

Factors Influencing Students' Intention to Use E-learning Systems: A Systematic Literature Review

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ABSTRACT

Throughout the years, electronic learning (e-learning) systems have been transforming higher education nationwide and worldwide, particularly in educational institutions. In this context, there is a need for a systematic synthesis of a variety of technological, psychological, and socio-cultural aspects that determine the students' intention to embrace e-learning. This study conducts a systematic literature review (SLR) using the Technology Acceptance Model (TAM) and its extensions, focusing on key factors such as self-efficacy, subject norms, enjoyment, experience, content quality, and computer anxiety. Additionally, it provides an argument that accessibility is a crucial but relatively less-studied moderator factor influencing e-learning adoption. The findings indicate that while numerous studies address infrastructure-related challenges, there is limited context-specific evidence regarding their impact on e-learning acceptance. This study contributes to the TAM literature and offers practical insights for enhancing digital learning initiatives in educational institutions.

Keywords: E-learning adoption, Perceived Usefulness, Perceived Ease of Use

INTRODUCTION

Modern education has been radically reshaped by digital technology, making e-learning systems a core aspect of higher education across the world. E-learning is no longer an optional tool for universities, especially top-ranked ones, which are embracing the demand for flexible and remote learning. This will make these systems a part of people's lives and not just an option for education due to the need for learning in remote areas. Accessibility and availability, as well as the power of these platforms to increase student engagement, are major factors driving the increasing reliance on online learning platforms [1]. The COVID-19 pandemic saw a major wave of transformation in the switch to online education, indicating the significant implications of digital education in the enhancement of effective learning and the increase of institutional competitiveness on a global level [2]. However, despite the increasing use of e-learning,

students have had varying degrees of dependence on these media [3]. These factors include self-efficacy, subject norms, enjoyment, experience, quality of the content, and computer anxiety, psychological, technological and experiential factors that could explain the differences. Self-efficacy affects the confidence of students in using the tools for digital learning, whereas subject norms, which include the subjective norms exerted by the peers, faculty, and academic institutions, critically influence the adoption tendency of students [4]. Also, the higher the enjoyment of the students in the learning process and the higher the quality of the digital content, the higher the engagement in the classroom. On the other hand, computer anxiety, which is still associated with poor digital literacy, continues to be a significant challenge that restricts some learners in fully accessing e-learning environments.

This is important because research into the adoption of technology has been conducted around the world and across various fields, yet it continues to fall short in explaining how these factors interplay to affect a student's intention over individual use of the e-learning platform. This study contributes to addressing these gaps by reviewing recent literature on e-learning adoption through a systematic literature review (SLR) while acknowledging the role of accessibility and psychological perspective in the formation of students' attitudes towards e-learning systems.

The following will demonstrate that PU and PEOU are two fundamental factors under the Technology Acceptance Model (TAM) contributing to their adoption. That is to say, PU relates to students' perceived learning effectiveness through e-learning, while PEOU is about the convenience that students have in using and trying to learn technology [5]. Some people argue that whilst TAM has been extensively studied in the perspective of e-learning, the complex of psychological, technological, and socio-cultural factors underlying people's willingness to adopt alternatives from traditional face-to-face classrooms goes beyond TAM's predictability [6].

Many additional external factors have been cited as determinants of high self-efficacy. These include aesthetic enjoyment and anxiety about using computers due to financial reasons or institutional support [7]. However, the impact of aspects such as accessibility (e.g., technological facilities, digital literacy, narrowband availability) on students' attitudes to e-learning systems now represents a wide gulf in research literature, which is quite unfathomable territory [8, 9]. If access to digital resources is low, psychological factors that facilitate adoption, such as motivation or attitude, might be insufficient to improve the quality of learning online. To this end, this study will therefore conduct an in-depth examination of e-learning and these three compounds in particular, and propose a contextual consideration of e-learning uptake within higher education institutions that highlights the role of accessibility, psychological aspects and experience with digital media in the conditions on the part of students that can influence the intention to use online learning. These findings will assist in creating more integrated digital education strategies, which will help institutions map their digital education platform which will ensure that students have an effective engagement approach, which will aid in improving their digital adoption rate overall.

