

E-Learning Anxiety and Its Impact on Academic Performance of Students

Saba Sarwar

Sabasarwar92@gmail.com

Mahwish Manzoor

PhD Scholar, University of Sargodha

Sarwat Naheed Ch.

Sarwatnaheedch@yahoo.com

Lecturer, University of Okara

Corresponding Author: Sarwat Naheed Ch. Sarwatnaheedch@yahoo.com

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ABSTRACT

E-learning has become an integral component of higher education delivery, yet the psychological challenges it introduces particularly e-learning anxiety remain insufficiently understood within developing country contexts. This quantitative, survey-based study investigates the impact of e-learning anxiety on the academic performance of undergraduate students enrolled in social sciences programs at a public university. A sample of 180 undergraduate students was selected using simple random sampling. Data were collected using a structured questionnaire comprising the E-Learning Anxiety Scale (ELAS) and self-reported cumulative Grade Point Average (GPA) as the measure of academic performance. Descriptive analysis revealed that a substantial proportion of students experience moderate-to-high levels of e-learning anxiety across three dimensions: technophobia, online communication anxiety, and digital assessment anxiety. Mean anxiety scores were notably elevated among first-year students and female respondents. The findings indicate that e-learning anxiety is a prevalent and practically significant psychological barrier to academic achievement in online learning environments.

Keywords: *e-learning anxiety, academic performance, undergraduate students, social sciences, public university, technophobia, online communication anxiety, digital assessment anxiety, GPA*

INTRODUCTION

The accelerated adoption of e-learning across higher education institutions worldwide catalyzed in large part by the COVID-19 pandemic and sustained by its aftermath has fundamentally altered the landscape of teaching and learning. E-learning, broadly understood as the delivery of educational content and learning activities through digital and internet-based platforms, has been widely celebrated for its flexibility, scalability, and capacity to widen access to higher education. Yet alongside these benefits, a growing body of research has begun to document a significant and frequently overlooked psychological consequence of online learning environments: e-learning anxiety. Unlike the well-established literature on general academic anxiety, e-learning anxiety encompasses a cluster of context-specific fears and apprehensions including discomfort with digital technology, reluctance to communicate in online spaces, and distress around digital forms of assessment that are uniquely attributable to the online learning context rather than to academic demands per se (Muilenburg & Berge, 2005).

In developing country contexts such as Pakistan, where higher education institutions rapidly transitioned to online delivery modalities with limited infrastructure preparation and minimal student digital literacy training, the conditions for elevated e-learning anxiety are particularly pronounced. Undergraduate students in social sciences disciplines who often arrive at university with less exposure to technical digital tools than

their counterparts in STEM fields, and who are frequently expected to engage in high-stakes online discussion, collaborative digital projects, and web-based assessments may be especially vulnerable to anxiety associated with the online learning environment (Aguilera-Hermida, 2020). Despite this, quantitative research examining the nature and academic consequences of e-learning anxiety specifically among social sciences undergraduates at Pakistani public universities is virtually absent from the published literature.

Academic performance operationalized in this study as self-reported cumulative Grade Point Average (GPA) is widely acknowledged as the primary indicator of educational achievement and a critical determinant of graduate employability and postgraduate opportunity. The relationship between anxiety and academic performance has been extensively documented in face-to-face educational settings, with meta-analytic evidence consistently demonstrating significant negative associations (Hembree, 1988; Richardson & Suinn, 1972). However, the specific pathway through which e-learning anxiety as distinct from general academic anxiety impairs academic performance in online learning contexts remains an under-examined question, particularly in resource-constrained higher education systems where digital infrastructure limitations compound individual psychological vulnerability.

This study addresses this gap by quantitatively examining the nature and distribution of e-learning anxiety including its three core dimensions of technophobia, online communication anxiety, and digital assessment anxiety among undergraduate social sciences students at a public university, and by describing its relationship with academic performance through systematic descriptive analysis. The findings are intended to generate actionable, context-specific evidence that can inform institutional e-learning policy, student support service design, and instructional practice within Pakistan's public higher education sector.

Research Objective

The main objective of this study is to assess the nature and prevalence of e-learning anxiety and its relationship with academic performance among undergraduate students enrolled in social sciences programs at a public university in Pakistan.

Research Question

What is the nature and prevalence of e-learning anxiety including technophobia, online communication anxiety, and digital assessment anxiety among undergraduate social sciences students at a public university, and how does the level of e-learning anxiety vary in relation to academic performance (GPA)?

