

Technology Involvement And Effectiveness For Online Learning During Covid-19 Pandemic

GHAS Navodya¹ and N Wedasinghe¹

¹Department of Information Technology, Faculty of Computing, General Sir John Kotelawala Defence University, Sri Lanka

#36-it-0004@kdu.ac.lk

Abstract: Every aspect of life has changed as a result of the ongoing COVID-19 pandemic. Schools and universities have been forced to conduct courses in online learning environments due to the COVID 19 epidemic. Online learning is a type of education in which students learn in a completely virtual setting. Due to the global breakout of the Covid-19 pandemic, distant learning is playing a key role in the education sector. The major goal of distance learning techniques is to improve the quality of learning and teaching in the educational system. The aim of this research is to examine the effect of online learning technology on the learning effectiveness. This survey involved both school and university students in Sri Lanka. The quantitative study was conducted by using Google Form as the online questionnaires for collecting data. The number of responses after the survey was 83. The survey helped to identify the technology involvement and effectiveness for online learning during Covid-19 pandemic in Sri Lanka. The results found that there is a powerful relationship and influence between online learning technology and learning effectiveness. Technology can be used to enhance learning in a variety of ways, including electronic grade books, digital portfolios, learning games, and real-time feedback on teacher and student performance. Furthermore, in rural areas, a lack of basic informational technical skills has a significant impact on online education. According to the research articles and survey clearly identified online learning effective for this pandemic situation and Covid-19 has impacted on education. Furthermore, this paper supports to identify online learning advantages for both school and university students and some of the most common issues students are having with online learning right now.

Keywords: Covid-19 pandemic, Effectiveness, Impact, Online learning, Technology

1. Introduction

Learning is the process of becoming skilled in the creation, acquisition, and transmission of knowledge, as well as the modification of behavior. Covid-19 has been labeled a pandemic by the World Health Organization as a current threat to humanity. Therefore various activities around the world have been paralyzed. And also the Covid-19 has resulted in schools, universities shut all across the world.

Numerous schools, universities, and colleges have discontinued face-to-face education. This will have a harmful impact on educational activities because social distance is so important at this period. Due to its contagious nature, Educational institutions are attempting to develop new ways to deal with this tough situation. As retaining social distance was recommended during the Covid-19 pandemic, online learning remained the best option. Therefore all are refer to online learning for their studies. Because of this Covid-19 pandemic, technology has gained momentum all activities. "Online learning" refers to education that takes place over the internet. As a basis for online learning are need laptop or smart phone, internet connection and technical knowledge. Many students and teachers are unable to interact with one another without physically meeting, therefore all are connected remotely through computers and the internet in the case of a pandemic.

Distance learning is easy with the support of a variety of educational platforms and learning management systems. Online communication platforms such as Zoom, Microsoft Teams, Google workspace, Dropbox, Microsoft 365, GoTo etc. are act as an intermediary for students and teachers. Schools and universities can use digital resources to help teaching and learning in a variety of ways. Students' participation can be increased, teachers' lesson plans can be improved, and personalized learning may be facilitated through the use of digital learning technologies in the classroom. Technology can be used to enhance learning in a variety of ways, including electronic grade books, digital portfolios, learning games, and real-time feedback on teacher and student performance. Self-learning, better time management, improved virtual communication and collaboration, self-motivation, critical thinking skills are some of benefits using online learning. However, the effectiveness of online learning differs by age group. Children especially younger ones, require a regulated environment and parent's constant attention for studies because they are more easily distracted. And also students who do not have reliable access to technology resources, require consistent internet access to connect to their online education.

In this research use the survey-based questionnaire method to elicit students' responses regarding online learning effectiveness. In this study, investigate the following research questions: Is there any impacts on education due to Covid-19 pandemic? Is any educational benefits of technology in the Covid-19 pandemic? Is the use of technology in education is effective due to the Covid-19 pandemic? The objectives of this research is to determine the impact of the Covid-19 pandemic on education. Secondly, to determine the educational benefits of technology in the context of the Covid-19 pandemic. Furthermore, to determine whether the use of technology in education is effective due to the Covid-19 pandemic.

The aim of this research is to examine the effect of online learning technology on the learning effectiveness. This article discussed the impact of the Covid-19 pandemic on education, educational benefits of technology in the context of the Covid-19 pandemic and also effectiveness of online learning during Covid-19 pandemic situation.

After examining all of the survey respondents' responses, the total number of respondents who have stated online learning is effective and ineffective was compared, and the majority of respondents have stated it as effective.

