

Challenges and Problems of e-Learning: A Conceptual Framework

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Abstract: E-Learning has recently gained significance among researchers. Although it has long been used in parallel with traditional learning styles, it is still known to be in its early stages. E-Learning is a broad self-standing category with many sub-types. However, there is a prevalent tendency to interchangeably use various terms to refer to this domain. With the strike of the recent pandemic around the globe, nearly all educational bodies including universities, colleges, and schools were urged to shift to e-Learning mediums. The use of e-Learning suddenly gained a tremendous amount of significance. Therefore, studying the problems and challenges that could impact the effectiveness of this phenomenon seemed to be of great importance. Accordingly, this study aimed at reviewing the problems and challenges encountered by students and educators involved in the e-Learning process. Through a systematic review, data were collected from studies on e-Learning. Using the findings of the systematic review, a conceptual framework was created consisting of two broad areas, namely problems vs. challenges of e-Learning. Then, semi-structured interviews with 15 participants of different ages, genders, academic qualifications, positions, and locations were conducted in search of their lived experiences on e-Learning. The present work may shed light upon the e-Learning process, ultimately leading to the development and reinforcement of this rather complicated phenomenon. The framework developed in this study holds potential applicability in studying the e-Learning phenomenon in comparable scenarios, such as pandemics or a complete transition to e-Learning driven by future technological advancements.

Keywords: COVID-19 pandemic, Educational technology, e-Learning, Online education, Online learning, Online teaching, Phenomenology

1. Introduction

E-Learning has recently gained significant attention among researchers around the world (Holmes and Gardner, 2006). To date, several definitions of e-Learning have been presented. For Dalsgaard (2006), e-Learning falls somewhere beyond learning management systems. On the contrary, e-Learning and learning management systems are often regarded as two identical concepts that are closely interrelated and go hand in hand (Vovides *et al.*, 2007). For Keegan (2002), e-Learning is known to be a sub-type of distance learning (d-learning) with various sub-categories. For instance, mobile learning (m-learning) is one of these categories (Kearney *et al.*, 2012). Similarly, various strategies have been proposed regarding how to approach e-Learning (e.g., MacKeogh and Fox, 2009; Morrison, 2003; Rosenberg and Foshay, 2002).

E-Learning has long been used in parallel with traditional learning styles. According to Bell and Federman (2013), 31 percent of college students in the United States have taken at least one online course during the Fall 2010 semester. However, e-Learning is still known to be in its infancy (Tavangarian *et al.*, 2004). This could be due to the continuous challenges and problems reported by the individuals involved in the process of e-Learning.

The success of e-Learning depends upon several variables. Some examples may include how the teaching and learning platform is designed, implemented, and evaluated for possible developments and reinforcements (Derouin, Fritzsche and Salas, 2005). Promising results have been reported with special reference to e-Learning as an alternative option to traditional learning styles (Zhang *et al.*, 2004). However, e-Learning is still in its early stages and a lot more needs to be done in this area.

2. Literature Review

There are various concepts related to e-Learning. For instance, m-learning, a platform enabling students to access pedagogical materials through their mobile phones is a sub-type of e-Learning that has recently gained popularity due to its wide availability and accessibility among community members in general, and students and educators in particular (Kearney *et al.*, 2012). While e-Learning mostly focuses on functionality, m-learning accounts for mobility (Georgiev, Georgieva and Smrikarov, 2004). D-learning is another term closely related to e-Learning, encompassing a broader scope that includes e-Learning and its associated learning domains. (Georgiev *et al.*, 2004). Although these terms are interrelated, they should not be used interchangeably, as each would represent a self-standing notion.

The challenges and problems of e-Learning and its associated phenomena have been subject to several investigations. The distinction between a challenge and a problem can be a subject of debate, and there is occasional interchangeability in the use of these terms. While the former has the potential to turn into a problem, it is not problematic on its own. Usually, challenges (also known as risks) are not harmful and do not directly affect a phenomenon negatively. However, these need to be taken care of through appropriate risk management criteria as well as risk mitigation plans; otherwise, the challenges have the potential to turn into systematic problems. The two categories studied in the present work (i.e., challenges vs. problems of e-Learning) could be readily distinguished by a risk factor analysis.

