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Research Article

Language, Anxiety, and Digital Assessment: Exploring Online Standardized Test Anxiety in English and Thai among University Students at a Thai University

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ABSTRACT

This article aimed to study (1) the prevalence and profile of online standardized test anxiety among university students for English and Thai subjects, (2) the relationship between test anxiety (in its various dimensions) and students' performance in online standardized tests, and (3) the primary challenges, preferences, and perceptions reported by students regarding the administration, technical systems, and processes of online standardized testing. The sample was 347 third-year undergraduate students from a university in Thailand. They were selected by purposive sampling. The instrument used to collect data was a set of validated multidimensional anxiety scales, institutional performance data, and student perception surveys for both English and Thai online exams. Data were analyzed using descriptive statistics, including frequency distributions, percentages, means, and standard deviations, to summarize anxiety levels and survey responses. Inferential statistical analyses were conducted using bivariate (Pearson's correlation) and multivariate (regression) techniques to examine the relationship between each anxiety dimension and students' performance in both English and Thai exams. The results of the study found that: 1. Psychological anxiety was highest for English and significantly lower for Thai, confirming the strong influence of language context. 2. Psychological anxiety negatively predicted test performance in both subjects, while technical anxiety was only significant for Thai. This finding is consistent with students' satisfaction results: although overall satisfaction levels were not markedly different between the two systems, the Thai online exam system received lower satisfaction ratings than the English system in several areas, including interface clarity, equipment availability, system standardization, and system suitability. 3. Students expressed high satisfaction with digital infrastructure and support but ongoing concerns about pressure in high-stakes English exams and fairness of administration. The study highlights the importance of targeted, context-sensitive strategies for addressing test anxiety in multilingual online assessment contexts.

Keywords: Academic Performance, Digital Assessment, Multilingual Assessment, Online Test Anxiety

Introduction

The digital transformation of educational assessment, accelerated by COVID-19 and ongoing technological change, has shifted high-stakes testing online and created new challenges for students and teachers (Coman et al., 2020; Stowell & Bennett, 2010). Test anxiety, previously linked mainly to worry

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and arousal during paper-based exams (Liebert & Morris, 1967; Moser et al., 2012), is now recognized as a multidimensional phenomenon shaped by physiological, psychological, and technical stressors (Chao et al., 2024; Owens et al., 2012; Taylor & Deane, 2002; Zeidner, 1998). Recent studies reveal a divided picture: while some suggest online assessments may reduce anxiety by lowering social pressures, others argue that technical issues and surveillance heighten stress (Mohammed et al., 2021; Tat & Kilic, 2024). Thus, the overall impact of digital assessment environments on test anxiety remains contested.

Linguistic context further complicates this landscape. Students consistently report higher anxiety levels during assessments in a second or foreign language—a pattern observed globally, and particularly in Southeast Asia where English proficiency testing is high-stakes and consequential for academic and professional advancement (Aydin et al., 2020; Dewaele & MacIntyre, 2014; Horwitz, 2017; Waluyo, et al., 2025). Although negative associations between test anxiety and academic performance are well established, especially for psychological and physiological domains (Chapell et al., 2005; Von der Embse et al., 2018), the shift to online testing introduces new factors such as digital literacy, system reliability, and device access, all of which interact with student anxiety and achievement (Gikandi et al., 2011; Coman et al., 2020). Despite these insights, most research to date has not systematically compared online test anxiety and outcomes across both native and foreign language domains, especially in non-Western, large-scale institutional settings.

These gaps are pronounced in the Thai context, where online standardized assessments are now routine (Waluyo et al., 2024), but the multidimensional effects on student anxiety and performance remain underexplored. Existing studies seldom account for student's lived experiences—such as device usage, internet reliability, and perceived fairness—despite their centrality to digital testing outcomes (Domínguez-Figaredo & Gil-Jaurena, 2025; Meulmeester et al., 2021). This study addresses these limitations by examining the prevalence, profile, and academic consequences of online standardized test anxiety at a Thai university, leveraging annual institution-wide testing in both Thai and English. Through validated, multidimensional measures and within-subjects comparisons, this research aims to advance understanding of student experiences and inform digital assessment design in Thai higher education and similar contexts.

Research Objectives

1. To examine the prevalence and profile of online standardized test anxiety among university students for English and Thai subjects.

2. To explore the multidimensional relationship between test anxiety (in its various dimensions) and students' performance in online standardized tests in English and Thai

3. To identify the primary challenges, preferences, and perceptions reported by students regarding the administration, technical systems, and processes of online standardized testing.

Research Methodology

We used a cross-sectional explanatory correlational design to investigate online standardized test anxiety among undergraduate students at a Thai public university. By collecting data at one point in time, we captured a detailed snapshot of test anxiety and its impact on academic performance in both Thai and English contexts (Creswell & Creswell, 2017). Pearson's Correlation was used to find the strength and direction of relationships between different types of anxiety and test scores. Multiple regression helped

us see how well these anxiety types predicted students' performance, while considering other factors. This approach allowed us to explore how physiological, psychological, and technical aspects of anxiety affect student achievement in high-stakes, technology-mediated assessments. Our methodology addresses key gaps in the literature on digital assessment equity and variability, providing crucial insights into how language context influences test anxiety. Additionally, we clearly identified the variables used in each stage of the analysis: descriptive statistics included gender, GPA (GPAX), monthly income, devices used for the exam, testing system, internet access, exam process, and testing platform; inferential statistics focused on physiological anxiety, psychological anxiety, technical anxiety, and examination results.

1. Participants and Sampling

Our participant pool comprised 347 third-year undergraduate students, each of whom had completed at least one online standardized test in both Thai and English during the 2024–2025 academic year. This cohort was strategically targeted to ensure maximum and equivalent exposure to both the university's Moodle-based WU E-testing platform for Thai and the SOLGEN Testing Center for English. By focusing on third-year students, we controlled for potential confounds such as first-year adaptation effects and incomplete system exposure among upper-level students. Sampling was conducted using a purposive approach, prioritizing authenticity and direct institutional relevance, consistent with best practices in educational research (Etikan et al., 2016). While this method may limit broader generalizability, it is well justified in studies aiming to capture real-world experiences within a specific institutional setting. The sample's demographic diversity, including a wide range of gender, academic achievement, and socioeconomic backgrounds, as presented in Table 3, supported rigorous multivariate analysis and subgroup comparisons, enhancing the contextual relevance and empirical strength of our findings.

