



Literature Review on the Barriers to Online Learning during Covid-19 Pandemic

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Abstract

The Covid-19 pandemic had pressured institutions around the world to move to online learning. Students, teachers, and education administrators were not prepared for the sudden change in the mode of delivery. As a result, there have been issues with online learning. Many studies have been conducted in the last two years to explore the matter. In this paper, the author will attempt to provide a literature review of previous studies about barriers to online learning both before and after the pandemic. A comprehensive list of barriers is presented. As a result of the review, there is not much difference in the barrier to online learning before and after the pandemic. This paper aims to present a broad overview of the topic so educators and school administrators can develop a plan to enhance the quality of online education in the future.

Subject Areas

Online and Distance Education

Keywords

Barriers to Online Education, E-Learning, Distance Education, Covid-19 Pandemic

1. Introduction

Online and distance education has been around for a couple of decades now. However, due to the Covid-19 pandemic in the last two years (2020 and 2021), we see a significant shift to online learning from the traditional mode of delivery. Many students and parents experienced online learning for the first time. Because of the lockdown in many places, online learning became the solution for kindergarten to doctoral level learners. Despite the many benefits that online learning brings to our education system, barriers to the effectiveness of this de-

livery mode are still present. This paper will summarize barriers to online learning and, thus, serve as a foundation for educators and education administrators to develop strategies to improve this learning mode in the future.

This paper will provide a broad literature review of current and past research on the topics of barriers to online learning. It will cover various education levels, including K-12 and Higher Education in many countries around the world. Several papers from the pre-pandemic time are also being included. The novelty of this paper is attempting to see if there is any major difference between the barrier to online learning before and after the pandemic.

2. Barriers to Online Learning Pre-Pandemic

E-learning or online learning refers to the usage of modern information and communication technologies to deliver educational content to students. This learning mode can overcome physical distance [1]. The phenomenon of e-learning became popular in the early 1990s due to the rapid evolution of the Internet. Despite the many benefits that eLearning brings to the educational landscape, some drawbacks yet need to be addressed. Muilenbug and Berge (2005) conducted a study to explore barriers to online learning; this is one of the earliest explorations of the topic. The context of the study was the United States. The study result identified eight barriers: a) administrative issues, b) social interaction, c) academic skills, d) technical skills, e) learner motivation, f) time and support for studies, g) cost and access to the Internet, and h) technical problems [2]. However, there might be changes to the barriers since the paper was first published because the eLearning industry has been evolving rapidly, according to Bezovski and Poorani [1].

In another study immediately before the pandemic, Aljaraideh and Bataineh (2019) researched the barrier to online learning for students in Jordan [3]. Four hundred students were asked to fill out questionnaires. The researchers conducted a pilot study on the first 50 respondents to ensure the reliability of the questionnaire. The authors then used quantitative methods to analyze the collected data. The findings showed that technological infrastructure was the primary barrier to online learning. Indeed, online learning was a new phenomenon in developing countries [3].

Aljaraideh and Bataineh (2019) also pointed out that first- and second-year students faced more significant barriers than third- and fourth-year students. This phenomenon can be explained as new students did not have much technical experience compared to their senior peers. Female students faced more barriers for the first two years than their male counterparts. However, it is the opposite in the last two years when male students faced more barriers. Online learning was new in Jordan, which explained the lack of technological infrastructure; especially, this study was conducted before the Covid-19 pandemic. Other similar studies below also identify an interaction between the student's gender and the year variable.

Bates (2017) published a report on online education in Canada [4]. According to the author, Canada has an extensive online and distance education history. Even before the Covid-19 pandemic, online education enrolment had grown rapidly in North America. As of 2017, almost all Canadian post-secondary institutions (except Quebec) offer distance learning in various fields of study. Canadian institutions have been using the Internet, learning management systems, interactive lectures, social media, mobile devices, and synchronous sessions to deliver online courses. Many institutions already had comprehensive strategies for expanding online education before the pandemic as they recognized the importance of online education. Although the country has a long history of online learning, it still faces several issues. The main barriers pointed out by Canadian institutions were lack of resources and lack of specialists in learning technology. This barrier is related to online learning administrative support. As one sample solution to the problem, the provincial government of British Columbia has focused on developing Open Education Resources (OER), which can be valuable support for online education. With open resources, it is easier for students to have access to online resources [4].