2. Literature Review

Online education is deeply rooted in adequate planning and designs of instructions with several available theories and models. The crisis-response migration methods of universities, faculty, and students, as well as challenges and opportunities, were discussed, and it was clear that online learning differs from emergency distant teaching. Online learning will be more sustainable, while instructional activities will become more complex, if the challenges faced during this pandemic are well explored and transformed into opportunities. This study researched challenges of online learning. Pandemic-related anxiety will have negative effects on student academic performance, academic performance of students might be affect by racial, economic and resource differences and the larger parts of instructors were not effectively ready to deliver high – quality instruction remotely. Online learning on its own has advantages, such as flexibility, interactivity, self-pacing and opportunities. [1]

Students' low engagement and participation, less interactive class, and network bandwidth problems were some of the challenges identified in the study. Accordingly, the study suggested for effective online learning, there are various factors to consider. The highly recommended features were instructor orientation and adequate training, as well as the use of effective monitoring methods. The study also found some of the online class's benefits. The most frequently reported goals were to improve technology skill and knowledge, encourage self- regulation, and save time and

money. Simultaneously, the study identified a number of difficulties faced by international students. Low student engagement and motivation, a less involved class, network bandwidth issues, difficulties expressing gestures and emotions, poor use of instructional time, and difficulty using digital tools were all indicated. [2] Students' low engagement and participation, less interactive class, and network bandwidth problems were some of the challenges identified in the study. Accordingly, the study suggested for effective online learning, there are various factors to consider. The highly recommended features were instructor orientation and adequate training, as well as the use of effective monitoring methods. The study also found some of the online class's benefits. The most frequently reported goals were to improve technology skill and knowledge, encourage self- regulation, and save time and money. Simultaneously, the study identified a number of difficulties faced by international students. Low student engagement and motivation, a less involved class, network bandwidth issues, difficulties expressing gestures and emotions, poor use of instructional time, and difficulty using digital tools were all indicated. [2]

The implementation of distant learning requires the use of electronic devices that can support and access information, such as smart phones, PCs, Android tablets, and laptops. Online learning was inefficient during the Covid-19 pandemic, and that there are still many challenges. Special supervision is required for both teachers and students in order for learning to be effective and easy. [3]

Participants had both positive and negative experiences when receiving online education. Participants' positive experiences were assisted by the flexibility of class participation time and self-paced study, as well as the cost effectiveness of online classes, electronic research availability, well-designed course layout, ease of Internet connection, easy navigation of the online class interface, and familiarity with the instructor. Delay in receiving feedback from the instructor, lack of technical help from the instructor, lack of self-regulation and self-motivation, isolation, boring instructional methods, and poorly designed course content were all factors that contributed to students' negative experiences. [4]

Coronavirus is a highly contagious disease that is rapidly spreading among humans. According to the findings of this study, the quality of the instructor is the most important element that influences student happiness during online lessons. Students' expectations are the second most important element affecting student satisfaction during online sessions, according to the current study. Feedback is the third component that influences student satisfaction. Design is the final component that influences student pleasure. [5]

Effective online education, according to the authors, requires well-designed course content, motivated interaction between the teacher and learners, well-prepared and fully supported instructors, the establishment of an online learning community, and quick technological advancement. As a result, the study recommends providing a platform for educators and policymakers to explore how to build and deliver effective online programs. [6]

This pandemic crisis posed a challenge to the global education system, forcing educators to switch to an online style of teaching almost immediately. This study investigated into the growth of EdTech start-ups during pandemics and natural disasters, as well as providing recommendations for academic institutions on how to deal with the challenges of online learning. Live online classes, web conferencing, webinars, video chats, and live meetings are all possible with Zoom. Due to curfews, most schools, colleges, universities, and businesses are closed, and most people work from home, this software helps in keeping people linked via video conferencing. [7]

Innovative networks of technology, such as Edmodo, social media, forum, Coursera, or special higher education platforms, apply computer-managed e-learning to immersive online learning. According to the research, online learning is an engaging and productive source of learning for students that helps with simple administration and accessibility of distant learning along with less use of resources and time. Furthermore, this study relates to areas of access where not many students have sufficient technology services that are linked to promoting conditions, especially Internet access. [8]

Learners' ability to gain from online education during Covid-19 is determined by their past online or mobile learning experience. The shift to online learning does not happen overnight. It all starts with computer-based learning and technological developments. According to the findings, differences in factor scores are positively connected in students' perceptions of online preference, efficiency, success, and involvement during online learning, but negatively correlated in assignments, tasks, and tests. The study's most important finding is that Pearson's r score for assignments, examinations, and other online learning tasks was low. [9]

