The Digital Transformation of Higher Education in Sri Lanka due to Covid -19

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Abstract— *Digitalization in education can be defined as the implementation of digital technologies to transform knowledge for learners and as well as educators. Digital technology has made a phenomenal entrance into Sri Lankan higher education during the Covid 19 pandemic since the Sri Lankan government followed the social distancing step to limit the spread of the syndrome. This study will elaborate answers to the issue; to what extent the steps taken by the government and private sectors have been sustainable in facilitating the e learning during the Covid - 19 outbreak. Therefore, the study is crucial in determining whether the steps above that have been taken to make online learning in Sri Lanka, are feasible with the real-world challenges that Sri Lankan university students encounter. Taking a quantitative research approach; a questionnaire, the paper observed the usage of digital platforms before and after the pandemic situation, some issues faced by the university students with the digital transformation, some steps taken by the authorities and to what extent, they have been sustainable in the higher education in both academics and economics. Furthermore, there are some recommendations for how to resolve the problems and improve the sustainability of the digital transformation in the future. In terms of the conclusion, it can be stated that Sri Lanka's digital transformation is at a sustainable level during the pandemic, and even after the outbreak, and it has a beneficial impact on education in the country's higher education system.*

Keywords— **Digital transformation, Sri Lankan higher education, Covid-19 pandemic, Digitalization, Sustainability**

I. INTRODUCTION

A. Background of the study

Covid 19 pandemic impacted the economies, tourism, education, and foreign relations of almost every country in the world. Similarly in every other country, the epidemic produced an impact on Sri Lanka's development in various manners, particularly in the area of education. Since conventional educational programs were not practical to be continued due to the COVID-19 pandemic, university education was nearly entirely completed online. The governments avoided large gatherings of people and managed the space between individuals as a result of the COVID 19 pandemic. This had a significant effect on the educational field and gave scope to resume educational activities as part of the measures that were adopted to stop the plague's spread. This led to the rise in popularity of terms such as "e-learning," "blended learning," "online education," "web-based education," "web-based instruction," and "online courses" in the educational community. Although students and teachers in Sri Lanka have been using e-platforms like email, Microsoft Office, and Google Drive, they were not aware of the utility of other platforms like WhatsApp, Messenger, and Viber for educational purposes like document sharing and communication that support group projects. After the pandemic, Zoom and Microsoft Teams gained recognition as a video conferencing service that gave teachers and students an opportunity to meet online synchronously on a personal computer, laptop, or mobile device with or without using video. These platforms were significant because they enabled virtual interactions between students and teachers, such as nonverbal feedback and replies, breakout rooms, and screen sharing. For giving online lessons, they also became accustomed to using Zoom and the Learning Management Systems (LMS).

B. *Sustaibability of e – learning*

Additionally, it is possible to see that many students and lectures are still using E-learning even now, after the epidemic. Although it is not used as frequently as it was during this outbreak time, the university sector adopts a "hybrid" approach that alternates between face-to-face and online learning. Also, studies show that, college students, professors, or instructional designers could choose and use tools and practices that improve the effectiveness and efficiency of self directed learning throey with technology encounters. The strength of effective usages of digital technologies in designing and delivering education leads to the sustainability of the e- learning process. This, highly depend on the facilities that have been provided by the government sector and the private companies that hold

power to facilitate the usage of e learning. The Ministry of Education is also changing the curricula to be more student-centric than teacher-centric, allowing students in the universities to engage in more independent study and take full advantage of the benefits of the readily available inclusive e-study platforms. To websites like the National Learning Content Management System to undergo textbook analysis/Learning Management System (LMS) and all official e-Learning platforms of State Universities under the jurisdiction of the University Grants education sector and to what extent that transformation in higher education has been sustainable during the pandemic and as well as until today

