From Classroom to Online: Security, Privacy, and Broader Challenges in Higher Education in the Global South

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***Abstract* — The COVID-19 pandemic forced higher education institutions worldwide to transition abruptly from traditional classroom teaching to online learning, a shift that exposed significant vulnerabilities in digital readiness, particularly in the Global South, where ICT infrastructure and technological adoption remain underdeveloped. This study investigates the security, privacy, and broader implementation challenges faced by students and lecturers during this transition, using the Technology Readiness and Acceptance Model (TRAM) as the guiding framework. Employing a quantitative case study approach, data were gathered from 1,248 respondents and analyzed using Structural Equation Modelling (SEM) in Amos. The findings reveal that all thirteen hypothesized relationships were statistically significant, demonstrating that perceived usefulness, ease of use, and institutional readiness strongly influence e-learning adoption. Conversely, security and privacy concerns were found to heighten discomfort, diminish optimism, and impede readiness for online learning. The study highlights the urgent need for robust digital infrastructure, comprehensive cybersecurity measures, and targeted digital literacy training to enhance trust and promote sustainable e-learning integration in resource-constrained contexts.**

Keywords—Online Learning, Cyber Security, Higher Education, Security and Privacy concerns, Global South

I. INTRODUCTION

The Coronavirus Disease of 2019 (COVID-19) significantly disrupted learning in many institutions across the whole world. Governments had to enforce lockdowns in order to curb the spread of the disease in line with the World Health Organization's advice to maintain social distancing. This meant that institutions that had previously relied on face-to-face learning as the primary means of pedagogy delivery had to find new solutions to facilitate continued learning. To address the challenge posed by the pandemic, many higher education institutions had to transition to online learning.

There is a growing consensus among educators and information technologists that ICTs, particularly online learning, are a solution to delivering affordable education and educational support to students, especially in light of the COVID-19 pandemic. ICTs have the potential to improve the quality, access, richness, and availability of education, especially to previously marginalized communities that had been shunned by educators for lack of good facilities. For instance, ICTs can link rural and remote communities with online educators, reducing the previous barrier of inadequate teachers in these communities. As educational institutions closed their doors to face-to-face lessons, there has been a growing demand for online learning services in low- and middle-income countries.

Online learning holds much promise and provides the most feasible solution to problems induced by the pandemic in the education sector. However, while this solution worked for some institutions, it proved to be ineffective in many other institutions, especially in the global south, where ICTs and technology appropriation are still in their infancy stages. Issues such as awareness among stakeholders as well as issues of confidentiality, availability, privacy, unfamiliarity with required skills and knowledge, and difficulties handling ICT applications form complex barriers to broader eLearning adoption in the global south. These barriers give impetus to this research.

II. LITERATURE REVIEW

A. What is Online Learning

Online learning, or electronic learning (eLearning), involves the conducting of lessons mediated by internet technologies. There appears to be no precise definition of eLearning. For example, Nichols [1] defined eLearning as "the establishment of technology-enhanced teaching and learning at an educational institution." Clark and Mayer (2011), in Ansong et al, [2], defined eLearning as "instruction to students offered via digital devices like computers or smartphones with the intention to support their learning." Ray et al. [3] offered another definition, describing eLearning as the "process of taking up courses over digital platforms". It emulates the traditional face-to-face lecture delivery model facilitated by the internet [4].

Different terms like online learning, digital learning, online lecture delivery, etc., have been attributed to eLearning [5]. The consensus among the different authors is that the learning process is facilitated online through network technologies [6]. The impetus of online learning is that it is a cost-effective solution that removes learning boundaries and provides flexibility and accessibility for education, more so in uncertain environments [7]. eLearning can facilitate learning to occur ubiquitously through technological gadgets like smartphones or computers, and an internet connection is the minimum requirement.

B. Why Online Learning?

There are many advantages of implementing eLearning in education, especially in today's world characterized by pandemics, wars, and numerous natural disasters that affect normal day-to-day operations. Turnbull et al. [8] posits that use of eLearning in higher education results in improved effectiveness in teaching, better learning experiences among students, improved competitiveness among institutions, and shifts in the traditional culture of teaching and learning at higher education institutions. Yalcin and Kutlu [9] add that eLearning facilitates easier document sharing and offers ubiquitous communication opportunities between students and their instructors. eLearning also facilitates the availability of learning materials to students at any time, thus offering flexibility to students in terms of pace, time, and location [10], [11], [12], [13].