2. Research Instruments

Data were collected through a developed, self-administered questionnaire, distributed online. The instrument was adapted from established sources, including the Test Anxiety Inventory (Szafranski et al., 2012) and validated digital test anxiety measures (Stowell & Bennett, 2010). It was refined via expert review and exploratory factor analysis to ensure cultural and contextual suitability. The final questionnaire comprised three sections: (1) demographic and academic background (gender, GPA, and family income); (2) a 15-item Multidimensional Test Anxiety Scale covering physiological, psychological, and technical anxiety domains; and (3) items capturing student perceptions of online exams—such as device usage, system preferences, internet reliability, process efficiency, and logistical challenges. The instrument demonstrated high internal consistency (Cronbach's α = .893 overall; α = .812–.874 for subscales), and the student perceptions section was also reliable (α = .843). Moreover, official test performance data were then retrieved from university records and matched to survey responses using anonymous student IDs, enabling robust linkage of anxiety and outcome variables while preserving participant confidentiality. This procedure ensured objectivity in performance measurement and strengthened the empirical rigor of the study. Table 1 presents the breakdowns.

Table 1 Breakdown of Survey Instrument Domains, Example Items, Validation Sources, and Reliability Indices

Instrument Section	Domains/Subscales	No. of Items	Example Items	Validation/Source	Reliability (Cronbach's α)
Demographic/ Academic Background	Gender, GPA, Income	3	–	Self-report	–
Multidimensional Test Anxiety Scale	Physiological Anxiety	5	"I feel dry mouth before an exam"	Spielberger (1980); Stowell & Bennett (2010); expert review	.812
	Psychological Anxiety	5	"I have negative thoughts about the test"	Spielberger (1980); Stowell & Bennett (2010); expert review	.874
	Technical Anxiety	5	"Using the online system makes me anxious"	Spielberger (1980); Stowell & Bennett (2010); expert review	.841
	Total Anxiety Scale	15			.893
Student Perceptions of Online Exams	Device use, system, process	10	"I am satisfied with my home internet"; "The system is easy to use"	Expert panel	.843

3. Data Collection

The university's annual institution-wide online assessment policy established an exceptionally controlled quasi-experimental environment for this study. Every academic year, all undergraduate students are mandated to complete standardized, proctored online proficiency tests in both Thai and English, using two unified digital platforms—Moodle-based WU E-testing for Thai and the SOLGEN Testing Center for English— each with strict invigilation protocols and camera-monitored proctoring. This systematic structure ensures uniform testing conditions across the student body and enables precise within-subjects comparison of anxiety and performance by language domain, substantially enhancing internal validity. The research procedures began with coordination between the research team and university administrators to secure ethical approval and participant consent. All eligible third-year students were invited to participate immediately after completing their annual online assessments, ensuring that their experiences with both testing systems were current and comparable. Participation was voluntary and confidentiality was strictly maintained throughout the data collection process.

4. Data Analysis

4.1 Descriptive Analysis: Data from the questionnaire on student test anxiety and perceptions of online exams were analyzed using descriptive statistics, including frequency distributions, means, standard deviations, and percentages. Mean anxiety scores were interpreted as follows:

3.26 - 4.00 = Always anxious
2.51 - 3.25 = Almost always anxious
1.76 - 2.50 = Sometimes anxious
1.00 - 1.75 = Rarely anxious

4.2 Bivariate (Pearson's correlation) and multivariate (regression) techniques were used to examine the relationship between each dimension of test anxiety and students' performance in both English and Thai exams.

Conceptual Framework

1. Prevalence and Multidimensional Profile of Online Standardized Test Anxiety

Test anxiety is a well-documented, multidimensional issue involving psychological distress, physiological arousal, and cognitive interference (Owens et al., 2012; Zeidner, 1998). Its impact has become more nuanced in digital contexts, where some students feel relief while others face heightened stress due to unfamiliar platforms and technical concerns (Stowell & Bennett, 2010; Coman et al., 2020). Digital therapies such as internet-based CBT have shown promise (Alibak & Alibak, 2021), but anxiety predictors like self-esteem and test stakes remain influential (von der Embse et al., 2018). Language anxiety, particularly in English assessments, further intensifies anxiety and reduces performance in multilingual settings (MacIntyre & Gardner, 1991; Dewaele & MacIntyre, 2014; Horwitz, 2017).

2. Relationship Between Test Anxiety and Online Test Performance

A strong inverse relationship exists between test anxiety and academic performance, especially in high-stakes settings (Chapell et al., 2005; von der Embse & Witmer, 2014). Psychological components like worry are the most disruptive (Cassady & Johnson, 2002; Schillinger et al., 2021), and these effects may be worsened by cognitive distortions or poor coping skills (Putwain et al., 2016; Owens et al., 2012). Online contexts add complexity—while digital formats may reduce social pressure, they also introduce new stressors like proctoring and tech failures (Stowell et al., 2012; Mohammed et al., 2021). Still, psychological anxiety remains the most consistent predictor of lower scores, especially in second-language assessments (Aydin, 2020; Theobald et al., 2022).

3. Student Challenges, Preferences, and Perceptions of Online Standardized Testing

Online testing poses both technical and emotional challenges. Students report concerns over fairness, connectivity, and system usability (Brown, 2019; Sefcik et al., 2022). Device disparities and unfamiliar systems can deepen anxiety, though experience with platforms improves perceptions over time (Coman et al., 2020; Gamage & Perera, 2021). Positive student experiences correlate strongly with clear instructions, fair design, and responsive support systems (Henderson et al., 2024; Duncan & Joyner, 2022). Institutions must prioritize transparency, anti-cheating protocols, and user-friendly design (Stowell & Bennett, 2010; St-Onge et al., 2022).

4. Research Gap and Study Contribution

Most prior studies focus on single-language or small-scale contexts. Few have compared anxiety profiles, performance outcomes, and student perceptions across multiple languages in standardized, digital university settings—particularly in Southeast Asia. This study addresses these gaps by investigating anxiety in both English and Thai online tests, exploring the multidimensional anxiety–performance relationship, and examining student perspectives on systems and processes. It contributes nuanced, comparative insight into the interaction of language, technology, and test anxiety within Thai higher education.