Edelhauser and Lupu-Dima (2020) conducted an interview by the end of April 2020, when nearly all educational institutions including universities had already translated the classic, traditional system of education into an online system due to the global spread of COVID-19. Their study highlighted some of the common online platforms used in Romania to implement e-Learning. They also showcased some of the challenges faced by the Romanians and suggested the recruitment of IT specialists to tackle the issues of relevant online platforms, virtual classes, and virtual libraries. In addition, the need for teacher training on how to upload the course materials, how to create and conduct online classes, and how to design e-tests and e-contents was highlighted.

In their study, Shahzad *et al.* (2020) conceptualized a theoretical framework to investigate the differences in the e-Learning portal accessibility among male and female students in Malaysia. System quality and use, service quality, information quality, user satisfaction, and e-Learning portal success were the criteria studied. Having collected 280 sets of empirical data, the researchers suggested that higher education institutions must ensure 24/7 accessibility to their e-Learning portals. In addition, the quality of the content and information provided to the students was suggested to have significant importance. It was also suggested to provide the students with training module materials relevant to e-Learning portal use. The need for a user-friendly design of the e-Learning portals and obtaining regular feedback from the portal users were also highlighted by Shahzad *et al.* (2020).

Aboagye, Yawson, and Appiah (2020) investigated the problems associated with the transition from traditional and/or conventional learning to online learning. The factor analysis of 141 data sets obtained from students in Ghana revealed 8 groups of constructs. These included social issues, lecturer issues, accessibility issues, learner motivation, academic issues, generic issues, learner intentions, and demographics (Aboagye *et al.*, 2020). Their findings also revealed that accessibility issues were the most significant challenges faced by the students, followed by social, lecture, academic, and generic issues. A blended mode of learning was suggested instead of the complete shift towards e-Learning to enable the students to keep pace with the new changes.

One year before the start of the COVID-19 pandemic, Hennig and Nazarkulova (2019) studied the benefits and challenges of e-Learning in Central Asia (Tajikistan, Kazakhstan, Turkmenistan, Kyrgyzstan, and Uzbekistan). Findings were obtained based on a survey, highlighting both the pros and cons of e-Learning in the aforementioned countries. It was suggested to provide awareness to those involved in the process of e-Learning in terms of the web-based tools utilized. In addition, further education was suggested to take place for the teachers in terms of the concepts, tools, and materials used in e-Learning. Internet connectivity, lack of motivation concerning self-study, and lack of adequate computer resources were also highlighted as the potential challenges of e-Learning in Central Asia.

A meta-study conducted by Truong (2016) highlighted the importance of replacement and/or integration of traditional teaching methods with more nascent methods such as e-Learning. Reviewing 51 studies, Truong (2016) reported various problems caused by the so-called integration, delving into various learning styles theories related to e-Learning (e.g., online learning style predictors and learning styles classifications and applications). The study offered insights into the achievements, developments, and problems of e-Learning.

In a study conducted by Fichten *et al.* (2009), the problems and solutions of e-Learning among students with disabilities studying in Canadian colleges and universities were addressed. The participants were the so-called students, e-Learning professionals, campus disability service providers, and educators. The four groups of participants were asked to fill out an online survey questionnaire, the results of which indicated problems related to a) websites and course/learning management systems accessibility, b) digital audio and video accessibility, c) inflexible time limits built into online exams, d) PowerPoint/data projection during lectures, e) course materials in PDF and f) lack of needed adaptive technologies. In addition, technical difficulties by students in using the Internet, and connecting to the management system and the website were reported. Similarly, poor use of e-Learning by educators and their lack of knowledge in the realm of online learning were reported. Finally, Fichten *et al.* (2009) reported that most of the participants were left with at least one unresolved e-Learning problem out of three.

In another empirical investigation, Kamba (2009) studied the benefits of, and the problems raised by e-Learning among Nigerian university students. Based on the findings of the questionnaire distributed among 18 universities, the awareness of e-Learning was found to be very high, although minimal efforts were made to develop an e-Learning application to be used by the universities. In addition, it was argued that most universities lacked a section on their websites or portals allocated for e-Learning. As a result, the staff and students were obliged to constantly use additional aids such as e-mail and other websites. In addition, statistically significant differences among the forms of e-Learning activities and the type of universities were reported by Kamba (2009).