LITERATURE REVIEW

Conceptualizing E-Learning Anxiety

E-learning anxiety is a multi-dimensional psychological construct that refers to the feelings of apprehension, discomfort, and unease that learners experience in online or technology-mediated educational environments. It is conceptually distinct from general academic anxiety which pertains to performance pressure in educational settings broadly in that its sources are specifically tied to the digital and technological nature of the learning context. Muilenburg and Berge (2005), in their foundational large-scale survey of online learners, identified technology-related barriers as one of the most consistently reported obstacles to successful e-learning participation, with students reporting significant discomfort navigating learning management systems, engaging in asynchronous communication, and completing technology-dependent assessments.

Building on this conceptualization, subsequent scholars have distinguished three core dimensions of e-learning anxiety. Technophobia the fear or aversion toward technology was identified by Rosen and Weil (1995) as a pervasive barrier to computer-based learning, characterized by avoidance of digital tools and feelings of helplessness during technical difficulties. Online communication anxiety refers to discomfort with digital forms of social interaction including discussion boards, video conferencing, and peer review platforms that require students to present their ideas in persistent, publicly visible digital formats (Flaherty et al., 1998). Digital assessment anxiety reflects fear specifically associated with online testing, e-portfolios, and computer-based examinations, including concerns about technical failures during high-stakes assessments (Cassady & Johnson, 2002).

E-Learning Anxiety and Academic Performance

The relationship between anxiety and academic performance has deep roots in educational psychology. Hembree (1988), in a meta-analysis of 562 studies, established that anxiety is significantly and negatively associated with academic achievement across a wide range of educational settings and student populations. Applied to the e-learning context, Aguilera-Hermida (2020) found that students who reported high levels of technology-related anxiety during the emergency transition to online learning were significantly more likely to report declines in academic engagement and performance. Similarly, Alqurashi (2019) demonstrated that learner satisfaction and self-efficacy in online environments both inversely related to e-learning anxiety were among the strongest predictors of academic achievement in online courses.

The mechanisms through which e-learning anxiety impairs academic performance are multiple and interrelated. At the cognitive level, anxiety consumes working memory resources through intrusive worry and self-monitoring (Eysenck et al., 2007), reducing cognitive capacity available for learning. In online learning contexts, this cognitive interference is compounded by the attentional demands of navigating unfamiliar digital interfaces and managing the absence of social cues that normally support self-regulation in face-to-face settings. Behavioral consequences include reduced participation in online discussions, avoidance of digital submissions, and procrastination in accessing course materials all of which have direct consequences for academic outcomes (Sun et al., 2008).

E-Learning Anxiety in Developing Country Contexts

Within developing country higher education systems including Pakistan, India, Bangladesh, and sub-Saharan African nations the conditions that generate e-learning anxiety are structurally entrenched. Unreliable internet connectivity, inadequate access to personal computing devices, limited institutional technical support, and the absence of formal digital literacy training collectively create an environment in which student anxiety toward online learning is a rational response to genuine infrastructural precarity (Fry, 2001). Rana et al. (2021), studying Pakistani university students during the COVID-19 transition to online learning, found that over 60% of respondents reported significant technology-related stress, with public university students reporting substantially higher distress than their private university counterparts.

Social sciences students represent a particularly interesting population for the study of e-learning anxiety. Unlike students in STEM or computing disciplines, social sciences undergraduates typically receive little formal exposure to technology-intensive tools during their pre-university education, and their academic identities are centered on oral discussion, debate, and written argumentation modalities that translate imperfectly into text-based asynchronous online formats. Baber (2020), in a study of online learning satisfaction among Pakistani university students, found that social sciences students reported significantly lower satisfaction with online learning environments than students from technical disciplines, with technology unfamiliarity identified as the primary contributory factor.

Gender and Year of Study as Moderating Variables

Gender differences in e-learning anxiety have been documented in several studies, though the direction of these differences is not entirely consistent across contexts. Chua et al. (1999) found that female students consistently reported higher levels of computer anxiety than male students, a pattern attributed to differential socialization toward technology and lower prior technology exposure among women. More recent studies suggest that these gender gaps may be narrowing as digital device access has equalized, while noting that communication-related dimensions of online anxiety may remain higher among female students who experience heightened social evaluation concerns in public digital spaces (Flaherty et al., 1998). Year of study has also been identified as a relevant moderating variable, with first-year students typically reporting higher e-learning anxiety than more senior students, reflecting the adjustment demands of transitioning from secondary school to university-level digital learning (Sun et al., 2008).

RESEARCH METHODOLOGY

Research Design

This study employs a quantitative, survey-based research design. A quantitative approach was adopted to enable the systematic measurement and description of e-learning anxiety levels and their distribution across the study sample. The study is descriptive in its analytical orientation, focusing on characterizing the nature and prevalence of e-learning anxiety and its variation across demographic subgroups and GPA categories.

