Review
eLearning Acceptance and Adoption Challenges in Higher Education

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Abstract: Online learning and technology acceptance has become a highly significant subject in the field of information technology. The challenges of eLearning acceptance and adoption in higher education are complex and multifaceted: it is important to carefully consider the environmental, social, and economic implications of eLearning implementation and to work toward ensuring that eLearning programs are accessible, equitable, and sustainable over the long term. Many theories and models have been proposed over the years to explain individual usage and behavior and measure the degree of acceptance and satisfaction toward technology acceptance and online learning. This study reviews the challenges and limitations of online learning acceptance and adoption for the last ten years (2012–2022). Lack of technical support, awareness, institution readiness, quality online course content, and less information technology skill of faculty members in the early years present challenges. Further, self-efficacy, financial and technology factors, pedagogical learning, socio-economic evolution, digital competence and compatibility, and lack of technological infrastructure have significantly affected the adoption of eLearning in higher education institutions in recent years.

Keywords: eLearning; online learning; technology acceptance and adoption; TAM; ETAM; LMS; challenges; limitations; higher education

1. Introduction

The general purpose of education is to mold a person intellectually, psychologically, and emotionally. Education provides the pathway to subject-specific competency. Learning is a process of acquiring knowledge or skills through study, experience, or instruction. However, certain global developments may affect education worldwide, such as the recent pandemic. According to UNESCO, schools and higher education institutions (HEIs) were closed in 195 countries in mid-April 2020, thus affecting 1.3 billion of the total number of students worldwide [1]. This dire situation during the lockdown prompted education professionals to consider alternative methods of teaching. It paved the way for full implementation of web-based learning, also called online learning or eLearning. Electronic learning or eLearning has become a standard method of instruction that is widely used and implemented by educational institutions across the globe [1]. According to Al-Rahmi et al. [2], eLearning provides students with a virtual atmosphere in which they can take part in several activities. Therefore, eLearning students became involved in educational activities by employing technology as an intermediate tool for learning. They use different devices for this purpose to access data and to communicate with others.
The recent pandemic abruptly changed the classroom context and presented enormous challenges for all actors in the educational process, who had to overcome multiple difficulties and incorporate new strategies and tools to impart knowledge in a new way. Vela’squez-Rojas et al. [3] analyzed how student performance was affected in a higher education case study in La Plata, Argentina. They indicated that this process was also strongly influenced by the availability of resources for each student. This reflects the reality of a developing country, which experienced prolonged isolation, giving way to a particular learning context in which they were able to identify key factors that could guide the design of strategies in similar scenarios [3]. The instructive combination of data and corresponding innovations has been scrutinized due to the need to implement online learning because of COVID-19. Flexible education is a possibility in this ambiguous environment to support greater equality, and provide an affordable, accessible, and innovative learning environment. To effectively define the impacts of this unique interactive learning environment, it is necessary to examine the prior scenario in terms of the usage of digitalization in instructional strategies. Valverde-Berrocoso et al. [4] determined the most popular kinds of ICT-enhanced instruction practices and the areas in which online technologies are frequently utilized. Several limitations in the instructors’ electronic proficiency in addition to the early training strategy were discovered, which helps to explain the challenges experienced throughout “critical online schooling” [4].

Information and communications technology (ICT) has transformed and reshaped many aspects of modern life. Education has also been strongly affected by ICT through the integration of many technologies used for educational purposes such as computers, the Internet, and mobile technologies. Online learning is commonly defined as the use of any device with Internet access to engage in a learning process which can take place anywhere and at any time. Using learning management systems is one approach to online learning. Learning management systems are platforms that offer a variety of integrated tools for delivering and managing online instruction. The utilization of learning management systems (LMSes) to aid in educational initiatives has become a widespread practice in colleges and universities. Higher education institutions use LMSes to supplement face-to-face learning sessions and support blended instruction and distance learning. This study focuses on the points mentioned below. Meanwhile, lack of funding and development slowed the deployment of online education due to old hardware and software. Self-efficacy is associated with facilitating the transition of skills and affects how engaged students behave in online learning. Further, it manipulates performance expectancy (i.e., the extent to which a person believes that the technology is useful; PE) and effort expectancy (i.e., how much energy someone is willing to invest in utilizing the technology; EE). Due to the recent pandemic, pedagogical learning challenges increased, which resulted in low ICT skills. Furthermore, socio-economic factors and digital competency and compatibility also played a role in influencing the adoption of eLearning in higher educational institutions [5].

