



Alleviating Second Language Writing Anxiety through Gamified Platforms: An Empirical Study on High School Learners

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Abstract

Developing academic writing proficiency often poses severe psychological and cognitive challenges for learners of English as a Foreign Language (EFL), though empirical evidence regarding active technological solutions in high school settings stays limited. This quantitative quasi-experimental inquiry examined how an 8-week intervention utilizing a theory-grounded gamified writing application influenced Second Language (L2) writing anxiety among Vietnamese secondary school students. Adopting a non-equivalent control group pre-test/post-test design, 80 learners from two pre-existing classrooms were divided into an experimental condition, which received gamified digital instruction, and a control condition, which underwent conventional product-focused, paper-based training. The Second Language Writing Anxiety Inventory (SLWAI) served as the primary data collection instrument. Results from paired-samples t-tests indicated a remarkable and profound decrease in global writing anxiety, alongside its distinct sub-dimensions of somatic, cognitive, and avoidance anxieties, specifically within the experimental cohort. Additionally, an ANCOVA confirmed that the experimental group exhibited significantly lower post-intervention anxiety scores than their conventionally taught peers, with the instructional approach explaining 61.2% of the variance. Ultimately, this evidence supports the integration of an anxiety-aware, autonomy-supportive pedagogy that utilizes game elements to alleviate debilitating affective hurdles.

INTRODUCTION

In the field of English as a Foreign Language (EFL) education, academic writing is widely considered the most complex and difficult skill for learners to master due to its structural intricacies and the heavy cognitive burden it imposes (Luu & Hien, in press). According to Cognitive Load Theory, the simultaneous management of linguistic, strategic, and rhetorical choices quickly depletes working memory capacity during text generation (Sweller, 1988; Kormos, 2023; Mehta et al., 2026). Beyond the challenges of acquiring linguistic mechanics and rhetorical fluency, the

process of composing text is deeply intertwined with affective and psychological factors (Dörnyei & Ryan, 2015; Luu & Nguyen, 2026). Writing anxiety, structurally defined as the anxious behaviors, avoidance tendencies, and cognitive worries displayed during the composition process (Daly & Miller, 1975), operates as a situated emotional barrier in foreign language classrooms. This internal apprehension is closely aligned with the conceptual boundaries of Foreign Language Anxiety (FLA), which represents a distinct, self-perceptions-driven psychological complex related to classroom language learning (Horwitz et al., 1986; Aslan & Thompson, 2021; Alamer, 2022).

In EFL contexts, English writing is often the precise skill that creates the most severe anxiety in learners, primarily driven by poor language knowledge, strict time limitations, pedagogical emphasis on overt correction, and an acute fear of being evaluated negatively by instructors and peers (Albaqami, 2023; Luu & Nguyen, 2026; MacIntyre & Gardner, 1994). This emotional strain frequently manifests as L2 writing anxiety, a multidimensional construct comprising physiological arousal (somatic anxiety), negative cognitive preoccupations (cognitive anxiety), and avoidant tendencies (avoidance behavior) (Cheng, 2004; Alshammari, 2025; Ballinan et al., 2026).

Recent empirical investigations in Asian EFL psychology have confirmed that writing anxiety operates as a severe psychological barrier. Specifically, correlational research involving Vietnamese university students revealed a strong negative relationship between writing anxiety and writing achievement, demonstrating that heightened anxiety directly hinders productive performance (Luu & Nguyen, 2026; Nguyen et al., 2025; Phuong, 2025). Interestingly, demographic and proficiency variables modulate these emotional states; for instance, male students have been found to experience significantly higher anxiety levels than female students across all subcomponents, whereas an increase in language proficiency and advanced linguistic skills serves as a vital factor that reduces both the physiological and mental symptoms of anxiety (Luu & Nguyen, 2026; Xu & Xie, 2024; Tasan et al., 2021; Quvanch et al., 2024).

Parallely, research highlights that writing motivation encompassing dimensions such as enjoyment, self-efficacy, instrumentality, recognition, and effort maintains a statistically significant positive correlation with writing performance, underscoring the profound influence of affective structures in academic writing (Luu & Hien, in press). This motivational network is heavily reliant on contextual configurations, as local educational climates in Asian developing countries continuously shape how learners navigate their internal drives and self-efficacy beliefs. Taken together, these insights advocate for the urgent development of an anxiety-sensitive pedagogy that effectively blends cognitive rigor with robust affective support (Oxford, 2017; Luu & Nguyen, 2026).

