model with Vygotsky's concept of *perezhivanie*, this framework situates emotion regulation within the sociocultural context of GenAI-assisted language learning. While Gross's model identifies regulatory stages, *perezhivanie* explains why different learners traverse these stages differently. It foregrounds that emotional regulation is not solely an intrapsychological process but a culturally mediated interpretation of the learning environment. Consequently, background variables such as academic year, geographical region, and frequency of GenAI use are not merely background factors but contribute to influencing how learners experience, regulate, and learn from their interactions with GenAI. This integrated perspective provides a theoretically grounded foundation for examining how emotion regulation strategies mediate the emotional and developmental demands of GenAI-enhanced EFL learning.

2.4. Research Gaps

Three interrelated gaps remain in the emerging literature on emotion regulation in GenAI-assisted language learning. First, although recent studies have begun to examine GenAI-induced emotions and regulatory processes (e.g., Rezai et al., 2024; Y. Yang & Yao, 2026), much of this work has focused on well-being, engagement, or performance outcomes, with emotion regulation treated primarily as a mediating variable rather than as a developmental process shaped by learners' contextual and academic trajectories. Consequently, less is known

about the developmental role of specific emotion regulation strategies, such as cognitive reappraisal and expressive suppression, in learners' emotional adaptation to GenAI-mediated language learning across different stages of academic experience.

Second, while existing research confirms that reappraisal often yields adaptive outcomes in GenAI-supported settings (e.g., Li et al., 2026), these findings have not been systematically situated within Gross's (1998, 2015) extended process model to clarify how different regulatory stages may unfold in interactions with autonomous GenAI tools. The absence of a process-oriented and theory-integrated approach limits our understanding of how regulatory strategies operate dynamically in GenAI-based learning.

Third, although several studies have been conducted in East Asian contexts (e.g., Wang et al., 2024; Y. Yang & Yao, 2026), cultural mediation of emotion regulation in AI-assisted EFL learning remains under-theorized. In particular, little is known about how learners' academic experience and educational contexts are associated with their use of emotion regulation strategies in GenAI-assisted EFL learning, especially when interpreted through a Vygotskian perspective on the socially mediated nature of emotional experience. Integrating *perezhivanie* allows for a more nuanced account of how emotional encounters with GenAI tools are refracted through learners' developmental histories and educational environments.

To address these gaps, the present study integrates Gross's (1998, 2015) process model of emotion regulation with Vygotsky's concept of *perezhivanie* to examine Vietnamese EFL learners' use of cognitive reappraisal and expressive suppression in GenAI-mediated learning. By foregrounding regulatory mechanisms as developmentally and socioculturally mediated processes, this study advances theoretical understanding of emotion regulation in GenAI-assisted language learning and offers empirically grounded implications for designing emotionally responsive GenAI-enhanced pedagogies.

3. Methodology

3.1. Participants

The study included 255 Vietnamese EFL learners aged 18–50 years (M = 21.2, SD = 4.5). The sample was predominantly female (n = 173, 67.8%), followed by male (n = 78, 30.6%), non-binary (n = 2, 0.8%), and participants who preferred not to disclose their gender (n = 2, 0.8%). Geographically, the sample was concentrated in Southern Vietnam (n = 210, 82.4%), with smaller proportions from Central Vietnam (n = 31, 12.2%) and Northern Vietnam (n = 14, 5.5%). In terms of academic year, second-year students constituted the largest group (n = 125, 49.0%), followed by third-year (n = 75, 29.4%), fourth-year (n = 39, 15.3%), graduate (n = 11, 4.3%), and first-year students (n = 5, 2.0%). Most participants were English majors (n = 189, 74.1%), while 66 participants (25.9%) were from other academic disciplines.