The use of eLearning technologies has been predicted to transform education by creating opportunities for participating effectively in the information society and enhancing the teaching and learning process [11]. Researchers have also noted the cost-effectiveness, flexibility of access, timeliness of content, consistency, and improved customer value associated with eLearning systems [10], [13]. Others have highlighted that eLearning platforms allow students to be in charge of their own learning, facilitate the development of critical thinking skills, and create a sense of community among students, which can result in them achieving better outcomes [10], [11].

Chisango et al. [14] also highlights the ease in accessing teaching and learning resources associated with eLearning. eLearning also lessens the burden of physical report making, a cumbersome and tedious task for instructors, thereby freeing up their time, which can be used for other productive tasks [13]. The author also suggests the ease of information dissemination to students associated with eLearning.

C. Limitations of Online Learning

Good as eLearning promises, there have been many studies that show implementation and acceptance of eLearning have had negative impacts, especially in the global south. Zinn [15] mentions the scepticism about e-learning that remains and points out that the scepticism emanates from issues relating to lack of ICT skills, time, and pedagogy. For instance, the author argues that lecturers who lack technological skills are not willing to spend extra time and effort learning to set up eLearning courses. The author also argues that students may lack not only the requisite ICT skills to navigate around LMS use but might also lack a stable ICT environment and self-discipline to study online. The issues of lack of access to computers or a suitable technological environment were also found to be significant barriers to LMS use in a study by [16].

Some of the inflated promises of eLearning have been quelled by reality checks that online learners have to go through. One major documented pro of eLearning raised in past literature is its ability to facilitate students to learn independently. However, reality has shown that learning a new concept strictly online without interacting with colleagues in a physical space is a barrier to LMS use [17]. Both Machika and Dolley [18] and Mtebe [16] observed that there is evidence of poor support services in an online environment as compared to a physical class environment. Turnbull et al. [8] concurred and argued that students felt a reduction in input from teachers in an LMS environment with very little reinforcement of learning activities by their teachers. The authors also mentioned the lack of a support structure in terms of online learning communities as a barrier to online learning. Al-Busaidi [19] further posits that online learning requires more self-discipline and responsibility on the part of students.

To add on, unclear eLearning promises have been observed to hinder LMS adoption among stakeholders. For instance, there is an exaggerated promise relating to cost savings associated with eLearning. Kaushik et al. [20], for example, claimed that "Digital learning has the power to zealously promote knowledge enhancement with a blend of conventional learning and modern learning techniques among youngsters by reducing the cost of learning earlier marked by the physical world." The argument here is that students may enjoy the flexibility of access times and save on travel costs. But reality is that eLearning implementation is very costly, especially considering the infrastructural requirements (servers, physical infrastructure, bandwidth requirements, computers, etc). Cavus [21] argues that LMSs "contain hidden costs, unclear user environments, bulky developer and administration manuals, and limitations regarding interoperability, integration, localization, and bandwidth requirements." Hence, careless selection and evaluation of LMS can lead to their limited use, thereby ultimately defeating the purpose of their implementation in the first place. The costs of implementation might end up losing management support [22] if a thorough feasibility report is not undertaken.

Jimerson et al. [23] posits that teachers often encounter difficulties in the use of information systems, which might lead to frustration over their use, especially considering that they are busy all day. In fact, ease of use has been observed to be one barrier that affects the use of many technological innovations, especially if they are software in nature. Turnbull, Chugh and Luck (2021), encouraged universities to work on the reliability and user friendliness of these systems to counter this barrier. Moreover, Lochner, Conrad and Graham (2015) noted that learners fail to utilize LMSs because they are not aware of their existence, a point that is also buttressed by Mtebe (2015). The survival of LMS in the long run depends on its continued adoption and use by stakeholders [27].

