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The Acceptance of Educational Content and University Support: Effects of E-learning Acceptance and Student Computer Competency

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Abstract

E-learning among university students is examined through educational content acceptance and university support, highlighting students' computer competency mediating effect. To optimize e-learning environments, it is essential to understand elements enhancing ELA. In the present study, 500 university students enrolled in e-learning courses were surveyed quantitatively. SEM analyzes the association among variables and measures constructs via validated scales. Moreover, It is hypothesized that construct educational content acceptance and university support positively influence ELA, with students' computer competency acting as a mediating factor. Hence, ELA is significantly predicted by both educational content acceptance and university support, with computer competency partially mediating the relationship. Using empirical evidence, this study provides actionable insights to educational institutions seeking to improve learning effectiveness.

Key Words

Course Content, University Support, Computer Competency, E-learning Acceptance

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Introduction

Electronic education is a flexible learning method that utilizes online platforms and digital technologies to support education in an adaptable environment. Unlike traditional in-person classes, e-learning enables students to participate regardless of geographical or distance-related barriers (Gama et al., 2022). Over the past two decades, educational institutions have increasingly adopted e-learning platforms, citing enhanced convenience and cost efficiency, and they have also maintained improved student outcomes (Abumandour, 2020). However, it remains essential for e-learning relevancy, recognition, and learners' acceptance of diverse abilities. The e-learning

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acceptance has attracted considerable scholarly interest across different educational settings, especially in universities.

Although most universities in Pakistan now utilize information and communication technology (ICT), there is still room for improvement (Ahmad & Sheikh, 2022). Recently, there has been an enormous amount of development in the field of information and communication technology (ICT). E-learning is a new type of education and was developed as a result of the growing desire for innovative educational methods and the emergence of information and communication technology. Many of them are still dedicated to the traditional teaching methods of in-person lectures in classrooms despite the advent of information and communication technology. However, universities have begun using ICT systems in the spirit of ensuring that everyone has access to university education. Some advocates of the information and communication technology methodology argued that it was just for wealthy individuals and that there was a considerable financial expense connected with its implementation (Puron-Cid & Gil-Garcia, 2022). This was also not very widespread in many universities, notably in western Pakistan. All of these things have become necessities in today's world: modifications to educational policy, access to digital services, the availability of widespread mobile internet connectivity, and the development of proficient digital abilities. There is still a low adoption rate and limited use of the e-learning system in universities, where some students are reported to be reluctant to use the new technology (Ikram et al., 2023). This is even though the system has been widely adopted despite its widespread adoption.

Previous research indicated that the university assistant's role in the creation of a qualified educational environment, developing capacity, and offering relevant online courses are of utmost importance (Ikram et al., 2023). Effective educational content and positive university support have been linked to student learning outcomes (Archambault et al., 2022). University support can significantly boost student motivation by providing resources and guidance that enhance the learning experience. Prior research identifies that students who receive timely assistance and encouragement from their institutions are more likely to engage actively with their coursework (Ikram et al., 2023). Likewise, an educational nurturing environment cultivates a sense of belonging and boosts students' confidence, inspiring student's academic goals. Similarly, research reveals that students have improved academic performance and higher graduation rates. Pakistani researchers found that universities should strive to create an environment where students feel supported in pursuing their educational goals (Ahmad & Sheikh, 2022).

University support and e-learning acceptance (Ahmad et al., 2022) go hand in hand, as institutions that provide robust support systems make the transition to online learning smoother for students. In addition to offering technical assistance, training, and resources tailored to online platforms, universities can alleviate common barriers to e-learning adoption. This proactive approach helps students adapt to digital learning environments, increasing their comfort and willingness to participate in online courses (Qazi et al., 2024). One way to manage academic delivery is higher student engagement, improved learning outcomes, and better overall educational experiences (Asghar et al., 2023). Additionally, universities can use this approach to foster collaboration between students and faculty, creating a more interactive and engaging learning environment. However, while educational content and university support are influential on their own, a third, equally important factor is computer competency among students, which acts as a mediator between the aforementioned factors and e-learning acceptance (Maphosa et al., 2020). Computer competency includes students' familiarity with digital tools, proficiency in using online platforms, and confidence in navigating digital resources. In the context of Pakistani universities, where students may have varying degrees of exposure to technology, computer competency can significantly impact how well students interact with and accept e-learning. In addition to this, the university provides comprehensive support and

high-quality educational content; students with limited computer skills may struggle to engage with digital platforms, leading to lower e-learning acceptance (Nes et al., 2021).