C. Litrature review and the problem matter

The study "Forced and Unplanned Digital Transformation of Education in Sri Lanka during Covid-19 Crisis" which was done by Shashini Rajaguru (2021) aims to understand the challenges faced by a primary school located in a relatively rural area in Sri Lanka. . Another study named as " Transition to online education in Sri Lanka during COVID-19: A descriptive phenomenological study" which was done by S.P. Kalpana Jeewanthi Subasinghe, A. M. Shyama Deepanie Pathiranage, S.P. K. J. Subasinghe (2022) explores how teachers in rural schools experienced the lockdown in relation to their teaching role during the pandemic. The study had found several challenges within the five aspects; (1) adjustment to the online teaching/learning process; (2) experience of challenges; (3) experience of new opportunities; (4) impact of parental involvement; and (5) impact of teachers' and children's physical, psycho-social well-being." The dark side of online home-schooling after Covid-19 in Sri Lanka" done by Mohamed Yaseen, Minnathul Suheera Thaseem and Mohamed Fathima Wazeema (2022) aim to determine the impacts of current home-based educational activities on low-income families in Sri Lanka. The findings revealed that most of the students from low-income families are unable to engage in the online learning process at home, learning activities of children have become a burden to the parents and parents temporarily abstain their children from learning in some families.

According to Jayatilleke and Gunawardena (2016), this significant dicussion on perceptions has not throughly been analyzed as a matter of fact. Concern before transferring from traditional to online education platforms has eventually led to a conundrum around online education. Also, undergraduate perception of the transition is extremely contentious, according to L.Smart & J. Cappel (2006), as there are both positive and negative responses.These are some of the studies which was done in order to investigate the digital transformation of Sri Lankan education during the Covid-19 pandemic period. But there is a lack of investigations specified into the higher. education sector and to what extent that transformation in higher education has been sustainable during the pandemic and as well as until today.

D. Research Question

To what extent the digital transformation in Sri Lankan higher education has been sustainable both during and after the Covid-19 pandemic?

II.METHODOLOGY

This research has been conducted in four primary stages, which are as follows: As the first step, in order to determine which topics should be covered in the questionnaire, it was first necessary to browse papers that were similarly done depending on the research topic. Secondly, creating the survey questionnaire as a means of gathering data. Analysis of the survey results was done as the third step to obtain the patterns and similarities of data which was followed by drawing conclusions and making recommendations based on the analysis' findings as the last step. The methodology was developed based a questionnaire survey that was designed and presented to university students who have been learning both during, and after the pandemic and who have the opportunity to compare traditional instruction with pure online instruction since they have participated in both online and in-person learning throughout their academic careers. Students at universities were sent the questionnaire survey using apps like WhatsApp, Instagram, and Messenger. It was possible to receive 87 responses from undergraduate students encompassing both public and private universities in Sri Lanka. The participants claim to come from a variety of geopolitical backgrounds, with the majority being from the western and southern provinces but representing all provinces in Sri Lanka. Additionally, it can be observed that 43% of the students attend state colleges, while 57% attend private universities, whom represent a variety of academic fields, and comprise different university years. The questionnaire includes four sections and was created using both open-ended and close-ended questions. The initial part of the survey was made to gather information about the participant's socioeconomic status and demographics, while the second section was made to gauge how conversant undergraduates were in e-learning. The third section was designed to gather undergraduates' impressions of e-learning whereas the final section collected undergraduates' practices in e-learning, which essentially evaluated a participant's e-learning experience.

III.QUANTITATIVE ANALYSIS

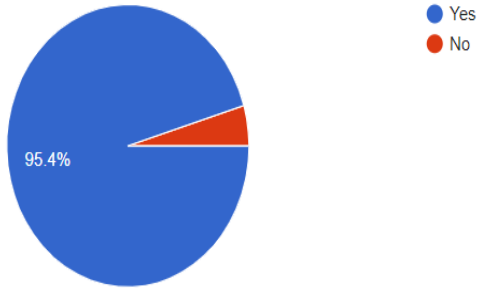
The sections and the questions included in it are selected from the questionaires of the existing paralal studies whereas new questions were also added based on the limitations of those studies and intuition.