Tynjala and Hakkinen (2005) aimed to highlight the applications of e-Learning in various contexts from a theoretical point of view. In doing so, theories of adult learning, learning at a workplace, and organizational learning were reviewed and the main pedagogical implications of these theories from an e-learning point of view were discussed. The findings of Tynjala and Hakkinen (2005) pointed out the need for the integration of research knowledge from various sources to develop e-learning solutions for the use of work organizations.

The present study aimed at classifying the challenges and problems of e-Learning from the viewpoints of its immediate users around the world (i.e., students and educators). Since the outbreak of COVID-19, several studies have been carried out worldwide. However, they mostly focused on a particular geographic area (e.g., certain countries, provinces, or cities). The present study, however, included participants from various countries. One might argue that the problems and challenges in question might vary from country to country. For example, there might be a huge difference in the quality and speed of the Internet between developed and developing countries. However, as the literature suggests, these issues might still be of concern even in developed countries. One example can be the United Arab Emirates, a high-income nation that is known to have good quality in terms of the Internet; yet, relevant issues were reported by Amarneh *et al.* (2021).

Through a mixed-methods approach consisting of a systematic review and semi-structured interviews, the present study aimed at answering the following questions:

- How can problems and challenges be distinguished within the context of e-Learning?
- What are the most common problems of e-Learning?
- What are the potential challenges to e-Learning?

3. Method

3.1 Design

The present work adopted a qualitative approach. To begin with, a systematic review of the literature was carried out based on the guidelines provided by Tranfield, Denyer, and Smart (2003). Then, semi-structured interviews with a phenomenological approach were conducted.

3.2 Materials and Instruments

Cardiff Metropolitan University's E-Library (MetSearch, 2020) was used to collect primary data. The search terms were (e-Learning OR online learning OR online education OR online teaching AND problems AND challenges). The final materials used in the present study (n=116) included theoretical articles (n=43), empirical reports (n=31), books (n=18), and other types of publications (n=24). Both open-access and subscription-based sources were used. The criteria for materials inclusion were a) the language (only English sources), b) publication time (not older than 2010), and c) relatedness (related to the challenges and/or problems of e-Learning). Consequently, a data bank was established for further use and analysis. Semi-structured interviews were then formed based on the findings of the systematic review.

3.3 Participants

Ten students and 5 educators participated in semi-structured interviews. Due to limited resources as well as the restrictions that were arisen by COVID-19 at the time the research was conducted, it was not possible to interview more participants. All interviews were conducted between the 28th of April and the 7th of May 2020. Each interview took around 15 minutes on average. Participants were selected from different educational levels, ages, and genders, and were all selected based on convenient sampling. To avoid possible bias, peers from different entities and institutions were requested to nominate participants from different countries. No conflicts of interest were reported between the researchers and the nominees at the time of research conduction. To have a global perspective, participants were selected from different nationalities residing in different countries all over the world. English was used as the medium of communication. Table 1 provides a demographic overview of the participants.

Table 1: Demographic Information of the Participants

Participant Code	Academic Qualification/Rank	Age	Gender	Country of Residence
Student 1	High School	15	F	Sweden
Student 2	High School	16	M	Iran
Student 3	Bachelor's	19	F	Oman
Student 4	Bachelor's	19	F	Germany
Student 5	Bachelor's	20	M	Oman
Student 6	Master's	24	M	UAE
Student 7	Master's	27	F	USA
Student 8	Ph.D.	32	M	Iran
Student 9	Ph.D.	42	M	Canada
Student 10	Ph.D.	33	F	Canada
Educator 1	Teacher	43	F	Sweden
Educator 2	Lecturer	45	M	Tunisia
Educator 3	Assistant Professor	37	F	Germany
Educator 4	Associate Professor	39	M	USA
Educator 5	Professor	52	F	USA
Total	15			

Due to the diversity in the participants' locations, all interviews were conducted through online meeting software and applications (e.g., Microsoft Teams, Zoom, Google Meet, WhatsApp, and Adobe Connect) based on the participant's preference. All interviews were recorded for further analysis. To abide by the health and safety protocols against the spread of the COVID-19 pandemic, the same procedures were followed for the participants living in the same areas as the data collectors did.