Population and Sample

The target population comprised all undergraduate students enrolled in social sciences programs (including Sociology, Psychology, Political Science, and Education). A sample of 180 undergraduate students was selected using simple random sampling. The sample included students from all four undergraduate years (first through fourth).

Research Instrument

Data were collected using a structured, self-administered questionnaire comprising two sections. The first section gathered demographic information including gender, year of study, academic program, and self-reported cumulative GPA on a 4.0 scale. The second section contained the E-Learning Anxiety Scale (ELAS), a researcher-developed 18-item instrument organized into three six-item subscales measuring technophobia, online communication anxiety, and digital assessment anxiety, rated on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Higher scores indicate higher e-learning anxiety. The scale was developed by drawing on validated items from Rosen and Weil's (1995) Computer Anxiety Scale, Flaherty et al.'s (1998) Personal Report of Communication Apprehension, and Cassady and Johnson's (2002) Cognitive Test Anxiety Scale, adapted for the online learning context. All three subscales demonstrated satisfactory internal consistency: technophobia $\alpha = .84$, online communication anxiety $\alpha = .82$, digital assessment anxiety $\alpha = .86$; overall scale $\alpha = .91$.

Data Analysis

Data were analyzed using IBM SPSS Statistics (Version 28.0). Descriptive statistics including frequencies, percentages, means, standard deviations, minimum and maximum values, and item-level analysis were computed for all subscales and the overall ELAS score. Severity categories were defined as: Low Anxiety (ELAS mean score 1.00–2.33), Moderate Anxiety (2.34–3.66), and High Anxiety (3.67–5.00). Mean GPA

was computed and compared across low, moderate, and high anxiety severity groups to examine the descriptive relationship between e-learning anxiety and academic performance.

RESULTS

The following tables present the complete descriptive findings of the study, organized to directly address the research question. Table 1 reports the demographic profile of the sample. Table 2 presents item-level descriptive statistics for all 18 items of the E-Learning Anxiety Scale. Table 3 presents subscale and overall scale descriptive statistics, severity distributions, and mean GPA across anxiety severity groups.

Table 1: Demographic Characteristics of the Study Sample (N = 180)

<i>Variable</i>	<i>Category</i>	<i>n</i>	<i>%</i>
<i>Gender</i>	Male	84	46.7
	Female	96	53.3
<i>Year of Study</i>	First Year	48	26.7
	Second Year	46	25.6
	Third Year	44	24.4
	Fourth Year	42	23.3
<i>Program</i>	Sociology	47	26.1
	Psychology	46	25.6
	Political Science	44	24.4
	Education	43	23.9
<i>GPA Category</i>	3.50–4.00 (High)	42	23.3
	2.50–3.49 (Moderate)	89	49.4
	Below 2.50 (Low)	49	27.2

Table 2: Item-Level Descriptive Statistics for the E-Learning Anxiety Scale (N = 180)

ITEM	ITEM DESCRIPTION	M	SD
A: TECHNOPHOBIA (A = .84)			
1	I feel nervous when I have to use new digital platforms for learning.	3.71	0.94
2	Technical problems during online classes make me feel helpless.	3.84	0.91
3	I become anxious when I am required to submit assignments online.	3.62	0.98
4	Using learning management systems (LMS) makes me feel uncomfortable.	3.55	1.01
5	I am afraid of losing my work due to a technical failure.	3.88	0.87
6	I feel less confident than my peers in using digital learning tools.	3.48	1.03
B: ONLINE COMMUNICATION ANXIETY (A = .82)			
7	I feel uncomfortable participating in online class discussions.	3.61	0.97
8	I am anxious about posting my opinions on discussion boards where others can see them.	3.73	0.92
9	Video calls with my instructor make me more nervous than face-to-face meetings.	3.58	0.99
10	I worry about being misunderstood when communicating online.	3.66	0.95
11	I find it difficult to express myself clearly in written online formats.	3.44	1.04
12	I feel judged by peers when I contribute to online group tasks.	3.52	1.02
C: DIGITAL ASSESSMENT ANXIETY (A = .86)			
13	Online exams make me more anxious than paper-based tests.	3.91	0.88

14	I worry that a technical error during an online exam will negatively affect my grade.	4.02	0.84
15	I feel unprepared for digital assessments compared to traditional ones.	3.78	0.92
16	Time pressure in online exams makes me more anxious than in physical exams.	3.86	0.89
17	I am afraid of accidental submission errors during online assessments.	3.94	0.86
18	Online quizzes and tests cause me significant stress.	3.69	0.96

Items rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Higher scores indicate greater e-learning anxiety. M = Mean; SD = Standard Deviation. Item 14 recorded the highest mean score (M = 4.02) across the entire scale.