In 2020, Karkar et al. described e-learning integration in Pakistani universities presents both unique challenges and opportunities. The country has a large, young population that is eager to pursue higher education; however, access to digital resources is uneven, particularly in rural and underserved areas. Recent reports indicate that nearly half of the population lacks reliable internet access, and only a small percentage of students have personal computers or tablets, which are essential for effective e-learning (Karkar et al., 2020).

Educational content, university support, and computer competency play pivotal roles in fostering e-learning acceptance among students. High-quality, accessible educational content tailored for digital platforms enhances engagement and learning effectiveness (Al-Azawei et al., 2017). Similarly, strong university support, including technical infrastructure and training, contributes significantly to students' readiness and comfort with e-learning (Eze et al., 2020). Meanwhile, computer competency acts as a foundational skill (Ahmad & Sheikh, 2022), mediating the association between these factors and e-learning acceptance, as higher self-efficacy students in using digital tools report greater satisfaction and usefulness in e-learning environments. Thus, a combined focus on content, support, and skill-building is essential for optimizing higher education e-learning adoption settings. Despite all prior research discussions, the study inquires about addressing subsequent questions.

1. Does educational course content influence e-learning acceptance in Pakistani universities?
2. How does university support influence e-learning acceptance?
3. What role does CC play in mediating the association between educational course content and e-learning acceptance?
4. How does computer competency mediate the connection between university support and e-learning acceptance?

Thus, the article makes several key contributions to understanding factors influencing e-learning acceptance. First, it emphasizes the role of educational competency, demonstrating how well-developed content enhances student engagement and encourages effective use of e-learning platforms. Second, it identifies university influence as a vital factor, where institutional support—such as resources, training, and infrastructure—positively impacts students' readiness to adopt e-learning. Third, the study presents computer competency as a critical mediator, connecting educational competency and university support with actual e-learning acceptance. This mediating role suggests that students with higher digital skills benefit more fully from educational content and institutional support. Fourth, the research provides evidence that computer self-efficacy directly influences student engagement, reinforcing the importance of integrating digital skills into educational curricula. Finally, the article advocates for universities to adopt targeted computer competency training as a strategic approach to bridging skill gaps, thus enhancing digital learning outcomes. These contributions offer valuable, imminent adoption of e-learning by supporting both content quality and essential digital skills among students.

Literature Review

Technology Acceptance Model (TAM)

TAM mainly recognized frameworks for understanding technology acceptance in educational settings. Originally developed to predict and explain users' technology-related behaviors, TAM centers around two critical constructs: a new educational perspective that believes technology would improve performance, and also ease technology effortlessly appears to operate (Davis, 1989; Venkatesh & Davis, 2000). These factors significantly influence learners' e-learning feelings, which also impacts usefulness directly (Davis, 1989). Later extensions of TAM have

integrated additional variables, such as cultural influences, technological infrastructures, and educator roles, to better understand their effect on e-learning acceptance (Saleh et al., 2022).

Educational Course Content and E-learning Acceptance

Education course content is new because it's hard to evaluate all its components for learning quality. E-learning performance is largely assessed through unique course material. Recent studies affirm that modern course content aligns with students' needs and engages, also fostering e-learning acceptance (Masadeh et al., 2023; Kazmi & Hashim, 2015). Moreover, Ibrahim et al. (2021) observed that e-learning acceptance is enhanced via course content that is excellently designed to facilitate information and learning efficiency. Indeed, Material/Content is recognized as a crucial dimension that boosts learning quality models, serving as one among ten quality assessment dimensions that influence e-learning effectiveness (Asghar, 2024). Material/content inclusion emphasizes the importance of educational content in shaping learners' overall experience and boosting e-learning culture. This dimension assesses whether the material is relevant, accurate, accessible, and engaging, as well as if it aligns with the learning objectives. In addition, Alqahtani and Rajkhan (2020) showed that structured and accessible content positively impacts students' perceptions of ease of use, reducing cognitive load and making the e-learning experience more seamless. Kumar et al. (2021) research also discovers learning content significance in evaluating e-learning quality. Likewise, numerous web contents have identified significant contributions in accuracy, visualization, and aesthetics to enhance e-learning quality. Likewise, e-learning acceptance depends on more student satisfaction towards e-learning and its acceptance (Arnas et al., 2023). Hence, based on these studies, it is proposed that:

H1: *Educational course content's positive influence on e-learning acceptance*

University Support & E-learning Acceptance

Especially in the post-2020 era, e-learning has rapidly become a prominent educational model, with universities prioritizing digital platforms to ensure continuity in education. Several studies have attempted to define university support in various ways, like resource availability, technical support, and institutional assistance that is provided to students (Akram et al., 2023). However, few studies have investigated the impact of university support on e-learning. The study conducted by this paper seeks to address this issue by evaluating university support's impact on e-learning acceptance. Prior research primarily investigated the association between university support and e-learning platforms students' acceptance (Latip et al., 2022; Masadeh et al., 2023). University students effectively use digital learning tools when universities provide robust support systems. However, it remains unclear how these mechanisms directly affect e-learning acceptance. In general, to improve university support for e-learning acceptance, institutions should promote comprehensive training programs for students to enhance digital literacy and platform proficiency. Additionally, universities could provide accessible technical support and mitigate issues promptly. A study by (Eze et al., 2020) highlights that institutional support, including technical assistance and instructional resources, is crucial for overcoming barriers to e-learning. Therefore, it can be hypothesized that:

H2: *University Support positive effects on students' e-learning acceptance*

Educational content, Computer Competency, E-Learning Acceptance

Previous studies on course content and e-learning acceptance have not significantly included the computer competency mediating effect (Arnas et al., 2023; Kumar et al., 2021). Also, Arnas et al. (2023) argue different forms of education content adopted retain numerous challenges for e-learning student acceptance. Educational content quality, often the primary determinant, has been identified as pivotal in e-learning contexts for its role in engaging

students and enhancing their learning experience. However, this relationship has heightened interest in understanding influencing e-learning acceptance elements among students. The educational course has traditionally been delivered in person. However, e-learning acceptance and online delivery in the university have gained considerable research attention due to the increasing demand for technological knowledge by students.

Duggal (2022) identified contextual challenges and interventions identified educational content and e-learning acceptance as increasing demand. Similarly, the quality of educational content and student interest increase students' e-learning acceptance. That and Francis (2020) described that quality educational content at educational institutes, along with learners' assessment, is a factor in the rise of e-learning acceptance. According to recent findings (Kumar & Singh, 2023), students who lack sufficient computer competency may struggle with certain e-learning features, making even well-designed content less accessible. Thus, computer competency may act as a crucial facilitator that bridges the gap between quality content and overall acceptance of e-learning (Gill et al., 2023). The implication is that educational institutions should consider both the quality of their digital content and the computer skills of their students to maximize engagement and acceptance. Thus, computer competency may act as a crucial facilitator that bridges the gap between quality content and overall acceptance of e-learning. The implication is that educational institutions should consider both the quality of their digital content and the computer skills of their students to maximize engagement and acceptance. Hence, it is proposed:

H3: *Computer Competency will mediate the relationship between Educational content ELA*

University Support, E-learning-Acceptance & Computer Competency

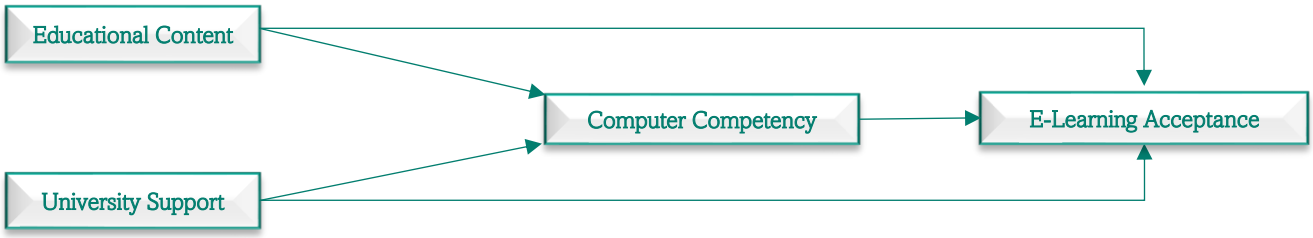
Empirical research specifically exploring computer competency's mediating role in the association between university support and e-learning acceptance is limited (Saleh et al., 2022). Nonetheless, similar elements have been examined in pertinent studies. Lin (2024) examined the nuanced factors affecting student satisfaction in e-learning environments. The findings suggested that various aspects, such as digital competency, instructional design, institutional support, and emotional engagement, contribute to students' overall satisfaction with e-learning. Lin emphasizes the unique challenges posed by the sudden shift to online learning, highlighting that factors like adequate university support and student readiness (particularly digital skills) significantly mediate the effectiveness of e-learning acceptance platforms. Li et al. (2024) investigated how the self-efficacy of computers influences students' intentions to use translation technologies. The findings suggest that increasing technology in education has emphasized the need to foster supportive learning environments that boost students' digital confidence and e-learning adoption in relationship to other variables interaction such as computer competency, training support, etc.