METHODOLOGY

The SLR approach is employed to examine the influencing factors on students' intention to use e-learning systems in the Kingdom of Saudi Arabia. We performed a search for relevant studies

published between 2020 and 2025 in the following academic repositories to ensure a comprehensive and systematic review of the existing literature, namely, Scopus, Web of Science, Google Scholar, IEEE Xplore, ScienceDirect, and Emerald Insight. Specifically, databases were selected that expand coverage of the peer-reviewed research literature in technology adoption, higher education, and e-learning. Through the search strategy, which used the key terms "TAM," "E-learning adoption," "Perceived Usefulness," "Self-Efficacy," "Subjective Norms," and "Accessibility," the studies retrieved were relevant to the study's focus, developed the search strategy with the help of Boolean operators. The inclusion criteria were peer-reviewed journal articles and conference papers published in English on higher education students' behavioral intention to adopt e-learning. Non-peer-reviewed sources, studies related to primary/secondary education, and studies that did not explicitly evaluate the use of e-learning systems for students in tertiary education were excluded. Duplicates were eliminated from review to remain quality and specific. The titles and abstracts were screened for inclusion, and the relevance of the full texts was assessed [10].

A framework-driven data extraction method was used to summarize key variables and theoretical contributions in the studies reviewed. The authorship, publication year, methodology, theoretical framework, key findings, and influencing factors were systematically captured in a literature review matrix. It focused on primary components of the TAM model (PU, PEOU, and Behavioural Intention (BI) followed by other external factors (e.g., self-efficacy, subjective norms, enjoyment, experience, content quality, computer anxiety, and accessibility). In earlier research, self-efficacy has been noted to impact on adoption of e-learning systems [11], whereas subjective norms have been found to affect students' behavioral intention through the views of peers, faculty, and society [6]. Factors such as content quality affect learners' perceptions of the mind and that enjoyment and experience shape students' engagement with digital learning environments. In addition, computer anxiety itself may be a hindrance, which may lead to reducing the student's confidence in adopting e-learning platforms [4, 12]. Most importantly, accessibility, specifically regarding technology infrastructure and digital literacy, has been to ensure a prerequisite of students' intentions towards adopting online learning [13].

A critical appraisal was performed on all the included studies based on their methodology type using the Critical Appraisal Skills Programme (CASP) qualitative checklist and Joanna Briggs Institute (JBI) checklist for quantitative studies to ensure the quality and validity of the review. Studies that underwent quality assessment and were deemed methodologically sound and relevant were included in the final synthesis. Independent validation of search results reduced bias in the review process, and inter-coder reliability checks reported on similar criteria were performed to ensure rigor among team members. The systematic documentation of each stage, from the search strategy to the thematic analysis in the current study, enhances the transparency of the review and can facilitate replicability. These insights into e-learning acceptance demonstrate how findings can be related to theoretical approaches that better fit higher education contexts. Overall, these results have meaningful implications for practitioners, policymakers, educators, and institutions, as the results identify key predictors of technology use in education. Additionally, the current study fills some gaps in the literature about e-learning adoption in higher education and opens avenues for future research. Figure 1 shows the step-by-step process of article selection, including identification, screening, and inclusion criteria used in this systematic literature review.