During the lockdown, students were mostly bored, uncomfortable, and frustrated, and expressed concerns about their future professional careers and study challenges. As onsite sessions were transferred online, semesters were postponed, and tests were rescheduled, the pandemic period was undoubtedly unprecedented and extremely stressful for students. [10]

To control the Covid-19 pandemic, physical distancing, and quarantine measures were mandated. In an effort to meet this mandate while trying to maintain the status quo, various types of human behavior (e.g., shopping, learning, working, meeting, and entertaining) shifted from offline to online, resulting in an accelerated diffusion of emerging digital technologies among ordinary people, while the digital divide further increases between citizens with versus without access to the technologies. In terms of daily use and digital technology, the most prominent activities were tracing, analyzing data, predicting/forecasting, and diagnosing the virus, and digital solutions significantly protected and supported public health. It provided a better understanding of education and highlighted the transition to online learning. [11]

Platforms that can successfully support the teaching and learning process. Students and instructors do not need to be in the same room; the teaching and learning process can take place from home or in other locations where students and teachers feel comfortable delivering and receiving material related to the day's major topic of class. The teaching and learning process can go smoothly with a good internet network. The online system is still in its early stages of development, but it has made significant progress. This is feasible because information technology has advanced to the point that all advances are now possible. As a result, the concept of learning through online systems can be effectively implemented. [12]

3. Methodology

The objective of this paper is to find how much effectiveness online learning during Covid-19 period. A survey was created to get enough responses covering the area of school students and university students. This survey involved within school students and university students in Sri Lanka. The contribution of this study is to examine the effect of online learning technology on the learning effectiveness.

The objective of this paper is to find how much effectiveness online learning during Covid-19 period. A survey was created to get enough responses covering the area of school students and university students. This survey involved within school students and university students in Sri Lanka. The contribution of this study is to examine the effect of online learning technology on the learning effectiveness.

From the first stage of the survey, engaged with the research question based on the technology involvement and effectiveness for online learning during Covid-19 pandemic. In the second step, establish the content identification of the research papers that were read during the studies. In the third step, decided to do a survey based

on the research questions. In the fourth step, collected the data from the survey that had been analyzed. From the last step determined the last outcome based on the survey.

At first, testing was to decide the facilities of having adequate materials for online joining school and university students. And have looked up about the students' performance of online learning, impacts of transition from traditional learning methods to online learning methods, challenges faced in online learning, benefits and symptoms after changing the technology based method. The questionnaire comprised of using technology involvement and effectiveness for online learning during Covid-19 pandemic. Information was gathered and organized using a Google form. The number of responses after the survey was 83.

4. Results and Discussion

The questionnaire is conducted to identify technology involvement and effectiveness for online learning during

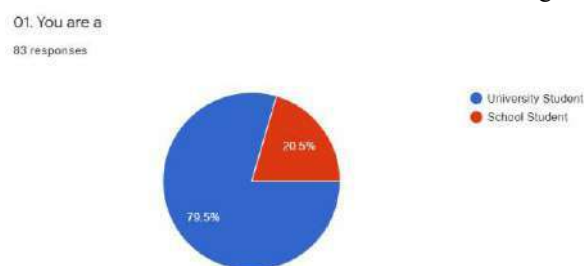


Figure 1: School or University student Covid-19 pandemic in Sri Lanka, according to the school students and university student's perspective. The questionnaire contains 15 questions for the audience for the better understanding. 83 valid responses are recorded that qualify for data analysis.

According to the results the majority are university students and the percentage is 79.5% while the school students are 20.5%. By considering the survey results, survey supports to solve the research questions.

Because of the Covid-19 pandemic, students need to electronic devices to learn from online platforms. Some students faced many difficulties unable to get electronic devices for their studies. Figure 2 shows the devices of using school and university students for online learning.



Figure 2: Online learning devices

According to the survey results, 8.4% are using computer, 71.1% are using laptop, 12% are using parent's smart phone, 51.8% are using personal smart phones and 4.8% using tablets for log in to online studies.

Some of school and university students engage in any other activities while listening to teachers/lecturers during the teaching. Following figure 6 shows the students who engage any other activities while listening the lectures.