Another significant barrier to LMS utilization in developing countries is the lack of access to reliable internet connectivity and the cost of accessing the internet [26]. While there are reports of high mobile penetration rates in sub-Saharan Africa, influenced by a rapid decline in prices of mobile phones [28], internet access among young people is very much subdued, with some communities, especially in rural areas (which constitute the bulk of territories in Africa), having no internet access at all [26], [29], [30], [31], [32], [33]. High data costs have been proposed in prior research as a major hindrance to adopting internet-mediated solutions in Zimbabwe [34]. Makumane [35] posits that the curriculum in sub-Saharan Africa has failed to shift significantly to digital platforms due to its failure to harness the fourth industrial revolution. They also reiterates the fact that many lecturers and students fail to use digital platforms due to their failure to embrace the knowledge complexities associated with LMSs. The author also observed the lack of adequate training, lack of technological resources, and absence of

online teaching guidelines as problematic due to digital technology illiteracy among stakeholders.

In their research from a southern African perspective, Sakala et al. [36] posited that limited support from top management, limited infrastructure, complexity of technology implementation, hostile attitudes from users and implementers, and poor organizational cultures are some of the challenges that hinder eLearning adoption. These factors are also buttressed by Mtebe [16] who claims that the lack of computers in institutions has resulted in a low uptake of eLearning initiatives. Khan [37] posited that barriers to LMS use include e-learning system technical issues, change management challenges, technology factors, financial assistance issues, e-learning quality system factors, self-efficacy elements, cultural factors, and trust factors.

D. The Security and Privacy Dilemma

A key issue that has been relatively overlooked in past e-learning research is the security and privacy challenge associated with online learning. Akhte [38] concurs and adds that even though privacy concerns are a critical dimension in online customer behavior, not much has been done by researchers to reflect on its psychological antecedents. Wang et al. [39] highlighted that "ethical issues, such as online privacy and security, and learners' personal data disclosure, are not receiving enough research attention". Some of those studies that discuss these issues, i.e., Asgari et al. [40] do so in passing. In this paper, we propose to explore deeper into the issues of security and privacy concerns and propose plausible solutions.

Security relates to the protection of one's data, intellectual property, and hardware components of a computer against harm. Privacy, on the other hand, relates to access, ownership, and control of private information. Youn (2009) defined privacy as a person's ability to control the extent to which their information is accessed by others.

Kim [42] highlighted that students may feel demotivated to participate in an online class if they feel that administrators are failing to take issues of their privacy and security seriously while online. Such issues as leaks of private data, hacking, misuse of other people's data, identity theft, cyber bullying, among others, have been observed to hinder online learning adoption among students in past literature [42]. Akhter [38] mentions the issue of self-efficacy and involvement as significant antecedents of privacy concern. Self-efficacy relates to one's self-belief in accomplishing what one is required to accomplish without a problem. Youn [43] posited that privacy concerns in an online environment include such issues as fear of being personally monitored, loss of anonymity, unasked-for commercial solicitations, identity theft, and fraud. The author further explains that such concerns are heightened if users are unaware of who is collecting their information and for what purpose the information is being collected, as is the case in an online class. In the same vein, Kim [42] noted that "students would feel weirder due to the feeling of being watched by somebody, without ever knowing it, in online classes".

The purpose of this study is to understand the challenges, including security and privacy concerns, that staff and students have in relation to online learning. Understanding these concerns and addressing them might ultimately lead to better utilization of e-learning systems. The current study is particularly relevant given the current context, where online education is becoming the norm. The findings of the study are potentially useful in aiding policy formulation among higher education administrators and other relevant stakeholders to help protect the privacy rights of students and staff online.

E. Theoretical Framework

To successfully implement a technological innovation, HEIs must be prepared to meet all the requirements it demands. Infrastructure, support structures, training, etc, are some of the requirements that should be put in place to support the successful integration of technology in education. To determine whether the institution is ready to deploy LMSs, the Technology Readiness and Acceptance Model (TRAM) (Figure 1) should be used. First proposed by Lin et al. [44], the theory attempts to integrate the Technology Acceptance Model with the Technology Readiness model with a view to explain customers' intention to use technology. The theory also seeks to have a more in-depth understanding of people's technology acceptance behaviours.