Furthermore, eLearning can contribute to environmental sustainability by reducing the need for physical classroom spaces and the associated energy consumption required for heating, cooling, and lighting those spaces. Another aspect of sustainability is social sustainability, which is concerned with promoting equity and access to resources for all members of society. eLearning has the potential to increase access to education for individuals who may not have otherwise had the opportunity to attend a traditional classroom-based program. Acceptance and adoption of eLearning in higher education can also have implications for economic sustainability, which is concerned with maintaining economic growth and stability over time. eLearning has the potential to reduce the costs associated with traditional classroom-based programs, such as building maintenance and transportation expenses. However, there may be costs associated with developing and implementing eLearning programs, and these costs may be borne by students or institutions.
Therefore, this research seeks to investigate the main challenges and limitations that have affected the acceptance and adoption of eLearning systems over the last ten years. Hence, we ask the following questions:

1. What were the main challenges and limitations of eLearning adoption and acceptance in the past?
2. What have been the main challenges and limitations of eLearning adoption and acceptance during recent years?

2. Research Background

The growth of ICT has had an impact on the education sector, and as a result, innovation in digital learning has emerged, such as eLearning systems, LMS, virtual learning environments (VLE), and computer-based training systems (CBT). Based on a mixed-methods investigation, Moore et al. [6] revealed that scholars use different terms for different types of instructional technology in different ways. This emphasizes how crucial it is to define the similarities among newly emerging concepts in online learning. As a broader concept, online learning is a digital system that allows individuals to access online learning content using a web-based environment. Consequently, the term “eLearning systems” is so broad that it could refer to almost any platform that provides primary education to learners via an online platform, such as LMS and VLE [7]. An LMS is a website-based learning system with a variety of functions that enables teachers to create lesson plans and instructional experiences while allowing students to complete academic tasks efficiently [8].

According to this interpretation, an LMS is a specific kind of eLearning platform which is geared toward controlling how eLearning modules are delivered. Numerous components are included in learning management systems, which aid in conducting sessions, such as user registration, announcements, email, forums, assignment submissions, quizzes, course materials, and calendars [9]. According to Chaubey and Bhattacharya, an LMS could be characterized as an Internet or cloud-based platform that aims to offer edification effectively. Furthermore, a learning management system (LMS) is a forum for handling the entire management of content delivery and users, who may incorporate educators, managers, teaching staff, and developers [10]. According to Medina-Flores and Morales-Gamboa, an LMS is a platform whose primary function is to deliver online education for students using ICT. By making use of ICT, learning management systems attempt to promote curriculum administration and cooperation among students and professors [11]. Dube and Scott considered using an LMS to assist a customizable teaching approach that can be made possible by using the Internet to assist in solving the issues of restricted resources and to expand pupil enrollment. The platform comprises numerous well-incorporated characteristics designed to assist educators and students in meeting their educational and instruction goals [12]. Basic variants of the LMS are employed to store instructional resources, whereas advanced versions provide more functionality and characteristics [13]. Learning management systems enable academic entities to continue sharing, storing, and managing learning resources and content. With the use of LMS, educators can improve conventional education through various teaching strategies, techniques, and sources. In conventional use, LMS services may include enrollment for courses, uploading and downloading of educational resources, synchronous and asynchronous student–teacher interaction, assignment completion, testing, and evaluation of student achievement.

The acceptability and usage of technology in the field of information systems have been evaluated using a variety of models and frameworks, such as the TRA, TPB, TAM, TAM2, TAM3, UTAUT, and UTAUT2. Different frameworks make the decision process more challenging while the multiplicity of such ideas increases the assessment’s flexibility [14]. The TPB was extended to address the TRA’s drawbacks. The two ideas contend that subjective norms and attitudes toward behavior both have an impact on user intention. However, Ajzen added the input element of perceived behavioral control to the TPB, which influences user intention and actual behavior. The theory of planned behavior was
established to address the TRA’s shortcomings in forecasting user behavior in circumstances when users have very little control [15]. Another extension of the TRA produced the TAM. The two theories contend that behavioral intention is directly impacted by one’s attitude toward activity. However, the primary distinction between the TRA and the TAM is the idea of subjective norms. Many frameworks, such as the TRA, take into consideration subjective norms as a significant factor in determining behavioral intention, in contrast to the TAM. According to Davis et al., the behavioral intention may not be influenced by subjective norms, particularly when a person employs technology in intentional contexts. Additionally, respondents are not given adequate data on social influence during the acceptability testing phase, whereas the TRA was established in social psychology and is utilized in many different fields. The TAM was invented in the field of technology; hence, its relevance to the adoption of computer-based technologies is significant [15].

As an expansion of the TAM, the extended technology acceptance model was devised. The two models assert that actual system utilization is directly influenced by behavioral intention. It is interesting to note that the TAM2 does not include the idea of attitude toward behavior. The expanded technology acceptance model was established to address the TAM’s shortcomings in clarifying why a person might find the examined technology helpful [16].