Participants also varied in self-reported English proficiency and technology-related backgrounds. Most reported intermediate English proficiency (n = 160, 62.7%), followed by advanced (n = 46, 18.0%), beginner (n = 43, 16.9%), and fluent levels (n = 6, 2.4%). GenAI use was relatively common, with participants reporting that they used GenAI tools often (n = 112, 43.9%), sometimes (n = 89, 34.9%), always (n = 25, 9.8%), rarely (n = 20, 7.8%), or never (n = 9, 3.5%). Most participants reported good (n = 168, 65.9%) or excellent access to IT resources (n = 56, 22.0%), while smaller proportions reported fair (n = 28, 11.0%) or poor access (n = 3, 1.2%).

Table 1

Descriptive Statistics of Participant Demographics (N = 255)

Variable	Category	n	%
Age	M = 21.21, SD = 4.45, range = 18–50	255	—
Gender	Female	173	67.84
	Male	78	30.59
	Non-binary	2	0.78
	Prefer not to say	2	0.78
Region	Central	31	12.16
	Northern	14	5.49
	Southern	210	82.35
Year of Study	1st year	5	1.96
	2nd year	125	49.02
	3rd year	75	29.41
	4th year	39	15.29
	Graduate	11	4.31
English Major	Yes	189	74.12
	No	66	25.88
English Proficiency	Beginner	43	16.86
	Intermediate	160	62.75
	Advanced	46	18.04
	Fluent	6	2.35
GenAI Use Frequency	Never	9	3.53
	Rarely	20	7.84
	Sometimes	89	34.90
	Often	112	43.92
	Always	25	9.80
IT Resource Access	Poor	3	1.18
	Fair	28	10.98
	Good	168	65.88
	Excellent	56	21.96

3.2. Data Collection Instruments

The data collection instrument comprised two sections: a background questionnaire and an adapted Emotion Regulation Questionnaire.

The background section gathered demographic and contextual information from participants, including age, gender, regions, self-reported English proficiency, and frequency of GenAI use for learning purposes. This section was intended to capture relevant characteristics that may influence learners' emotion regulation strategies and their interaction with GenAI tools.

The Emotion Regulation Questionnaire (ERQ), originally developed by Gross and John (2003), was employed to measure participants' emotion regulation strategies. The original ERQ consists of 10 items assessing two key strategies: cognitive reappraisal (6 items) and expressive suppression (4 items), rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). For the present study, the ERQ items were adapted to the Vietnamese EFL learning context with GenAI tools.

Adaptation involved broadly maintaining the original ERQ item order and two-factor structure while contextualizing the wording to refer to GenAI-assisted English learning. For

example, the original item "When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about" was adapted to "When I want to feel more positive emotion, such as joy or amusement, while using a GenAI tool for learning English, I change what I am thinking about the situation". Similarly, the original item "I keep my emotions to myself" was adapted to "I keep my emotions to myself when I am frustrated or disappointed by the GenAI tool's performance in helping me learn English". These adaptations were intended to ensure that participants responded with reference to emotion regulation in GenAI-assisted English learning, while preserving the intended distinction between cognitive reappraisal and expressive suppression in the original ERQ.

Reliability analysis indicated that the adapted ERQ was internally consistent. The reappraisal scale (6 items) demonstrated excellent reliability (Cronbach's $\alpha = .91$; average inter-item correlation = .63), suggesting strong coherence among items. The suppression scale (4 items) also showed good reliability (Cronbach's $\alpha = .83$; average inter-item correlation = .55). For both subscales, item-deletion analyses confirmed that no item significantly improved reliability, supporting the stability of the instrument in the GenAI-enhanced EFL context.

3.3. Procedure

The study employed an online survey distributed to EFL learners across various Vietnamese universities in September 2024. The survey commenced with an introductory section that outlined the research objectives and sought participants' informed consent. Subsequently, participants completed a background questionnaire and the Emotion Regulation Questionnaire. The entire survey took approximately 15 minutes to complete.

Initially, participants were prompted to provide demographic and background information. Following this, they responded to ERQ items, which assessed their approaches to emotion regulation while utilizing GenAI tools in language learning activities. Data were collected anonymously to uphold confidentiality, and participants were given a two-week period to complete the survey at their convenience.