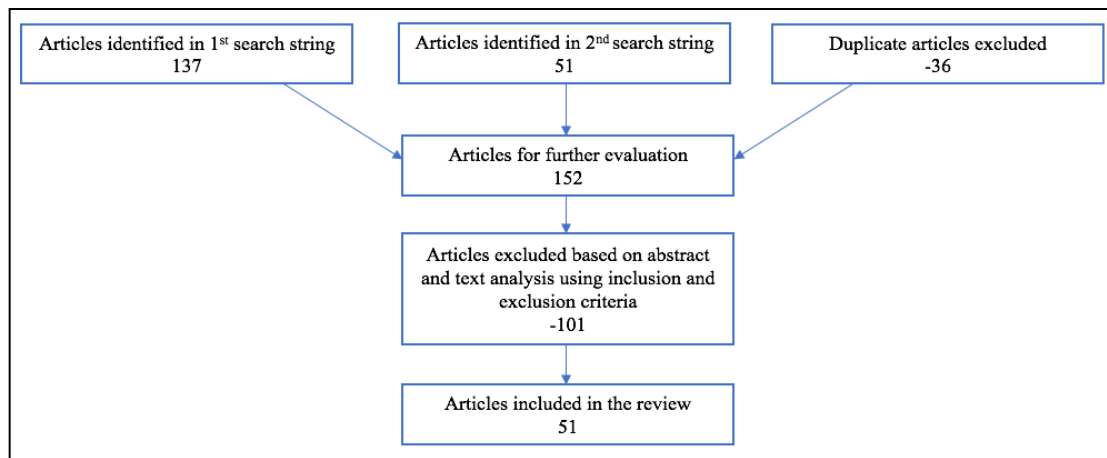


Figure 1: The Systematic Review Process

Factors Influencing Students' Intention to Use E-learning

The intention of students to use the e-learning system can be determined by several factors, which have been extensively examined in the literature. In general, PU will still be an important predictor, as it influences the behavior of students learning about e-learning in terms of their perception of its support for their academic success [14]. Likewise, PEOU is important, as students are likely to use e-learning platforms that they find easy to use [15]. The other constant predictor of e-learning adoption seems to be self-efficacy, which means that students are confident in using digital learning environments. Learners who feel competent to properly use e-learning platforms are more likely to embrace their adoption [12]. Lastly, the subjective norms positively affect the behavioral intention of students, owing to the influence of peers, faculty, and society in general, as learners are likely to adopt e-learning when they notice a positive attitude toward it in their surrounding academia and social life [6].

In addition, accessibility has become a decisive characteristic in deciding the adoption of e-learning. In countries or regions with stable internet access and sound infrastructure, digital learning is less affected, while in regions where digital resources are low, the adoption still faces severe barriers [16]. As an example, well-developed locations in North America and Western Europe offer a widespread digital infrastructure, influencing the regulation of e-learning. On the other hand, developing regions such as portions of Africa, South Asia, and the Middle East face difficulties related to patchy internet access and insufficient institutional support that dissuade students from frequent use of e-learning platforms [8, 9, 17]. Furthermore, it has also been examined the role that the culture plays in technology acceptance as students from cultures with a favorable attitude toward online learning are more open to accepting the e-learning solution [18]. For instance, in collectivistic cultures like East Asia and the Middle East, social norms and institutional endorsement have a greater influence on the adoption of e-learning systems by students. In contrast, individualistic societies such as the US and some European countries consider internal factors for the e-learning adoption higher than [19]. Amusement plays an important role in e-learning; students facing boredom in online learning and not attending will lead to a positive end towards e-learning testability systems [8, 9]. In addition, previous exposure to technology helps with the adaptability of the students to digital learning environments. Also, the quality of content is a key determinant as students are more attracted to e-learning when the content is well-organized, relevant, and participatory [20].

Computer anxiety is fear or discomfort associated with digital platform use and is negatively related to students' willingness to continue with e-learning. Particularly for students who have never been exposed to tech before, they may feel a certain mental resistance [21].

All these factors together reveal the complexity of the e-learning adoption process that requires institutions to improve accessibility, content quality, and the technical infrastructure for e-learning. Tackling these crucial points can also optimize student engagement and will allow more smoother transition towards e-learning systems. Table 1 shows a detailed literature review matrix, summarizing key variables and constructs from the selected studies, including technological readiness, digital competence, perceived usefulness, content quality, and other psychological and contextual factors that influence students' behavioral intention to use e-learning platforms.