Based on the literature review, key themes and gaps in online standardized test anxiety and performance were summarized (see Table 2).

Table 2 Key Themes and Gaps in the Literature on Online Standardized Test Anxiety and Performance

Research Focus	Prior Findings & Theoretical Insights	Notable Gaps/Unresolved Issues	Key References
Prevalence & Dimensions of Online Test Anxiety	Test anxiety is multidimensional (physiological, psychological, cognitive); online formats add technical and surveillance-related stressors.	Few studies compare prevalence/profiles across first and second languages in institution-wide digital tests.	Owens et al., 2012; Stowell & Bennett, 2010; Tat & Kılıç, 2024; von der Embse et al., 2018
Language Anxiety in Online Testing	Foreign/second language assessments heighten anxiety and reduce performance; English tests provoke more anxiety than native language assessments.	Limited comparative analysis of anxiety across language domains within the same digital system, especially in Thai HE.	MacIntyre & Gardner, 1991; Dewaele & MacIntyre, 2014; Nawas, 2020; Xu & Xie, 2024
Test Anxiety–Performance Relationship	Strong inverse relationship between anxiety and performance; mediated by cognitive, emotional, and technical factors.	Lack of integrated, multi-dimensional analysis linking anxiety and outcomes in dual-language online contexts.	Chapell et al., 2005; Cassady & Johnson, 2002; Schillinger et al., 2021; Bertrams et al., 2013
Student Challenges, Preferences, & Perceptions	Technical, access, and design issues influence anxiety and attitudes; support, usability, and fairness are critical for positive perceptions.	Insufficient focus on student voice and cross-language comparison in standardized, high-stakes online exams.	Brown, 2019; Eltahir et al., 2023; Sefcik et al., 2022; James, 2016; Henderson et al., 2024
Device Usage & Digital Equity	Device type/quality and internet reliability affect anxiety, satisfaction, and sometimes performance; smartphone use mixed in impact.	Gaps in device- and context-specific analysis in Asian higher education, especially within standardized testing.	Coman et al., 2020; Di Meo & Marti-Ballester, 2020; Gamage & Perera, 2021; Sage et al., 2021
Institutional and Contextual Factors	Institutional support, clear communication, and user-centered design mitigate anxiety and improve engagement.	Limited evidence from mandatory, institution-wide online assessments in under-researched regions like Thailand.	Henderson et al., 2024; St-Onge et al., 2022; Gikandi et al., 2011; Duncan & Joyner, 2022

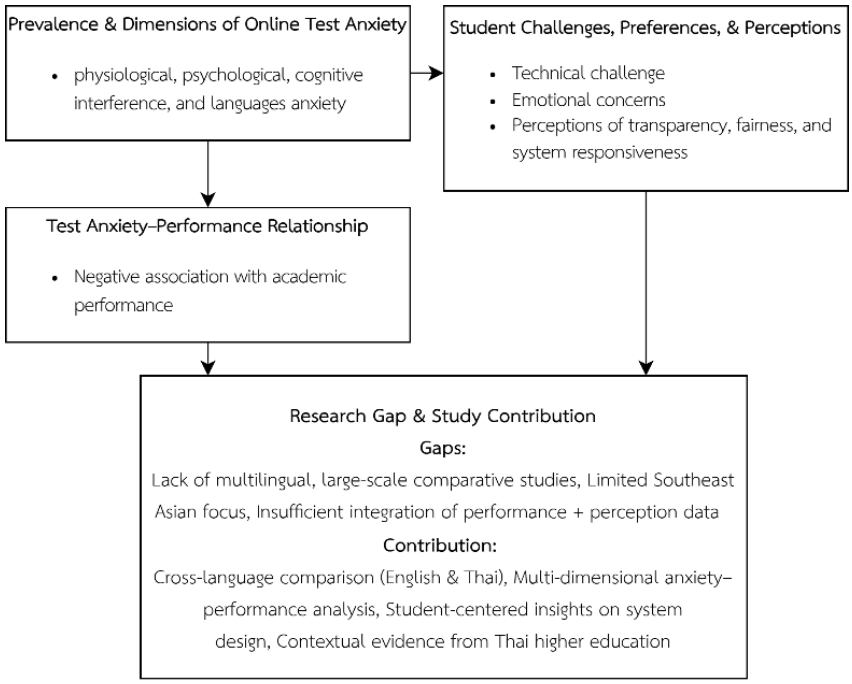

Figure 1 Conceptual Framework

Research Results

Based on the findings, the study revealed the following results:

1. Prevalence and Multidimensional Profile of Online Standardized Test Anxiety

This study surveyed 347 undergraduate students to explore their experiences with anxiety in online standardized testing for both English and Thai subjects. The sample was predominantly female (73.8%), which mirrors gender distributions in many language and education programs across Southeast Asia and may itself influence the prevalence and manifestation of test anxiety. The participants represented a wide range of academic achievements, with the largest subgroup (37.8%) reporting a GPAX between 3.00 and 3.49, and a substantial minority (34.8%) below 3.00, indicating sufficient variation to meaningfully assess the relationship between anxiety and academic performance. Monthly income data also showed socioeconomic diversity, although the largest segment (38.6%) reported family incomes between 10,001 and 20,000 baht, reflecting the socioeconomic landscape of a typical regional university in Thailand (see Table 3).

Table 3 Demographic and Academic Profile of Respondents (N = 347)

Variable	Category	n	%
Gender	Male	91	26.2
	Female	256	73.8
	Total	347	100
GPA (GPAX)	2.00–2.49	33	9.5
	2.50–2.99	88	25.4
	3.00–3.49	131	37.8
	3.50–3.99	94	27.1
	4.00	1	0.3
	Total	347	100
Monthly Income	<10,000 THB	56	16.1
	10,001–20,000 THB	134	38.6
	20,001–30,000 THB	68	19.6
	30,001–40,000 THB	40	11.5
	40,001–50,000 THB	23	6.6
	>50,000 THB	26	7.5
Total		**347**	**100**

Test anxiety was conceptualized and measured across three core domains: physiological, psychological, and technical. The findings reveal a nuanced and differentiated profile of anxiety experiences across language contexts. For online English standardized tests, students reported the highest anxiety in the psychological domain, with a mean score approaching the "sometimes anxious" threshold ($M = 1.96$, $SD = 0.94$). This domain captured feelings of restlessness, negative thoughts about exam outcomes, fear of failure, and acute stress regarding test results—most notably, the item "I feel very stressed because I don't know if I will pass the exam" yielded the highest mean, highlighting outcome-oriented worry as a salient stressor even in digital testing environments. Physiological symptoms such as rapid heartbeat, sweating, or sleep disturbances were also present, though to a slightly lesser extent ($M = 1.81$, $SD = 0.90$). Technical anxiety—comprising discomfort with online platforms, concerns about proctor

competence, or fear of technology failure—was less prominent (M = 1.55, SD = 0.78), falling below the "sometimes anxious" threshold and suggesting a growing familiarity with digital tools among the university population (see Table 4).