Despite the documented need for supportive pedagogical environments, conventional EFL instruction in Vietnam often remains bound by product-oriented, paper-and-pen approaches that reward memory retention rather than active involvement (Luu et al., 2025). Such arrangements rarely support an array of active participation, frequently leading to learner disengagement, chronic boredom, and passive learning (Luu et al., 2025). To revitalize the classroom, gamification has emerged as a major pedagogical innovation, selectively embedding game mechanics such as points, badges, leaderboards, and collaborative challenges into non-game environments to stimulate multidimensional engagement (Dichev & Dicheva, 2017; Luu et al., 2025). Empirical systematic reviews have shown that the systematic integration of game elements in EFL contexts not only provides an authentic language learning environment but also generates positive emotional responses and significantly reduces cognitive strain (Zhang & Hasim, 2023; Li et al., 2025; Zhang & Hasim, 2023). When integrated purposefully, these game mechanics fulfill critical

educational goals, facilitating distinct behavioral, cognitive, and affective mechanisms that support both performance enhancement and target-driven learning tasks (Sailer et al., 2017).

Grounded in Self-Determination Theory (SDT), Flow Theory, and Keller's ARCS Model, theory-driven gamification moves beyond temporary external rewards to nurture long-term, intrinsically motivated engagement by satisfying core psychological needs for autonomy, competence, and relatedness (Csikszentmihalyi, 1990; Luu et al., 2025; Ryan & Deci, 2017). Within a context-sensitive framework, game elements act through critical mediating factors, namely task authenticity and anxiety reduction, enabling educators to design sustainable, culturally responsive learning structures that prolong active focus (Luu, 2025).

Recent longitudinal and intervention studies focusing on gamified language environments confirm that platforms incorporating points, clear objectives, and low-stakes feedback loops can explicitly support student skill development while lowering situational performance anxiety (Dehghanzadeh et al., 2019; Zainuddin et al., 2020). Furthermore, when writing tasks are structured around explicit pedagogical frameworks that emphasize systematic input, consciousness-raising, and scaffolding, learners are better equipped to acquire complex components like formulaic and idiomatic sequences, thereby enhancing overall rhetorical power and composition fluency (Luu, 2025; Nation, 2013).

While the foundational links between anxiety, motivation, and academic outcomes have been established at the tertiary level (Luu & Hien, in press; Luu & Nguyen, 2026), there remains a pronounced empirical gap concerning active instructional interventions in secondary education. Most existing literature relies heavily on quantitative correlational approaches to map psychological constructs, leaving a shortage of experimental research validating concrete methodologies to alleviate these affective barriers. High school students in Vietnam encounter acute writing anxiety as they face rigid curricula and high-stakes testing, yet few studies have deployed longitudinal, quasi-experimental designs to evaluate technological innovations. This study addresses this critical gap by implementing a structured, 8-week gamified writing platform intervention. By shifting writing tasks into an interactive, need-supportive digital environment, this study aims to experimentally evaluate the extent to which gamified instruction can reduce overall L2 writing anxiety and its respective somatic, cognitive, and behavioral sub-dimensions among secondary school EFL learners. To achieve the aforementioned objectives and address the empirical gaps in secondary EFL literature, this study seeks to answer the following specific research questions:

Research Question 1: To what extent does the integration of an 8-week gamified writing platform intervention affect secondary school EFL students' overall L2 writing anxiety levels and its three respective sub-dimensions (somatic anxiety, cognitive anxiety, and avoidance behavior)?

Research Question 2: Is there a statistically significant difference in L2 writing anxiety reduction between secondary school EFL students who participate in a gamified writing environment and those who receive traditional product-oriented, paper-and-pen instruction?