Computer proficiency is expected to mediate the association between university assistance and e-learning acceptability, highlighting its importance in moulding students' ability to use e-learning platforms. Technical tools, planned training, and continuing digital assistance from the university help students move to digital learning settings. Recent studies reveal that university assistance alone may not guarantee e-learning acceptability; rather, it depends on students' computer competency (Singh Kaurav et al., 2019). Students with high digital competency can maximize institutional support, resulting in meaningful engagement and e-learning adoption. Thus, while university support is needed to promote e-learning acceptance, students' digital skills determine how well they can navigate and internalize resources, determining their overall acceptance and satisfaction with e-learning. Computer competency bridges the gap between university assistance and e-learning success, emphasizing the need for holistic approaches that incorporate external help and skill development for a more effective and inclusive experience. Hence, it is proposed that.

H4: *Computer Competency will mediate the association between University Support and E-learning Acceptance*

Figure 1

Conceptual Framework



Research Method

This research employs a quantitative methodology to examine the relationship between educational competency and university influence on acceptance of e-learning, emphasizing computer competency mediating effects. Within the context of a structured environment, this methodological framework makes it easier to examine the power and direction of linkages. It also offers a data-driven approach to comprehending complicated interactions. To collect data in a single instant in time, the research design is cross-sectional, and the method of data collection is a survey. The usefulness of this method in defining characteristics of large groups of persons and analysing interrelationships among several factors simultaneously led to its selection as a method of choice. AMOS-28 and SPSS-26 were primary analytical methods that we utilized to permit in-depth study and decide links that exist between dimensions that were of interest to us. The exploratory research approach, which focuses on modelling complicated interactions among latent components, is a good fit for this methodology.

Population

The study included a group of 500 college students from a public university in Pakistan. These students are chosen from among those enrolled in e-learning courses. An online questionnaire was utilized for gathering the data between January 10 and March 30, 2023. The sampling approach was changed to purposive non-probability sampling, which recognizes the target group's unique characteristics and experiences while allowing for voluntary involvement.

Of the total participants, 68% (340) were male, while 32% (160) were male. Almost all of the participants, 20% (100 students), were aged 20 to 24. One person, or approximately 0.3% of the sample, was under the age of 18. Following the determination of this participant's age, we took additional steps to comply with ethical requirements for research involving minors. A parent's consent was acquired to assure compliance with ethical norms and regulatory criteria for the participation of individuals under the age of 18 in research investigations. This step was taken to ensure the integrity of the study process and to uphold the highest ethical standards. Among the remaining participants, 25 students (5.0%) were older than 25. A considerable majority, 57.2% (286 students), came from rural areas. The urban participants made up 42.8% (240 students) of the sample, indicating a relatively low proportion.

Measurement Instrument

course content was measured using a 6-item scale developed by Sharif-Nia et al. (2024). Simple things include the following: The course information is well-organized and simple to navigate. Selim (2007) assessed students' computer competency using five items. Sample goods include: I am adept at using computers for academic purposes. E-learning Acceptance: ELA is measured using three questions from Selim (2007) (for example, "E-learning is an effective method of learning"). Examples include E-learning as an efficient means of learning. The university support was examined using five items (Selim, 2007). Sample item: The University provides adequate

technical assistance for resolving E-learning concerns. All items were assessed on a 5-point Likert scale, with 1 indicating complete disagreement and 5 indicating complete agreement. In this study, four sections of the questionnaire were examined for internal consistency. Table 1 displays Cronbach's alpha, factor loading, AVE, mean, and SD.