3.4. Data Analysis

All statistical analyses were conducted using R (Version 4.5.1; R Core Team, 2025). The significance level for all inferential tests was set at .05. Initial data preparation involved the calculation of composite scores for cognitive reappraisal and expressive suppression by averaging their respective items. To ensure the internal consistency of these scales, Cronbach's alpha (α) coefficients were calculated and reported.

To address Research Question 1 (RQ1), which examined the extent to which learners employ specific emotion regulation strategies, descriptive statistics including means (M) and standard deviations (SD) were computed. A paired-samples t-test was then performed to determine whether learners reported a significant preference for one strategy over the other. The magnitude of this difference was indexed using Cohen's d for paired samples.

To address Research Question 2 (RQ2), investigating whether emotion regulation strategies differ across demographic and academic variables, a multivariate analysis of variance (MANOVA) was conducted. The model included reappraisal and suppression as dependent variables, with gender, region, year of study, English major status, English proficiency, AI use frequency, and access to IT resources serving as predictors. Significant multivariate effects were followed by Type-III univariate ANOVAs, with partial eta squared (partial η^2) reported as the measure of effect size. Where necessary, Tukey-adjusted pairwise comparisons were conducted to identify specific group differences.

Prior to analysis, the data were screened for statistical assumptions, including Levene's test for homogeneity of variance and an inspection of residual normality. While some variables exhibited minor deviations from normality, the analyses proceeded as planned; given the relatively large sample size (N = 255), the F-statistic is considered sufficiently robust to handle such minor departures without compromising the validity of the findings.

4. Results

4.1. Research Question 1: Extent of Emotion Regulation Strategies

The first research question examined the extent to which Vietnamese EFL learners employ emotion regulation strategies, specifically cognitive reappraisal and expressive suppression, when interacting with generative AI tools such as ChatGPT. To address this question, descriptive and inferential analyses were conducted on the two ERQ subscales.

Descriptive statistics indicated that participants reported moderate to moderately high use of both strategies on a 7-point scale. The mean score for cognitive reappraisal was M = 4.82 (SD = 1.20), while the mean score for expressive suppression was M = 4.67 (SD = 1.19). These values suggest that learners generally engaged in adaptive emotion regulation behaviors during AI-mediated learning interactions, with slightly greater endorsement of reappraisal relative to suppression.

Internal consistency was high for both subscales, with Cronbach's alpha coefficients of α = .91 for reappraisal and α = .83 for suppression, indicating strong reliability and supporting the stability of the measured constructs within this sample (see Table 2).

Table 2

Descriptive Statistics and Reliability for Emotion Regulation Strategies (N = 255)

Variable	M	SD	Cronbach's α
Reappraisal	4.82	1.20	.91
Suppression	4.67	1.19	.83

** Note. Scores were measured on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Higher scores indicate greater reported use of the strategy.*

To examine whether learners differentially employed the two strategies, a paired-samples t-test was conducted. Results indicated that participants reported significantly greater use of cognitive reappraisal than expressive suppression, t(254) = 3.31, p = .001. The mean difference was 0.15, 95% CI [0.06, 0.24]. Although statistically significant, the magnitude of this difference was small (d = 0.21, 95% CI [0.08, 0.33]), suggesting that while learners tend to favor reappraisal slightly over suppression, both strategies are comparably utilized in GenAI-supported learning contexts.

In short, these findings indicate that Vietnamese EFL learners engage in both adaptive reinterpretation of learning challenges and regulation of emotional expression when interacting with generative AI, with a modest preference for cognitive reappraisal.

4.2. Research Question 2: Effects of Background Variables on Learners' Emotion Regulation Strategies

Although Levene's test indicated heterogeneity of variance for suppression across year groups, supplementary variance-robust procedures yielded consistent conclusions. Given the relatively large sample size (N = 255), minor deviations from normality were not considered to meaningfully affect the results.