METHODS

Research Design

This study adopts a quantitative quasi-experimental design, specifically a Pre-test/Post-test Non-Equivalent Control Group Design. Since the participants are naturally assembled in intact school classes, random assignment of individual students is neither practical nor disruptive to the school's academic schedule. To

implement this design, two existing classes will be selected and designated into distinct groups. The Experimental Group will receive L2 writing instruction integrated with a gamified writing platform, whereas the Control Group will receive L2 writing instruction via traditional, non-gamified methods. In this framework, the independent variable is defined as the mode of instruction (Gamified vs. Traditional), while the dependent variable is the students' L2 writing anxiety levels. The entire treatment period will span over a course of 8 weeks.

Research Context and Participants

Context

The study will be conducted at a local high school in Vietnam, where English is taught as a compulsory Foreign Language (EFL) subject. The traditional writing curriculum at this institution typically focuses on product-oriented approaches. Under this conventional method, students generally write individually on paper based on teacher-prompted topics. Literature has consistently shown that such teacher-centered, product-oriented writing environments often induce high cognitive and emotional anxiety among EFL learners, as students are frequently pressured to produce error-free texts under strict time constraints without sufficient process-based support (Cheng, 2004).

The target institution is equipped with a stable ICT infrastructure, including school-wide Wi-Fi access and a dedicated computer laboratory. Furthermore, a preliminary survey indicated that 100% of the participating students possessed personal smartphones or laptops with stable internet connectivity at home, ensuring seamless access to the gamified learning platform used in this study.

Participants

A purposive sampling technique will be employed to select 80 high school students from two intact classes in Grade 10. The selection of 80 participants (40 students per class) was determined primarily by institutional constraints and the naturally occurring size of the intact classrooms assigned by the school administration, which reflects a typical sample size for quasi-experimental research in classroom settings.

These specific classes will be chosen based on their close similarities in English proficiency levels and prior writing performance. To ensure that the latest semester examination scores accurately represented the students' actual writing abilities rather than general language proficiency, only the specific scores from the standalone writing section of the examination which was graded independently using a standardized analytic rubric covering content, organization, and language use were extracted and compared. Demographic data, including age and gender distribution, will be thoroughly documented prior to the intervention. Furthermore, all participants will participate on a voluntary basis, and official administrative permission will be secured from both the school board and the respective classroom teachers before commencement.

Research Instruments

The primary data collection instrument for this study is the Second Language Writing Anxiety Inventory (SLWAI) developed by Cheng (2004). The SLWAI is a highly reliable and widely validated 27-item questionnaire designed to measure L2 writing anxiety across three distinct sub-dimensions. Specifically, it assesses Somatic Anxiety through 9 items that measure the physiological effects of anxiety such as nervousness and sweating; Cognitive Anxiety through 8 items that capture cognitive aspects including worry, fear of negative evaluation, and preoccupation with performance; and Avoidance Behavior through 10 items that evaluate behavioral tendencies like the avoidance of writing tasks and procrastination. All items are rated

on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). During data processing, reverse-scored items will be recoded accordingly. To ensure clear comprehension and avoid language barriers during self-reporting, the questionnaire will be meticulously translated into Vietnamese.

Data Collection and Analysis

Data Collection Procedure

The data collection process will be carried out across three distinct phases over a designated 8-week timeline.

In Phase 1 (Week 1), which represents the pre-intervention stage, the Vietnamese version of the SLWAI will be administered to both the experimental and control groups to establish baseline writing anxiety levels.

Following this, Phase 2 covers the 6-week intervention period from Week 2 to Week 7. During this phase, both groups will be taught identical writing topics aligned with the national curriculum. To control for potential confounding variables such as differences in teaching style, pedagogical expertise, or classroom management strategies, the same teacher will deliver the instruction to both the experimental and control groups. The teacher will follow a strictly standardized lesson plan for both classes, ensuring that the only differentiating factor is the mode of task delivery. Specifically, the Experimental Group will complete their writing tasks, quizzes, and peer reviews through a designated gamified platform incorporating badges, leaderboards, immediate feedback, and point systems. Meanwhile, the Control Group will complete identical tasks using traditional paper-and-pen and teacher-led instruction.

Finally, Phase 3 takes place post-intervention in Week 8, where the identical SLWAI questionnaire will be re-administered to both groups to measure shifts in their L2 writing anxiety levels.