A. *Knowledge of the undergraduates on E-Learning*

1. Familiarity with E- learning

The purpose of the questions in this section are to evaluate the digital literacy of the undergraduates According to the survey results, 95.4% of the undergraduates polled are conversant with e-learning, compared to 4.6% who are not. This indicates the group being surveyed has a high degree of knowledge and exposure to e-learning. The commanding majority of 95.4% indicates that E-Learning has significantly obtained popularity and recognition among the undergraduates questioned. This data suggests that a significant proportion of students have used digital materials, online learning platforms, or other types of E-Learning. The considerable familiarity with E-Learning suggests that it has emerged as a significant and distinctive characteristic of contemporary education. On the other side, a smaller number of undergraduates—4.6%—are unfamiliar with e-learning. This group of students may be less familiar with or knowledgeable about e-learning techniques, platforms, or resource

Chart 1 - Familiarity with E- learning



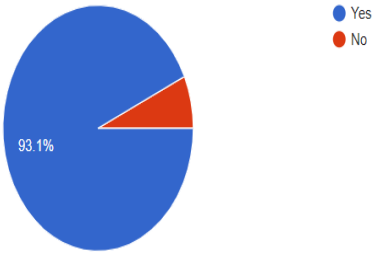
Source: Data collected survey

It is important to investigate the causes of this unfamiliarity as there are many potential causes, including lack of access to technology, cultural barriers, or individual preferences for traditional methods of education. Overall, this descriptive research shows how commonplace E-Learning is among undergraduates, demonstrating how central it has become to modern education.

2. Competency in using LMS and MOODLE

The result of the survey also shows that 93.1% of the respondents are familiar with LMS and Moodle, whereas 6.9% are not. This suggests that the population being polled has a rather high degree of knowledge and familiarity with these technologies. A significant fraction of the respondents, as indicated by the high percentage of 93.1%, have knowledge of and experience with LMS and Moodle. While Moodle is a well-known open-source learning platform commonly used in educational contexts, a learning management system (LMS) is a software program that makes it easier to organize, distribute, and track online learning content. The high level of familiarity with these technologies shows that a significant percentage of the people being polled has adopted and accepted them. On the other side, only a fraction of respondents—6.9%—are unfamiliar with LMS and Moodle. Due to reasons including restricted access to educational technology or individual preferences for conventional learning techniques, this fraction of respondents may have little experience with modern tools.

Chart 2 - Competency in using LMS and MOODLE



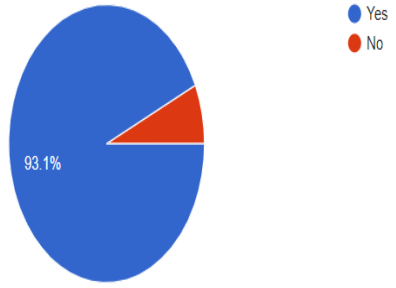
Source: Data collected survery

This descriptive study reveals the respondents' general experience with LMS and Moodle. The findings imply that most respondents have used these platforms, which points to their broad adoption and application in educational contexts. This familiarity suggests that respondents have probably used the tools and advantages offered by LMS and Moodle, such as accessing course materials, taking part in online conversations, submitting assignments, and getting involved in collaborative learning activities.

3. *Familiarity with E – conferencing*

According to the research, 93.1% of the respondents are familiar with web conferencing, while only 6.9% are not. This shows that the population of the survey has a high degree of knowledge and expertise with internet conferencing. The overwhelming majority of 93.1% indicates that a sizeable proportion of the respondents had knowledge about and experience using web conferencing systems to conduct meetings, presentations, or collaborative sessions. A lesser proportion of respondents (6.9%) state they are unfamiliar with web conferencing, suggesting that some may have had little exposure to or experience with this technology.

