Learning Remotely during a Pandemic

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Before the COVID-19 pandemic, face-to-face learning was the generally accepted mode of knowledge dissemination, and the use of technology was often limited to using learning management systems (such as Moodle, Blackboard) for many higher education institutes. Particularly in the developing world, the issues related to online learning, such as limitations in devices, access to the internet, or technical know-how impeded the speedy transition to the e-learning sector. Additionally, the learning eco-system that has been developed is one for face-to-face learning where there is a significant emphasis on using libraries, meeting lecturers and colleagues as part of the learning process. In this backdrop, moving the learning process online was a risk for many higher educational institutes, where they risk alienating (fee-paying) students as well as teachers in an increasingly competitive sector. As various levels of social-distancing measures were implemented around the world, the educational institutes and students had very little choice but to transit quickly to remote (online) learning. In this process, the students were required to tap into key skills (such as digital skills) and technical experiences many have gained through pre-university learning.

Keywords: higher education ; online learning ; students' perspectives of remote learning ; learning technology ; COVID-19

1. Challenges and Benefits of Online Learning

Remote learning had gained popularity in many developed countries due to its ability to access greater student demography at a lower cost. However, in developing countries, the online mode of learning was a less popular option but forced to use due to social-distancing measures imposed during the pandemic. Previous literature reports some of the challenges faced by students as they shifted to online learning. In a study presented in 2020 [1], a group of English language learning students was asked about the barriers to online learning and they listed three main problems: unfamiliarity of e-learning, slow internet connection, and physical conditions such as eye strain. The students suggested that it is important to implement the learning management system before the real class, compress big data files into smaller ones and give intermittent intervals during lectures for a better experience [1]. In some other studies, similar problems of accessibility were highlighted: availability and sustainability of internet connection, accessibility of the teaching media, and the compatibility of tools to access the media [2][3]. In rural South Africa, studies revealed the challenges faced by students during the COVID-19 pandemic. Despite the government push for online learning, the mode excludes many rural learners due to a lack of resources to connect to online platforms, the learning management system, and low-tech software [4].

Despite the challenges, some educationalists have sought novel solutions to continue the learning objectives set for the year. For example, some experimented with Mozilla Hubs virtual reality platform for students to present posters and communicate with the community [5]. The main benefits of the virtual poster presentation were learning the subject matter interacting with peers; further, students received well the flexibility, novelty, and the ability to interact in an isolated environment. For the lecturers, it was experienced that the remote session was similar to a physical session. On the other hand, both students and lecturers experienced challenges with using the internet, devices, or software but these challenges were easily remedied by practice [6][5]. In another instance, researchers used the "Second Life" three-dimensional virtual environment [7]. The students reported the environment to be interesting and activities beneficial to overcome timidity in verbalizing in a technical forum. At the same time, the students also reported inter-campus access and sound issues.

More studies found that the inclusion of e-learning in English language education to be beneficial as it increased student interaction and sharing of information both within and outside the online space. It was noted that many students did not follow the academic rules of writing during online tasks, but they were able to apply what they learned to text-based assignments. Further, while it was found that incorporating online learning into the curriculum may be beneficial, it was noted that the lecturers must be careful when conducting assessments online [8]. Among students with dementia, the use

of technology was found to provide high-quality care. The majority of students reported that online learning broadened their thinking and said it broadened their practice [9].

Previous research has been conducted to evaluate students' preference of different modes of learning: face-to-face, online, and hybrid (a combination of physical and online modes of delivery). According to the students' perspectives obtained from the study, the students who studied face-to-face did not indicate the learning was more effective than their peers who studied the same courses online [10]. From the analysis of students' grades, students studying face-to-face performed better than those studying online, remote-learning students said they were more satisfied with the learning experience. For online students, independent learning skills were found to be more important. For students studying face-to-face, anxiety and motivation played important roles in their preferred mode of learning environment and the effectiveness of their learning. In the same study, it was noted that the factors most appreciated by students are the skills of the lecturers and the usefulness of the course. Further, it was shown that using technology increases understanding of the material and promotes greater interaction during the delivery, and also technology use seemed to increase the level of autonomy and motivation.

In further research, it was found that the students were generally technically competent and issues associated with equity and access varied among students in the same department [11]. Further, the students had reconceptualized what is understood as 'personal' study spaces as physical proximity among students in learning did not become a factor in online learning. In some studies, such as in medicine, where physical practice is essential, the researchers reported the advantage of having initial face-to-face teaching before shifting to the online mode. It was recommended that a hybrid learning approach with both face-to-face and also online learning has the potential to provide the necessary knowledge to skilled dementia care practitioners [9]. Furthermore, research has shown students' interest in remote learning, in particular, mobile-based education: the authors of [11] showed behavior patterns of medical undergraduate students preferring mobile technology for learning and willingness to recommend it.

Previous literature also reports that students generally view themselves as having the necessary attributes to be good online learners. Generally, students enrolled in qualitative courses and introductory classes showed more positive perceptions of online learning and various aspects of coursework than those who are in quantitative courses and advanced level classes [12]. Another study explored nursing students' views on online learning [13]. It was found that online learning enabled students to hold a higher level of accountability for their own learning and be independent learners. On the other hand, students complained about reduced peer interaction which was needed for group discussions/projects. Furthermore, it has been noted that the online learning environment can be used to integrate students from different parts of the world by the appropriate use of discussion boards and other learning strategies which would yield many benefits to students [14]. Despite the conventional wisdom, some researchers reported that it is possible, with careful design and delivery, to successfully deliver foundational outdoor education modules [15].