A Type-III MANOVA was conducted to examine whether selected demographic, academic, and technology-related variables were associated with students' reported use of cognitive reappraisal and expressive suppression. Because the two dependent variables were conceptually related, a multivariate approach was used to evaluate overall patterns across both emotion regulation strategies. Box's M tests were significant for both year of study and region, indicating that the homogeneity of covariance assumption was not fully met. Accordingly, Pillai's Trace was used as the primary multivariate statistic.

The multivariate results showed significant overall effects for year of study, Pillai's Trace = .068, $F(8, 468) = 2.06$, $p = .039$, and region, Pillai's Trace = .040, $F(4, 468) = 2.40$, $p = .049$. No significant multivariate effects were found for gender, English major status, English proficiency, GenAI use frequency, or access to IT resources. These findings suggest that variation in learners' emotion regulation strategies was most clearly associated with academic year and, to a more limited extent, geographical region.

Follow-up Type-III univariate ANOVAs indicated that year of study was significantly associated with both cognitive reappraisal, $F(4, 234) = 3.53$, $p = .008$, partial $\eta^2 = .057$, and expressive suppression, $F(4, 234) = 3.36$, $p = .011$, partial $\eta^2 = .054$. Region was significantly associated with cognitive reappraisal, $F(2, 234) = 4.19$, $p = .016$, partial $\eta^2 = .035$, but not with expressive suppression, $F(2, 234) = 1.36$, $p = .258$, partial $\eta^2 = .012$. All other predictors were non-significant in the univariate analyses.

Tukey-adjusted estimated marginal mean comparisons showed that first-year students reported significantly lower reappraisal than second-year students, third-year students, and fourth-year students. The difference between first-year and graduate students approached, but did not reach, statistical significance. The same pattern was found for suppression: first-year students reported significantly lower suppression than second-, third-, and fourth-year students, while the difference between first-year and graduate students was not statistically significant. No significant differences were observed among second-year, third-year, fourth-year, and graduate students. For region, although the omnibus effect for reappraisal was significant, Tukey-adjusted pairwise comparisons did not identify statistically significant differences between any two specific regions. Therefore, the regional finding should be interpreted cautiously as a modest omnibus association rather than evidence of clear pairwise regional differences.

Table 3

Type-III ANOVA Results for Predictors of Emotion Regulation Strategies

Predictor	Reappraisal *F*(df)	*p*	Partial η^2	Suppression *F*(df)	*p*	Partial η^2
Gender	F(3, 234) = 1.13	.336	.014	F(3, 234) = 0.98	.405	.012
Region	F(2, 234) = 4.19	.016	.035	F(2, 234) = 1.36	.258	.012
Year of Study	F(4, 234) = 3.53	.008	.057	F(4, 234) = 3.36	.011	.054
English Major	F(1, 234) = 0.04	.843	< .001	F(1, 234) = 0.95	.330	.004
English Proficiency	F(3, 234) = 0.42	.740	.005	F(3, 234) = 0.20	.899	.003
GenAI Use Frequency	F(4, 234) = 1.19	.317	.020	F(4, 234) = 1.04	.387	.017
Access to IT	F(3, 234) = 1.02	.383	.013	F(3, 234) = 1.35	.260	.017

Note. Type-III sums of squares are reported. Partial η^2 values were calculated from the Type-III sums of squares. Pillai's Trace was used as the primary multivariate statistic because Box's M tests indicated violations of covariance homogeneity.

5. Discussion

5.1. Emotion Regulation Strategies in GenAI-Assisted EFL Learning

Emotion regulation is increasingly recognized as a crucial factor in language learning because it influences how learners sustain motivation, manage anxiety, and engage with challenging tasks (Saito et al., 2025; Swain, 2013). In GenAI-assisted EFL contexts, this role becomes even more prominent. Unlike traditional classrooms, where teachers can provide emotional reassurance or adapt instruction in real time, GenAI-driven learning environments rely on automated feedback that is immediate, frequent, and often highly corrective. Without appropriate emotional regulation strategies, such feedback may overwhelm learners, leading to disengagement or avoidance behaviors. Thus, understanding how learners regulate their emotions in GenAI-enhanced language learning is essential for ensuring that technological tools become enablers of learning rather than sources of stress.