Chart 3 - Familiarity with Online Conferencing

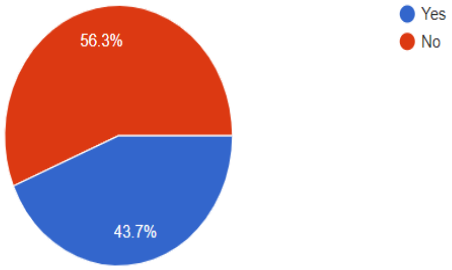


Source: Data collected survery

4. Receiving of a formal training on E- Learning

According to the data, among those surveyed, only 56.3% have had formal training in e-learning, while 43.7% have. This shows that a sizable chunk of the population polled has received formal training or education that has been especially tailored to online learning. A large number of respondents may not have had the chance or exposure to organized E-Learning programs or courses, as indicated by the greater percentage of 56.3% who have not received official training. This research emphasizes the opportunity for organizations and corporations to close the gap by offering more extensive options for training and professional growth connected to E-Learning techniques.

Chart 4 - Receiving of a formal training on E- Learning

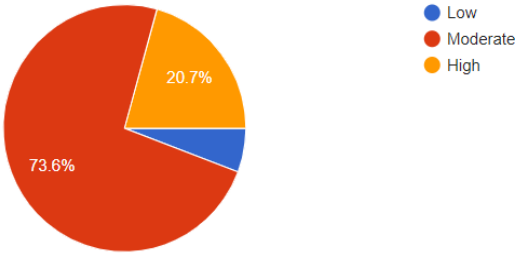


Source: Data collected survery

5. Rating the knowledge on ICT.

In the research, among the respondents, 5.7% assess their understanding of ICT as low, 73.6% rank it as moderate, and 20.7% rate it as high. This suggests that the majority of the population that was polled has an average amount of self-perceived competence of ICT. It implies that a sizeable percentage of respondents have a good grasp of and familiarity with several ICT-related topics. It is important to note that just a tiny fraction of respondents rank their knowledge as being inadequate, suggesting a possible need for more instruction or assistance in this area. This research emphasizes the significance of continued ICT education and professional development activities to improve digital literacy and equip people with the abilities necessary to properly use technology.

Chart 5 - Rating the knowledge on ICT.



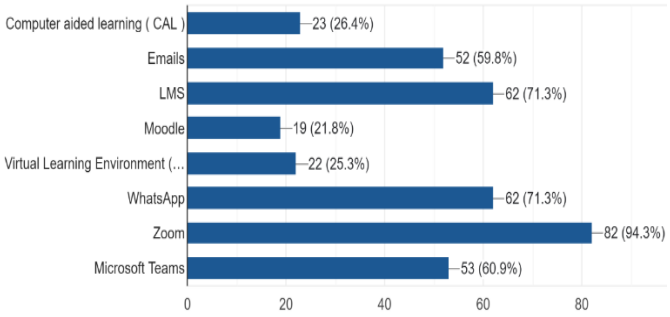
Source: Data collected survery

- *Perceptions of the undergraduates upon E-learning*

The third section focuses on the perceptions of the undergraduates upon E-learning. The perceptions of students about e-learning occupy a distinctive role in the sustainability of e-learning, notwithstanding all the efforts made by the government and the businesses that promote e-learning.

E-learning is preferred by 79% of students, while only 20% of students disagree. It also showed that, with 68% of the students shared that, laptops are the most popular device for processing e-learning, followed by mobile phones, tablets, and computers, respectively. 34% of the undergraduates claimed they used mobile data to access the internet, compared to 73% who indicated they used Wi-Fi. Only 5% of undergraduates reported using a dongle to access online learning, compared to 29% of those who use hotspot. 37% of respondents stated they use regular standard data, while 62% of respondents reported they utilize e-learning Wi-Fi and data bundles.

Chart 1- responses for What are the medias the undergraduates use for E – learning.