Table 1: Literature Review Matrix

No	Author(s) and Year	Technological Readiness	Social Presence in Online Learning	Cognitive Absorption	User Motivation and Engagement	Quality of E-learning Content	Instructor Support and Interaction	Privacy and Security Concerns	Gamification and Interactive Learning Features	Behavioral Intention to Use Technology	Digital Literacy and Competence	Perceived Usefulness	Perceived Ease of Use	Perceived Enjoyment	Self-Efficacy	Subjective Norms	Digital Infrastructure	Content Quality	Computer Anxiety	Cultural Influences and Experience on Technology Adoption
1.	Abdelfattah et al. (2023)	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
2.	Al Mulhem (2020)	✓		✓		✓				✓	✓	✓						✓		
3.	Al-Fahim et al. (2024)	✓			✓	✓		✓				✓	✓	✓				✓		
4.	Banu et al. (2024)	✓			✓		✓	✓	✓			✓	✓	✓				✓	✓	
5.	Barhoumi et al. (2022)		✓			✓		✓		✓		✓	✓				✓	✓		
6.	Bhardwaj & Sharma (2024)	✓		✓											✓				✓	
7.	Bizjak et al. (2020)	✓					✓				✓	✓	✓					✓		
8.	Candra & Jeselin (2024)		✓		✓				✓					✓				✓	✓	
9.	Daultani et al. (2021)	✓				✓				✓	✓	✓	✓					✓		
10.	ElSayad (2024)	✓				✓		✓		✓	✓	✓	✓	✓				✓	✓	
11.	Errabo et al. (2024)		✓		✓										✓			✓		
12.	Fayaz & Gulzar (2025)														✓				✓	
13.	Gashi et al. (2024)	✓	✓		✓	✓						✓						✓		
14.	Gentile et al. (2020)	✓	✓	✓	✓	✓	✓		✓	✓				✓	✓			✓	✓	
15.	Gibson (2024)						✓								✓				✓	
16.	Gonzalez-Tamayo et al. (2024)	✓									✓				✓			✓		
17.	Goyal & Verma (2024)	✓			✓					✓		✓	✓					✓	✓	

18.	Gregori et al. (2024)											✓			✓			✓	
19.	Gupta et al. (2024)					✓		✓				✓	✓					✓	✓
20.	Ho et al. (2020)	✓	✓	✓	✓						✓				✓	✓	✓	✓	
21.	Alshammari et al. (2024)	✓	✓		✓	✓				✓	✓	✓	✓		✓			✓	✓
22.	Jermisittiparsert et al. (2023)			✓				✓		✓		✓				✓			✓
24.	Kashive et al. (2020)	✓								✓	✓		✓					✓	✓
25.	Krishnan & JNV (2024)	✓			✓					✓		✓	✓					✓	
26.	Kumar (2022)		✓	✓	✓	✓					✓	✓	✓	✓				✓	✓
27.	Larson et al. (2024)						✓				✓				✓			✓	✓
28.	Latreche et al. (2024)	✓								✓		✓	✓					✓	
29.	Lestari et al. (2024)							✓										✓	
30.	Luppacini & Walabe (2021)		✓			✓						✓	✓					✓	✓
31.	Madi et al. (2024)	✓				✓			✓			✓	✓					✓	✓
32.	Nedeljković & Petrović (2023)		✓				✓			✓		✓						✓	✓
33.	Nikou & Maslov (2021)		✓			✓	✓				✓		✓	✓	✓			✓	✓
34.	Pajković et al. (2023)	✓													✓	✓	✓	✓	
35.	Panigrahi et al. (2021)		✓	✓	✓				✓			✓	✓	✓				✓	✓
36.	Podder & Saha (2024)						✓								✓			✓	
37.	Price-Howard & Lewis (2023)	✓			✓					✓		✓						✓	
38.	Raza et al. (2022)		✓			✓	✓				✓	✓	✓				✓	✓	✓
39.	Salimon et al. (2023)		✓	✓								✓	✓					✓	✓
40.	Salimon et al. (2021)		✓	✓	✓	✓				✓	✓	✓	✓					✓	✓
41.	Saoula et al. (2023)	✓		✓		✓		✓		✓			✓					✓	
42.	Sareminia & Mohammadi Dehcheshmeh (2024)		✓		✓	✓	✓				✓	✓	✓					✓	✓
43.	Soomro & Habeeb (2024)							✓					✓					✓	
44.	Sorkun, Yurt & Hsuan (2022)	✓		✓						✓		✓						✓	
45.	Stavrou & Piki (2024)	✓			✓				✓					✓	✓			✓	
46.	Teng, Wu & Kuo (2024)		✓						✓	✓		✓		✓				✓	✓
47.	Twum, Ofori, Keney & Korang-Yeboah (2022)	✓			✓					✓	✓	✓	✓			✓		✓	✓
48.	Vlachogianni & Tselios (2022a)		✓			✓						✓	✓				✓	✓	
49.	Vlachogianni & Tselios (2022b)			✓			✓					✓					✓	✓	
50.	Xu, Bao & Lu (2022)	✓	✓		✓						✓				✓			✓	
51.	Yesmin et al. (2024)	✓					✓				✓			✓	✓			✓	✓