The present study found that Vietnamese EFL learners used both cognitive reappraisal and expressive suppression at moderate to moderately high levels, with a small but significant preference for reappraisal. This finding aligns with prior research suggesting that reappraisal is particularly beneficial in academic contexts because it reframes emotionally challenging situations as manageable and growth-oriented (Gross, 2015; Ma & Liu, 2024). In GenAI-mediated language learning, reappraisal may help learners reinterpret repeated error corrections as constructive feedback, thereby sustaining their persistence and willingness to engage with the tool. For example, Yang and Zhao (2024) showed that EFL learners who engaged in antecedent-focused reappraisal strategies were more likely to maintain positive engagement.

Although suppression is often considered less adaptive because it involves inhibiting emotional expression without altering underlying feelings (Gross & John, 2003), the present study found that Vietnamese EFL learners also used this strategy at moderate levels. In the context of GenAI-assisted language learning, suppression may serve a pragmatic function by helping some learners maintain composure during repeated corrective cycles, particularly in cultures where emotional restraint is valued in academic settings (Matsumoto et al., 2008). The concurrent use of reappraisal and suppression suggests that emotion regulation in GenAI-based language learning may not be reducible to a simple contrast between adaptive and maladaptive strategies. Rather, learners may draw on multiple strategies to manage the affective demands of GenAI-mediated learning tasks.

This finding contributes to the literature by reframing emotion regulation in GenAI-assisted language learning as a complementary system of strategies rather than as a simple preference for reappraisal. This interpretation also resonates with a Vygotskian view of psychological development, in which higher psychological functions emerge through the transformation of more elementary responses into more conscious, mediated, and self-regulated forms of activity (Vygotsky, 1978, 1987). From this perspective, expressive suppression may be understood as a relatively immediate form of emotional control that helps learners remain behaviorally focused when facing high-stakes feedback or unfamiliar GenAI-driven tasks. Cognitive reappraisal, however, involves a more mediated form of regulation because learners reinterpret corrective feedback and assign it a more constructive learning meaning. Thus, rather than treating suppression and reappraisal as oppositional strategies, the findings suggest that both may form part of learners' developing emotion regulation repertoire in GenAI-assisted EFL learning.

5.2. Developmental and Contextual Influences in GenAI-Supported Language Learning

The findings further suggest that learners' reported use of emotion regulation strategies appeared to vary in relation to selected background variables in GenAI-assisted EFL learning. Academic year was found to be associated with both cognitive reappraisal and expressive suppression, whereas regional background was associated only with cognitive reappraisal. These patterns provide a basis for considering how developmental experience and contextual variation may relate to learners' emotional adaptation in GenAI-mediated learning environments.

The significant effect of academic year suggests that learners' use of both reappraisal and suppression differed across stages of academic experience. This finding aligns with Saito et al.'s (2025) conclusion that emotion regulation skills in language learning are closely tied to academic maturity and accumulated experience. Vygotsky's (1994) concept of *perezhivanie* provides a useful lens for interpreting these findings because it foregrounds how learners experience, interpret, and respond to the same learning environment in different ways. The significant association between academic year and both reappraisal and suppression suggests that emotion regulation in GenAI-assisted EFL learning may be connected to learners' accumulated educational experience rather than being merely a fixed individual disposition. For first-year students, GenAI-generated feedback may be experienced as unfamiliar, evaluative, or emotionally demanding, whereas learners in later years may be more able to interpret similar feedback as part of normal academic improvement. In this sense, cognitive reappraisal can be understood as a mediated form of meaning-making, through which learners reinterpret emotionally charged feedback in more constructive ways, while expressive suppression may reflect a more immediate but still socially shaped form of emotional control.