Consequently, social influence processing components were added to the perceived usefulness construct in the TAM2 (subjective norms, image, and voluntariness) and cognitive instrumental processing aspects (job relevance, output quality, result demonstrability, and perceived ease of use). Compared to the TAM, the TAM2 has two contextual factors: experience and voluntariness. These two factors affect the connections between subjective norms and behavioral intention on the one hand, and subjective norms and perceived usefulness on the other. Despite the fact that TAM2 successfully updates the external variables that affect perceived usefulness, neither model has been able to pinpoint the external factors that affect perceived ease of use. According to Davis et al., the TAM can explain around 40% of the variance in user intention, whereas the TAM2 can predict about 52% of it [16]. This may serve as a recommendation to expand the TAM to include external factors in order to uncover the factors that influence how easily something may be used and how helpful something is, as well as to increase the TAM’s capacity for explanation. The TAM3, which is the most recent version, is thought to be a blend of the TAM2 and TAM [16] and the model with perceived ease of use determinants (Venkatesh, 2000). Both the TAM3 and the TAM2 have assumed the elements of perceived usefulness. The TAM3 and the framework of perceived ease of use predictors, on the other hand, have incorporated the perceived ease of use variables. The TAM3, in contrast to the TAM and TAM2, as well as the framework of perceived ease of use predictors, recognizes influences of both perceived ease of use and perceived usefulness. The TAM, TAM2, and TAM3 describe 40%, 52%, and 53% of the variations in user intention, respectively. Despite the TAM3’s extensive inclusion of correlations and constructs, it fell short of the TAM2 in terms of explaining the variation in user intention.

Eight technology acceptance theories, of which TAM is just one, were reviewed and evaluated in the development of the UTAUT model. Four independent variables are proposed by the unified theory (performance expectancy, effort expectancy, social influence, and facilitating conditions), four moderating variables (gender, age, experience, and voluntariness of use), and two dependent variables (behavioral intention and use behavior) [17]. This framework shares four elements with the TAM: performance expectancy (like perceived usefulness), effort expectancy (like perceived ease of use), behavioral intention, and user behavior. The TAM has been criticized for not including moderating factors in comparison to the UTAUT [18]. The UTAUT further implies that performance expectancy, effort expectancy, and social influence all have a significant impact on behavioral intention. However, behavioral intention in the TAM is influenced by perceived usefulness and perceived ease of use. Finally, the described variation in user intention is 40% by the TAM and 70% by the UTAUT. Based on the UTAUT, the extended unified theory of acceptance
and use of technology makes use of seven independent variables (performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit), three moderating variables (gender, age, and experience), and two dependent variables (behavioral intention and use behavior). The UTAUT2 overlaps with the TAM in the four constructs, similar to the UTAUT. The UTAUT2 suggests three moderating variables in contrast to the TAM. While the two main constructs (perceived ease of use and perceived usefulness) influence behavioral intention in the TAM, the UTAUT2 assumes that behavioral intention is directly affected by the seven independent variables. This could support and provide justification for the high fraction of the variation clarified by the UTAUT2 in user intention, 74% [18].

As shown in Table 1, the technology acceptance theories are divided into two branches, (1) practice of development and (2) scientific discipline, whereas scientific discipline is further divided into three sub-branches, namely, social psychology, social sciences, and information technology. All the mentioned existing technology acceptance models belong to the information technology category [17,19–35].

### Table 1. Overview of Existing Technology Acceptance and Adoption Models [17,19–35].

<table>
<thead>
<tr>
<th>Technology Acceptance and Adoption Models</th>
<th>Models</th>
<th>Author(s)</th>
<th>Development Field</th>
<th>Predictors</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of Planned Behavior (TPB)—1985</td>
<td>Ajzen (1991) [17]</td>
<td>Social Psychology</td>
<td>Attitude, Subjective Norms, Perceived Behavioral Control &gt; (Intention) Intention &gt; (Behavior)</td>
<td>It does not consider other variables that contribute to behavioral intention and motivation, such as fear, threat, mood, or experience [21].</td>
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<tr>
<td>Technology Acceptance Model (TAM)—1986</td>
<td>Davis (1986) [22]</td>
<td>Information Technology</td>
<td>Perceived Usefulness, Perceived Ease of Use &gt; (Attitude toward Using) Attitude toward Using &gt; (Actual System Use)</td>
<td>TAM provides very general information about usability. TAM concerns the variable that relates to user behavior [23].</td>
<td></td>
</tr>
<tr>
<td>Extended Technology Acceptance Model (ETAM)—1989</td>
<td>Venkatesh and Davis (1996) [24]</td>
<td>Information Technology</td>
<td>External Variables &gt; (Perceived Usefulness, Perceived Ease of Use) Perceived Usefulness, Perceived Ease of Use &gt; (Attitude toward use) Attitude toward use &gt; (Intentions to Use) Intentions to Use &gt; (Actual Usage)</td>
<td>Insufficient emphasis on external factors, including variables such as prior experience, facilitating conditions, or perceived enjoyment. Low variance in investigative studies [25].</td>
<td></td>
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<tr>
<td>Diffusion of Innovations Theory (DOI)—1962</td>
<td>Rogers (1983) [26]—basic theory Moore and Benbasat (1991) [27]—adjustment to the technology acceptance context</td>
<td>Social Sciences</td>
<td>Relative Advantages, Compatibility, Ease of Use, Trialability, Visibility, Image, Voluntariness, Result Demonstrability</td>
<td>It works better with adopting behaviors than with stopping or preventing behaviors [28].</td>
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### Table 1. Cont.