2. Psychological Impact of Online Education

Some researchers have attempted to understand the effectiveness of online learning from a psychological point of view. For example, a study was conducted to understand the relationship between the used amount of working memory resources (i.e., cognitive load) and student satisfaction with learning online [16]. It was found that there is a positive correlation between cognitive load and student satisfaction with online learning. Furthermore, 25% of the variance in satisfaction with learning online was found to be related to cognitive load.

It has been theorized by some researchers that online learning can be viewed as online participation [17]. According to the theory, if we want to improve online learning, we have to improve online learner participation. It is outlined that online learning is a complex process of participating and maintaining relations with peers and lecturers, supported by physical and psychological tools, not synonymous with oral or written expression of information, and is supported by all kinds of engaging activities.

A team of researchers conducted a survey among 255 students in an online university to understand the direct and indirect social factors that affected learners' engagement online. It was found that social support provided by teachers was the only interindividual factor that influenced students' engagement. Additionally, a sense of community was also found to be a significant predictor of online learners' engagement [18].

Furthermore, researchers have explored the possible link between student satisfaction with online learning and the predetermined but unspecified expectations for online courses by both students and lecturers [19]. The results identify

three main satisfaction components: engaged learning, agency, and assessment. In the analysis, it is found that the satisfied students characterize important differences in engaged learning and agency, but not assessment.

3. Transition to Online Learning

A study presented in [20] collected data from 270 students to explore college students' perceptions of their adoption, use, and acceptance of emergency online learning during COVID-19. It was pointed out that educational institutes should not assume that online learning has the same effect as emergency online learning. In such a pandemic, the delivery of lectures has to be a creative and flexible emergent response to a particular crisis. It demands greater thought and clear communication between all involved parties than previous educational experiences as this is unique to the emergency. The results showed there was a downward trend for motivation, self-efficacy, and cognitive engagement, but a positive trend for the use of technology, after the transition to online learning. Further, face-to-face learning was preferred by the surveyed students as this mode of learning has developed an overall ecosystem designed to support learners [20].

A study was conducted to analyze the experience of converting three modules from physical mode to online mode of delivery as a response to the pandemic [21]. During the transition, the lecturer's role also shifted towards curation of online and offline student experience which included providing blended online learning experiences. In this process, it was needed to create learning roadmaps to facilitate student learning and improve online engagement between students and lecturers. It was noted that online learning provides opportunities to adapt learning experiences on the go.

Some researchers in Pakistan surveyed 126 undergraduate and postgraduate students to analyze students' perspectives of online learning and found that the majority of students overwhelmingly preferred face-to-face learning [22]. For the unpopularity of online learning, it is outlined that it is affected by internet accessibility issues and economical issues. Further, it was reported a lack of interaction with lecturers, response time, and absence of traditional classroom socialization as key factors for this unpopularity. As a result of no on-campus socialization, a significant proportion of students said they found it difficult to do group projects. Considering all the difficulties of making the transition, it was reported that the majority of the students did not want to pursue online learning after the pandemic and it was highlighted that the mode may not be effective, especially for developing countries. This suggests the importance for educational institutes to improve curriculum and design appropriate content for online lectures [22].

In Zambia, some researchers provided evidence that mathematics teachers can also learn via using online tools [23]. However, it was found that there are significant mean differences between sample groups suggesting possible differences in attitudes towards the use of technology in learning. For this variation in attitudes, it is suggested that lack of skill and knowledge in using online tools, unstable electricity connections, unaffordable internet costs to sustain long hours of online learning dissuade away from online learning [23].

A group of researchers conducted a study among 60 undergraduate medical students aimed to explore undergraduate students' perceptions regarding the effectiveness of synchronized online learning [24]. It was found that the online mode of learning was well-received, and all participants agreed remote learning was time-saving and that their performance improved due to effective time management. However, they also reported that they faced challenges in methodological, content perception, technical, and behavior during online sessions. A majority of preclinical students indicated their preference for online learning for future academic years. The researchers pointed out that the online mode of learning has a significant and promising potential tool for medical education, however, the online learning model and learning outcomes must be rigorously and consistently assessed to check effectiveness [24].

4. Conclusion

The device usage analysis showed that the most preferred device for online learning is a laptop, followed by a smartphone and desktop, lastly tablet. Furthermore, it was noted that the most relied on combinations of device use are laptop and smartphone, laptop only and smartphone only. The greater reliance on laptop and smartphone combinations indicates the possibility that students are depending on mobile internet to connect to lectures, especially in rural parts of the country. Additionally, smartphones may be used as a backup when attending lectures due to their relatively long battery life, greater portability, and easier accessibility due to lower cost. It is noted that there is a significant proportion of users of smartphones as the only medium for attending lectures. This trend has been identified in previous research focusing on similarly developing countries as well [17]. This could potentially be more prevalent in rural parts of the country where access to WiFi connections is limited therefore users depend on mobile internet for internet access. Conversely, it is noted that a very low proportion of students stated that they are using a desktop as their only medium for attending lectures. These trends highlight the importance of portability, the presence of in-built network components, and

the cost of choosing the device for online learning. We see that smartphones could be a great equalizer in education in developing countries as they allow rural communities to connect to the internet and profit from the free resources available. In the development of rural communities, providing access to the internet through smartphones could be an avenue that governments of developing countries could analyze further.

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