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COVID-19: What are the challenges of online learning? A literature review

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ABSTRACT

The COVID-19 pandemic has made countries and organizations around the world to revise their business operations. Some countries took a step further by executing Movement Control Order (MCO) to reduce the spread. During MCO like Malaysia, all non-essential businesses were closed, interstate travel was prohibited, and purchasing of daily needs were limited. This pandemic had rendered Malaysian homebound. The majority of students who are still staying in hostels were not allowed to return home. To prevent direct contact, face-to-face classes were not possible to conduct. Alternatively, online learning was implemented for teaching and learning purposes for safety reasons. Sadly, most were not prepared for online learning due to the unexpected abruptness of COVID-19. Many issues were raised but little guidelines were available to be followed. Therefore, this paper aimed to identify the challenges of online learning, i.e institutional readiness, students' difficulties, and teachers' dilemma. Findings would assist organizations to adopt necessary actions for better education. This study was conducted by reviewing previous and recent literature from several journals, conferences, and news focusing on tertiary education. In addition, the study has proposed that organization should adopt the ADKAR framework introduced by Hiatt for transformation and change towards better online transition. The use of Learning Management System (LMS), infrastructure improvements, teaching methods and parents involvement were also crucial factors for online education success.

Keywords:
Covid-19, online learning, learning management system, movement control order

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1. Introduction

The coronavirus COVID-19 has created a global pandemic that led to the rapid closure of school worldwide, rendering 1.2 billion students out of classrooms [1-2]. An unprecedented event that has not happened in a decade except for the SARS period has created such uncertainty and challenges in education for teachers, parents, and students. Given the infective nature of the virus, face-to-face interaction was prohibited. The congregation was unadvisable, and confinement at home has taken into place. The majority of institutions turned to online learning as a solution [3-5] to weather through the COVID-19 crisis, leading to online learner ship penetration to soar over the past four months. Online learning has mitigated the impact of COVID-19 on the education sector. The effectiveness of this approach has yet to be determined, with future research needed to corroborate findings. As for

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the challenges, it's important to note that research in education technology is not new. Issues identified in education technology include privacy, personalization, student assessment, social learning support, and teaching strategies [6]. In this pressing time amidst the COVID-19 pandemic, other factors come into play, namely the availability of electronic devices, internet access, number of students to device ratio, student attentiveness, institutional infrastructure, technical capability, and government policies [3-4, 7]. It ranges from a gradual approach to a rapid closing of schools. For instance, Singapore introduces a mandatory online course once per week [8] before entering into the circuit breaker, where institutions were closed. While other countries, like Malaysia, transited directly to the online platform and school closure upon announcement of the Movement Control Order (MCO) [9,10]. Another intervention includes intimate aid, where companies in Brunei were encouraged to donate laptops for needy students [11]. These have an impact on education technology.

1.2 Research Question

Our research aims to study the difficulties of online learning during the coronavirus pandemic. As well as using past articles to identify solutions. Hence, our main research question is:

"What are the challenges and recommendations for online learning during COVID-19?"

1.3 Research Objectives

The goal of this research is to identify the factors affecting online learning during COVID-19. Hence, our studies objectives are as follow:

1. What are the factors that affect education technology during COVID-19?
2. How to use solutions identified in previous research to solve these challenges?

1.4 Organization of Paper

There are four sections in this article. In Section 2, the methodology of this study is discussed. It involves choosing literature reviews, identify the online databases, determine the period of the selected articles, and the keyword search strategy in finding the required papers. In Section 3, findings on the challenges of online learning during COVID-19 are presented. They are categorized into three main domains, which are the institution's readiness, the student's difficulties, and the teacher's dilemma. Each domain emphasizes the challenges faced by individuals from different vantage points, giving readers a better understanding of the matter. Lastly, Section 4 reports on the various recommendation by past scholars to remedy the challenges described in the previous section. These embrace solutions from the organization's perspective, optimal teaching methods, and level of student-parent involvement during online learning. We hope the results of this study will use as guidelines in the development of future online learning in times of crisis that provide insights for researchers, Information Communication Technology (ICT) analysts, and board of members should a similar occurrence happen once again.