In contrast, anxiety levels reported for the online Thai standardized test were uniformly lower across all domains. Students averaged below the "sometimes anxious" threshold on physiological (M = 1.61, SD = 0.82), psychological (M = 1.68, SD = 0.86), and technical (M = 1.45, SD = 0.73) dimensions. These findings suggest that students feel substantially more secure and less threatened when tested in their native language, a pattern widely documented in the literature on test anxiety in multilingual and EFL contexts. Importantly, the relatively low technical anxiety in both subjects may reflect successful digital infrastructure investment by the university, improved student digital literacy, or possible sample selection bias favoring technologically adept students. Nonetheless, these results counter the assumption that technical barriers remain a primary obstacle to successful online assessment in Thai higher education (see Table 4).

Table 4 Test Anxiety Levels: English and Thai Subject (N = 347)

Domain	Item	English			Thai		
		M	SD	Interpretation	M	SD	Interpretation
Physiological	Dry mouth	1.82	0.84	Sometimes anxious	1.59	0.78	Rarely anxious
	Muscle twitches	1.47	0.75	Rarely anxious	1.40	0.72	Rarely anxious
	Trouble sleeping	1.86	0.91	Sometimes anxious	1.66	0.84	Rarely anxious
	Heart beats fast	2.07	0.95	Sometimes anxious	1.75	0.89	Rarely anxious
	Sweating, hot/cold palms	1.85	0.92	Sometimes anxious	1.63	0.84	Rarely anxious
Subscale Mean		1.81	0.90	Sometimes anxious	1.61	0.82	Rarely anxious
Psychological	Anxious/restless	2.11	0.93	Sometimes anxious	1.72	0.86	Rarely anxious
	Negative thoughts	1.87	0.86	Sometimes anxious	1.62	0.81	Rarely anxious
	Fear of failure	1.81	0.90	Sometimes anxious	1.63	0.85	Rarely anxious
	Feels ineffective	1.63	0.83	Rarely anxious	1.48	0.73	Rarely anxious
	Stressed about passing	2.37	1.00	Sometimes anxious	1.95	0.97	Sometimes anxious
Subscale Mean		1.96	0.94	Sometimes anxious	1.68	0.86	Rarely anxious
Technical	Uncomfortable with tech	1.67	0.86	Rarely anxious	1.54	0.82	Rarely anxious
	Poor proctor communication	1.64	0.81	Rarely anxious	1.50	0.72	Rarely anxious
	Proctor system inexperience	1.60	0.77	Rarely anxious	1.45	0.71	Rarely anxious
	Online > on-site stress	1.47	0.72	Rarely anxious	1.36	0.68	Rarely anxious
	Expect lower online scores	1.40	0.67	Rarely anxious	1.38	0.68	Rarely anxious
Subscale Mean		1.55	0.78	Rarely anxious	1.45	0.73	Rarely anxious
Total Anxiety		**1.78**	**0.89**	**Sometimes anxious**	**1.58**	**0.81**	**Rarely anxious**

2. Relationship Between Test Anxiety and Online Test Performance

To probe the impact of anxiety on actual academic outcomes, the study analyzed the relationship between each anxiety domain and standardized test performance using both bivariate (Pearson's correlation) and multivariate (regression) techniques.

For the English subject, both physiological and psychological anxiety were found to be statistically significant but weakly negative predictors of test performance ($r = -.120$, $p = .025$ and $r = -.158$, $p = .003$, respectively). Notably, technical anxiety did not demonstrate a meaningful association with English test scores ($r = -.011$, $p = .843$), further supporting the conclusion that technology-related concerns have a

negligible effect on achievement within this student population. The aggregate anxiety score also showed a weak but statistically significant negative correlation with test performance ($r = -.118$, $p = .028$) (see Table 5).

These patterns are consistent with international research that identifies psychological stress as the most potent and consistent correlate of reduced academic achievement, even as online test delivery becomes normalized.

The Thai subject, meanwhile, exhibited a slightly different pattern. Here, all three anxiety domains— physiological, psychological, and technical— demonstrated statistically significant negative relationships with test scores ($r = -.165$, $p = .002$; $r = -.202$, $p < .001$; $r = -.137$, $p = .010$, respectively), with psychological anxiety again showing the largest effect. While all correlations fell within the weak to moderate range, the broader profile of anxiety-related detriments to test performance in the Thai subject suggests that native-language confidence may be offset by a greater sensitivity to contextual factors such as technical difficulties or physical discomfort. Alternatively, it may reflect differences in test format, proctoring stringency, or other latent variables not directly measured in this study (see Table 5).

Table 5 Correlations between Anxiety Dimensions and English-Thai Test Performance

Anxiety Domain	English			Thai		
	r	p-value	Interpretation	r	p-value	Interpretation
Physiological	–0.120*	0.025	Weak, negative	–0.165**	0.002	Weak, negative
Psychological	–0.158**	0.003	Weak, negative	–0.202**	<.001	Weak-to-moderate, negative
Technical	–0.011	0.843	Not significant	–0.137*	0.010	Weak, negative
Total Anxiety	**–0.118***	**0.028**	**Weak, negative**	**–0.192****	**<.001**	**Weak-to-moderate, negative**

Note: *p < .05; **p < .01

Regression analyses further elucidate the predictive strength of each anxiety domain. For English, both physiological and psychological anxiety retained their status as significant negative predictors in the multivariate model, with regression coefficients indicating that each one-unit increase in psychological anxiety is associated with a 0.32-point decrease in test scores, and each unit of physiological anxiety with a 0.25-point decrease. The overall explanatory power of the model, however, was limited ($R^2 = 0.014–0.025$), signaling that while anxiety is a statistically detectable factor, it accounts for only a small fraction of variance in test performance (see Table 6).