3.4 Data Collection and Analysis Procedures

Having collected the materials, some keywords were selected and searched, and the results were recorded subsequently. The keyword selection, categorization, and extraction procedures were adopted from a similar empirical study (Nouraey and Karimnia, 2015). Although there were several pieces of software available to carry out this task (e.g., Atlas, NVivo) in general, as well as keyword extraction in particular (e.g., MonkeyLearn, IBM Watson, Amazon Comprehend, AYLIE), human processing was used due to more accuracy in keyword inclusion (Cohen, Manion and Morrison, 2013). Some lemmas used in the present study along with their possible derivatives are shown in Table 2.

Table 2: Examples of the Lemmas and Their Possible Forms

Lemmas	Other Possible Forms
learning	e-Learning, d-learning, m-learning, digital learning, correspondence learning, virtual learning
e-Learning	electronic learning, fixed e-Learning, adaptive e-Learning, linear e-Learning
education	distance education, online education
online learning	synchronous online learning, asynchronous online learning, interactive online learning, collaborative online learning, individual online learning
computer/Internet-*.learning/instruction	computer-managed learning, computer-assisted instruction, computer-aided language learning, computer-assisted language learning, computer-based learning, Internet-based learning
problem	problems, problematic
challenge	challenges, challenging, challenged, challengeable

After highlighting the text containing the challenges and problems of e-Learning (and other similar learning means), a conceptual framework was taxonomized. This framework aimed at providing a classification of the possible problems and challenges of e-Learning from the viewpoints of both students and educators and was later used in forming the semi-structured interviews. To conceptualize the framework, first, all duplicated items were removed and only the main lemmas were considered as individual entries. As an example, the terms “*interactive online learning*”, “*collaborative online learning*”, and “*individual online learning*” were all considered under the umbrella term “*online learning*”. The same procedure was adopted for the semi-structured interviews. Some items were not duplicates yet were very similar and/or interrelated. For instance, although the terms “*fixed e-Learning*”, “*adaptive e-Learning*”, and “*linear e-Learning*” vary functionally, they were all considered “*e-Learning*”. Where possible, these cases were merged to form a single umbrella term.

4. Results

The findings of the literature review through keyword analysis formed the two main categories in question (viz. the problems vs. challenges of e-Learning). These results were then used in forming the semi-structured interviews held with the participants (both students and educators). The following section provides a comprehensive elaboration of the interview results obtained in light of the findings from the systematic review.

4.1 Problems Associated with e-Learning

The main problems associated with e-Learning were the following:

- *Unavailability of technical facilities*: Not every member had a suitable technological device such as a laptop or a PC. In addition, some functions of the software being used were inactive for smartphone users. This would in turn have a negative impact on the accessibility of the courses.
- *Internet connection issues*: No Wi-Fi connection and/or weak mobile data signals were reported by some of the participants.
- *Physical and mental presence*: In some cases, the students were not asked to turn their cameras on, which was linked to cultural issues. Therefore, the educator could not ensure whether the students were physically and/or mentally present in the classes, which would, in turn, affect attendance reliability.
- *Impossibility of teaching some modules online*: Some courses may not be taught online, including modules with laboratory activities and those requiring participation through workshops.
- *Limited level of interaction*: Face-to-face interaction among students and educators was far less compared to a normal classroom environment.
- *Monitoring class activities*: Monitoring class activities by educators was not possible in some cases. As an example, English language educators usually benefit from activities such as chain drills. However, doing such activities was reported as almost impossible or extremely challenging due to the lack of face-to-face interaction.
- *Excuses not to attend*: Students would hide behind excuses not to attend. E-Learning made it easier for students not to attend their courses either at all or regularly. The excuses (which were sometimes genuine and justifiable) were mostly related to a lack of Internet connection or having faced technical issues with students’ devices.
- *Time waste*: It took some time to settle everything down and start the classes. Setting up the connection and waiting for the students to join the online calls would waste a few minutes of class time.
- *Lack of familiarity with technology*: Members did not know how to download, install, and efficiently use the software. Surprisingly, few educators also faced the same issue, as the shift to e-Learning was sudden and there was no time for preparation.
- *Students’ preferences*: Students preferred not to use ready-made materials. Few of the participants referred to mathematics and believed it would be more practical to study in a real classroom environment rather than having ready-made materials in front of them. Based on the participants’ opinions, the classroom context would in turn allow them to have real communications with their educators and/or peers, which would subsequently be more useful.
- *Lack of seriousness*: Students and their family members were reported to take online classes for granted. This caused a lot of difficulties for the students in finding a quiet and suitable place to have their online courses.