Importantly, other background variables, such as gender, English proficiency, and GenAI usage frequency, did not significantly predict emotion regulation strategies. This finding challenges earlier research that linked individual traits such as gender to emotion regulation (e.g., Nolen-Hoeksema & Aldao, 2011) and suggests that, in GenAI-assisted EFL contexts, developmental and contextual factors play a more decisive role than demographic characteristics. This shift underscores the need for GenAI-enhanced language pedagogy to move beyond static learner profiles and instead consider how learners' academic and sociocultural environments shape their emotional adaptation. Another noteworthy finding is that GenAI use frequency and access to IT resources were not significantly associated with either reappraisal or suppression. This suggests that emotional adaptation to GenAI-assisted learning may not depend simply on how often learners use GenAI tools or whether they have sufficient technological access. Rather, learners' emotion regulation may be more closely related to how GenAI tools are pedagogically framed, how feedback is interpreted, and whether learners receive support in making sense of emotionally challenging learning experiences.

The modest regional difference in reappraisal suggests that contextual factors may be relevant to learners' use of emotion regulation strategies, although this finding should be interpreted cautiously. While previous studies have emphasized cross-cultural differences in emotional expression (Matsumoto et al., 2008), the present finding raises the possibility that variation may also exist within a single national context. From a cultural-historical perspective, this pattern may reflect differences in learners' educational experiences, prior exposure to technology-mediated learning, or locally situated classroom practices (e.g., Zaccaron et al., 2026). However, because the study did not directly examine these contextual mechanisms, regional differences should be understood as a tentative indicator of contextual variation rather than as direct evidence of specific cultural or institutional effects.

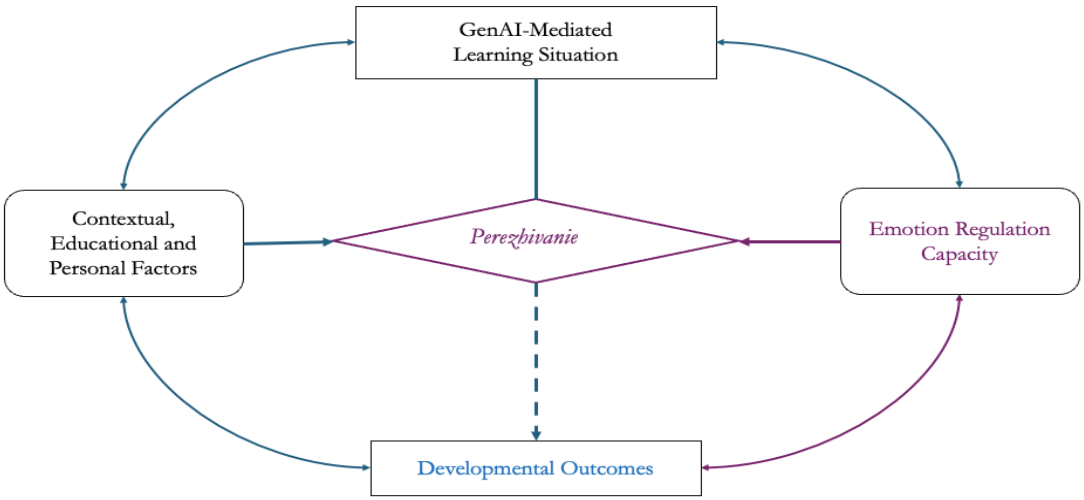
The findings also open a connection between emotion regulation and learner agency in GenAI-mediated learning. Essien et al. (2026) argue that human–AI agency involves students' initiative, monitoring of AI outputs, and final decision making in AI-supported learning, and their study links such agency to reflective engagement and self-reported critical thinking. From a Vygotskian perspective, this suggests that agency in GenAI-assisted learning is not merely a matter of tool access or technical competence, but of learners' capacity to interpret and respond meaningfully to AI-mediated situations. The present findings add an affective dimension to this argument. Learners who can reappraise GenAI feedback may be better positioned to treat AI output as an object for reflection and judgment, while learners who struggle to regulate frustration or uncertainty may be more likely to withdraw from, avoid, or over-rely on the tool. Thus, emotion regulation may function as part of the psychological basis for human–AI agency, enabling learners to remain engaged, critically reflective, and decision-making subjects within GenAI-supported language learning.