TRAM is an amalgamation of the Technology Acceptance model by Davis [45] and the Technology Readiness Index by Parasuraman [46]. The TAM model offers validated scales for two variables, perceived ease of use and perceived usefulness, as key determinants of users' intention to accept and use technology [47]. In this model, perceived ease of use has been statistically proven to be a causal antecedent to perceived usefulness [47]. The Technology Readiness Index, on the other hand, is "a multiple-item scale to assess people's readiness to interact with technology." [48]. Technology Readiness refers to " people's propensity to embrace and use new technologies for accomplishing goals in home life and at work." [48].

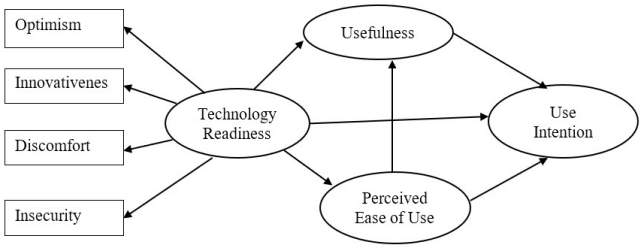

Fig. 1. Technology Readiness and Acceptance Model. Source: Yu et al. [49]

The model illustrates that factors that influence the use of a technological innovation are its Perceived Usefulness and Perceived Ease of Use. The theory also shows that customers' technology readiness propensities are positively correlated with their intentions to use it. In turn, Technology readiness is also assessed by innovativeness, discomfort, insecurity, and optimism in the technology. From the TRAM model and the literature review, the researcher proposes Fig. 2 as the conceptual framework to guide the research process.

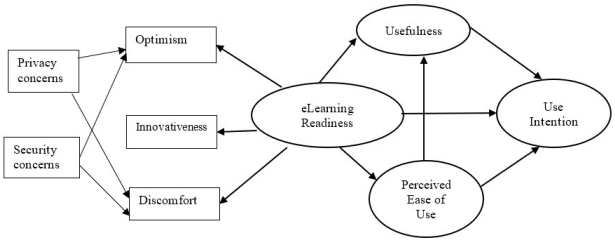

Fig. 2. Conceptual Framework

The following hypotheses are hence proposed:

- H_1: Perceived usefulness influences the intention to use eLearning technology
- H_2: Perceived ease of use has a direct influence on the intention to use eLearning platforms
- H_3: Perceived ease of use influences the usefulness of eLearning
- H_4: The e-learning readiness of an institution affects the usefulness of e-learning platforms
- H_5: The e-learning readiness of an institution has a direct influence on the actual use of the e-learning platforms
- H_6: The e-learning readiness of an institution has a direct influence on the perceived ease of use of e-learning technology
- H_7: The e-learning readiness of an institution is assessed by optimism among users in the use of the technological solution
- H_8: The e-learning readiness of an institution is assessed by the innovativeness of the e-learning platform
- H_9: Security concerns result in limited optimism in the use of e-learning technologies
- H_{10}: The e-learning readiness of an institution is assessed by discomfort in the use of the e-learning platform
- H_{11}: Privacy concerns result in discomfort in the use of e-learning platforms
- H_{12}: Privacy concerns result in limited optimism in the use of e-learning technologies
- H_{13}: Security concerns result in discomfort in the use of e-learning platforms

III. Methodology

The study, which adopts a quantitative approach and follows a positivist philosophy, was undertaken at one of the fourteen state universities in Zimbabwe. Zimbabwe is a lower-middle-income economy and can be comfortably placed in the narrative of the study, which seeks to explore security and privacy concerns associated with e-learning adoption and implementation in the global south. The institution, with an estimated student enrolment of approximately sixteen thousand, primarily administered its courses through a dedicated face-to-face method of tuition, with very limited options of online learning before the COVID-19 pandemic. The COVID-19-induced lockdowns forced the institution to quickly transition to online pedagogy delivery in line with worldwide trends. The institution selected Google Classroom as the e-learning platform.