2. Methodology

The literature review began with the selection of conference papers, proceedings, and journal articles sourced from eleven online databases available in our university library. The online databases

are the Academic Search Premier, Emerald, IEEE, JSTOR, ProQuest, Reaxys, SAGE, ScienceDirect, Scopus, SpringerLink, and Wiley Online Library. The search is limited to the papers published in December 2019 to July 2020 as it is the period of the COVID-19 pandemic. Conference papers, proceedings, and journal articles that were published before December 2019 were omitted except for which required for definition purposes. The search strategy with combination keywords of "COVID-19 + online learning + education technology" was resulted in the abstract, title, and keyword of the articles found in the online database. The term COVID-19 and coronavirus were used interchangeably in the search process to identify more papers. The search results displayed 324 published articles. However, up to eighty percent of the search results were not related to the topic. Hence, we extended our search in Google Scholar. The pertinent section of the chosen article was read and re-read to decide the key stages to reveal the intricate process of literature searching. The scrutinizing process involves reviewing all challenges and recommendations reported by prior researchers before suggesting a unified approach which suitable to the current COVID-19 pandemic, establishing a common consensus across multiple papers that were translated into the literature review.

3. The challenges of online learning during COVID-19

Findings concerning the difficulties of online learning during the pandemic are described in this section.

3.1 Institution's Readiness

Studies have shown that a lack of resources in any institution can affect the transition to online learning. In Brazil, issues on quality control and mode of delivery in online teaching have emerged among hospital lecturers due to the COVID-19 pandemic. The physicians had trouble juggling between their clinical practices and teaching responsibilities. This scenario mostly happened in the low- and middle-income community. The constraint in the institution resources has resulted in neglecting several aspects of online learning, such as incorporating social value, namely the verbal and non-verbal communication technique [12]. Hence, with the current education technology provided by the institution, lecturers are facing challenges in delivering practical skills learned from hospitals to technical institutions via online teaching [12, 13]. It is a tacit component in knowledge management, which could have been better addressed if more lecturers were available. Close to the center of the pandemic. Lecturers at Peking University, China, reported problems that with the rapid online transition due to the fast emergence of COVID-19, the lecturers who were lacking in online teaching experience required constant aid from the educational support team [3]. A complete online learning facility needs proper plan designs, teaching materials, and technical supports, which has become a challenge for the institution. There were also reports of online learning platforms like Cloud Classroom, Rain Classroom, and Ding Talk, become overwhelming [14] and resulting in network crashes. Therefore, the main focus in making online learning success was on the server capabilities and infrastructure readiness of the institution. The same challenge happened in Perlis, Malaysia. A study was conducted involving twenty educators who utilize online learning for the first time during COVID-19. The online learning platform used was unsatisfactory and the internet access was not stable to support the needs [15], which affected the educational qualities. In addition, Wang et al. stated that the use of the online medium has made the teaching materials readily available to the public. Therefore, it caused raises in copyright issues that inhibit the lecturer's freedom in education and limiting the effectiveness of learning [16]. Hence, legal trademarks are vital for a tertiary institution to protect the intellectual property of the lecturers.