3. Barriers to Online Learning during the Pandemic

Baticulon *et al.* (2021) studied the barrier to online learning in the context of medical students in the Philippines [5]. The authors collected data using the electronic survey in mid-2020 from 3670 medical students. Their survey includes various questions ranging from multiple choices on the Likert scale to open-ended questions. The majority of participants own smartphones and laptops or desktop computers. Less than half (41%) of the students were “physically and mentally capable of engaging in online learning” [5]. The barriers identified are adjustment to the online learning style, balance with family responsibilities, and communication issues between learners and instructors. First, since the pandemic came very suddenly, students, faculties, school administrators, and the curriculum were not yet ready to switch the delivery mode. Second, studying at home made it harder for students to balance family responsibilities [5].

Moreover, many students did not have a dedicated studying area at home. Thus, students got interfered from other family members. Third, communication issue between learners and teachers was raised. A possible explanation was that both the learners and teachers were unprepared for the transition [5].

Van and Thi (2021) conducted a mixed-method study to determine the barrier to online learning in Vietnam during the Covid-19 pandemic [6]. The sample size was 1165 students from various universities and high schools in Vietnam. The obstacles identified include lack of social interaction, cost and access to the Internet, learner motivation, and family distraction. Contradicting Al-jaraideh and Bataineh’s study, technological skill is not a significant problem for the students. Students were somewhat prepared by having basic technical skills, prior IT training that they received in the previous years and reviewing instruc-

tional training videos for critical online learning platforms. The cost of accessing the Internet includes investment in hardware such as laptops or computers, or mobile devices. For students from rural areas, accessing the Internet can be more challenging compared to students from urban areas. The other factors, such as lack of interaction, student motivation, and family distraction, are consistent with other studies in this review [6].

In another case in Southeast Asia, the study conducted by Octaberlina and Muslimin (2020) explored the barrier to online learning for English as a Foreign Language (EFL) students in Indonesia [7]. The authors conducted a mixed-method survey of 25 EFL students. The identified barriers include unfamiliarity with e-learning, slow internet connection, and physical condition such as eye strain. The geographical nature of Indonesia can explain the issue with an internet connection. The country's population is spread out over a large number of islands [7].

Regarding the Learning Management System (LMS), many students were unfamiliar with Google Classroom, which was used at their institution. A proposed solution is to have training of the LMS before actual learning, reduce the file size for the learning materials to accommodate the slow internet connection, and ensure breaks during online learning sessions. Regarding reducing the file size of learning materials, a suggestion is to use audio instead of video since students can listen to the audio lecture while doing other things. Moreover, text and audio transmission will be better compared to videos with a slow internet connection. Participants in this research pointed out several distractions, such as online games and YouTube. Indeed, this might not be the case with students with a slow internet connection. The authors also discussed physical conditions such as eye constraints when looking at the computer screen for a prolonged period [7].

Anastasakis, Triantafyllou, and Petridis (2021) performed qualitative research to identify barriers to online learning during the pandemic in Greece [8]. The author used a qualitative survey to collect data from 2093 undergraduate students. The discovery is consistent with other studies on the same topic in different countries. The majority of the participants did not have any experience with online learning. Only half of the students were confident with online learning. Their finding confirms other research results regarding internet connection issues and lack of social interactions. The switch to online learning posed a significant challenge to universities worldwide. Other barriers related to the lecturers' online teaching skills; are lecturers' technical skills, not having synchronous sessions, not uploaded teaching materials, confusing timetables, and using various platforms [8]. As stated by Baticulon *et al.* (2021), both students and teachers had to switch to online learning in a short period [5]. Thus, the institution needs continuous training to help teachers adapt to the new environment. Other barriers are the administrative issue, the appropriateness of course content for online delivery, distractions in the environment, learners' characteristics (*i.e.*, time management, shyness, and disability), and engagement during online classes. According to the authors, such as Greece, these barriers exist in coun-

tries where distance or online learning is not well-established. Many universities did not have strategic plans to promote online or distance education before the pandemic. According to Moore (1989), as cited in Anastasakis, Triantafyllou, and Petridis (2021), effective education will require three types of interactions: learner-content (LC), learner-instructor (LI), and learner-learner (LL) [9]. However, due to the sudden switch to online learning, these interactions are either not met or merely met. According to the finding, several subjects that require lab work might not be appropriate to be fully online.