Factors Affecting E-learning Adoption

An analysis of the current literature provides a comprehensive overview of the factors affecting the students' usage intention of e-learning systems, and their classification into psychological, technological, and contextual factors. Specifically, PU and PEOU are at the core of the

technology adoption, which leads to the students' attitudes towards digital learning platforms. PU strongly impacts students' perception of the benefit provided by e-learning to academic success, while PEOU affects the level of ease of use of these platforms for students [10]. Furthermore, the self-efficacy and subjective norms are critical to that. Self-efficacy (direct): indicates the confidence of the learners in processing the digital-learning tools and that might affect their willingness towards e-learning [12] (as demonstrated below the subjective norm is another external construct that concerns the online delivery of students impacted by peer, faculty, and institutional effects [42, 51, 52]).

Studies highlight the importance of technology readiness and digital/IT literacy in adopting e-learning [15]. When it comes to e-learning, for example, students who have been taught on digital tools and ICT competencies feel more comfortable with e-learning systems, while the opposite is true for students who have not been exposed to these tools and experience barriers to adoption [29]. Likewise, the quality of content and social presence are also high indicators of student engagement in a digital environment. The effective design of educational components offers a variety of preparation training, interactions, simulations, and pieces of content to impressively enhance motivation, recall, and satisfaction [47, 53-55]. In addition, if an instructor is available and there is prompt feedback, students have higher levels of satisfaction and use of e-learning platforms [27]. Research shows students who perceive disconnection from instructors and peers are more prone to attrition in the online environment, creating the need for a virtual climate of support [2, 56-58].

Though there are barriers that stop e-learning from widespread implementation, many articles and research papers have been published on the positive determinants of e-learning adoption. Of these nine factors, computer anxiety is one of the most prominent psychological barriers to students with low-level technological confidence, causing them to be reluctant to adopt digital platforms [8, 9]. Furthermore, the students' reluctance to utilize online learning systems is attributed to privacy and safety issues, especially due to data security policies leakage/inconsistency [32]. Furthermore, some have studied gamification and interactive learning features to help bolster student motivation [27, 59-61]. Quizzes, simulations, and achievement badges positively impact student engagement and behavioral intention in digital learning environments [47].

In addition to the psychological and technological conditions that support the adoption of e-learning systems by students, accessibility and digital infrastructure are also significant factors in this regard. Research indicates that there are discrepancies concerning regions, with students in regions that are developed and where the transition to online learning was stable, enjoying relatively high adoption of online education in their studies compared to those in developing regions, who are still daunted by issues such as poor internet connectivity, low access to devices and limited technical support [8, 9]. In addition, the effects of in or out of cultural experience background (at college) have been studied; students whose national culture shapes their value of digital education appreciate online learning more than a student from a culture rigid on traditional classroom learning [18, 62-64].

In an attempt to provide a clearer synthesis of the literature reviewed, Table 2 below summarizes, in structured table form, the main constructs shaping e-learning adoption. Some of the findings were classified into three major dimensions: Individual Factors (PU, PEOU, self-

efficacy, Computer Anxiety, perceived enjoyment, etc), Cultural Factors (Experience, accessibility, Subjective Norms, etc), and System Factors (content quality, interactivity, etc). This study provides a tabular representation of this data for a brief but clear summary of the key e-learning adoption enablers and barriers.