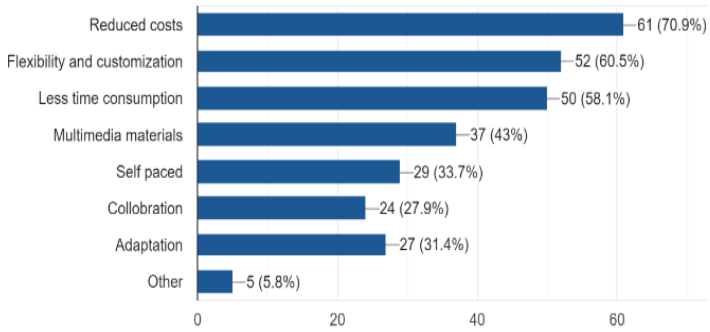


Source: Data collected survery

According to chart 1, it is possible to observe that Zoom is the mostly used E- learning platform whereas WhatsApp and LMS are the second mostly used medias to access E –

learning. Email is used by 52% which is closer to half of the responses received to the survey. Computer aided learning and virtual learning environment is used by 23% and 22% of the undergraduate population respectively. learning. The percentages of undergraduates who reported being satisfied and neutral with the university's internet services are nearly equal at 39% and 35%, respectively. Additionally, 10% and 11%, respectively, of respondents are highly satisfied and unsatisfied with the internet services offered by their universities. The findings show that only a few students are dissatisfied with the university internet facilities. While the least number of students who responded indicated that they are unsatisfied, and more than 50% of students believe their lecturers were successful in using e-teaching technologies.

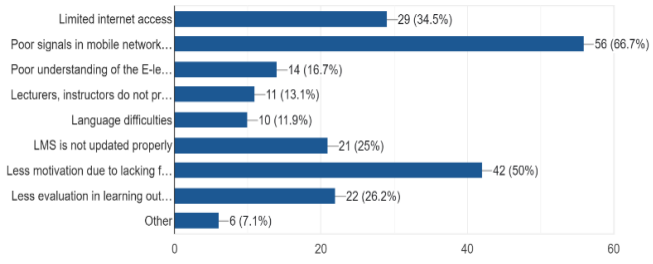
Chart 2 – Percentages of the advantages that undergraduates encountered in E – learning process.



Source: Data collected survery

It is possible to observe that undergraduates have voted for reduced costs as the major advantage in e – learning followed by flexibility and customization in E – learning platforms and less time consumption. Usage of multimedia materials, adaptability E – learning aiding self-paced learning, collaboration and adaptation can be illustrated as other advantages.

Chart 3 – Issues faced by undergraduates in E – learning

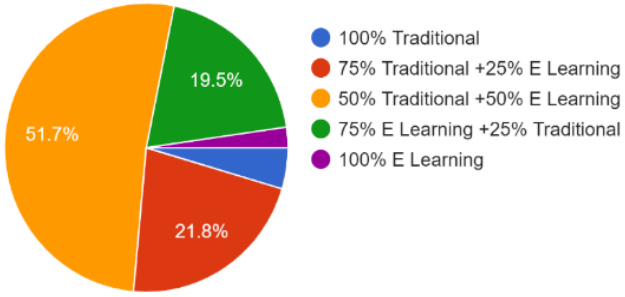


Source: Data collected survery

Poor signals in mobile network connection and less motivation due to the lack of face-to-face interaction seem to be the most frequently encountered issues in E learning. Less evaluation of the learning outcomes due to distance and LMS that is not properly updated properly are depicted as other important issues to focus on alone with some other minor issues.

According to the data, the majority of students have suggested using online learning, and chart 4 below illustrates that more than 50% of students prefer using both online and face-to-face learning equally in their educational process. Additionally, the proportion of students who prefer a more conventional approach to education and a lesser amount of e-learning is roughly equal to the proportion of undergraduates who choose more e-learning and less traditional approach in their education. Least number of students prefer 100% E – learning method followed by 100% traditional method in learning.