A. Data Collection Methods

A survey to understand concerns relating to privacy and security of the online system was undertaken during the period January to May 2023. An online tool, Google Forms, targeting 524 staff members and 16340 students at the institution, was used to administer the questionnaire. We calculate our sample based on the sample size calculator formula by Yamane:

$$n = \frac{N}{1+N(e)^2} \qquad (1)$$

where N is the population size, e is the margin of error

The sample calculated at the 95% level of significance and 5% margin of error was 222 for staff and 376 for students. There are a number of points to be noted about the sample. It was neither random nor weighted but, nonetheless, statistically important because of the highly specialized nature of the group that was invited to participate in the survey. Firstly, all the participants are directly involved in the teaching and learning process. Secondly, all the participants were drawn from an institution in one of the countries that can be defined as in the Global South, a contextual factor that is relevant for understanding digital access and security perceptions. A mass mailing system was used to send the link to the questionnaire to all prospective respondents. To increase visibility and encourage participation, the link was also posted on students' online portals and on the university's library webpage. The instrument included a Likert-type scale designed to measure respondents' perceptions of various aspects of privacy and security in online learning environments. To complement the quantitative items, several open-ended questions were included to gain more insights and concerns in greater depth.

B. Data Analysis

The data were analysed using Structural Equation Modelling (SEM) with IBM SPSS Amos 22. We adhered to the recommended two-step analytical approach proposed by Anderson and Gerbing [50]. First, a Confirmatory Factor Analysis (CFA) was conducted to assess the measurement model. This step evaluated the reliability, convergent validity, and discriminant validity of the latent constructs. Second, the structural model was examined to test the hypothesised relationships among the constructs.

Model fit was assessed using a combination of absolute and incremental fit indices. Specifically, we report the chi-square statistic (χ^2), its degrees of freedom (df), and its associated p-value. Given the sensitivity of the χ^2 test to large sample sizes, we also examined the following approximate fit indices: the Root Mean Square Error of Approximation (RMSEA), for which values < 0.06 indicate close fit and < 0.08 indicate reasonable fit; the Standardised Root Mean Square Residual (SRMR), for which values < 0.08 are considered good fit; and the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), for which values ≥ 0.90 are considered acceptable and ≥ 0.95 indicate excellent fit.

C. Reliability and Validity

Prior to testing the hypotheses, a Confirmatory Factor Analysis (CFA) was conducted to evaluate the measurement

model. The model demonstrated a good fit to the data: χ^2 = 845.67, df = 412, $p < 0.001$; CFI = 0.96; TLI = 0.95; RMSEA = 0.05 (90% CI [0.04, 0.05]); and SRMR = 0.04. All factor loadings were statistically significant ($p < 0.001$), and the composite reliability and average variance extracted for each construct exceeded the recommended thresholds, supporting the reliability and validity of the constructs. Detailed specifications are described in the following paragraphs.

To assess the face validity of the questionnaire items, the questionnaire was given to three senior scholars, who reviewed it and suggested some recommendations. All of the recommendations were considered and implemented in the final version of the questionnaire. After implementing the corrections, the form was distributed to staff and students initially via email. To assess the convergent validity of the constructs, factor loadings, Average Variance Extracted (AVE), and Composite reliability (CR) were used. According to Peterson [51], a factor loading greater than 0.7, AVE greater than 0.5, and a CR value greater than 0.7 are generally considered satisfactory. Table 1 shows the results of these tests.

TABLE II. CONVERGENT VALIDITY TEST

Construct	Item Code	Factor Loading	AVE	CR
Perceived Usefulness (PU)	PU1	0.78	0.62	0.85
	PU2	0.81		
	PU3	0.76		
Perceived Ease of Use (PEOU)	PEOU1	0.84	0.59	0.83
	PEOU2	0.77		
	PEOU3	0.72		
Intention to Use (IU)	IU1	0.80	0.65	0.87
	IU2	0.82		
	IU3	0.79		
E-learning Readiness (ELR)	ELR1 (Optimism)	0.75	0.60	0.86
	ELR2 (Innovativeness)	0.78		
	ELR3 (Discomfort)	0.74		
Security Concerns (SC)	SC1	0.81	0.58	0.82
	SC2	0.77		
Privacy Concerns (PC)	PC1	0.79	0.61	0.84
	PC2	0.80		

To measure internal consistency, composite reliability and Cronbach's Alpha (α), which should both be higher than 0.7, were analyzed. Finally, to measure discriminant validity, the square root of average variance extracted is compared against all the correlation coefficients among other variables. Payne et al. [52] suggests that a threshold of at least 0.5 is sufficient. Tables 2 and 3 show the respective results. Our factors surpass these thresholds and were thus all retained for evaluation.