- *Course withdrawal and dropouts:* Some students were reported to apply for course withdrawal, hoping the situation would be over soon and things would go back to normal. In a few cases, student dropouts or intentions to do so were reported.
- *Members' freedom:* Educators' and students' freedom caused a lack of attention, eventually leading to partial class dismissal. This was particularly evident among students, as educators were the ones running the classes for most of the class duration. This factor was observed to vary based on the educational level. For example, Ph.D. students were mostly asked to give class presentations. Therefore, the students were the ones utilizing most of the class time and were busy enough not to be distracted easily.
- *Lack of equal accessibility:* The administrations did not provide equal access for the students and educators. In some cases, students did not have access to online materials and courses because their countries of residence were different from where they were studying. As a result of administrative decisions and to avoid security risks and potential cyber-attacks, some universities banned external access from other regions without taking into consideration that some students might live abroad.
- *Students' shyness:* Students (especially females) mostly felt inconvenient to participate in classes by sending voice messages to and/or holding video calls with their educators and peers during the online courses. These were reported by certain participants and seemed to be closely related to cultural beliefs as well as the regions where students lived.
- *Member's privacy:* Educators' and students' privacy was affected, as they had to provide their personal phone numbers and other details that they would normally prefer not to reveal. Similarly, most of the participants (both students and educators) reported the unintentional violation of their privacy during online classes. For instance, some unmuted their microphones and/or activated their cameras unintentionally. Other examples were the cases in which the microphones or the cameras were already active, yet members did not notice this. Some educators also complained about students calling or messaging them late at night, causing them inconvenience.
- *Lack of space for data storage:* A large amount of data needed to be stored and members would sometimes lack enough space on their devices. One of the educator participants argued that she had to format her phone device at least twice a week, as she did not have enough time to delete all the downloaded materials one by one. This would subsequently cause some inconvenience such as data loss (including contact names and numbers, photos, videos, voices, music files, etc.), but seemed to be the fastest way to prepare for the rapidly approaching, upcoming courses.
- *Physical fatigue:* Using computers and other electronic devices for a long time caused fatigue, eye strain, dizziness, and other health issues. In some cases, students and educators had to visit clinics or take a rest to recover from the health hazards caused by e-Learning.

4.2 Challenges Associated with e-Learning

Accordingly, the main challenges associated with e-Learning were:

- *Finding a suitable place for teaching and learning:* This challenge was closely related to one of the aforementioned problems (i.e., lack of seriousness). Some of the participants reported difficulties in finding a suitable place for learning and/or teaching purposes. In some cases, they were unwantingly distracted by their family members.
- *Infra-structure and technical facilities:* The phenomenon of e-Learning requires a strong infrastructure backed by an expert IT and administrative team along with many other technical facilities. Some educational bodies, especially at smaller scales (e.g., schools) could not afford all these requirements. Based on the participants' responses, those who were working in large-scale organizations such as universities and colleges faced fewer difficulties.
- *Prior arrangements and liaison:* The establishment of e-Learning, along with its related phenomena, was reported to require multiple preparations and collaborations before and after its implementation. Few participants reported the numerous difficulties they faced in making all the required arrangements. Examples included, but were not limited to, a) making announcements on the website regarding the decisions about how the courses were going to be conducted, b) sending bulk emails and messages to students to ensure they have seen the announcements (as part of their academic advising responsibilities), c) keeping in touch with students and updating them regarding the revised timings, the software to be used, and other related issues, d) announcement on the course beginning, and e) updating the students' timetables, exam timetables, and academic calendar due to the possible gaps between the normal and online classes.