Chart 4 - Prefered combination of learning

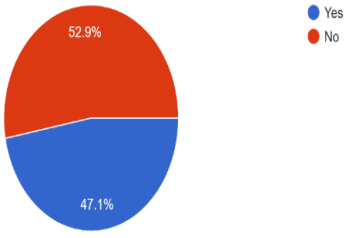


Source: Data collected survery

C. Practices of the undergraduates on E Learning

1) Experience in E-Learning before the Covid -19

Chart 1- Experience in E-Learning before the Covid -19



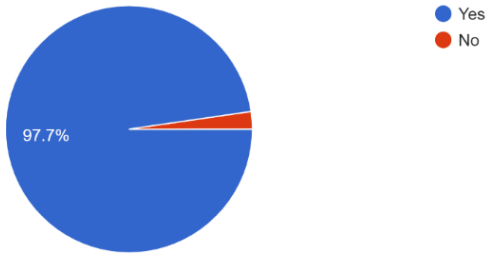
Source: Data collected survery

The purpose of this section is to explore the frequency of the undergraduate's usage of online platforms prior and latter to the Pandemic. ;According to chart 1, it is observable that most of the undergraduates do not have experiences in using E-learning before the Covid-19 pandemic period. Out of (87) responses, (46) undergraduates, 52.9%; more than a half of respondents do not have experiences in E learning before the Covid-19

while (41) undergraduates ,47.1% have experiences in using E-learning before the Covid-19.

2) Experience in E-Learning during the Covid -19

Chart 2. Experience in E-Learning during the Covid -19

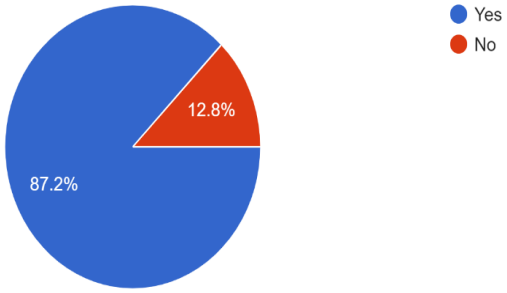


Source: Data collected survery

When comparing the responses percentage of chart 2 with the percentage of chart 1, there is an increasement of E-learners during the Covid-19 than before the pandemic and it is stated as 97.7% which is 85 undergraduates out of all the responded undergraduates (87) has used E-learning during the Covid period. Therefore, there is a least percentage of 2.3% or (2) undergraduates who has not used E-learning during the Covid-19.

3) Are you still using E- learning even after the Covid-19?

Chart 3. Are you still using E- learning even after the Covid-19?

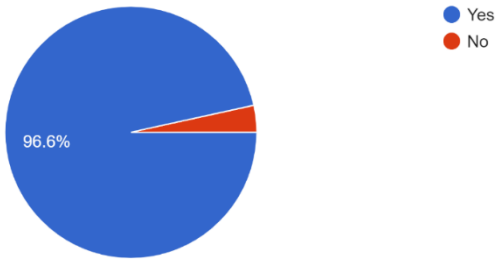


Source: Data collected survery

According to the chart 3, more than half of respondents, 87.2% (75) use E-learning even after the Covid-19. It is observable that there is a much improvement of using E-learning affected by the pandemic even after when comparing to the responses of chart 1; 47.1% and chart 2; 97.7% which is about the experiences of using E-learning before the Covid-19 and experiences of using E-learning during the Covid-19 respectively. Therefore, there is a least percentage of undergraduates as 12.8% (11) who do not use E-learning after the Covid-19.

4) *Did the pandemic's effects promote your E-learning?*

Chart 4. Did the pandemic's effects promote your E-learning?

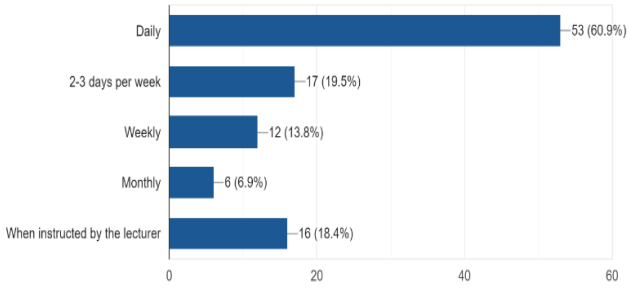


Source: Data collected survery

Most of the participants have stated that their E-learning has prompted with the pandemic and the percentages as followed, 96.6% (84) and 3.4% (3) do not agree that the pandemic has promoted their E-learning. Hence, most of the undergraduates agree that their E-learning has promoted with the Covid-19 pandemic situation.