TABLE III. INTERNAL CONSISTENCY TEST

Construct	Item Code	Factor Loading	AVE
Perceived Usefulness	PU1, PU2, PU3	0.84	0.87
Perceived Ease of Use	PEOU1, PEOU2, PEOU3	0.82	0.85
Intention to Use	IU1, IU2, IU3	0.86	0.88
E-learning Readiness	ELR1 (Optimism), ELR2 (Innovativeness), ELR3 (Discomfort)	0.83	0.86
Security Concerns	SC1, SC2	0.79	0.82
Privacy Concerns	PC1, PC2	0.81	0.84

TABLE IV. DISCRIMINANT VALIDITY

Construct	PU	PEOU	IU	ELR	SC	PC
Perceived Usefulness (PU)	**0.79**					
Perceived Ease of Use (PEOU)	0.62	**0.77**				
Intention to Use (IU)	0.68	0.60	**0.81**			
E-learning Readiness (ELR)	0.55	0.58	0.52	**0.77**		
Security Concerns (SC)	0.32	0.30	0.28	0.35	**0.76**	
Privacy Concerns (PC)	0.34	0.29	0.27	0.33	0.54	**0.78**

IV. RESULTS

The demographic analysis provides insights into the composition of the study participants, highlighting diversity in age, gender, academic role, and digital exposure. Table 4 provides a holistic view of the demographic data for participants. The survey yielded 1,248 valid responses, of which 1,102 were from students and 146 from academic staff. This represented a response rate of 65.8% among staff and over 100% amongst the student population. The high response rate, especially among students, can be attributed to the vigorous publication of the survey link, initially via their email addresses, then via their web portals, and a link on the university library webpage.

TABLE V. DEMOGRAPHIC DATA

Variable	Category	Frequency (n)	Percentage
Gender	Male – Students - Staff	441 83	42%
	Female – Students - Staff	661 63	58%
Age Group	18-24	899	72%
	25-34	150	12%

Variable	Category	Frequency (n)	Percentage
	35-44	162	13%
	45+	37	3%
Education level (among students)	Undergraduate	992	90%
	Postgraduate	110	10%
Role	Student	1102	88%
	Staff	146	12%
Primary internet access method	Mobile network	836	67%
	Campus network	275	22%
	Broadband	137	11%
Primary hardware for eLearning access	University computers	162	13%
	Personal Laptop	187	15%
	Mobile/smartphones	899	72%
Prior experience with eLearning	Had no Prior experience	811	65%
	Had Little exposure	287	23%
	Had a fair share of experience	125	10%
	Had loads of experience	25	2%

The demographic breakdown showed an overall 58% (724) female and 42% (524) male respondents. The majority of respondents were young adults, consistent with the student-dominated sample, with 72% aged between 18 and 25. Most participants were undergraduate students (n = 992), reflecting the institution's enrolment structure. Figure 3 below shows a snapshot visualization of key demographic metrics.

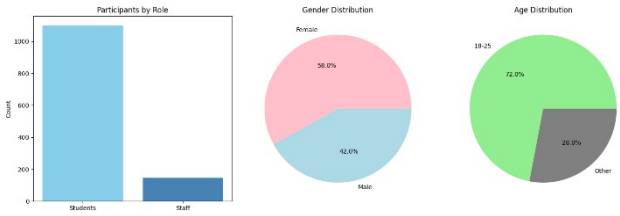

Fig. 3. Demographic distribution of participants

A. Gender Distribution

In terms of gender representation, female respondents accounted for 58% (n = 724) while male respondents accounted for 42% (n = 524). Among students, 60% were female, while staff showed a more balanced distribution (43% female, 57% male).

B. Internet Access Type and Hardware Used for Access

Mobile data was the dominant access method (67%), underscoring infrastructural limitations in broadband availability. Smartphones (72%) were the primary device for accessing online learning platforms, especially among students (86%).

C. Prior Experience with e-learning

A significant portion of respondents had limited or no prior experience with e-learning before enrolling in the university, which may influence perceived ease of use and readiness. However, at the time of the research inquiry, most of the respondents (81%) had used Google Classroom for at least one semester.