This aligns with consensus in the literature that academic achievement is multifactorial, and emphasizes the caution needed when interpreting effect sizes in social science research.

In contrast, the regression model for the Thai subject found all three domains— physiological, psychological, and technical—to be significant negative predictors. Psychological anxiety was the strongest predictor, with a regression coefficient of –0.44, followed by physiological (–0.37) and technical (–0.35) anxiety. The model accounted for 3.7% of the variance in Thai test scores, which, although still modest, represents a more substantial effect than that observed for English (see Table 6).

Table 6 Multiple Regression Predicting English and Thai Test Scores from Anxiety Dimensions

Predictor	English					Thai				
	β	B	p-value	R^2	Interpretation	**β**	B	p-value	R^2	Interpretation
Physiological Anxiety	−0.120	−0.25	.025*	0.014	Significant, negative effect	−0.165	−0.37	.002**	0.027	Significant, negative effect
Psychological Anxiety	−0.158	−0.32	.003**	0.025	Significant, negative effect	−0.202	−0.44	<.001**	0.041	Significant, negative effect
Technical Anxiety	−0.011	−0.02	.843	0.000	Not significant	−0.137	−0.35	.010*	0.019	Significant, negative effect
Constant		**43.55**	**.028***				**71.36**	**<.001****		

Note: *p < .05; **p < .01

This differential may reflect either the cumulative impact of minor anxieties in a low-stakes environment, or specific aspects of the Thai testing process that exacerbate performance barriers for anxious students.

Critically, these findings must be situated within the broader context of ongoing debates regarding online assessment and learner well-being. The limited variance explained by anxiety suggests that interventions aimed at reducing student anxiety, while valuable, cannot substitute for broader reforms in test design, instructional support, and digital access. At the same time, the consistent negative association between anxiety and test scores—especially in the psychological domains, supports the case for integrating psychological skills training, resilience-building, and test-wiseness strategies into language education curricula. The near-negligible influence of technical anxiety in English, but not Thai, points to the need for ongoing, context-specific investigations into how technology mediates assessment outcomes in rapidly digitizing educational systems.

3. Student-Reported Problems and Evidence Regarding Online Standardized Testing

The transition to online standardized assessment has surfaced a complex array of student experiences, both logistical and perceptual. To gain a holistic understanding, the study surveyed all 347 participants regarding the tools, systems, and contexts used during online examinations for both English and Thai subjects. The results indicate a strong reliance on personal technology and highlight preferences, barriers, and systemic differences that warrant institutional attention.

3.1 Device Utilization for Online Examinations

Most students reported using a Tablet or iPad as their primary device for online tests (45.8%), followed by a PC or Notebook (36.6%), and a smaller group using a Smartphone (17.6%) (see Table 10). This finding signals considerable student access to mid-to-high-end personal technology, which is likely to reduce device-related inequity, but may inadvertently disadvantage students with less reliable hardware or larger screens. Notably, when required to open their camera for invigilation (e.g., via Zoom), device preferences shifted: PCs/Notebooks became the most common choice (35.7%), closely followed by Smartphones (32.6%) and Tablets/iPads (31.7%). This reflects flexibility in device access but also highlights the expectation for students to manage multiple devices or adapt to platform-specific requirements.

Table 7 Devices Used for Online Examinations and Camera Activation (N = 347)

Purpose	Smartphone	Tablet/iPad	PC/Notebook	Total	SD
For exam taking	61 (17.6%)	159 (45.8%)	127 (36.6%)	347	0.712
For camera (Zoom)	113 (32.6%)	110 (31.7%)	124 (35.7%)	347	0.827

3.2 Testing System Preferences

Students exhibited a clear preference for the WU e-Testing system (used for Thai exams), with 58.8% favoring it over the Website SOLGEN Testing Center used for English (41.2%). The reasons for this preference were elaborated in qualitative comments (see Section 4.3.2), often relating to interface familiarity, ease of use, or fewer technical issues with the e-Testing platform (see Table 8).

Table 8 Student Preferences for Online Testing Systems

System	n	%
WU e-Testing (Thai)	204	58.8
Website SOLGEN Testing Center (English)	143	41.2
Total	**347**	**100**

3.3 Internet and Exam Process Readiness

The readiness of students' internet connections and the perceived efficiency of the examination process are critical for successful online assessment. Students were asked to rate their agreement with statements regarding their main internet source and various exam process factors on a Likert scale (see Table 9).

Internet Connection. Most students reported high satisfaction with their home Wi-Fi (M = 2.84, SD = 1.05) and mobile network (5G/4G/3G) (M = 2.83, SD = 0.88), while public Wi-Fi (campus, cafes, etc.) received the lowest satisfaction (M = 2.56, SD = 0.92). This underlines a reliance on private connections, which could deepen the digital divide if some students lack stable home networks.

Exam Process. Across all items, students strongly agreed that the online exam process was smooth, supportive, and well-managed. The highest ratings went to staff guidance (M = 3.17, SD = 0.79) and on-time administration (M = 3.16, SD = 0.79). Even the lowest-rated items—clarity of exam rules and anti-cheating procedures—were rated favorably (M ≈ 2.93–2.94).

Table 9 Student Perceptions of Internet Readiness and Exam Process (N = 347)

Domain	Aspect/Item	Mean	S.D.	Interpretation
Internet	Home Wi-Fi	2.84	1.05	Strongly Agree
	Public Wi-Fi	2.56	0.92	Strongly Agree
	Mobile Network	2.83	0.88	Strongly Agree
Process	Rule/Instruction Clarity	2.93	0.79	Strongly Agree
	Anti-cheating Method	2.94	0.84	Strongly Agree
	Exam Smoothness/Convenience	3.01	0.81	Strongly Agree
	Timeliness	3.16	0.79	Strongly Agree
	Staff Support	3.17	0.79	Strongly Agree
Overall Exam Process (Mean)		**3.08**	**0.02**	**Strongly Agree**

3.4 Perceived Effectiveness of English and Thai Online Test Systems

Student perceptions of system effectiveness were also probed with specific items for each platform. Both systems received high marks for efficiency, accessibility, technical stability, and perceived fairness, with overall mean ratings close to or above 2.95 ("strongly agree") (see Table 10).