Data Analysis Procedure

Quantitative data gathered from the pre- and post-tests will be analyzed using statistical software such as SPSS or R Studio through three consecutive steps.

First, descriptive statistics, including Mean score (M) and Standard Deviation (SD), will be calculated to profile the overall anxiety and its three sub-dimensions.

Second, regarding the inferential statistics for the first research question (RQ1), a Paired-samples t -test will be executed to examine the internal changes in anxiety within each group from pre-test to post-test. Prior to running the t -test, the assumption of normality for the differences between paired scores will be rigorously evaluated using the Shapiro-Wilk test and visual inspections of Q-Q plots.

Third, to address the second research question (RQ2) and evaluate the difference in anxiety reduction between the two groups, an Analysis of Covariance (ANCOVA) will be performed. In this model, the Post-test anxiety score will serve as the dependent variable, the Instructional Type (Gamified vs. Traditional) as the independent variable, and the Pre-test anxiety score will be treated as the covariate to effectively control for initial baseline discrepancies between the intact classes. To ensure the statistical validity of the ANCOVA results, primary statistical assumptions will be verified beforehand. The assumption of normality for the residuals will be assessed via the Shapiro-Wilk test. Levene's test of equality of error variances will be computed to confirm homoscedasticity across groups. Most importantly, the assumption of homogeneity of regression slopes will be tested by examining the interaction effect between the covariate (Pre-test) and the independent variable (Instructional Type) on the dependent variable to ensure it is not statistically significant ($p > .05$).

RESULTS AND DISCUSSION

Exploratory Factor Analysis

Although the SLWAI (Cheng, 2004) possesses an established theoretical framework, Exploratory Factor Analysis (EFA) was deliberately employed in this study rather than Confirmatory Factor Analysis (CFA). This decision was justified by the fact that the instrument was meticulously translated into Vietnamese and administered within a distinct cultural and educational context. Conducting an EFA allowed for an empirical exploration of whether the original three-factor structure naturally emerged without imposing a rigid pre-existing structure on the newly translated items, thereby ensuring that any potential contextual variations in latent construct patterns among Vietnamese EFL learners could be captured.

To evaluate the psychometric properties of the Vietnamese version of the Second Language Writing Anxiety Inventory (SLWAI), the dataset underwent a sequential statistical evaluation comprising Cronbach's alpha reliability analysis and Exploratory Factor Analysis (EFA). Reverse-scored items were successfully recoded prior to computation to ensure directional consistency. The initial internal consistency check yielded highly satisfactory results, with all subscales demonstrating robust reliability well above the conventional thresholds, thereby justifying further multivariate factor examinations.

The construct validity and underlying factor structure of the 27-item instrument were scrutinized using Exploratory Factor Analysis. To determine the data's suitability for factor extraction, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were computed. The KMO index reached an admirable value, indicating an excellent marvel of sample-to-variable ratio, while Bartlett's test returned high statistical significance, confirming that the correlation matrix was not an identity matrix and was highly amenable to factorization. Factor extraction was subsequently executed utilizing Principal Axis Factoring paired with a Promax oblique rotation, a choice mathematically driven by the theoretical assumption that the sub-dimensions of language anxiety are inherently inter-correlated.

The empirical extraction clean-cut into a three-factor solution based on the Kaiser criterion of eigenvalues greater than 1.0, collectively accounting for a substantial proportion of the total variance. All 27 items loaded cleanly onto their respective latent constructs, precisely mirroring the original theoretical framework proposed by Cheng (2004). The factor loadings for all items comfortably exceeded the strict conservative threshold of 0.50, displaying strong convergent validity. Furthermore, no problematic cross-loadings or cross-cutting item assignments emerged, substantiating the distinct discriminant validity among the three sub-dimensions: Somatic Anxiety, Cognitive Anxiety, and Avoidance Behavior. The item-to-total correlations further reinforced the stability of the scale, as no single item deletion would meaningfully improve the overall internal consistency of the constructs.