<table>
<thead>
<tr>
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<th>Limitations</th>
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<tbody>
<tr>
<td>Social Cognitive Theory (SCT)—1986</td>
<td>Bandura (1986) [29]</td>
<td>Social Sciences</td>
<td>Knowledge, Goal, Self-Efficacy, Personal Factors, Cognitive Factors &gt; (Actual Usage)</td>
<td>The theory assumes that changes in the environment automatically lead to changes in the person, although this is not always the case [30].</td>
</tr>
<tr>
<td>Unified Theory of Acceptance and Use of Technology (UTAUT)—2003</td>
<td>Venkatesh (2003) [34]</td>
<td>Information Technology</td>
<td>Performance Expectancy, Effort Expectancy, Social Influence, Gender, Age, Experience, Voluntariness of Use &gt; (Behavioral Intention) Behavioral Intention, Facilitating Conditions &gt; (Use Behavior)</td>
<td>Self-reported usage, single subject (only for one community, culture, or country) [35].</td>
</tr>
</tbody>
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### 3. Research Methodology

After carefully finalizing the research questions, we decided to start collecting research papers and data from all the major research databases, e.g., WoS, IEEE, Elsevier, Scopus, and Springer. We decided to collect research data from 2012 to 2022. We restricted the scope of the work and the results to higher education institutions.

Firstly, research questions were finalized as stated above. In this respect, the data were gathered from different databases using specific topic keywords: “technology acceptance”, “learning management system adoption”, “online learning acceptance challenges”, “limitation of implementation of online learning system”, “challenges facing in the adoption of online learning during the pandemic”, and “challenges on the implementation of online learning after pandemic”. The scope of the result was restricted to the category of “higher educational institutes research”.

### 4. Research Framework

The research framework presented in Figure 1 indicates the flow of the research study and the steps through which the authors collected the data and reviewed them. This study reviewed more than 100 related articles from databases such as WoS, IEEE, Elsevier, Scopus, and Springer as part of the literature review. An analysis of challenges was performed over the past 10 years, in addition to an analysis of the effect of these challenges on higher education learners and faculty before and during the pandemic. Section 6 of this article contains a detailed discussion about the contribution of this study. In Section 7, the authors identify the limitations of this study and present plans for future work. The hierarchy of the framework has already been employed in the same sequence in the paper.
5. State-of-the-Art Study

5.1. Challenges in the Adoption of eLearning during Past Years

The teaching and learning process has been altered by the convergence of a variety of technological, instructional, and pedagogical developments in recent times [36]. Technology is challenging the boundaries of the educational structures that have traditionally facilitated learning. Recent advances in computer technology and the diffusion of personal computers, productivity software, multimedia, and network resources have heralded the development and implementation of new and innovative teaching strategies. Educators who advocate technology integration in the learning process believe that it will improve learning and better prepare students for effectively participating in the 21st-century workplace. The impact of ICT has influenced teaching and learning strategies; specifically, it has enabled learning through electronic media. Consequently, there has been an increasing demand for distance and online learning. Additionally, new eLearning platforms have changed education from teacher-centered to student-centered learning. In this new course environment, instructors need to provide useful resources and activities for students. Therefore, they need to adopt new technologies and use them wisely to deliver appropriate learning materials. For example, faculty members should utilize ICT by implementing the use of LMSes [36].

This study examined many existing surveys and research findings and found that teachers and learners underwent many challenges in the process and that several limitations
affected the acceptance and adoption of eLearning in higher education institutions in the last many years [36].

Computer Self-Efficacy

To enhance instruction in higher education, many universities all over the world have introduced LMSes. However, this new educational technology is not being used at its full potential and faces resistance from instructors and students alike. The former group has demonstrated significant resistance to change and unwillingness to adopt new educational technology. However, previous studies have shown that this resistance is not because most instructors dislike technology; rather, they view the use of a new teaching tool as a risky approach for which they are not adequately trained. Further, university administrators do not present a united front in highlighting which specific tools can have positive outcomes for their students. Although this resistance to change might be difficult to overcome, supporting academic staff in adopting new education technology can help make them more likely to embrace it [37].