D. Summary of critical results of hypothesis testing.

Following confirmation of the measurement model, we tested the structural model. The structural model also exhibited an acceptable fit to the data: $\chi^2 = 892.34$, df = 428, $p < 0.001$; CFI = 0.95; TLI = 0.94; RMSEA = 0.06 (90% CI [0.05, 0.06]); and SRMR = 0.05. Perceived usefulness significantly influenced intention to use e-learning platforms ($\beta = 0.63$, $p < 0.001$), supporting H1. Perceived ease of use also had a strong direct influence on both perceived usefulness ($\beta = 0.59$, $p < 0.001$) and use intention ($\beta = 0.47$, $p < 0.001$), supporting H2 and H3, respectively. eLearning readiness positively affected perceived ease of use ($\beta = 0.52$, $p < 0.001$) and usefulness ($\beta = 0.49$, $p < 0.001$), confirming H4 and H6. Optimism and innovativeness were significant predictors of eLearning readiness ($\beta = 0.61$ and $\beta = 0.57$, respectively, $p < 0.001$), supporting H7 and H8. Discomfort and insecurity negatively impacted eLearning readiness ($\beta = -0.44$ and $\beta = -0.39$, respectively, $p < 0.001$), supporting H10 and H9. Privacy concerns were positively correlated with discomfort ($\beta = 0.46$, $p < 0.001$) and negatively with optimism ($\beta = -0.41$, $p < 0.001$), supporting H11 and H12. Security concerns were positively correlated with discomfort ($\beta = 0.49$, $p < 0.001$) and negatively with optimism ($\beta = -0.38$, $p < 0.001$), supporting H13. These results are also presented in Table V and with the resulting model shown in Figure 4.

Qualitative responses revealed recurring themes such as fear of surveillance, lack of clarity on data usage policies, and anxiety over cyberbullying and identity theft.

TABLE VI. SUMMARY OF HYPOTHESIS TESTING RESULTS

Hypothesis	Path Relationship	β Coefficient	p-value	Supported	Interpretation
H1	Perceived Usefulness Influences Use Intention	0.62	< 0.001	Yes	Usefulness strongly drives adoption.
H2	Ease of Use Influences Use Intention	0.48	< 0.001	Yes	Simplicity boosts intention to use.
H3	Ease of Use influences Usefulness	0.55	< 0.001	Yes	Ease of use enhances perceived value.

Hypothesis	Path Relationship	β Coefficient	p-value	Supported	Interpretation
H4	Readiness affects Usefulness	0.51	< 0.001	Yes	Institutional readiness improves usefulness.
H5	Readiness affects Use Intention	0.44	< 0.001	Yes	Readiness directly impacts adoption.
H6	Readiness influences Ease of Use	0.49	< 0.001	Yes	Better readiness leads to a smoother experience.
H7	Optimism affects Readiness	0.58	< 0.001	Yes	Optimistic users perceive higher readiness.
H8	Innovativeness boosts Readiness	0.61	< 0.001	Yes	Innovative platforms boost readiness perception.
H9	Security Concerns reduce Optimism	-0.39	< 0.001	Yes	Security fears reduce optimism.
H10	Discomfort affects Readiness	-0.42	< 0.001	Yes	Discomfort undermines readiness.
H11	Privacy Concerns increase Discomfort	0.47	<0.001	Yes	Privacy fears increase discomfort.
H12	Privacy Concerns reduce Optimism	-0.43	< 0.001	Yes	Privacy concerns dampen optimism.
H13	Security Concerns leads to Discomfort	0.49	< 0.001	Yes	Security threats heighten discomfort.