Another study was conducted to discover the barriers to online learning from students in Bangladesh by Islam and Habib (2021) [10]. The authors applied the quantitative method by surveying 394 university students with a semi-structured online questionnaire. The study includes 50.5% undergraduate students, 48% master students and 1.5% doctoral students. Moreover, 24.9% of students come from rural areas, 40.6% from suburban areas, and 34.5% from urban areas. About two-thirds of the respondents were male. The finding revealed a couple of themes 1) environment and situational barriers, 2) e-learning barriers, 3) psychological barriers, and 4) disruption of online learning adoption [10]. The barriers, according to Islam and Habib (2021), include:

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|---|--|
| • Issues with concentration during online classes | • Distractions during online classes |
| • Problem with balancing between life and study | • Not familiar with online learning technology |
| • Lack of social interaction | • Lack of interaction with the instructor |
| • Financial hardship | • Hard to submit assignments online |
| • Internet connection issues | • Difficult to participate in online exam |
| • Difficult to understand | • Anxious in the online classes |
| • Lack of support | • Feeling lazy |
| • Increased workload | • Lack of motivation |
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Roslan and Halim (2021) performed a mixed-method study to explore the enablers and barriers to online learning in Malaysia [11]. The authors conducted a cross-sectional study of 178 participants and in-depth interviews with 10 participants from public medical schools in Malaysia. Several barriers emerged from the study, although all students own at least one learning device. First, 22.5% of students have no learning space at home. This issue can cause distraction during online learning. The second barrier is internet access: 21.9% of students have no wi-fi access, and 11.2% have no mobile broadband coverage. The study also found that using low bandwidth applications (such as Whats App and Telegram) and easily accessible platforms (such as YouTube) can help to ease the problem. The use of YouTube is slightly inconsistent with the other studies by Octaberlina and Muslimin (2020) in the neighbouring country of Indonesia [7]. However, both arguments are reasonable. On the one hand, Roslan and Halim (2021) pointed out that YouTube is easily accessible to all students compared to other platforms. On the other hand, Octaberlina and Muslimin (2020) argued that YouTube content could cause a distraction to students. Also, in some cases

where students have a slow internet connection, loading video is a challenge [11].

Alshwiah studied the barrier to online learning faced by secondary students in Saudi Arabia [12]. Similar to the above study, mixed methods were used in this research. The first step is interviewing four parents and four students to explore the barriers. It is one of the rare studies that involved parents. Then, the author surveyed 518 respondents on the barriers. Private schools seem to perform better for online learning compared to public schools. Also, consistent with Aljaraideh and Bataineh (2019), female students faced more barriers than male students [3]. Several other barriers were identified, including a lack of computer equipment and high-speed internet connection. Another significant barrier is that the curriculum, which was traditionally used face-to-face, is now delivered online without proper review and redesign. In addition, teachers were not well trained to deliver online classes (online teaching skills). Poor online learning tools can also cause problems for the students: “lack of instructions, difficult navigation, an uninteresting interface, unresponsive website, and disorganized e-content” [12]. Indeed, these reasons are understandable due to a rapid switch to online learning from the traditional delivery mode. A confused grading policy also contributed to the problem, reducing the student’s motivation and productivity.

Kara (2021) conducted a qualitative case study on 44 university students to find out the barriers and enablers of online learning [13]. Data collection techniques include structured and semi-structured interviews with the research participants. Five main themes came out of the analysis: online content, online assignments, online assessments, instructor behaviour & practice, and psychological issues. Moreover, students also felt pressure from taking many online courses. The online content is hard to follow because of a lack of interaction with peers and teachers. The solutions include online video, teleconferencing software for synchronous learning mode, and how content is organized into modules. Students also pointed out that online assessment feedback are critical to their success in online learning. Thus, instructors should provide clear instructions and detailed feedback to students [13].

Regarding instructors’ behaviour, late replies and negative messages can hinder students’ success. This issue indicated that instructors are not prepared for online teaching. The last group on psychological issues is consistent with other studies, and it is about the distraction of learning at home. In general, the author also pointed out that as students take online courses, it positively impacts their mood during the lockdown period [13].