3.2 Student's Difficulties

A survey by CCTV News identified that two percent of students in China do not have access to online learning because they are living in mountainous areas who had to walk for hours before finding internet services [14]. A similar situation happened throughout the globe. A report from the Sapienza University of Rome highlighted that 25 percent of families in Italy are depriving of broadband connection, raising the issues of students not being able to afford the cost of laptop or internet access [17]. Larger figures revealed that before the COVID-19 pandemic, only 47 percent of the population in developing countries used the internet, compared to 86 percent in developed countries. This disparity elicited the lack of internet ownership and hence limited the implementation of online education opportunities in the poorer countries [17]. In Malaysia, poor internet connection and frequent disruption have caused problems to synchronize pedagogy making live teaching via video conferencing difficult. These factors contribute to the absenteeism of the students. Apart from internet accessibility, students easily get distracted during online class has also been a big challenge in online learning. Yusof & Ahmad reported that students being less focused during online learning was the top concern among Malaysian lecturers, which result in the unconducive study environment. It includes distraction at home with other electronic devices, lack of a study area, poor internet connection, and more [15]. Another factor contributing to challenges in online learning is the attitude of the students. Studies in China have shown that 60 percent of college students have vague career goals, lack in academic participation, and spend more study time in class than outside of the classroom [3]. Fernades et al. also reiterated similar challenges to online learning; encompassing a lack of self-discipline, proper learning places at home, or appropriate learning materials [12]. Likewise, Zhang *et al*. elicited matching problems that hinder China's "Suspending classes without stopping learning" policy. Household commitments such as house chore was a notable addition. They also warned of the negative impact on student's mental and physical well-being [14] should online teaching remain as the sole mode of delivery for a long time.

3.3 Teacher's Dilemma

Despite the wide availability of online learning facilities before the COVID-19 pandemic, many lecturers are using the platform for the first time when the government closed down all institutions due to the abrupt spreading of the virus. Complete training on the system have yet been imparted to all lecturers prompting many to call for more courses on the matter. This scenario was identified in studies from both Malaysia and China. In Perlis, Malaysia, up to 65 percent of the lecturers advocated more online classroom management workshops to be conducted, indicating that these training would aid them to fully prepare for online teaching in the future [15]. In Peking University, China, the virus has forced the education sector to initiate online live courses for 2,613 undergraduate and 1,824 postgraduate modules. The large-scale migration to online learning has prompted issues of lack of online teaching experience, early preparation, and supports from the technical division [3, 18]. Also, the differences that exist between regions, inter-schools, and subjects have made it difficult for the online course to be delivered consistently in a short period. Zhang et al. realized that a large number of China's lecturers were uploading their teaching contents without appropriate adaptation to the platform requirements [14]. All of which summarize the difficulties that were facing by the lecturers. A study from Fiji, Japan, explored the willingness of the lecturers to change and adapt the new norm as the main requirement to integrate technology into the education system. Factors such as lesson preparation time and unsupportive platform designs were said to discourage online teaching [4].

Hence, supporting elements for the move is essential for the integration process, which include adequate training, ICT support, and appropriate pedagogy.

4. The recommendations for online learning during COVID-19 pandemic

Solutions for the challenges described in Section 3 are illustrated here. A detailed discussion of the proposed factors is as below.

4.1. Organization's Perspective

Sandar et al. [19,20] recommended the adoption of the ADKAR model to change the organization's management performance. ADKAR model consists of five elements which include: 1) having the Awareness for change, 2) the Desire to be active and supportive for the change, 3) owning the Knowledge for change (including the selection of an appropriate technology platform and tools), 4) using the Ability of the required skill and behaviors (such as feedback collection), 5) and Reinforcement for the maintenance of this change. The organization that implements the ADKAR model led to a predictable path, as seen in Figure 1, with much better performance in a short period, compared to organizations that did not implement the model [19].