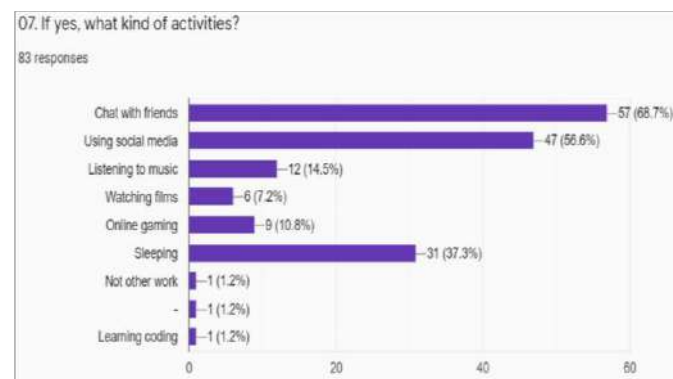


Figure 3: Other activities while listening the lectures

In home based online learning creates a less teacher-student interaction than physical attending. Therefore most of the students focusing other activities when listening lectures.

According to the results received 68.7% chat with friends during the lecture time. And also 56.6% using social media. Furthermore, some of school and university students engage listening to music, watching films, sleeping and learning coding in the lecture time.

Some of the most common issues students are having with online learning right now.



Figure 4: Challenges of online learning

Figure 4 shows the challenges are faced on during this pandemic period. When discussing the survey results 91.6% students are faced on connection issues, 57.8% are electricity problems, 39.8% are technical problems, 48.2% are high data cost, 15.7% are language or technical knowledge problems and 1.2% are not facing any other challenges. Many students are unable to engage with the high bandwidth or the strong internet connection that online courses require may be high data cost or rural area. Furthermore, many students find fixing basic computer problems troublesome, as they have no knowledge in technical area. However, technological knowledge is a must for following online courses. It allows students to keep control of their assignments and course materials without having to struggle.

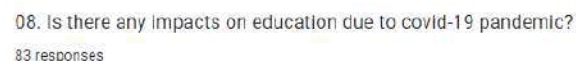


Figure 5: Covid-19 impact

According to the results received 90.4% of the respondents believe that Covid-19 pandemic has impacted on education and on both university and school students. The Covid-19 pandemic has both positive and negative impacts on education. According to the positive responses received from the survey, online learning allows students to spend more time with their families, the use of technology can help students understand and retain concepts better, and students have more opportunities to learn new things. However, the majority of students stated that the Covid-19 pandemic has negative impacts on education as well. For example, some students do not have electronic devices to learn from online platforms, and the majority of students have poor signal strength, and some students cannot afford Wi-Fi facilities. Due to technical and health issues, students have found it more difficult to concentrate on online lectures than in lecture halls, they are unable to obtain a true school

experience, there is less teacher-student interaction, and children are addicted to online gaming, among other negative effects on education during the pandemic period. Due to online learning some students have missed practical sessions as well. Furthermore, some students believe that class attendance is required for education. Many students believe that once the pandemic crisis begins, they will be physically unable to attend lectures, school, and classes, which will have an influence on education.

According to the survey, there are a number of advantages to switching from traditional to online learning methods. Some of them are time saving, easy to learn in comfortable home environment and no need to travel therefore cost saving, students can learn how to use the technology and new technological skills, students can gain self-discipline and responsibility. And also Students can also look back to lecture recordings if they forget something or miss a lecture. It is beneficial in resolving challenges encountered during self-study. According to the results the majority of respondents answered that they can stay at home and learn in a safe setting during this time.

Virtual classrooms may create serious mental health issues for many students. As a result of the pandemic and online learning, others may suffer new changes in mental health and mood. Following figure 6 shows the symptoms that faced by online learning. According to the results some of students affected symptoms such as headache, eye strain, neck ache, apathy and back pains moving to online learning.

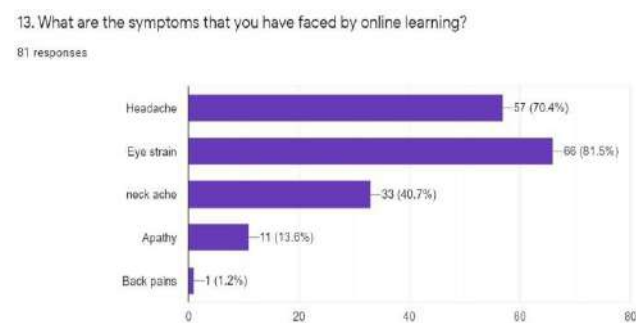


Figure 6: Symptoms after engaging online learning

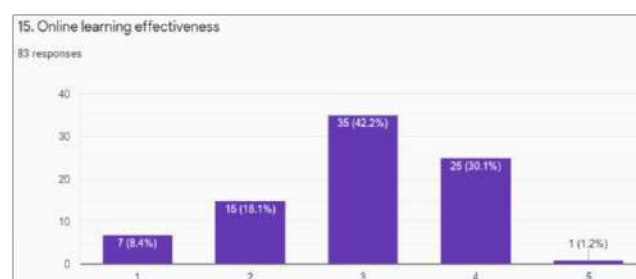


Figure 7: Online learning effectiveness

Figure 7 shows the summary of the effectiveness of online learning. Out of all the respondents 42.2% strongly agrees

that online learning is effective during this Covid-19 pandemic situation and resulted in many benefits for the school students and university undergraduates.