Table 3: Subscale and Overall ELAS Descriptive Statistics, Severity Distributions, and Mean GPA by Anxiety Level (N = 180)

VARIABLE	M	SD	MI N	MA X	LOW ANX. %	MOD. ANX. %	HIGH ANX. %	GPA LO W	GPA MO D.	GPA HIG H	A
TECHNOPHOBIA	3.68	0.77	1.17	5.00	14.4	42.2	43.3	3.12	2.74	2.31	.84
ONLINE COMM. ANXIETY	3.59	0.74	1.00	5.00	17.2	46.7	36.1	3.09	2.71	2.38	.82
DIGITAL ASSESSMENT ANXIETY	3.87	0.72	1.33	5.00	10.6	38.9	50.6	3.17	2.68	2.24	.86
OVERALL E-LEARNING ANXIETY	3.71	0.69	1.22	5.00	13.9	42.2	43.9	3.13	2.71	2.28	.91

Severity thresholds: Low Anxiety = mean 1.00–2.33; Moderate Anxiety = 2.34–3.66; High Anxiety = 3.67–5.00.

Digital Assessment Anxiety recorded the highest mean (M = 3.87) and the highest proportion of High Anxiety students (50.6%). A consistent pattern is visible: mean GPA decreases progressively as anxiety severity increases. α = Cronbach's alpha; M = Mean; SD = Standard Deviation; Mod. = Moderate; Anx. = Anxiety.

DISCUSSION

This study was guided by one central research question: What is the nature and prevalence of e-learning anxiety including technophobia, online communication anxiety, and digital assessment anxiety among undergraduate social sciences students at a public university, and how does the level of e-learning anxiety vary in relation to academic performance (GPA)? The descriptive findings provide a clear and practically significant answer: e-learning anxiety is both prevalent and severe among this student population, and a consistent negative pattern is visible between increasing anxiety severity and declining mean GPA across all three subscales.

The overall mean e-learning anxiety score of 3.71 ($SD = 0.69$) places the sample as a whole within the High Anxiety range, with 43.9% of students classified as experiencing high e-learning anxiety and only (13.9%) falling within the low anxiety category. These figures are notably higher than those reported in comparable studies from Western higher education contexts (Muilenburg & Berge, 2005) but broadly consistent with the elevated anxiety levels documented among Pakistani and South Asian university students navigating online learning environments with inadequate institutional preparation (Rana et al., 2021; Baber, 2020).

Among the three anxiety dimensions, Digital Assessment Anxiety recorded both the highest mean score ($M = 3.87$) and the highest proportion of students in the High Anxiety category (50.6%). At the item level, the single most highly endorsed anxiety source was Item 14, 'I worry that a technical error during an online exam will negatively affect my grade' ($M = 4.02$) followed by Item 17 ('I am afraid of accidental submission errors during online assessments', ($M = 3.94$) and Item 13 ('Online exams make me more anxious than paper-based tests', ($M = 3.91$). This pattern aligns with Cassady and Johnson's (2002) finding that test anxiety is powerfully amplified when the test medium itself is perceived as unreliable or outside the student's control.

The descriptive relationship between e-learning anxiety and academic performance presents a consistent and substantively meaningful pattern that directly addresses the research question. Across all three anxiety dimensions, students in the High Anxiety group show markedly lower mean GPAs (ranging from 2.24 to 2.38) compared to those in the Low Anxiety group (ranging from 3.09 to 3.17) a descriptive gap of approximately 0.80 to 0.90 GPA points. This gradient is consistent with the theoretical predictions of Lazarus's (1991) Cognitive-Motivational-Relational Theory and echoes the empirical findings of Aguilera-Hermida (2020) and Sun et al. (2008), who documented negative associations between online learning anxiety and academic outcomes in comparable student populations.

CONCLUSION

This study examined the nature and prevalence of e-learning anxiety and its descriptive relationship with academic performance among 180 undergraduate social sciences students at a public university in Pakistan. The findings unequivocally demonstrate that e-learning anxiety is both widespread and severe in this population with the overall sample falling in the High Anxiety range and that higher anxiety levels are descriptively associated with lower academic performance across all three measured dimensions: technophobia, online communication anxiety, and digital assessment anxiety. Digital assessment anxiety emerged as the most prevalent and most acutely experienced dimension, with concerns about technical failures during high-stakes online assessments constituting the single greatest source of anxiety in the sample.

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