Table 1

CR, AVE & Cronbach Alpha

	Items	Mean	S.D	F.L	CR	AVE	α
CC	CC1	3.39	1.02	0.879	0.824	0.809	0.921
	CC2	3.35	0.98	0.721			
	CC3	3.27	1.21	0.824			
	CC4	3.25	1.22	0.713			
	CC5	3.14	1.19	0.709			
	CC6	3.3	1.27	0.87			
SCC	SCC1	3.4	1.11	0.81	0.815	0.791	0.838
	SCC2	3.45	1.03	0.82			
	SCC3	3.42	1.22	0.815			
	SCC4	3.38	1.24	0.811			
	SCC5	3.37	1.12	0.718			
ELA	ELA1	3.33	1.10	0.81	0.822	0.862	0.812
	ELA2	3.1	1.19	0.79			
	ELA3	3.45	1.19	0.81			
US	US1	3.15	1.14	0.812	0.838	0.801	0.820
	US2	3.28	1.12	0.823			
	US3	3.28	1.43	0.715			
	US4	3.12	1.41	0.811			
	US5	3.19	1.34	0.814			

Table 2

Correlation coefficient

	(1)	(2)	(3)	(4)
CC	(0.90)			
SCC	0.759	(0.89)		
ELA	0.517	0.544	(0.93)	
US	0.203	0.302	0.598	(0.89)

**Fornell & Larcker (1981)*

Data Analysis

The initial step involved estimating the measurement model through the use of AMOS. The measurement model demonstrated a good fit ($\chi 2$ /df = 1.89; CFI = 0.96; TLI = 0.95; RMSEA = 0.05). $\chi 2$ /pdf < 2, CFI > 0.90, TLI > 0.90, and RMSEA are established criteria for model fit assessment. Composite reliability and Cronbach's alpha were employed to evaluate reliability. Table 1 demonstrates that the composite reliability ranged from 0.815 to 0.838, while Cronbach's alpha varied between 0.812 and 0.921, indicating satisfactory reliability. Additionally, we

evaluated both convergent and discriminant validity. Table 2 demonstrated that the correlations among constructs were lower than the square root of the AVE, indicating strong discriminant validity (Fornell & Larcker, 1981). The AVE values for all constructs exceed 0.5, indicating strong convergent validity within the measurement model.

Following the establishment of a suitable measurement model, we employed AMOS to evaluate the structural model and test the hypotheses. The results indicate that the structural model demonstrates a good fit to the data ($\chi 2$ /df = 1.90; $p < 0.001$; IFI = 0.96; CFI = 0.96; RMSEA = 0.05). Table 2 presents the findings from the testing of our research model. Hypotheses 1 and 2 posited positive correlations among course content, university support, and e-learning acceptance. Results from H1 indicated a positive association between course content and e-learning acceptance (β=0.237, $p < 0.001$). Similarly, the results for H2 indicated a positive association between university support and e-learning acceptance (β=0.237, $p < 0.001$). Consequently, hypotheses 1 and 2 received support. Table 3 presents the summary of the hypotheses testing results.

We conducted a mediation test to evaluate the mediation effects of computer competency, adhering to the methodology outlined by Hair et al. (2010). This approach involved assessing the indirect effect by analyzing the product of the A path and B path while controlling for a direct effect of the C path. In alignment with hypothesis 3, the findings indicated a significant indirect effect of computer competency on course content via e-learning acceptance (B= 0.201, $p < 0.05$), with a confidence interval ranging from 0.076 to 0.337. Hypothesis 4 results indicated the significant indirect effect of computer competency on university support via e-learning acceptance (B = 0.201, $p < 0.05$), with a confidence interval ranging from 0.076 to 0.337.

Table 3

Hypothesis testing

Hypothesis	β	T-value	C.R	Significant-level
H1: CC - ELA	0.237	0.052	3.889	P<0.001
H2: US- ELA	0.201	0.058	3.418	P<0.001

Table 3

Mediating influence

	Direct	Indirect	Total effect	Lower	Upper
H3: SCC-CC-ELA	0.201	O.043	0.208	0.076	0.337
H4:SCC-US-ELA	0.198	0.043	0.198	0.056	0.326

Discussion

This study provides critical insights into how course content and university support, mediated by computer competency, influence students' e-learning acceptance. Grounded in TAM, this research introduces computer competency as a new mediating variable, advancing our understanding of how students' digital skills play a role in their engagement with online learning environments. TAM Traditional applications focus on perceived ease of computer use and perceived usefulness as primary factors, yet our findings suggest that students' ability to navigate and utilize digital platforms—their computer competency—also significantly affects e-learning acceptance. By identifying this mediator, we extend TAM's explanatory power, offering a more comprehensive view of technology acceptance in educational settings.