Table 2: Summary of Key Factors Influencing E-learning Adoption

Category	Factors Identified in Literature
Individual Factors	PU, PEOU, Self-Efficacy, Computer Anxiety, Perceived Enjoyment
Cultural Factors	Experience, Accessibility, Subjective Norms
System Factors	Content Quality

Global Distribution of Studies in the SLR

The geographic distribution of studies in this SLR illustrates the global landscape of research on e-learning adoption, settled regionally within distinctive continents. Out of these studies, nearly 39.2% are from Asia (see Figure 2), showing that this region is actively involved in examining the adoption of e-learning systems. This is consistent with expected digital transformation and rapid integrations of online learning technologies in higher education institutions in countries such as China, India, and Malaysia. Studies from this area highlight specific regional-focused challenges such as technological readiness and digital literacy, along with infrastructural barriers, while addressing the growing interest in online learning in diverse educational settings, comparing how students embrace online learning.

Europe, which covers 27.5% of the reviewed studies, shows a solid academic interest in digital learning practices, following Asia. Considering that the European higher education systems are rather mature already concerning online learning, the European research predominantly belongs to the areas of social presence in online learning, instructor interaction, and privacy issues. In contrast, just 13.7% of the studies considered in this overall analysis were of African origin, implying that critical research into the benefits of e-learning solutions needs to be conducted in this growing reliance area post-COVID pandemic era. Digital infrastructure, internet access, and computer anxiety continue to be important barriers to e-learning adoption, and much of the research from Africa emphasizes these key issues.

North America, after readability, also has a tiny proportion of the studies (11.8%) that were carried out, and that seems a bit strange since in this region online educational systems are quite developed technological infrastructure is very advanced. This may be because e-learning has reached saturation, which has caused researchers to explore other, more emergent issues, such as gamification, interactive learning features, and models of behavioral engagement used instead of the fundamental factors of adoption.

Lastly, South America has the least representation among all regions (7.8% of the reviewed studies), emphasizing an important research gap. Few studies indicate that, although e-learning is becoming a bigger part of higher education in South American institutions, there is little empirical research on the adoption of the method to date.