Table 10 Perceived Effectiveness of Online Testing Platforms

Item/Platform	English		Thai	
	M	SD	M	SD
Reduces cheating	2.67	0.85	2.76	0.85
Login ease	2.99	0.83	3.01	0.79
System standardization	3.02	0.79	3.00	0.78
Exam/time match	2.87	0.86	2.90	0.86
Access to items	3.04	0.76	3.05	0.76
Interface clarity	3.01	0.79	2.96	0.83
Enough equipment	3.14	0.79	3.08	0.80
System suitability	3.06	0.75	3.04	0.78
Score reporting	2.91	0.83	2.92	0.84
Internet connection smoothness	2.92	0.82	2.95	0.83
Total	**2.96**	**0.82**	**2.97**	**0.82**

Discussions

This study sought to address major gaps in the literature by systematically examining the prevalence and multidimensional profile of online standardized test anxiety, its relationship to test performance, and student-reported challenges and perceptions within both native (Thai) and foreign (English) language domains at a large Thai university. Prior research has documented the complexity of test anxiety in digital environments, the role of language context, and the technical and institutional factors shaping student experiences (Owens et al., 2012; Stowell & Bennett, 2010; von der Embse et al., 2018; Coman et al., 2020). However, few studies have directly compared anxiety and outcomes across multiple language domains in a single, highly standardized, non-Western institutional setting, nor have they comprehensively integrated student perceptions about technological and administrative processes (Dewaele & MacIntyre, 2014; Nawas, 2020; Domínguez-Figaredo & Gil-Jaurena, 2025). By combining large-scale survey data, multidimensional anxiety profiling, performance analytics, and student experience metrics, this study advances the field's understanding of how language, anxiety, and digital infrastructure intersect in contemporary higher education, particularly in Southeast Asia.

The findings for Research Objective 1 reveal that test anxiety remains a salient issue in online assessments, but its severity and profile are strongly mediated by language context. Students exhibited the highest levels of anxiety in the psychological domain during English online standardized tests, with concerns about outcomes, failure, and self-efficacy most pronounced—aligning with extensive literature on language anxiety as a barrier in foreign language testing (Horwitz, 2017; MacIntyre & Gardner, 1991). Physiological anxiety was also present but somewhat less intense, while technical anxiety was notably the lowest, suggesting that increased digital literacy and robust infrastructure may be mitigating technology-related stressors. In contrast, anxiety scores for the Thai test were uniformly lower across all domains, consistent with research showing reduced anxiety in assessments conducted in students' native

language (Dewaele & MacIntyre, 2014; Xu & Xie, 2024). This result highlights the persistent challenge of high-stakes English testing in the Thai context, where performance on such exams carries substantial academic and professional implications (Waluyo et al., 2025). It also emphasizes that digital transformation alone does not neutralize language-related affective barriers.

Turning to Research Objective 2, the relationship between test anxiety and online test performance was confirmed to be negative, though generally weak, with psychological anxiety emerging as the most significant predictor of lower scores in both English and Thai. These findings resonate with meta-analyses indicating that psychological anxiety—especially worry and negative thoughts—consistently undermines academic achievement (Cassady & Johnson, 2002; von der Embse et al., 2018; Schillinger et al., 2021). This research contributes meaningfully to the design of assessment processes that aim to reduce pressure and enhance students' confidence, particularly in relation to language proficiency and psychological support during examinations. Notably, technical anxiety showed little to no association with English test scores, further supporting the claim that, in well-resourced settings, technology concerns are less critical than affective or linguistic barriers. However, in the Thai subject, even technical and physiological anxiety demonstrated significant, albeit modest, negative effects, possibly reflecting greater sensitivity to contextual or test-specific variables in native-language assessment. This difference is supported by student satisfaction data. While overall satisfaction was similar, the Thai exam system received lower ratings in interface clarity, system standardization, equipment availability, and system suitability. This suggests possible design or implementation mismatches, which may have increased technical anxiety and impacted performance. Importantly, the modest variance explained by anxiety domains signals that other factors—such as prior preparation, instructional quality, or unmeasured social stressors—remain central to digital assessment outcomes, echoing broader debates about the multifactorial nature of academic achievement (Owens et al., 2012; Putwain et al., 2016).

Research Objective 3 addresses students' lived experiences and perceptions regarding online standardized testing. The data reveal generally positive views of digital assessment processes, with high ratings for system usability, fairness, staff support, and exam management—particularly for the university's e-Testing platform used for Thai tests. Access to reliable personal devices and home internet was widespread, which likely contributed to the low reported technical anxiety and high satisfaction. However, challenges persist: students highlighted anxiety related to high-stakes English testing, differences in system familiarity, and concerns about rule clarity and anti-cheating measures. Device usage patterns showed flexibility but also pointed to potential disparities for those lacking access to higher-end hardware, echoing global concerns about digital equity (Coman et al., 2020; Gamage & Perera, 2021). Although system quality and institutional support were generally viewed as strengths, there remains room for improvement in transparency, communication, and ongoing adaptation of digital assessment practices to better support diverse student needs.

In comparison to previous research, this study both confirms and complicates existing understandings. The persistent, multidimensional nature of test anxiety and its negative—if limited—impact on performance are consistent with findings from Western and multilingual settings (Chapell et al., 2005; von der Embse et al., 2018). However, the relatively low technical anxiety and high student satisfaction with institutional platforms challenge assumptions that technology remains the primary barrier in Southeast Asian higher education (Stowell & Bennett, 2010; Tat & Kılıç, 2024). Instead, the results

underline the continued dominance of psychological and linguistic stressors, even in highly digitized environments. Notably, this study's context-sensitive, cross-domain comparison highlights the critical importance of language, assessment design, and local digital capacity in shaping anxiety and outcomes—issues that are often overlooked in the broader literature. These findings emphasize the need to incorporate stress and language management into assessment design. Recommended strategies include providing clear instructions, allowing students to familiarize themselves with the exam format in advance, supporting language and stress management skill development, and accounting for students' language proficiency when designing test content and formats. The findings call for further research into targeted, language-specific interventions and ongoing investment in student-centered, equitable digital testing systems as online assessment becomes ever more central to global higher education.