The results indicate that course content positively impacts e-learning acceptance, underscoring the importance of designing materials that are relevant, clear, and well-suited for digital learning. When educational content is interactive, engaging, and logically organized, it can reduce cognitive load and increase students' motivation to engage with e-learning platforms. This finding aligns with existing literature that stresses the value of high-quality content in facilitating technology adoption among learners. As students encounter thoughtfully designed digital materials, they are more likely to embrace online learning, indicating that course content plays essential positive feelings toward e-learning.

Similarly, university support emerged as a key factor in fostering e-learning acceptance. Institutional resources—such as access to technology, training sessions, and continuous IT support—can help students overcome barriers to digital learning. By providing this support, universities create a conducive environment that promotes confidence and competence in using e-learning tools. Our study suggests that when students perceive strong institutional backing, they engage with e-learning platforms, supporting TAM's premise that external factors significantly influence technology adoption. University support, therefore, catalyzes digital learning, as it reduces technological uncertainties and promotes a positive e-learning experience. A particularly noteworthy finding is the mediating role of computer competency. While course content and university support have direct positive effects on e-learning acceptance, computer competency partially mediates these relationships. This implies that students with greater digital skills are better equipped to maximize the benefits of both high-quality content and institutional support, which in turn fosters a more favorable view of e-learning. Higher computer competency allows students to navigate digital resources efficiently, engage more fully with course content, and feel more comfortable within e-learning platforms, enhancing their overall learning experience. This suggests that computer competency serves as a bridge, linking educational and institutional influences with the students' actual engagement and e-learning acceptance.

Identifying computer competency as a crucial factor, the study contributes to nuanced technology acceptance in educational contexts. In addition to improving educational content and institutional support, universities need to recognize the value of developing students' digital skills. Computer competency enables students to access, interpret, and interact with digital content more effectively, which in turn strengthens their engagement and satisfaction with e-learning. This insight builds on existing theoretical frameworks and expands TAM's relevance to contemporary educational technology research, offering valuable perspectives for institutions looking to enhance e-learning acceptance among students.

Theoretical Implications

This study offers several key theoretical implications that extend and adapt TAM for e-learning contexts. First, by identifying computer competency as a mediator, the research expands TAM, highlighting the essential role of digital skills in technology acceptance. Traditionally, TAM focuses on perceived ease, but this study shows that students' technical proficiency directly impacts their engagement with e-learning platforms. Additionally, CC influence quality on e-learning acceptance suggests that TAM could be refined to include content relevance as a factor, particularly in educational settings where content plays a central role in user motivation. University support also emerges as a crucial contextual factor, indicating that institutional resources and guidance significantly shape students' technology acceptance. This aligns with TAM's framework while suggesting a need to integrate support-related elements in education-focused applications. Furthermore, this study points to the value of incorporating user skill levels into TAM, especially in contexts where digital literacy is critical. Finally, given the cultural setting of this study in Pakistan, TAM may benefit from considering socio-cultural factors, like institutional capacity and technology access, to enhance its relevance across diverse educational and regional contexts.

Practical Implications

This study offers several practical implications for improving e-learning acceptance among students. First, universities should prioritize digital skills training, as computer competency significantly influences students' willingness and ability to engage with e-learning. Institutions can benefit from integrating digital literacy components into the curriculum, ensuring that students are prepared to navigate and maximize the benefits of online learning platforms. Additionally, emphasis on high-quality, engaging, and digital-friendly course content is essential to maintain student interest and promote effective learning. University support systems, including accessible technical resources, regular training, and responsive IT assistance, are also crucial; these resources provide the necessary foundation for students to feel supported and confident in using e-learning tools. Finally, e-learning strategies should be adapted to the cultural context, taking into account factors such as local access to technology and varying levels of digital proficiency, to encourage broader and more inclusive e-learning adoption.

Limitations and Future Research Directions

This study may have various drawbacks. First, it is limited by its focus on a specific cultural and regional context, which may affect the findings' generalizability; future research could replicate the study in diverse settings to validate results across cultures. Second, reliance on self-reported data might introduce response bias, so future studies might incorporate objective measures or mixed methods to strengthen data reliability. Third, this study considers only computer competency as a mediating factor; future research could explore additional mediators, i.e. digital self-efficacy or motivation, to provide a more comprehensive understanding of e-learning acceptance. Fourth, cross-sectional design restricts the ability to make causal inferences, suggesting that longitudinal studies could better capture changes over time in technology acceptance. Lastly, the study is related to students, but future research could examine faculty perspectives to understand how institutional readiness and support influence e-learning adoption at all levels of the educational system.

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