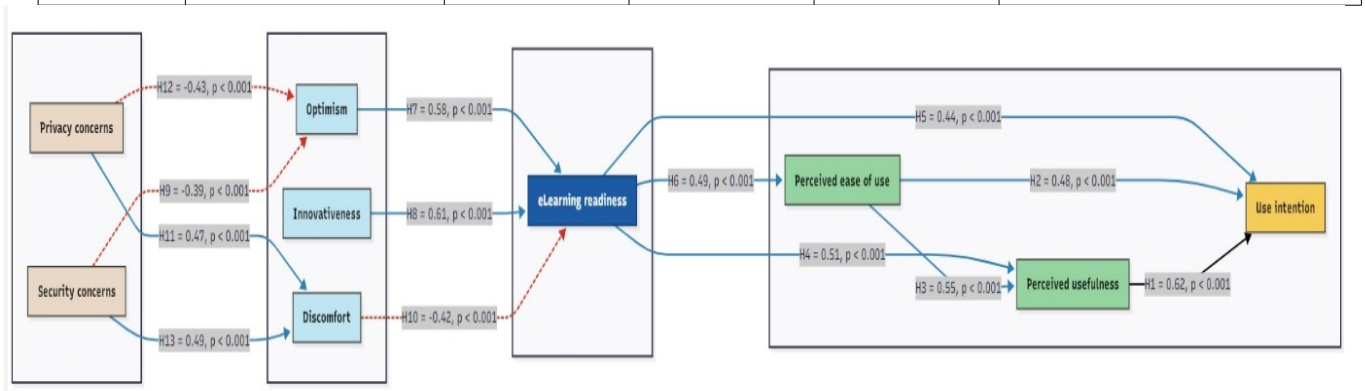

Fig. 4. Summary of hypothesis testing

V. Discussion

While the extant literature has highlighted the importance with which users regard issues of their privacy and security when navigating online platforms, i.e. [39], [53], Barth et al. [54] argues that users "have a tendency towards privacy-compromising behavior online which eventually results in a dichotomy between privacy attitudes and actual behavior". Through education and training, such misdemeanors can be alleviated so as to create a safer online environment for both students and lecturers.

The findings confirm that while online learning platforms like Google Classroom offer flexibility and access, their adoption in the global south is hindered by psychological and infrastructural barriers. The strong influence of perceived ease of use and usefulness on use intention aligns with TAM theory, reinforcing the need for intuitive and reliable platforms.

The role of eLearning readiness driven by optimism and innovativeness highlights the importance of institutional culture and stakeholder attitudes. However, discomfort and insecurity, often rooted in privacy and security concerns, significantly dampen readiness and optimism. This suggests that technical training alone is insufficient; institutions must also address emotional and ethical dimensions of technology adoption.

Interestingly, students expressed greater discomfort than staff, citing fears of being recorded without consent and uncertainty about who accesses their data. Staff, on the other hand, were more concerned with system reliability and workload implications.

A. Practical implications

This study contributes to the growing body of literature on technology adoption in higher education by extending the Technology Readiness and Acceptance Model to include ethical dimensions, specifically, privacy and security concerns. While TRAM traditionally emphasizes perceived usefulness, ease of use, and readiness, this research demonstrates that psychological discomfort and diminished optimism driven by privacy and security anxieties are significant inhibitors of eLearning adoption in the global south.

The findings validate the causal relationships proposed in the conceptual framework and reinforce the notion that technology acceptance is not solely a function of usability and infrastructure, but also of emotional and ethical trust. By integrating constructs such as discomfort, optimism, and privacy concerns into the TRAM model, this study offers a more holistic understanding of user behavior in digital learning environments.

To foster sustainable adoption, higher education institutions must invest in secure infrastructure and transparent data policies. Digital literacy training should not be once of thing; rather, institutions must provide ongoing training that includes digital ethics and privacy awareness.

Institutions must cultivate a culture of optimism and innovation among staff and students and develop support structures that address both technical and emotional needs.

The study also highlights the contextual relevance of TRAM in low-resource settings, where infrastructural limitations and digital literacy gaps amplify the psychological barriers to adoption. This opens avenues for future research to explore cross-cultural variations in technology readiness and the role of digital ethics in shaping user engagement.

B. Limitations

We acknowledge that while our single case study design provides valuable depth and internal consistency, it limits the direct extrapolation of our findings to other settings with different demographic profiles or practice patterns. Similar and multiple case study validation studies are necessary to confirm these results in broader populations.

VI. Conclusion

This study underscores the complex interplay between technological readiness, user perceptions, and ethical concerns in the adoption of online learning in the global south. While platforms like Google Classroom offer a lifeline during crises, their success depends on more than just availability; they must be secure, private, and user-friendly.

Future research should expand to multiple institutions across different regions to validate these findings and explore the longitudinal impacts of online learning on academic performance and digital trust. While efforts were taken to minimize bias, this study is susceptible to the common method bias by using data gathered at just one institution. Future research should focus on a broader population survey across different types of institutions to increase the generalizability of research findings.

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