Originality and Body of Knowledge

This study reveals that psychological anxiety is the most significant factor affecting student performance in online standardized testing, particularly in English assessments. In contrast, technical anxiety appears to have minimal impact, suggesting a high level of digital readiness among students. Although participants expressed general satisfaction with online testing infrastructure, high-stakes English exams continue to be a major source of stress. The findings also underscore the strong influence of language context, with Thai-language exams generating significantly lower anxiety levels. These results highlight the need for targeted psychological and language-based interventions, rather than technical solutions, to more effectively support students in multilingual online assessment environments.

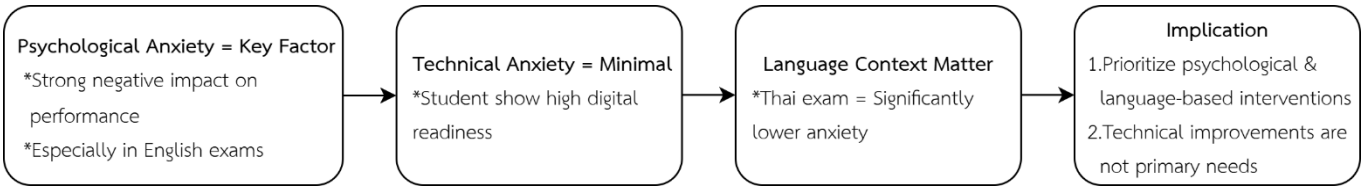

Figure 2 New Knowledge

Conclusions

This study reveals that online standardized test anxiety among Thai university students is predominantly psychological and significantly heightened in English assessments compared to Thai, with psychological anxiety emerging as a consistent negative predictor of performance in both language domains. While students reported high satisfaction with digital infrastructure, support, and exam administration, ongoing concerns regarding high-stakes English exams and perceptions of fairness persist, indicating that language-related and psychological stressors remain primary challenges even in well-supported environments. However, the study's cross-sectional design, reliance on self-reported data, and single-institution focus limit the generalizability of the findings, and do not capture changes in anxiety or performance over time or in other educational settings.

To advance fairness and effectiveness in assessment practices, institutions should extend beyond mere investment in digital infrastructure by implementing policies and interventions that address psychological barriers and perceived inequities. At a broader level, the findings underscore an urgent need to reform online testing systems to accommodate multilingual anxiety, ensure procedural transparency, and foster emotionally

supportive learning environments—particularly in high-stakes and linguistically diverse contexts. Without such systemic measures, performance disparities are likely to persist, regardless of technological readiness.

Recommendations

1. Policymaking Recommendations

Institutions are encouraged to implement targeted interventions— such as psychological skills training, resilience-building, and improved communication of exam procedures—while continuing to enhance digital infrastructure. Addressing both psychological and contextual factors is essential for creating equitable and supportive online assessment environments, particularly in multilingual and high- stakes educational contexts. Practical recommendations include training instructors to support students experiencing test anxiety effectively. Such training can raise awareness of the causes, symptoms, and impacts of anxiety in learning and assessment contexts, while also strengthening instructors' roles in providing emotional support to foster trust and psychological safety in the classroom. Additionally, training can help instructors design learning activities and assessments that reduce pressure, encourage healthy coping strategies, and clearly communicate exam procedures and grading criteria fairly and transparently— thereby enhancing students' confidence in the assessment process. Educators may also be equipped to connect students with institutional support services, such as counseling or academic advising units. These efforts are vital to mitigating the negative effects of test anxiety and promoting students' long-term psychological well-being.

2. Recommendations for Future Research

Future research should adopt longitudinal or experimental designs, include diverse institutional contexts, and integrate qualitative interviews to provide deeper insight into students' lived experiences.

References

Alibak, F., & Alibak, M. (2021). Comparing online cognitive behavioural therapy versus online positive psychotherapy, well-being theory (PERMA) on test anxiety of online learning students: A randomised control study. *Journal of the Australian and New Zealand Student Services Association, 29*(1), 6-17.

Aydin, S., Akkaş, F. D., Türnük, T., Beydilli, A. B., & Saydam, İ. (2020). Test Anxiety among Foreign Language Learners: A Qualitative Study. *Qualitative Report, 25*(12), 4290-4309.

Bertrams, A., Englert, C., Dickhäuser, O., & Baumeister, R. F. (2013). Role of self-control strength in the relation between anxiety and cognitive performance. *Emotion, 13*(4), 668-680.

Brown, G. T. (2019). Technologies and infrastructure: costs and obstacles in developing large-scale computer–based testing. *Education Inquiry, 10*(1), 4-20.

Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology, 27*(2), 270-295.

Chao, T. Y., Sung, Y. T., & Tseng, F. L. (2024). High-stakes test anxiety among Taiwanese adolescents: A longitudinal study. *Cogent Education, 11*(1), 2321019.

Chapell, M. S., Blanding, Z. B., Silverstein, M. E., Takahashi, M., Newman, B., Gubi, A., & McCann, N. (2005). Test anxiety and academic performance in undergraduate and graduate students. *Journal of Educational Psychology, 97*(2), 268-274.

Coman, C., Ţîru, L. G., Meseşan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability, 12*(24), 1-24.

Creswell, J. W., & Creswell, J. D. (2017). *RESEARCH DESIGN: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, California: Sage publications.

Dewaele, J. M., & MacIntyre, P. D. (2014). The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in Second Language Learning and Teaching, 4*(2), 237-274.

Di Meo, F., & Martí-Ballester, C. P. (2020). Effects of the perceptions of online quizzes and electronic devices on student performance. *Australasian Journal of Educational Technology, 36*(1), 111-125.

Domínguez-Figaredo, D., & Gil-Jaurena, I. (2025). Effects of familiarity with digital assessment in online education. *Distance Education, 46*(2), 301-317.

Duncan, A., & Joyner, D. (2022). On the necessity (or lack thereof) of digital proctoring: Drawbacks, perceptions, and alternatives. *Journal of Computer Assisted Learning, 38*(5), 1482-1496.