- *Cost*: E-Learning was reported to be costly by most of the participants. Some of the participants quoted students not attending classes, as they were waiting to get a new device. Some complained about the cost of Wi-Fi and mobile data subscription fees. In some regions, a monthly subscription fee for a Wi-Fi connection with an unlimited data plan would cost approximately \$90 including taxes and additional charges. In the same region, a monthly mobile data plan of 1 GB would cost around \$8. On the contrary, these prices were much lower in some other regions, ranging from \$5 for Wi-Fi and \$1 for mobile data connections with similar data plans, respectively (all in US dollars).
- *Recognition of efforts*: Based on the arguments put forth by some participants, they felt a lack of appreciation at the end of the day, as nobody truly understood the extent of their hard work and struggles in conducting online classes. Therefore, in some cases, educators felt that their efforts were neglected by the students and their families.
- *Assessments*: How to conduct the assessments was a huge challenge reported by both students and educators. In addition, assessment and examinations were at the center of attention of other stakeholders such as students' parents (and other family members), sponsoring bodies, and the organizations' management and administrative staff. Various challenges were reported regarding the assessments including a) what security measures had to be taken to ensure that students would attend the exams by themselves in a real exam environment, b) what types of questions would fit the online assessments in question, c) what measures had to be taken if the students lost connection during the online examinations and d) how to conduct assessments that were not merely of a question-and-answer type (e.g., listening comprehension tests, speaking tests, etc.).
- *Material development and approval*: The process of e-Learning required material development and administrative approval. In a few cases, the participants reported experiencing prolonged approval intervals by the approving bodies within their organizations (such as the Board of Directors, Board of Trustees, College Board, etc.). In some cases, obtaining the required approvals from external bodies such as ministries took longer than expected and therefore, the organization had to revise its academic calendar and other related timetables.
- *Boredom and fatigue*: E-Learning was reported to be more boring and tiring as compared to normal classes. This was associated with the lack of face-to-face interactions between the participants and their peers and/or educators. In some cases, students tended to lie down on a couch and would unintentionally fall asleep during classes, which in turn, could be related to a lack of physical movement.
- *Class duration*: Online classes were usually shorter as compared to normal classes due to various reasons. One of the possible reasons reported by a participant was the lack of managerial supervision on the start and end of class timings. Another reason reported was a lack of motivation among educators, as many students would not attend the online course, potentially leading to the early dismissal of classes.
- *Freedom at home*: The home environment was often more appealing and enjoyable as compared to conventional classroom environments, leading to a potential lack of attention from both educators and students. Due to a lack of direct supervision and face-to-face interaction, students and educators were distracted from time to time. As an example, students could use their phones without being monitored by their educators.
- *Unavailability of technical facilities*: Some students in particular regions did not even have mobile phones to join the classes, let alone computers or tablets. One of the participants explained how she struggled to convince a charity organization to purchase a few inexpensive mobile phones for students to be able to attend online courses.
- *Special Needs Students*: In some organizations, educators complained about the measures taken for students with special needs. For example, for deaf and hard of hearing students, an option of simultaneous interpretation with an interpreter's online video was available; yet, more actions were required to be taken in their support.

Figure 1 provides a conceptual framework of the e-Learning problems and challenges. This framework is based on the systematic review as well as the participants' responses during the semi-structured interviews.