5) How often did you used E- learning before the Covid -19?

Chart 5. How often did you used E- learning before the Covid -19?

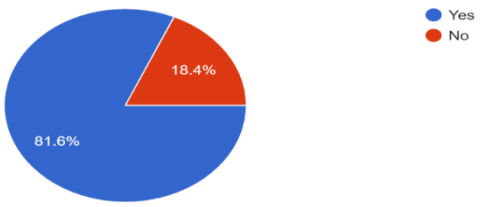


Source: Data collected survery

As for the percentages of responses, most of the participants tend to use E-learning when instructed by the lecturer before the Covid-19 and the percentage is 60.5% (49) out of all the respondents. The usages of 2-3 days per week, weekly and monthly were limited to percentages of 17.3% (14), 14.8% (12) and 13.6% (11) respectively. According to the chart, the daily E-learners are limited to 11.1% (9) before the Covid-19 period.

6) How often did you used E- learning during the Covid -19?

Chart 6. How often did you used E- learning during the Covid –

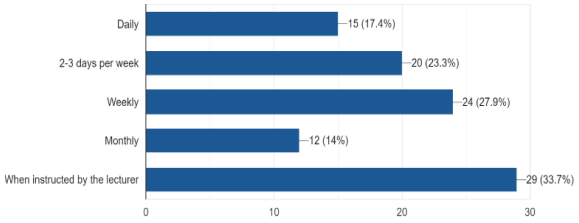


Source: Data collected survery

When comparing these percentages with the percentages of chart 5, it is observable that the daily E-learners have made an increasement during the Covid-19 period and it is stated as 60.9 % (53) out of all the respondents (87). The usages percentages of 2-3 days per week, weekly and when instructed by the lecturer as 19.5% (17), 13.8% (12) and 18.4% (16) respectively. In this chart, it is shown that there are least number of monthly E-learners, 6.9% (6) in the Covid-19 period.

7) *How often did you use E- learning after the Covid -19*

Chart 7. How often did you use E- learning after the Covid -19?

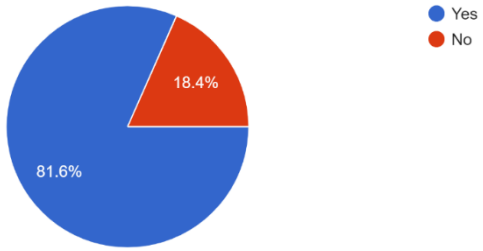


Source: Data collected survery

It is observable that after the pandemic, there is an increasement in all the mentioned usage constraints. But the responses show that most of the participants, 33.7% (29) use E-learning after the Covid-19 when they are instructed by the lecturer like in the chart 5 which is about the usage count of E-learning before the Covid-19. The usages of Daily, 2-3 days per week and weekly show percentages as 17.4% (15),23.3% (20) and 27.9% (24) respectively. After the pandemic also, limited number of undergraduates, 14 % (12) are represented as monthly E-learners.

8) *Did E-learning packages of Data / Wi-Fi facilitate internet issues in E- learning?*

Chart 8. Did E-learning packages of Data / Wi-Fi facilitate internet issues in E- learning?

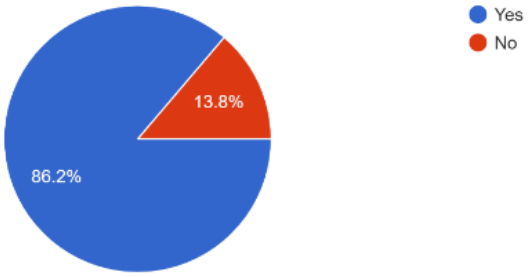


Source: Data collected survery

Most of the participants state that the E-learning data or Wi-Fi packages have facilitated internet issues in E-learning and the stated percentage is 81.6% (71) out of all the responses. But limited number of participants, 18.4% (16) reveal that E -learning data or Wi-Fi packages have not facilitated internet issues in E-learning.