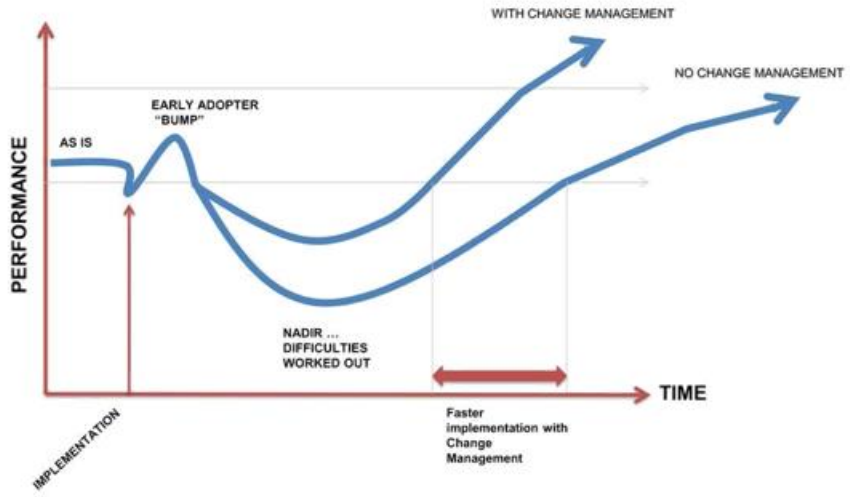

Fig. 1. Model depicting an early surge in performance, followed by majority acclimatizing quicker to the change factor [21]

Sander et al. [19] suggested the need to continue using the current LMS as students and lecturers are more familiar with the system. This approach allows an easier transition to online learning, given the fact that face-to-face teaching was prohibited. The capabilities of lecturers to assess their students' performance in person are dampened [19, 22]. Showing attention to every single student is difficult even with video conferencing. Hence, the use of LMS analytics could be an indicator of the student's motivation. This method will help the lecturers to identify which students need additional support and pay more attention to [19]. The need for infrastructure upgrades is also pertinent in these times of crisis. Institutions should coordinate and provide feedback to their respective Ministry of Education for better management. In China, during the implementation of the "Suspending classes without stopping learning" policy, the Ministry of Education collaborated with several telco companies. Namely China Education and Scientific Research Computer Network, China Telecom,

China Mobile, China Unicom, and more to provide network services to the mass [14]. This collaboration supports maintaining public service platforms and school network at a different level. Ceilion-Fernandes et al. reported that Brazil being low- and middle-income country, also recommends the importance of online learning. In the event where the network remains an issue, mobile phones create ample opportunities for online asynchronized learning by downloading the application of pre-prepared sources of the institution. With this, students can learn on the go [12].

4.2 Teaching Method

Concerning the challenges in the learning and focus of the students, teaching through online are crucial. The recommendation of having a small online group by Sander aims to optimize the learning experience. This approach is to ensure that each student contributes during the live streaming lecture [19] using any of the synchronize video conference applications such as ZOOM, Webex, Skype, Top hat, and more. Tips for synchronizing classes are to segregating it into a series of components that have smaller learning tasks to better convey the lessons, with a break in between. These breaks provide a space for the students to digest the lessons and ask any related questions, and for the lecturer to explain further. Hence, improving the student-lecturer engagement during the lectures [3]. Asynchronized lecture session caters to individual learning as they become more self-directed with heightened motivation as they can access the e-materials at their own time. This method involves a list of multimedia attributes such as videos, animations, and quizzes uploaded on the platform. Yet, the students still need to depend on the lecturer for the learning outcomes, curriculum, and other available resources [12, 23]. Hence, the guideline of the lessons should be published to ensure uniformity between lecturers, institutions, and regions. For a successful online learning experience to be established as a nation, lecturers should leverage on both pedagogy methods by delivering blended flipped classroom learning experiences by implementing asynchronized materials before and after live video teaching [19].

4.3 Students and Parents

The current notion of students being a digital native is not a given stance. Despite their receptive age to technology, students need to be exposed, train, and become familiar with online educational platforms [3]. Hence, prior experience in education technology before the pandemic is crucial. Sitting in front of a camera for class sessions remains a new experience for most of them, especially for younger students who need technical support from their parents. Therefore, the parents play a crucial role during these troubling times. Coordinating timetables for different classes can be messy, especially for those who have more than one child. Hence, it is the parent's responsibility to ensure that their children have a conducive environment for studies. Also, the need for electronic devices and network connections so that every child will benefit most from the education technology era. As for the students in their tertiary education, having the right attitude is crucial for success [24]. Being eager to learn and not succumb to the pseudo-holiday ambiance would be a start. Closely monitoring and aware of the timetable by being actively involved in group discussions is also highly recommended. Preparing for the school reopening and anticipating possible reschedule of the national examination would be a plus.

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