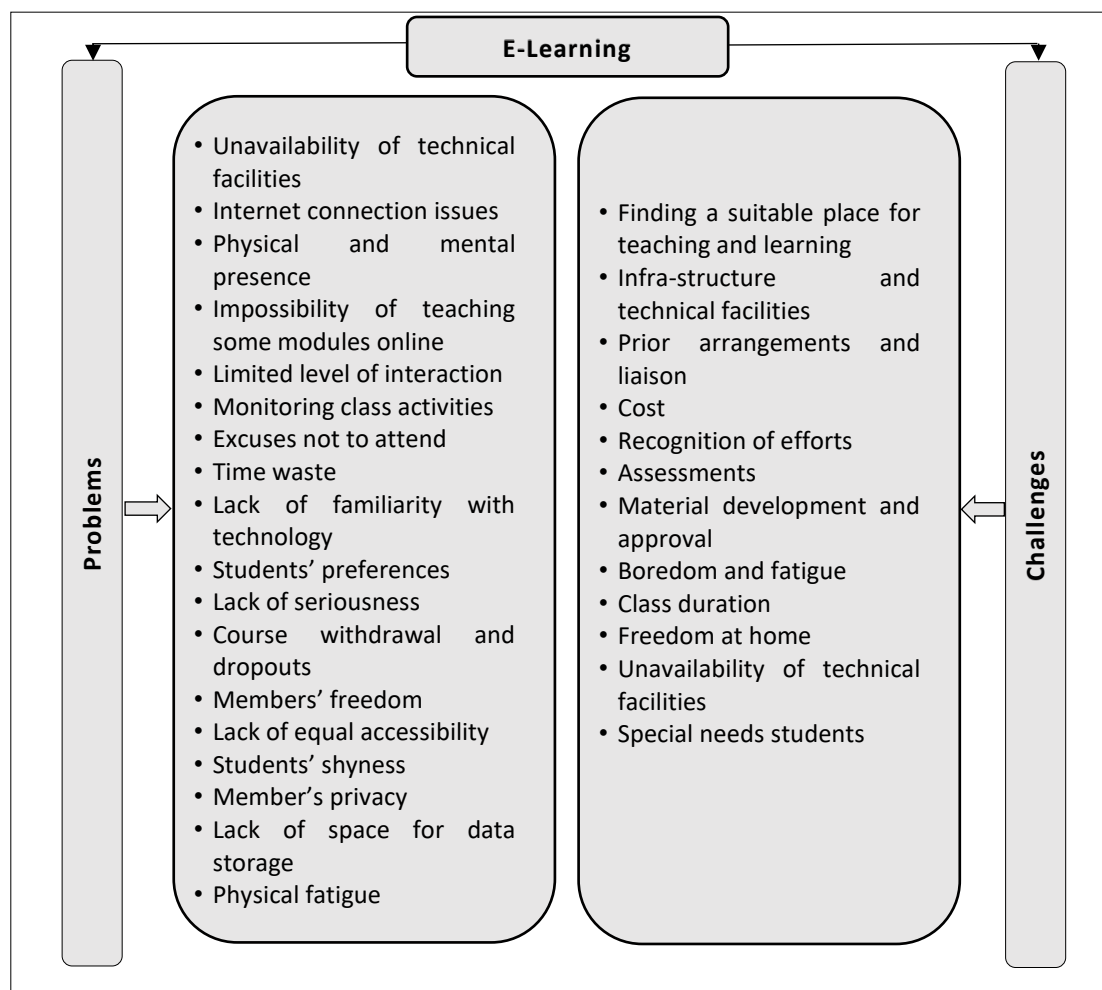


Figure 1: A Conceptual Framework on the Problems And Challenges Associated with e-Learning

5. Discussion

The problems and challenges reported in the present work were mostly in agreement with those of other studies. For example, lack of direct contact with educators, lack of information about the changes planned, lack of a suitable place to study at home, no Internet access, lack of educators' engagement in e-Learning, and no access to computer devices were frequently reported by students as part of the e-Learning requirements imposed by the COVID-19 pandemic.

In support of computer fatigue, Kamba (2009) reported some physical risks caused by excessive use of computers during the e-Learning process, including eye strain, back pain, and chronic pins and needles in the legs and feet. Regarding mental traits and personality factors such as self-confidence and shyness, conflicting results have been reported. For example, Tham and Werner (2005, p.15) have claimed that studying in an "invisible classroom", e-Learning may take away social and physical boundaries such as shyness, location, gender, and race. However, others have reported less participation in e-Learning courses due to shyness and lack of self-confidence (e.g., Al-Fadhli, 2008; Al-Rahmi, Othman, and Yusuf, 2015). The shyness resulting in a lack of participation and communication during the e-Learning process has mostly been reported among Asian students (Zhang *et al.*, 2012). As a solution, Ashour (2021) argued that any educational model of e-Learning should be first customized to the cultural, local, economic, and social context within which the education is taking place.

Chou and Chen (2016) have highlighted a few issues related to the privacy of members involved in e-Learning. The issue of members' freedom during online courses and how it might affect the successful implementation and effectiveness of e-Learning has also been studied (Quadri *et al.*, 2017). Dropouts and course withdrawals as results of e-Learning have been investigated by others, as well (e.g., Burgess, 2017; Kim *et al.*, 2017).

Poor Internet quality and difficulties in accessing printers, computers, and other technological devices have also been discussed (Digolo, Andang'o, and Katuli, 2011; Kamba, 2009). Similar to our results, studies have reported some other difficulties related to technology including insufficient computer and Internet skills, lack of experience in Internet-based teaching, insufficient support (especially technical support) from the organization, management, and/or home (or in some cases partner) universities (Fichten *et al.*, 2009; Kamba, 2009). Digolo *et al.* (2011, p.138) have used the term "technical shyness" for the lack of ability to use computers among students and educators, which has been classified as a challenge to e-Learning.