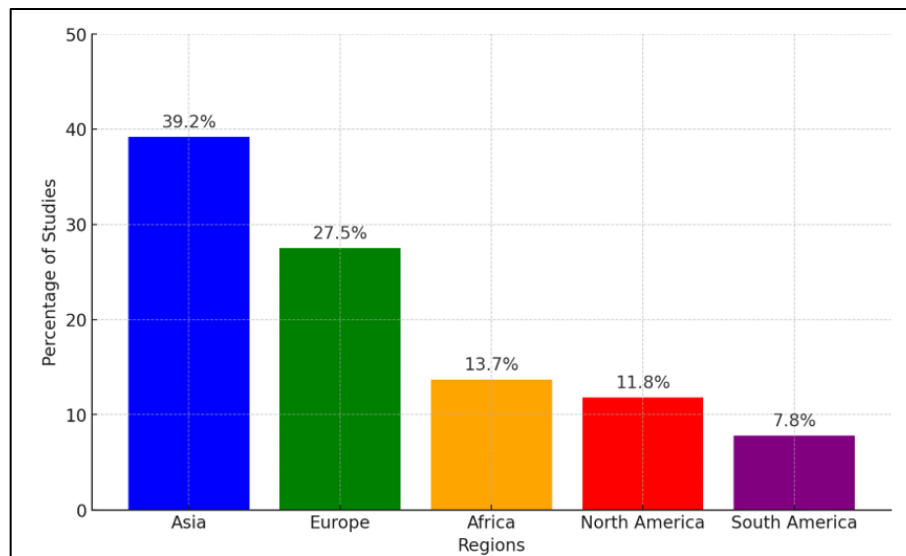


Figure 2: Geographic Distribution of Studies On E-Learning Adoption

DISCUSSION

TAM and its extended versions have been essential for the modelling of student behavioral intention to adopt an e-learning system. Perceived usefulness and perceived ease are the two most significant factors; this is a well-established fact in the literature of technology adoption over the past decades [14]. While they are core constructs, external elements such as self-efficacy, subjective norms, enjoyment, experience, content quality, and computer anxiety can influence these core constructs [3]. This review brings key issues of contextual on the adoption of e-learning to the fore and explores its key aspects in educational institutions that are characterised by challenging socio-cultural and infrastructural contexts. Although self-efficacy captured the attention of many researchers as an important variable to identify the success of students in coping with digital learning platforms [12], the impact of subjective norms is equally significant. Peer colleagues and faculty members have their role to play as the students' attitude towards adopting e-learning has been influenced by the peer colleagues and faculty members [6]. Moreover, enjoyment and experience can boost motivation and engagement in e-learning environments. When students perceive digital learning platforms to be realistic, interesting, and beneficial, they are encouraged to use them consistently [47]. Likewise, content quality continues to be as critical as before contributing to perceived usefulness, as relevant, well-organized, and well-designed course materials improve learning [20].

Computer anxiety is also important as it affects students' perception of ease of use and self-efficacy, negatively [8, 9]. When students are hesitant to use digital tools in the classroom due to a lack of confidence, they cannot work with e-learning systems properly. However, addressing digital literacy and providing training programs can alleviate these issues and increase adoption rates. Accessibility has contributed to emerge as an important moderator of e-learning adoption; however, there has not been enough research conducted in this area. In Educational institutions, the infrastructural limitations, such as unstable internet connectivity, absence of cheap wireless devices, and discrepancies between regions in access to technology, show that accessibility restraints may impair students' intention to use online learning platforms [17]. Their mediation role within PU and PEOU has also not been previously examined about their effect on students' behavioral intention sufficiently [8, 9]. Future studies

should examine whether the constraints of accessibility lead students to regard e-learning as ineffective and should provide further guidance on how institutions and governments can invest to help bridge the digital divide [40].

These implications should be considered when designing e-learning system policy in institutions. At the same time, upgrading digital infrastructure, broadening access to the internet, and affordable digital devices will help students from rural and disadvantaged areas [15]. Simultaneously, the symptomatic and instrumental digital literacy self-efficacy and skills can be increased with the planning the right training methods and strategies, which results in shaping the reduced computer anxiety of the students and thereby creating a conducive learning environment [12]. Elements such as gamification, interactivity, visualization, and Top-tier course materials can make learning more interactive, exciting, and effective and promote learning [47]. Finally, peer influence should also not be ignored since subjective norms, embedded in policies that provide incentives to faculty to be involved in e-learning, peer influence for e-learning adoption, and a favorable digital learning environment can facilitate e-learning adoption [6].

While external factors such as economic climate are important, future research should be longitudinal and mixed-method focused so that we see how these external factors change over time and how they affect long-term adopters in educational institutions [17]. Overcoming these issues can help educational institutions provide more inclusive and effective e-learning environments that can ensure students have access to better resources, support, and motivation to successfully engage in digital education.

GAP WITHIN THE LITERATURE

Although students' intention to use e-learning systems has been an attractive topic for researchers, there are still several research gaps that need to be addressed. For example, there is a lack of research on accessibility as a moderator. Although accessibility as an external factor is acknowledged in many studies as a determinant of e-learning adoption, past research has rarely investigated the relationships between accessibility and core TAM constructs (i.e., perceived usefulness and perceived ease of use). Access to digital resources such as stable internet connectivity, reasonably priced devices, and digital infrastructure also significantly lowers the student perception and acceptance rate toward e-learning. However, the availability of better accessibility is not sufficiently studied in the literature in the case of moderating the role of student perception towards technology and his/her intention to adopt an e-learning system. The COVID-19 pandemic (2020-2025) highlighted the digital divide, as students in regions with poor accessibility faced major disruptions in education, yet research on how this crisis shaped long-term e-learning adoption remains limited [13]. This gap could be addressed to offer greater granularity regarding how accessibility affects the adoption of digital education across different infrastructural settings.