5.3. Toward a Developmental–Sociocultural Model of Emotion Regulation: Integrating Perezhivanie and Gross's Framework

Drawing on the empirical patterns identified in this study, this section proposes a developmental–sociocultural model of emotion regulation in GenAI-assisted EFL learning. The model is not intended to claim a fully tested causal pathway; rather, it offers a theoretically grounded account of how learners may come to interpret and regulate emotionally demanding encounters with GenAI tools. Three findings provide the empirical basis for the model. First, learners reported moderate use of both cognitive reappraisal and expressive suppression, with only a modest preference for reappraisal. Second, academic year was associated with both strategies, suggesting that learners' regulation of GenAI-related emotional experiences may be connected to their educational trajectories. Third, regional background was associated with reappraisal but not suppression, whereas GenAI use frequency and access to IT resources were not significant predictors. Overall, these patterns suggest that emotional adaptation to GenAI-assisted learning may depend less on technological exposure alone and more on how learners make sense of GenAI-mediated feedback within their academic and contextual learning histories.

Figure 1

A Vygotskian Developmental Model of Emotion Regulation in GenAI-Mediated Learning



The proposed model (see Figure 1) consists of five dynamically interrelated components. The first component is the GenAI-mediated learning situation, which refers to emotionally significant encounters with feedback, uncertainty, task difficulty, and opportunities for improvement. The second component comprises contextual, educational, and personal factors, which shape how learners enter and interpret these learning situations. At the centre of the model is learners' *perezhivanie*, understood as the lived and emotionally mediated experience through which GenAI-mediated situations are refracted and given personal developmental meaning (Cong-Lem, 2025; Vygotsky, 1994). The fourth component is emotion regulation capacity, represented in this study through learners' reported use of cognitive reappraisal and expressive suppression. The fifth component is developmental outcomes, understood not as uniform or automatic effects of GenAI use, but as possible developmental consequences that depend on how learners experience, interpret, and regulate emotionally demanding learning encounters.

In this model, the dotted line from learners' *perezhivanie* to developmental outcomes indicates that developmental consequences are not assumed to occur uniformly or automatically. Rather, the same GenAI-mediated learning situation may generate different developmental possibilities depending on how individual learners experience, interpret, and regulate emotionally significant encounters with feedback, uncertainty, or task difficulty. Thus, the model does not present developmental outcomes as objective or equal effects of GenAI use across learners. The curved arrows further indicate that the model should not be read as a one-way linear sequence. Instead, the components are understood as dynamically interconnected: learners' emotion regulation capacity may shape how they experience future GenAI-mediated situations, while developmental outcomes may also reshape the learning environment by influencing learners' confidence, participation, help-seeking, and subsequent engagement with GenAI-supported tasks.

This model contributes to GenAI-assisted language learning research by moving beyond a purely technological or individual-difference account of learner emotion. It suggests that learners' emotional responses to GenAI tools are not determined simply by access, frequency of use, or proficiency level. Rather, emotion regulation may develop through the interaction between GenAI-mediated learning situations, learners' accumulated educational experiences, and the sociocultural meanings attached to feedback, error correction, and emotional expression. In this sense, the model links Gross's (1998, 2015) psychological account of regulatory strategies with Vygotsky's (1987, 1994) cultural-historical view of emotional experience as developmentally and socially mediated. Future research can further examine this model through longitudinal, qualitative, or mixed-methods designs that trace how learners' emotional meanings and regulation strategies change through repeated engagement with GenAI-supported language learning.

5.4. Pedagogical and Technological Implications

The findings suggest several practical implications for GenAI-enhanced language learning. For teachers, the association between academic year and both cognitive reappraisal and expressive suppression suggests that learners may need different forms of emotional support at different stages of their studies. First-year students reported lower use of both strategies than learners in later undergraduate years, indicating that early-stage learners may need more guidance in responding to the emotional demands of GenAI-mediated feedback. For this reason, GenAI instruction should not focus only on prompt writing, output checking, or responsible use. It should also help learners understand how to respond when AI feedback feels

confusing, discouraging, overly corrective, or difficult to interpret.