Table 1. Psychometric Properties and Factor Structure of the Modified SLWAI Scale

Construct / Item Identifier	Factor Loading	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Overall Cronbach's α
Somatic Anxiety				.885
SA1	.782	.654	.871	
SA2	.741	.612	.874	
SA3	.735	.598	.875	

SA4	.689	.543	.880	
SA5	.712	.587	.876	
SA6	.654	.521	.882	
SA7	.795	.672	.869	
SA8	.704	.569	.878	
SA9	.677	.538	.881	
Cognitive Anxiety				.842
CA1	.754	.621	.819	
CA2	.711	.589	.824	
CA3	.698	.554	.829	
CA4	.642	.512	.835	
CA5	.615	.498	.837	
CA6	.733	.601	.822	
CA7	.762	.635	.817	
CA8	.685	.547	.830	
Avoidance Behavior				.895
AB1	.812	.712	.881	
AB2	.794	.695	.883	
AB3	.756	.643	.887	
AB4	.733	.618	.889	
AB5	.688	.574	.892	
AB6	.652	.539	.895	
AB7	.701	.591	.891	
AB8	.724	.607	.890	
AB9	.745	.631	.888	
AB10	.669	.552	.894	

Note. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy = .876; Bartlett's Test of Sphericity: $\chi^2 = 3425.16$, $df = 351$, $p < .001$; Total Variance Explained = 61.45%. Extract Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization. Loadings below .40 are omitted for clarity.

Source: Primary data collected and analyzed by the authors, 2026

Descriptive Statistics of L2 Writing Anxiety

Before conducting inferential statistics, descriptive analyses (Mean and Standard Deviation) were computed for the overall SLWAI scores and its three sub-dimensions: Somatic Anxiety, Cognitive Anxiety, and Avoidance Behavior.

Table 2. Descriptive Statistics for Pre-test and Post-test Scores

Group	Anxiety Dimension	Pre-test M (SD)	Post-test M (SD)	Mean Difference
Experimental (n = 40)	Somatic Anxiety	3.65 (0.52)	2.45 (0.41)	-1.20
	Cognitive Anxiety	3.82 (0.48)	2.60 (0.53)	-1.22
	Avoidance Behavior	3.58 (0.61)	2.52 (0.50)	-1.06
	Overall Anxiety	3.68 (0.44)	2.52 (0.39)	-1.16

Control (n = 40)	Somatic Anxiety	3.61 (0.55)	3.52 (0.51)	-0.09
	Cognitive Anxiety	3.75 (0.50)	3.61 (0.49)	-0.14
	Avoidance Behavior	3.62 (0.58)	3.55 (0.54)	-0.07
	Overall Anxiety	3.66 (0.47)	3.56 (0.45)	-0.10

Note: Scores range from 1 to 5; higher scores indicate higher anxiety.

Source: Primary data collected and analyzed by the authors, 2026

As shown in Table 1, both groups started with relatively high and comparable overall anxiety levels at the Pre-test phase, where the Experimental group exhibited a mean score of $M = 3.68$ and the Control group displayed a mean score of $M = 3.66$. Looking closely at the individual dimensions, Cognitive Anxiety was recorded as the highest baseline trigger for both the experimental cohort ($M = 3.82$) and the control cohort ($M = 3.75$), which underscores that the fear of negative evaluation and preoccupation with academic performance are heavily prevalent among Vietnamese high school EFL learners. However, after the 8-week intervention, a stark contrast was observed between the two instructional environments. The Experimental group exhibited a substantial and uniform decrease across all affective domains, culminating in a drastically lower overall post-test anxiety level of $M = 2.52$. In sharp contrast, the Control group experienced only a negligible, nominal decline, arriving at a final overall anxiety mean of $M = 3.56$, which indicates that conventional teacher-directed methods failed to alleviate the psychological tension surrounding L2 writing.

RQ1: To what extent does the integration of gamified writing platforms affect students' overall L2 writing anxiety levels?

To address RQ1, a Paired-samples t-test was conducted for each group to determine whether the internal changes in overall L2 writing anxiety from pre-test to post-test were statistically significant.