A significant gap is first, the lack of contextualized research within institutions that operate in the educational space, outside of Western and East Asian jurisdictional and cultural contexts. Although contextualized studies examining the role of cultural and societal factors for technology adoption abound, we find a lack of studies examining localized, socio-cultural influences in local institutional contexts. As universities dig into digital transformation, they need to understand the relationship between e-learning adoption, regional norms, institutional

policies, and student expectations should be understood make customized and inclusive digital education strategies. Through the COVID-19 crisis, institutional digitalization accelerated, but few studies have addressed universities' approaches in modifying their regulations and programs to maintain long-lasting online study [18].

Second, previous studies have not sufficiently explored the interaction effects of self-efficacy, perceived enjoyment, content quality, experience, and computer anxiety in the suggested model, which reflects students' intention to use e-learning. Although these factors have been studied separately, their joint effect has not been fully examined. For example, a greater degree of self-efficacy reduces computer anxiety; in turn, perceived enjoyment will be heightened, and the use of an e-learning system is increased. But that may create an overwhelming effect among students with poor digital literacy and confidence in using e-learning platforms, which, in turn, affects adoption rates negatively.

Third, although the quality of content greatly influences perceived usefulness and ease of use, its interactions with other variables from outside the model are still ambiguous. Future research needs to explore this to gain a more complete picture of how students develop their attitudes toward e-learning. Witnessed how the COVID-19 pandemic prompted reliance on digital platforms; however, studies on the impacts of this shift on students' learning behaviors, also including their motivation and self-efficacy, as well as the long-term effects or persistence in online education, remain sparse [25].

Fourth, an essential research gap of research is they are is qualitative research on students lived experience of e-learning. The majority of recent studies are quantitative (survey-based), providing statistical, but not personal insights regarding the challenges students face, the motivations hiding behind their behaviour as well as the dynamics of their interaction with digital learning platforms. However, the lack of qualitative studies (e.g., interviews, focus groups, case studies) limits the understanding of what are the actual barriers and facilitators of e-learning adoption. While the COVID-19 pandemic did cause worldwide students transition from in-class to home-based online learning just overnight, qualitative insights into their challenges, levels of engagement, and perspectives on long-term digital education remains limited 1 This, in turn, can furnish a necessarily well-rounded and contextualized narrative surrounding e-learning uptake, which could help policymakers and educational institutions design more effective and inclusive digital learning polices and strategies.

CONCLUSION

This SLR highlights the key factors that influence students' intention to use e-learning systems at educational institutions. Additionally, the results verify the high influence of PU and PEOU as predictors in the e-learning adoption framework. Moreover, the external forces such as self-efficacy, subjective norms, enjoyment, experience, content quality, and computer anxiety, significantly influence perceptions of e-learning platforms by students. Accessibility, among these factors, has been considered a major intervention moderator, but there is little research in this area. However, ongoing issues with digital infrastructure, internet access, and e-learning material availability have hampered widespread uptake, and there is a need for initiatives aimed at developing a more inclusive and engaging online learning system.

In addition, COVID-19 proved to be a game-changer regarding the adoption of e-learning. But the accessible research on how students adapted, where barriers continued to exist, and whether the acceptance of e-learning continued to increase following the global pandemic and students' return to class remains scarce. Though the pandemic acted as the catalyst for digital transformation and utilization of digital tools, the question of whether such changes resulted in long-lasting improvements in e-learning adoption is still unanswered [8, 9].

Future studies need to investigate the impact of pedagogical methods, institutional preparedness, and learner engagement variables on online learning environments. Apart from filling the system accessibility gap or at least a huge digital gap from the policy and practitioner angle by investment in digital infrastructure, we need to focus on enhancing content quality to increase students' learning experiences and perceived usefulness. We fill these gaps in the literature by extending and adapting the TAM model in a higher education context, which is relatively rare, given the developing nature of universities, the rapidly changing approaches to education, and recent political and technological developments within educational institutions. Higher education institutions, policymakers and researchers will be able to derive a meaningful implication for the framework contextualized to their settings, which will be helpful to devise an effective and sustainable orientation towards e-learning in the future.

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