At the classroom level, teachers can support learners by embedding simple emotional scaffolding into GenAI-supported tasks. For example, after receiving AI-generated feedback on a writing or speaking activity, students could be guided to identify which parts of the feedback are useful, which parts require verification, and how they will use the feedback for revision. Such routines may help learners move beyond immediate emotional reactions and engage with GenAI feedback more reflectively and selectively. This is particularly important because learners reported moderate use of both reappraisal and suppression, suggesting that they may benefit from support in developing a more flexible emotion regulation repertoire rather than relying on a single strategy.

At the institutional level, the non-significant effects of GenAI use frequency and IT access suggest that access to technology alone may not be sufficient to support learners' emotional adaptation to GenAI-assisted learning. Universities may therefore need to move beyond simply providing tools or encouraging AI use and develop structured support for feedback literacy, emotional readiness, and learner agency. This support should include teacher professional development on emotionally responsive AI pedagogy, including how to design GenAI-supported tasks, guide students in interpreting automated feedback, and recognize when learners may experience AI correction as confusing, discouraging, or threatening. In this way, institutional support for GenAI integration should include not only technological infrastructure, but also teacher capacity-building so that GenAI use can support learners' critical, confident, and constructive engagement with AI-mediated feedback.

5.5. Limitations and Future Directions

This study offers new insights into emotion regulation in GenAI-assisted EFL learning, but several limitations should be noted. First, the reliance on self-report measures, while practical and widely used in language education research (Gross & John, 2003), may not fully capture how learners regulate their emotions during actual interactions with GenAI tools. Future studies could complement surveys with classroom observations, learner interviews, or log data from GenAI platforms to provide a more contextually grounded view of emotional regulation in practice.

Second, the sample was unevenly distributed across region and year of study, with most participants coming from Southern Vietnam and only a small number of first-year students. Therefore, findings related to regional background and first-year comparisons should be interpreted cautiously and should not be taken as evidence of stable group-level differences without further validation in more balanced samples.

Finally, the study did not directly examine how emotion regulation strategies translate into specific language outcomes. Subsequent research should investigate whether learners who frequently use reappraisal or suppression achieve better performance in language tasks such as writing, reading, or speaking when supported by GenAI tools. This would strengthen the pedagogical relevance of emotion regulation for technology-mediated language learning.

6. Conclusion

This study examined Vietnamese EFL learners' use of emotion regulation strategies in GenAI-assisted learning and considered how these strategies varied across selected background variables. The findings indicate that learners reported moderate use of both cognitive reappraisal and expressive suppression, with only a small preference for reappraisal. This pattern suggests that learners may draw on more than one regulatory strategy when responding

to the emotional demands of AI-mediated feedback, uncertainty, and task difficulty. Academic year was associated with both strategies, whereas regional background was associated only with reappraisal and should be interpreted cautiously. By integrating Gross's process model of emotion regulation with Vygotsky's concept of *perezhivanie*, the study highlights emotion regulation as a developmental and socioculturally mediated process rather than a purely individual response to technology. Pedagogically, the findings suggest that GenAI integration in EFL education should extend beyond technical access and prompt-use training to include guided reflection, feedback literacy, and emotional scaffolding, particularly for learners in the early stages of university study. Future research using longitudinal, qualitative, or mixed-methods designs would be valuable for examining how learners' emotion regulation develops through repeated engagement with GenAI-supported language learning tasks.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors used ChatGPT to support language editing, improve readability, and refine academic expression. The tool was used to assist with grammar, clarity, coherence, and stylistic presentation. The authors reviewed and edited all AI-assisted outputs and take full responsibility for the content, accuracy, analysis, interpretation, and conclusions presented in the manuscript.

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APPENDIX

Survey Questionnaire