Table 3. Paired-Samples T-Test Results for Pre- and Post-test Overall Anxiety

Group	Mean Diff.	t	df	p (2-tailed)	Cohen's d
Experimental Group (Pre vs. Post)	-1.16	12.45	39	.000	2.79 (Large)
Control Group (Pre vs. Post)	-0.10	1.35	39	.185	0.22 (Small)

Source: Primary data collected and analyzed by the authors, 2026

The paired-samples t-test executed for the Experimental group revealed a highly statistically significant decrease in overall L2 writing anxiety from pre-test to post-test, with the statistical parameters establishing that $t(39) = 12.45$, $p < .001$. The calculated effect size was exceptionally profound (Cohen's $d = 2.79$), greatly exceeding the standard threshold for a large effect, which statistically confirms that the integration of the gamified writing platform had a remarkably powerful, non-random impact on mitigating students' writing anxiety levels over the 8-week duration. Conversely, students who underwent instruction in the traditional writing classroom achieved an extremely minor reduction in overall anxiety (Mean Difference = -0.10).

This internal longitudinal shift within the control condition was not statistically significant, as demonstrated by the values of $t(39) = 1.35$, $p = .185 > .05$, thereby suggesting that traditional, product-oriented teaching methods alone are incapable of facilitating meaningful anxiety reduction for high school language learners.

RQ2: Is there a significant difference in writing anxiety reduction between students who use gamified platforms and those who learn through traditional writing methods?

To resolve RQ2, an Analysis of Covariance (ANCOVA) was executed to robustly compare the post-intervention scores of the two groups while statistically neutralizing and controlling for any pre-existing individual discrepancies at the baseline. Within this inferential model, the Dependent Variable was designated as the Post-test Overall Anxiety score, the Fixed Factor (Independent Variable) was the Group Type (Experimental vs. Control), and the Pre-test Overall Anxiety score was entered as the Covariate.

Preliminary statistical checks were conducted to verify that the dataset fully satisfied all required parametric assumptions. The distribution of the scores was confirmed to be normal via a Shapiro-Wilk test ($p > .05$), and Levene's test successfully established the homogeneity of variances across the groups, returning a non-significant value of $F(1, 78) = 0.64$, $p = .426 > .05$. Furthermore, the critical assumption of homogeneity of regression slopes was thoroughly met, as the interaction between the pre-test covariate and the instructional grouping factor yielded no statistical significance ($p = .521$), validating the appropriateness of running the main ANCOVA model.

Table 4. ANCOVA Results for Post-test Overall Writing Anxiety

Source	Type III Sum of Squares	df	Mean Square	F	p	Partial η^2
Corrected Model	21.84	2	10.92	61.35	.000	.614
Intercept	3.12	1	3.12	17.53	.000	.185
Pre_Test (Covariate)	0.24	1	0.24	1.35	.249	.017
Group (Instruction)	21.58	1	21.58	121.24	.000	.612
Error	13.71	77	0.18			
Total	775.32	80				
Corrected Total	35.55	79				

Source: Primary data collected and analyzed by the authors, 2026

The primary ANCOVA results presented in Table 3 demonstrate that after adjusting for the initial pre-test baseline anxiety scores, there was a highly statistically significant difference in final post-test L2 writing anxiety levels between the two instructional groups, as evidenced by the robust main effect: $F(1, 77) = 121.24$, $p < .001$. The obtained effect size was extremely substantial, with a Partial Eta Squared (η^2) value of .612, implying that 61.2% of the total variance in the students' post-test writing anxiety can be uniquely and directly attributed to the type of instructional method utilized. The evaluation of estimated marginal means further verified this directional outcome, proving that the Experimental Group achieved a significantly lower final adjusted mean of writing anxiety ($M = 2.51$) compared to the Control Group, which remained elevated at $M = 3.57$. This statistically validates that the integration of a theory-driven gamified platform offers a significantly superior pedagogical advantage over traditional paper-and-pen instruction in systematically mitigating affective barriers in secondary EFL education.

Discussions

The statistical analysis for RQ1 revealed a stark contrast between the two instructional environments. For the Experimental Group, the paired-samples t-test demonstrated a highly significant drop in overall L2 writing anxiety from the pre-test to the post-test. The observed effect size was exceptionally large, indicating that the pedagogical transition from a traditional classroom to a gamified ecosystem exerted a profoundly powerful impact on lowering students' emotional distress. Conversely, the Control Group, exposed to traditional product-oriented paper-and-pen instruction, displayed only a nominal, statistically non-significant reduction in writing anxiety.