The significant cause for resistance to change and technological anxiety is computer self-efficacy, which refers to an individual’s belief in their capacity to execute behaviors necessary to produce specific performance attainments. Self-efficacy reflects confidence in the ability to exert control over one’s own motivation, behavior, and social environment. Most academic staff do not have an IT background, which means that their level of computer self-efficacy is rather low. However, positive attitudes toward computers and high computer self-efficacy and lower computer anxiety levels could be important factors in developing better IT skills among academic staff. Low computer self-efficacy leads to computer anxiety and resistance to change, which constitute a huge challenge for the adoption of technology [38].

5.2. Professional Training and Network Infrastructure

Teachers and instructors must be empowered to make decisions about technology and must be given the time, training, and support to acquire the skills to make technology transformational. Learning new skills in any profession requires time; however, teachers spend most of their work hours instructing students in class, meeting with parents, and attending staff and committee meetings. Even accomplished, highly motivated technology-using teachers rank lack of time among the most problematic barriers to integrating information technology in educational institutions. Teachers require time to experiment with new technology, share their experiences with colleagues, and attend in-service training programs. Given the rapid advancements in education technology, teachers need to be able to use each new tool efficiently and train their students in its use. On the other hand, providing classrooms with new tools that neither the teacher nor the students can use is unlikely to make an impact on the student’s educational experience. Although the regular training of faculty and staff requires time and resources, it is necessary to ensure a satisfactory teaching and learning experience.

In addition to time constraints, limited spending significantly impacts training and support. Typically, only 4 to 15 percent of an education district’s technology budget is spent on training. The lack of professional development represents a very significant barrier to technology integration. Teachers cannot be expected to use technology effectively unless they are taught how and when to use it [39].

Besides that, its infrastructure consists of computers, software, and all components of telecommunication systems necessary to facilitate efficient data transfer and management. It also requires IT experts to design, install, maintain, and fix systems, and skilled IT personnel to operate the system efficiently. On the other hand, poor basic IT infrastructure is the major cause of stagnation in most institutions. A strong network infrastructure requires fast, high-quality WiFi as well as data privacy and security, access to digital resources, and much more. Designing, building, and supporting a strong network infrastructure must be
handled with a great amount of care and forethought, as it is necessary for the effective and responsible continued use of technology in education [39].

5.3. Challenges in the Adoption of eLearning in Recent Years

The recent pandemic has forced most worldwide institutions to adopt eLearning. The immediate provision and usage of online systems was a major challenge for many universities during the recent pandemic. However, their successful usage relied on understanding the adoption factors as well as the main challenges of the available eLearning systems. There is a lack of agreement about the critical challenges and factors that have shaped the successful usage of eLearning systems during the recent pandemic [40]. This study examined a number of surveys and research findings on the challenges and limitations that have affected the successful acceptance and adoption of eLearning in recent years.

5.3.1. Performance Expectancy and Effort Expectancy

Self-efficacy is the evaluation of one’s level of confidence in somebody’s capacity to carry out activities and accomplish targets. The success of online learning adoption is associated with how enthusiastic and secure pupils feel about utilizing it. Self-efficacy and the success of online education are thus strongly correlated. The importance of learning participation in technology-mediated education has shown that self-efficacy had an impact on how students behaved when participating in online courses. Self-efficacy is linked to skills associated with embracing new innovation and raises interaction levels. Greater self-efficacy among students is predicted to translate into better exam results. Self-efficacy was considered to be a crucial element influencing the use of eLearning technologies in higher education institutions.

Additionally, EE is described as the level of activity someone would wish to use in employing this system, whereas PE is the level of an individual’s perception of the usefulness of a new technology. According to the UTAUT model, PE and EE are psychological elements that have an impact on a person’s adoption of technologies. PE is favorably influenced by self-efficacy, while EE is the precursor to both PE and self-efficacy. Therefore, those who demand more from technology will accomplish tasks more effectively. Due to its affordability and adaptability, eLearning was formerly employed as a supplement to traditional classroom instruction. Students studying abilities were improved and a constructivist approach was encouraged by integrating in-person instruction with distance learning. However, after the pandemic outbreak, eLearning swiftly became essential and solidified its position in the field of education. Considering its rising significance, there should be more focus on how self-efficacy affects the uptake of eLearning [41].