Elmagzoub Eltahir, M., Annamalai, N., Uthayakumaran, A., Zyoud, S. H., Ramírez García, A., Mažeikienė, V., Zakarneh, B., & Al Salhi, N. R. (2023). Students' Experiences of Fairness in Online Assessment: A Phenomenological Study in a Higher Education Institution Context. *SAGE Open, 13*(4), 21582440231209816.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1-4.

Gamage, K. A., & Perera, E. (2021). Undergraduate students' device preferences in the transition to online learning. *Social Sciences, 10*(8), 1-15.

Gikandi, J. W., Morrow, D., & Davis, N. E. (2011). Online formative assessment in higher education: A review of the literature. *Computers & Education, 57*(4), 2333-2351.

Henderson, M., Awdry, R., Chung, J., Bryant, M., Patel, S. V., Yu, A. S., Mundy, M., Ryan, K., & Ashford, C. (2024). Online examinations: Factors that impact student experience and perceptions of academic performance. *Australasian Journal of Educational Technology, 40*(4), 73-89.

Horwitz, E. K. (2017). On the misreading of Horwitz, Horwitz, and Cope (1986) and the need to balance anxiety research and the experiences of anxious language learners. *New Insights into Language Anxiety: Theory, Research and Educational Implications, 31*(47), 9781783097722-004.

James, R. (2016). Tertiary student attitudes to invigilated, online summative examinations. *International Journal of Educational Technology in Higher Education, 13*, 1-13.

Liebert, R. M., & Morris, L. W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data. *Psychological Reports, 20*(3), 975-978.

MacIntyre, P. D., & Gardner, R. C. (1991). Language anxiety: Its relationship to other anxieties and to processing in native and second languages. *Language Learning, 41*(4), 513-534.

Meulmeester, F. L., Dubois, E. A., Krommenhoek-van Es, C., de Jong, P. G., & Langers, A. M. (2021). Medical students' perspectives on online proctoring during remote digital progress test. *Medical Science Educator, 31*(6), 1773-1777.

Mohammed, T. F., Nadile, E. M., Busch, C. A., Brister, D., Brownell, S. E., Claiborne, C. T., ... & Cooper, K. M. (2021). Aspects of large-enrollment online college science courses that exacerbate and alleviate student anxiety. *CBE—Life Sciences Education, 20*(4), 1-23.

Moser, J. S., Moran, T. P., & Jendrusina, A. A. (2012). Parsing relationships between dimensions of anxiety and action monitoring brain potentials in female undergraduates. *Psychophysiology, 49*(1), 3-10.

Nawas, A. (2020). Grading anxiety with self and peer-assessment: A mixed-method study in an Indonesian EFL context. *Issues in Educational Research, 30*(1), 224-244.

Owens, M., Stevenson, J., Hadwin, J. A., & Norgate, R. (2012). Anxiety and depression in academic performance: An exploration of the mediating factors of worry and working memory. *School Psychology International, 33*(4), 433-449.

Putwain, D. W., Daly, A. L., Chamberlain, S., & Sadreddini, S. (2016). 'Sink or swim': buoyancy and coping in the cognitive test anxiety–academic performance relationship. *Educational Psychology, 36*(10), 1807-1825.

Sage, K., Jackson, S., Fox, E., & Mauer, L. (2021). The virtual COVID-19 classroom: Surveying outcomes, individual differences, and technology use in college students. *Smart Learning Environments, 8*, 1-20.

Schillinger, F. L., Mosbacher, J. A., Brunner, C., Vogel, S. E., & Grabner, R. H. (2021). Revisiting the role of worries in explaining the link between test anxiety and test performance. *Educational Psychology Review, 33*, 1887-1906.

Sefcik, L., Veeran-Colton, T., Baird, M., Price, C., & Steyn, S. (2022). An examination of student user experience (UX) and perceptions of remote invigilation during online assessment. *Australasian Journal of Educational Technology, 38*(2), 49-69.

Spielberger, C. D. (1980). *Preliminary professional manual for the Test Anxiety Inventory*. Palo Alto, California: Consulting Psychologists Press.

St-Onge, C., Ouellet, K., Lakhal, S., Dubé, T., & Marceau, M. (2022). COVID-19 as the tipping point for integrating e-assessment in higher education practices. *British Journal of Educational Technology, 53*(2), 349-366.

Stowell, J. R., & Bennett, D. (2010). Effects of online testing on student exam performance and test anxiety. *Journal of Educational Computing Research, 42*(2), 161-171.

Stowell, J. R., Allan, W. D., & Teoro, S. M. (2012). Emotions experienced by students taking online and classroom quizzes. *Journal of Educational Computing Research, 47*(1), 93-106.

Szafranski, D. D., Barrera, T. L., & Norton, P. J. (2012). Test anxiety inventory: 30 years later. *Anxiety, Stress & Coping, 25*(6), 667-677.

Tat, O., & Kilic, A. F. (2024). electronic assessment anxiety scale: development, validity and reliability. *Turkish Online Journal of Distance Education, 25*(4), 16-32.

Taylor, J., & Deane, F. P. (2002). Development of a short form of the Test Anxiety Inventory (TAI). *The Journal of General Psychology, 129*(2), 127-136.

Theobald, M., Breitwieser, J., & Brod, G. (2022). Test anxiety does not predict exam performance when knowledge is controlled for: Strong evidence against the interference hypothesis of test anxiety. *Psychological Science, 33*(12), 2073-2083.

Von der Embse, N. P., & Witmer, S. E. (2014). High-stakes accountability: Student anxiety and large-scale testing. *Journal of Applied School Psychology, 30*(2), 132-156.

Von der Embse, N., Jester, D., Roy, D., & Post, J. (2018). Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. *Journal of Affective Disorders, 227*, 483-493.

Waluyo, B., Zahabi, A., & Panmei, B. (2025). Examining the Correlates and Components of English Test Anxiety in EFL Students: A Quantitative Study. *MEXTESOL Journal, 49*(1), 1-16.

Waluyo, B., Zahabi, A., & Ruangsung, L. (2024). Language assessment at a Thai university: A CEFR-based test of English proficiency development. *REFLections, 31*(1), 25-47.

Xu, Y., & Xie, Z. (2024). Exploring the predictors of foreign language anxiety: the roles of language proficiency, language exposure, and cognitive control. *Frontiers in Psychiatry, 15*, 1492701.

Zeidner, M. (1998). *Test anxiety: The state of the art*. London: Springer.