5. Conclusion

After thoroughly evaluating the data contained in numerous research articles and survey, it was clearly identified the technology involvement and effectiveness for online learning during Covid-19 pandemic in Sri Lanka. The evolution of technology has become a huge impact to our future.

In the current Covid-19 pandemic situation in the world, the field of information technology has expanded due to closure of educational institutions, which has caused barriers to student's traditional methods of learning. Online learning remains the best alternative during the Covid-19 pandemic as keeping social distance was advocated. Through the survey created, it received sufficient responses covering by the area of school and university students in Sri Lanka. The questionnaire was comprised of technology involvement and effectiveness for online learning during Covid-19 pandemic. Quantitative data were deciphered using this survey. As per the given responses, 90.4% believe that Covid-19 pandemic has impacted on education and on both university and school students. It has both positive and negative impacts. And also students need a fundamental knowledge of computer hardware and software for participate in online classes without interruptions. However, due to the pandemic period online learning gets the lot of benefits both school and university students. After examining all of the survey respondents' responses, the total number of respondents who have stated online learning is effective and ineffective was compared, and the majority of respondents have stated it as effective. As a result, despite its shortcomings, online learning has proven to be effective during the Covid-19 pandemic.

References

- O. B. Adedoyin and E. Soykan, "Covid-19 pandemic and online learning: the challenges and opportunities," *Interactive Learning Environments*, pp. 1-13, 2020.
- Y. K. Mekonen and N. C. Nneoma, "The Two Sides of Online Learning Post Covid-19: Perspectives of International Students in China," *International Journal of Research Publications*, pp. 1-14, 2021.
- T. Rusman, M. Maskun and S. Suroto, "Constraints to the Application of Online Learning during the Covid-19 Pandemic," 2021.
- Y. Yang and L. F. Cornelius, "Students' Perceptions towards the Quality of Online Education: A Qualitative Approach," *Association for Educational Communications and Technology*, 2004.
- R. Gopal, V. Singh and A. Aggarwal, "Impact of online classes on the satisfaction and performance of students during the pandemic

period of COVID 19," *Education and Information Technologies*, pp. 1-25, 2021.

A. Sun and X. Chen, "Online Education and Its Effective Practice: A Research Review," *Journal of Information Technology Education*, 2016.

S. Dhawan, "Online Learning: A Panacea in the Time of COVID-19 Crisis," *Journal of Educational Technology Systems*, pp. 5-22, 2020.

I. Alyoussef, "E-Learning System Use During Emergency: An Empirical Study During the COVID-19 Pandemic," *Frontiers in Education*, 2021.

M. Mahyoob, "Online Learning Effectiveness During the COVID-19 Pandemic: A Case Study of Saudi Universities," *International Journal of Information and Communication Technology Education (IJICTE)*, pp. 1-14, 2021.

A. Aristovnik, D. Keržič, D. Ravšelj, N. Tomaževič and L. Umek, "Impacts of the COVID19 Pandemic on Life of Higher Education Students: A Global Perspective," p. 8438, 2020.

D. Vargo, L. Zhu, B. Benwell and Z. Yan, "Digital technology use during COVID-19 pandemic: A rapid review," *Human Behavior and Emerging Technologies*, pp. 13-24, 2021.

E. D. Ratnasari, N. Saputra and F. Rahmana, "The Effect of Online Learning Technology on Learning Effectiveness," *Information Management and Technology (ICIMTech)*, vol. 1, pp. 702-705, 2021.

Acknowledgment

This research wouldn't have been able to successfully complete without the inspiration and guidance of many kind souls. I would like to express my gratitude to my supervisor, AAA (Blinded) for her invaluable assistance in the completion of this research. A thank you goes out to everyone who joined hands with me for the completion of this paper.

Author Biography

Sithumini Navodya is a 4th-year Information Technology student of General Sir John Kotelawala Defence University. Sithumini Navodya is a 4th-year Information Technology student of General Sir John Kotelawala Defence University.



Nirosha Wedasinghe is completed her PhD in Computing and graduated from London Metropolitan university-UK, and she has completed her Masters in CSU Australia. Her research interests are in the field of Digital accessibility and Management Information Systems. She has published, reviewed, and supervised many researches nationally and internationally.