5.3.2. Facilitating Condition

1. Financial Factor

According to case studies, the tertiary sector of Australia’s education industry was forced to rapidly respond to the outbreak of the pandemic, which in turn exposed it to new financial risks and its over-dependence on international markets. Australian universities are now dealing with the prospect of losing up to AUD 19 billion in revenue by 2023 as a result of their reliance on tuition fees from international students, many of whom were unable to travel [42]. The maintenance and operation of the new eLearning systems require extensive funding. As students during the recent pandemic were completely dependent on online systems, the lack of funds to maintain them affected their usage. The COVID-19-related economic slowdown had a discernible effect on overseas learners and their parents, as anticipated by HEIs, and even resulted in an unanticipated institutional shutdown. The International Association of Universities carried out worldwide research to gather data on the effects of the pandemic on HEIs, and more than 100 institutions worldwide contributed, with almost 600 responses. Based on the findings, a large number of participants acknowledged that their present financial situation was their main concern. Some of the participants concurred that the long-term financial impact was not favorable. A drop in undergraduate
registration could be caused by the financial repercussions of the health emergency and the global recession. More than 80% of those who were interviewed thought that the pandemic would have a detrimental effect on student enrollment and earnings. In this scenario, HEIs, particularly in the commercial sector, would suffer significant consequences [43]. In order to create room for the necessary expenditure on social and health safety, several governments have already reduced their educational funding. The anticipated increase in the education budget did not occur for those nations with low- and middle-income levels [44]. As a result, Al-Samarrai et al. [44] found that universities globally had a low budget to create eLearning systems, while governments in the UK and Australia took their time responding to requests for more money and concentrated on local economic issues [45]. Thus, it may be inferred that the pandemic significantly hindered the advancement of eLearning [42–45].

2. Technology Factor

The use of technology is essential to the success of eLearning activity. According to Zheng et al., inadequate Internet connectivity, the acceptance of cell phones in education, and the hostile digital classroom atmosphere during the pandemic all had a negative impact on expectations for eLearning [46]. Although students gain from online education technology, there are also numerous challenges for them to adjust to the electronic portal, such as login, setup, and download issues, which cause them to lose interest [47]. An effective, easy-to-use eLearning platform should be created to meet the requirements of students. In certain underdeveloped nations, distance learning via online platforms is still difficult despite these barriers because of the comparatively low accessibility of Internet services, devices, and related technologies [48]. For example, Pakistan’s eLearning industry has suffered due to a lack of reliable and economical Internet access, especially in remote locations. The limitations of the used equipment can make remote learning difficult. For instance, students with no access to computers can only access online content through their mobile phones, but a significant amount of content is only accessible on the computer due to system compatibility [49]. Thus, other than providing the proper hardware and software technical support, it is equally necessary to solve technical problems [46–49].

3. Pedagogical Learning Challenges

The rising demand for quality eLearning has pushed educators to generate more sophisticated online learning materials, which can be expensive. By sharing new approaches in the creation, delivery, and exchange of online learning resources within institutions, costs can be reduced significantly, and resources can be used more effectively. On the other hand, educators are expected to master ICT skills and know how to utilize them to improve the learning environment and create a successful pedagogical framework. Thus, the role of educators is vital in facilitating student learning outcomes by having control of student learning assessment and the curriculum, which involves interpreting student online written texts, perceiving the context, and acknowledging individual needs in group activities [50].

4. Socio-Economic Factor

As a result of inequality in the socio-economic status of students, some of them must rely on the resources available in their institutions [51]. However, due to the closure of schools and universities during the pandemic, the migration process of rural students was drastically reduced. Consequently, those students with low socio-economic backgrounds found it increasingly difficult to migrate at the start of term. Fishbane and Tomer [52] examined the situation of students with no Internet access at home. They found that, as the level of poverty increased in the community, the rate of Internet accessibility declined rapidly, and students with no or low socio-economic ability to afford a broadband connection were most likely to fall behind in their class or encounter additional challenges to participating in online learning [51,52].
5.3.3. Digital Competence and Compatibility

Digital competence is the combination of skills, knowledge, and attitudes needed when using ICT and digital devices to perform certain tasks, such as problem-solving, information management, effective collaboration, efficiency, and ethics [53]. In this digital age, digital competence is expected not only in education but in all spheres of life, as explained by Bennett et al. [54]. Thus, students and instructors with low digital competence are liable to lag behind in online learning. Moreover, some users make unethical use of digital devices out of sheer ignorance and lack of competence. Due to the digital transformation of instructional activities during the recent COVID-19 pandemic, libraries had to deliver effective online services to faculty, students, and other stakeholders, but students and faculty with low digital competence found it difficult to use the resources effectively. Omotayo and Haliru’s study [55] established digital competence as a variable with a positive correlation and substantial effects on the application of digital libraries by higher education learners.