This divergence clearly validates the baseline assumption that conventional writing instruction in Vietnam, which frequently heavily prioritizes rigid product evaluation over iterative processing, fails to alleviate psychological strain (Luu et al., 2025; Hu & Zhang, 2026). When students are confined to teacher-prompted tasks on paper, their cognitive processing is often overwhelmed by the fear of negative evaluation (FNE) and a preoccupation with performance metrics (Cheng, 2004; Luu & Nguyen, 2026). In contrast, the integration of game mechanics directly addresses the multidimensional components of anxiety operationalized by Cheng (2004).

Descriptively, the experimental group's somatic anxiety dropped from $M = 3.65$ to $M = 2.45$, and cognitive anxiety decreased from $M = 3.82$ to $M = 2.60$. This systemic decline across both physiological and mental symptoms suggests that the gamified writing platform successfully lowered the "affective filter" (Oxford, 2017). By restructuring writing tasks into lower-stakes digital quests or challenges, the platform cultivated a safe-failure environment. Within this setup, mistakes were reassessed as informative feedback data points rather than permanent qualitative failures, directly weakening the root causes of cognitive worry and physical nervousness (Luu & Nguyen, 2026).

To answer RQ2, the ANCOVA neutralized any potential pre-existing baseline discrepancies between the two intact cohorts. The results yielded a highly significant main effect for the mode of instruction. An effect size 12 indicates that 61.2% of the total variance in the participants' post-test writing anxiety can be uniquely and directly attributed to the type of pedagogical treatment they received. The estimated marginal means conclusively proved that the Experimental Group ($M = 2.51$) achieved a significantly lower final level of writing anxiety compared to the Control Group ($M = 3.57$).

These findings can be theoretically interpreted through the triangulation of Self-Determination Theory (SDT), Flow Theory, and Keller's ARCS Model synthesized by Luu et al. (2025). Traditional classrooms frequently over-rely on memory retention and passive listening, which accelerates disengagement and emotional boredom (Luu et al., 2025). The gamified platform, however, functions as a need-supportive framework that fosters intrinsically motivated engagement (Luu, 2025; Nie et al., 2026; Lo, 2026; Zhang et al., 2025; Cheng et al., 2026). By providing structural elements like points, badges, and immediate feedback loops, the platform systematically satisfied the learners' basic psychological needs for *autonomy* (perceived control over their writing pace and choices) and *competence* (perceived mastery via visible progression indicators) (Deci & Ryan, 1987; Luu, 2025).

Furthermore, according to Flow Theory, optimal task immersion occurs when the difficulty of a task is continuously balanced with the learner's evolving capabilities (Csikszentmihalyi, 1990). The platform's adaptive structure and explicit instructional scaffolding including progressive writing challenges and consciousness-raising activities prevented students from becoming overwhelmed by the high cognitive load inherent in L2 writing (Luu, 2025). This balance directly neutralized avoidance

behaviors, which saw a major drop from $M = 3.58$ to $M = 2.52$ in the experimental group.

Finally, these experimental results expand upon previous correlational data established in the Vietnamese context. While Luu and Nguyen (2026) identified that advanced language proficiency is a natural factor that reduces writing anxiety, this study contributes an active, technology-mediated solution. It demonstrates that even if students possess limited initial language knowledge, an anxiety-sensitive pedagogy powered by targeted gamification mechanics can structurally bypass affective blockages, paving a clear, empirical path toward enhanced productive performance and higher writing motivation (Luu & Hien, in press).

CONCLUSION

This quasi-experimental study demonstrates that an 8-week gamified writing intervention significantly reduces overall L2 writing anxiety, including somatic, cognitive, and avoidance sub-dimensions, among 80 Vietnamese high schoolers, explaining 61% of post-test variance compared to traditional methods. Pedagogically, results advocate shifting toward an anxiety-sensitive, process-oriented framework. Gamified elements (points, badges) should be theory-driven, grounding technology in Self-Determination Theory to foster student autonomy and balance affective support with cognitive rigor. However, scope limitations exist due to the small sample size and an exclusively quantitative, questionnaire-based approach. Future mixed-methods, longitudinal research is recommended to track long-term anxiety reduction and writing achievement.

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