Some studies have investigated the costs associated with e-Learning (Chatterjee, Ghosh, and Chatterjee, 2020; Harris *et al.*, 2011; Scarafiotti, 2004). Based on the literature, most of the studies have reported these costs to be additional burdens to the e-Learning members, especially the host institutions, as they had to build (or strengthen) infrastructures before the establishment of the e-Learning phenomenon. Some researchers have conceptualized models to be followed to ensure the cost-effectiveness of the e-Learning process. As an example, Scarafiotti (2004) has highlighted five steps including a) identification of e-Learning costs, b) exploring ways to maximize human resources, c) implementing policies to aid course development and production costs, d) considering scale and scalability, and e) redesigning large-enrollment courses to reduce cost and improve learning.

One of the most important elements in the context of (higher) education is the assessment of students (Jalali *et al.*, 2018). In line with its significance, Lara, Aljawarneh, and Pamplona (2020) have recently conducted a literature review, citing different barriers faced by the people involved in e-Learning, including problems of self-assessment (e.g., Wong *et al.*, 2020), peer-assessment (e.g., Ng, 2016) and automated assessment (e.g., Barana and Marchisio, 2016). Lara *et al.* (2020) have suggested a few recommendations such as paying more attention to e-Learning assessments in Data Science projects, expanding the domain of research in terms of assessment and not adhering to education in a single area, and using new means to deliver assessments (e.g., through Blockchain technology).

Concerning the students with special needs, the results of our study were mostly in agreement with those of Fichten *et al.* (2009), who conducted an exploratory investigation on the problems of e-Learning faced by Canadian students with disabilities. Based on the findings of Fichten *et al.* (2009), students with disabilities faced several issues as a result of e-Learning, including problems in accessing the website, opening course materials, downloading, and using files, to name but a few.

Finally, a debating question remains as to what extent factors such as the student's background, ethnicity, culture, and other intervening issues may affect the learning process. To address this issue, researchers have claimed that ethnic factors may affect the learning process (e.g., Lundberg and Schreiner, 2004; Lundberg *et al.*, 2007; Okagaki, 2006; Ro, Knight, and Loya, 2016). A careful analysis was then required to investigate the intervening roles of culture and ethnicity on the learning output of students; therefore, these factors were not extensively discussed in the present work.

6. Conclusion

The present study was an attempt to investigate the effectiveness of e-Learning by delving into its possible challenges and problems reported by both students and educators. The beginning of 2020 witnessed a unique scenario where educational sectors worldwide were prompted to seek alternative teaching mediums in response to the global COVID-19 pandemic. All in all, the entire experience of e-Learning seemed to be challenging for educators, students, administrative staff, policymakers, management teams, and other relevant stakeholders, some of which have been discussed in the present work.

The e-Learning style is considered a big challenge among its users, as compared with the traditional learning styles they have usually experienced in normal classroom environments. Each challenge and problem highlighted in the present work could be extensively investigated and detailed, either individually or in pairs. It is noteworthy to mention that a few of the points discussed in the present study could be regarded as a challenge or a problem simultaneously. Some examples may be the unavailability of technical facilities and finding a suitable place for teaching and/or learning (c.f., the literature review section for differences between these two terms).

The main limitation of the present work was the number of interviews, which was due to our limited resources and the restrictions that were caused by COVID-19 at the time the research was conducted, although data saturation was reached for both interviewee groups (i.e., students and educators). Finally, knowing the challenges and problems of e-Learning may contribute to formulating solutions to be used in similar

circumstances in the future, or just to improve the e-Learning process as an alternative to the traditional means of teaching and learning worldwide.

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Ethical Approval

This study was conducted in accordance with the Gulf College Research Ethics Committee. The ethical approval of this study (Approval Code: [GC/RD/REC/20/01](#)) was obtained from this committee before collecting the data from participants as a prerequisite for conducting this study and all committee requirements have been fulfilled.

Informed Consent

Informed consent was obtained from all participants (or their guardians) prior to their participation.

Conflict of Interest

The authors declare no conflict of interest.

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