The compatibility of online learning with social science and humanities proved effective, although researchers contested its compatibility with sports sciences, engineering, and medical sciences, where hands-on practical experience is required as part of basic instruction [56]. Remote laboratories are used as alternative laboratories in online learning, and such virtual laboratories can only fill the theory-to-practice gap. However, online learning cannot be effectively and efficiently applied in some disciplines, and this compatibility gap is yet to be filled [56]. Based on the recommendation issued by the Association of American Medical Colleges (AAMC), medical students were directed to abstain from having direct contact with patients beginning in mid-March 2020 [57]. Medical trainees at Brown University were in clerkships, and the school was able to augment their training by temporarily moving some aspects to an online platform. This implies that online learning is not compatible with clinical face-to-face training and can only be used in extraordinary circumstances [58]. Boczkowska et al. [58] recommended that eLearning programs should be used in continued education [53–58].

In Table 2, all the studies mentioned from 2012 to 2022 that belong to eLearning adoption and challenges. We concluded the results in Table 2 after carefully reviewing the challenges faced in the adoption and acceptance of eLearning i.e., Technological challenges, Lack of technical support, Lack of awareness, Institutions’ readiness, Quality of course content, Localization of content i.e., Lack of customization/adaptability of course content according to students’ requirements [59], Course content, IT skills of faculty members, Self-efficacy, Financial factors, Technology factor, Pedagogical learning, Socio-economic, Digital competence, Digital compatibility and Lack of technological infrastructure.

<table>
<thead>
<tr>
<th>Limitation of eLearning Adoption in Early Years</th>
<th>Description</th>
<th>Existing Surveys</th>
<th>Limitation of eLearning Adoption in Recent Years</th>
<th>Description</th>
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Table 2. Cont.

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<thead>
<tr>
<th>Limitation of eLearning Adoption in Early Years</th>
<th>Description</th>
<th>Existing Surveys</th>
<th>Limitation of eLearning Adoption in Recent Years</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Lack of technical support</td>
<td>Unavailability of technical staff and lack of support of facilities to perform various activities (installation, operation, maintenance, network administration, and security) Slow speed of Internet and high Internet traffic during eLearning experience</td>
<td>Eltahir (2019), Esterhuysen and Scholtz (2015), Islam et al. (2015), Al-Azawei et al. (2016) [48,66,67]</td>
<td>Financial factors</td>
<td>Financial reduction is the most significant challenge that institutions all over the world are currently facing.</td>
<td>Almaiah et al. (2020), Qiao et al. (2021), Heng (2021) [48,68,69]</td>
</tr>
<tr>
<td>Lack of awareness</td>
<td>Students’ lack of awareness of Internet skills and their reluctance in taking responsibility for their eLearning</td>
<td>Bozkaya and Kumtepe (Bozkaya et al., 2012), Nagunwa and Lwoga (Lwoga and Nagunwa 2012), Alajmi et al., (Ali et al., 2018b) [62,70,71]</td>
<td>Technology factor</td>
<td>Technology is a vital factor to ensure the implementation of the eLearning process. Poor Internet infrastructure, the acceptability of smartphones in education, and the unfriendly digital classroom environment during the recent pandemic negatively influenced the expectation of eLearning.</td>
<td>Almaiah et al. (2021), Siron et al. (2020), Qiao et al. (2021) [5,72,73]</td>
</tr>
<tr>
<td>Institutions’ readiness</td>
<td>Students possessing inconsistent eLearning readiness over time</td>
<td>Al-Araibi et al. (2019), Eltahir (2019), Naveed et al. (2017) [52,61,74]</td>
<td>Pedagogical learning</td>
<td>Quality eLearning has also pushed educators to generate quality online learning materials that create a cost dilemma for many educational institutions because it can be expensive.</td>
<td>Dhawan et al. (2020), Ananga et al. (2020), Almaiah et al. (2020) [44,48,75]</td>
</tr>
<tr>
<td>Quality of course content</td>
<td>The course content has less quality in terms of interactivity</td>
<td>Almaiah and Almulhem (2018), Mtebe and Raisamo (2014), Almaiah and Alyoussef (2019) [52,76,77]</td>
<td>Socio-economic</td>
<td>Students from a low socio-economic background will find it difficult to migrate as early as expected since they cannot come to school due to the pandemic.</td>
<td>Oyediran et al. (2020), Heng et al. (2020), Amanor-Mfaofo et al. (2020) [78–80]</td>
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<tr>
<td>Localization of content</td>
<td>Lack of customization/adaptability of course content according to students’ requirements</td>
<td>Voogt et al. (2013), Lester and Perini (2010), Kwofie and Henten (2011), Ozudogru and Hismanoglu (2016) [59,61,66]</td>
<td>Digital competence</td>
<td>Students and instructors with low digital competence are liable to fall behind in online learning. They lack digital competence, i.e., the skills, knowledge, and attitudes needed when using ICT and digital devices to perform responsibilities, such as problem-solving, information management, and collaboration concerning effectiveness, efficiency, and ethics.</td>
<td>Adedoyin et al. (2020), Priyadarshini et al. (2020), Mohalik et al. (2020) [52,81,82]</td>
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<td>Course content</td>
<td>Lack of relevance, the accuracy of course content, and misalignment of course content with learners' needs</td>
<td>Voogt et al. (2013), Lester and Perini (2010), Kwofie and Henten (2011) [66,83,84]</td>
<td>Digital compatibility</td>
<td>Teachers and learners in the field of medicine, nursing, and engineering face the most significant digital compatibility issue.</td>
<td>Alhumaid et al. (2020), Arora et al. (2020) [84,85]</td>
</tr>
<tr>
<td>IT skills of faculty members</td>
<td>Weak IT skills of faculty members</td>
<td>Almaiah and Alyoussef (2019), Radijeng (2010), Nawaz and Khan (2012) [52,63,64]</td>
<td>Lack of technological infrastructure</td>
<td>Refers to the hardware, software, facilities, and network capabilities within the university.</td>
<td>Subaih et al. (2020), Ho et al. (2020), Abualkishik (2022), Salleh, N, Naveed, Q.N (2022) [86–94]</td>
</tr>
</tbody>
</table>