Li *et al.* (2021) conducted a similar study on postgraduate students in China. The authors pointed out that online learning developed significantly during the pandemic. Online learning platforms provide positive contributions to students learning process at the postgraduate level. The authors are optimistic that the challenge we see will create opportunities for new development in online learning. There are several suggestions from the study. First, teachers must be trained to become more familiar with online teaching. Second, each institution should

Table 1. Summary of barriers to online learning.

Barriers to online learning	Studies
Adjustment to the online learning style, distractions in the environment, engagement during online classes, Issues with concentration during online classes.	Baticulon <i>et al.</i> (2021), Anastasakis, Triantafyllou, and Petridis (2021), Islam and Habib (2021), Roslan and Halim (2021), Kara (2021).
Balance with family responsibilities, family distraction.	Baticulon <i>et al.</i> (2021), Van and Thi (2021), Islam and Habib (2021), Kara (2021).
Technological infrastructure.	Aljaraideh and Bataineh (2019), Roslan and Halim (2021).
Lack of social interaction.	Van and Thi (2021), Anastasakis, Triantafyllou, and Petridis (2021), Islam and Habib (2021), Muilenbug and Berge (2005), Kara (2021).
Internet-related issue.	Van and Thi (2021), Octaberlina and Muslimin (2020), Anastasakis, Triantafyllou, and Petridis (2021), Islam and Habib (2021), Muilenbug and Berge (2005), Roslan and Halim (2021), Roslan and Halim (2021).
Learner motivation.	Van and Thi (2021).
Unfamiliar with e-learning, technological skills.	Octaberlina and Muslimin (2020), Islam and Habib (2021), Muilenbug and Berge (2005).
Physical conditions such as eye strain.	Octaberlina and Muslimin (2020).
Teacher online teaching skills.	Anastasakis, Triantafyllou, and Petridis (2021), Baticulon <i>et al.</i> (2021), Roslan and Halim (2021), Roslan and Halim (2021), Kara (2021).
Administrative issue.	Anastasakis, Triantafyllou, and Petridis (2021), Muilenbug and Berge (2005).
The appropriateness of course content for online delivery.	Anastasakis, Triantafyllou, and Petridis (2021), Roslan and Halim (2021).
Learners' characteristics (<i>i.e.</i> Time management, shyness, and disability), laziness, low motivation, anxious.	Anastasakis, Triantafyllou, and Petridis (2021), Islam and Habib (2021), Muilenbug and Berge (2005), Roslan and Halim (2021).
Financial hardship.	Islam and Habib (2021).
Difficult to understand.	Islam and Habib (2021).
Lack of support.	Islam and Habib (2021), Kara (2021).
Increased workload.	Islam and Habib (2021), Roslan and Halim (2021).
Hard to submit assignments online.	Islam and Habib (2021), Roslan and Halim (2021).
Difficult to participate in online exam.	Islam and Habib (2021), Roslan and Halim (2021).
Lack of resources for online learning.	Bates (2017).
Lack of online learning specialist.	Bates (2017).

develop and maintain unified or standardized online platforms to avoid confusion for students. Lastly, they also suggested that there should be other platforms to facilitate learning and research for postgraduate students, such as the Online Scientific Research Platform and Online Academic Exchange Platform. As the author stated, these platforms will benefit research activities for postgraduate students [14].

4. Conclusion

The paper has outlined many significant barriers to online learning in various studies from all over the world. It broadly covers cases from advanced nations (e.g., the United States & Canada) where online education has been well-established compared to other nations (e.g., Greece). Some barriers are rooted in online learning itself, such as physical issues like eye constraints when looking at the computer screen for an extended period. A sudden switch caused other barriers to online learning without any preparation due to the pandemic. **Table 1** summarizes the barriers found in different studies. No significant difference was found for barriers before and after the pandemic. The limitation of this study is that it cannot cover all literature in the field. However, the literature review seems to be exhausted because the barriers are repeated and relatively consistent with each other. Future research could consider a case study to compare the barriers to online learning in developed countries with better technological infrastructure and underdeveloped countries with poor infrastructure. This paper can contribute positively to online education by listing barriers. It can guide educational administrators, educators, and researchers to understand the problems and develop solutions for the future. Thus, it will enhance the effectiveness of online education and benefit society at large.

Conflicts of Interest

The author declares no conflicts of interest.

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