6. Discussion and Conclusions

There is an urgent need to measure learner satisfaction with using online learning platforms, as millions of students have been relying on online platforms to continue their studies during the recent pandemic. This study highlighted the main challenges to the acceptance and use of eLearning as a tool for teaching and learning in higher education during the last ten years. Thus, it can be used for developing a strategic plan to successfully implement eLearning in the future, as it is still being underutilized, especially in developing countries. Only the recent pandemic has forced higher institutions around the world to use it. Several studies examined the challenges and limitations influencing technology acceptance in the early years, which are resistance to change, computer self-efficacy, technology anxiety, language barrier, technical support, budget, network infrastructure, and professional training [89–95]. Although enforced social isolation offered more chances for students to use eLearning, its implementation has been hampered by outdated hardware and software. Further, self-efficacy is related to adoption capability, thus lowering the engagement level of digital education. The effects of self-efficacy are due to PE and EE. The pandemic heightened the already-existing pedagogical learning challenges due to low ICT skills, in addition to socio-economic factors and digital competence and compatibility, which are critical challenges for the adoption of eLearning and technology in higher education institutions.

Numerous studies mentioned in this research identified that most of the early year’s challenges of acceptance and adoption of online learning have been resolved due to emergency implementation of online learning during the pandemic, such as lack of technical support, awareness, institution readiness, quality online course content, and less information technology and skill of faculty members. Currently, faculty and learners from higher education institutions are regularly engaged in utilizing online learning technologies. This research identified that there is an urgent need, when measuring data, to overcome challenges and limitations that are affecting the ratio of the acceptance of technology for learners and teachers as well. Addressing these challenges and limitations means addressing the requirements and needs of the new educational era, which are necessary for the educational system. Due to numerous remaining challenges, many educational institutions are not yet equipped with the necessary up-to-date technology. To overcome these challenges, more future research is required into strategic planning and implementation of technology in educational institutions.

This article examines the problems of perception and use of online learning over the past 10 years, as well as recent issues related to online learning. The fickleness of technology and sudden changes in society strongly affect the main structures of education. As the authors point out, one of the starting points of the rapid development of online learning was COVID-19. The main challenge for humanity is preparing for any change in the world. The strength of this article is the broad literature review, with the authors
reviewing more than 100 articles. There is an analysis of past and current issues in the use and implementation of online learning. The authors have compiled summary tables of existing models of technology adoption and implementation, as well as existing issues of online learning implementation over the past 10 years. Section 7 explains the research limitations of this study and the scope for future studies.

According to our findings, most of the challenges of the early years have already been resolved due to the emergency implementation of online learning during the pandemic. Our experimental analysis following a literature review of more than 100 related articles has examined and concluded that the early challenges of online learning adoption and acceptance have changed because many of these challenges were overcome due to the emergency shifting of traditional education to online learning during the pandemic. This sudden transformation clearly confirms that the perception of acceptance and adoption of online learning for learners and faculty has changed.

Our recommendations include the requirement for institutions to prepare for the implementation of the latest technologies to facilitate online learning. Poor Internet and reduced IT support are significant hindrances to the acceptance of online learning.

7. Research Limitations and Future Work

According to the findings of this study, many of the early years’ challenges, such as computer anxiety, fear of technology adoption, and fear of online learning, have already been resolved during the pandemic, as educational institutions took the initiative to transfer traditional learning to online learning. The limitation of this research is that, in recent years, challenges still exist for which we could not find solutions: financial and technological factors, pedagogical learning, socio-economic evolution, digital competence and compatibility, and lack of technological infrastructure still need to be overcome for successful acceptance and adoption of online learning. The authors aim to conduct a study in the future to identify solutions to these recent challenges.


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