9) *Have permeant internet facility at home*

Chart 9. Have permeant internet facility at home



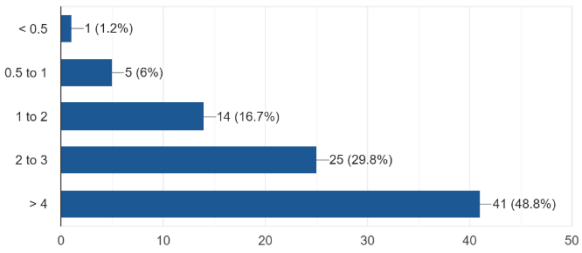
Source: Data collected survery

Chart 9 illustrates whether the participants have permeant internet facility at home. According to the chart, more than half of the all participants, 86.2% (75) state that they have permeant internet facility at home while limited number of participants, 13.8% (12) state that they do not have permeant internet facility at home.

10) Internet surfing time (Hours)

As stated in the chart, most of the participants, 48.8% (41) use internet for more than 4 hours. While around 29.8% (25) of participants use internet for 2 to 3 hours and 16.7% (14) participants use internet for 1 to 2 hours. And only 6% (5) participants use internet for 30 minutes to 1 hour. Only 1.2% (1) participant use internet for 30 minutes. The participants are questioned about their internet usage time period in hours in order to calculate how long they use internet. Following chart 10 demonstrates the time in hours that the participants use internet

Chart 10. Internet surfing time (Hours)



Source: Data collected survery

IV. DISCUSSION, RECOMMENDATIONS AND CONCLUSION

- *Discussion*

As in the second section, the survey results depict that most of the undergraduates are with the awareness of E – learning and that they have a moderate level of knowledge on ICT but it was obvious that most of them have not

received a formal training on using E – platforms for educational purposes prior to the university.

According to the third section, more than half of the students like E – learning whereas some students do not. Even the survey revealed that laptop is the most popular device to process e – learning, 32% of the students claimed that they use other devices which indicates the lack of laptops to process E – learning. As laptops are comparatively with more options, undergraduates may find E – learning, complex which can affect the sustainability of E – leaning. Also, it can be seen that most of the students face issues in internet connection problems and signal strength which can be linked with their internet accessing methods such as hotspot and data, as the signal strength can vary due to the weather. Also, even though the amount of standard data that consumes in E – learning can cost more than E- learning data bundles, the survey revealed that some of the undergraduates used standard data which illustrates the need for raising awareness about these specific data and Wi-Fi bundles. The usage of medias illustrated satisfiable results as the major E – learning platforms indicated a higher usage (zoom, LMS) which is beneficial for the sustainability of E – learning although the usage of computer aided learning showed a lower percentage. As some of the major issues in E – learning, connection issues and less motivation to learn due to lack of face-to-face interaction were indicated. Also, the survey revealed that E – learning tends to provide poor evaluation of learning outcomes which should be focused by the lecturers in the future for the sustainability of E – learning. The statistics show that more than half of the participants preferred equal rates of E – learning and traditional learning being applied in their learning process which indicates a positivity in the sustainability of E – learning. The reasons for the results can be reduced costs in printing, traveling and buying resources to learn, adaptability and flexibility which were highlighted from the survey.

The results of the fourth section shows that the usage of E – learning as increased by 50% during the covid – 90 epidemic period which indicated that the pandemic marked a turning point in digitalizing the learning process in the Sri Lankan universities. Even though after the pandemic the usage of E – learning has decreased by 10%, 30% of the undergraduates continued on using E – learning. The results also indicate the frequency of the usage of E – platforms increased to be daily in the pandemic. Also, a considerable number of students have stated that the E - learning Wi-Fi and data packages have facilitated them. Having no permanent internet facilities at home can be an issue to promote the sustainability of E – learning as mobile data can cause issues in the connectivity, due to weather changes. Also, as another important point, the usage of internet was indicated to be in a high rate, stating that most of the students spend more than 4 hours surfing the internet.

- *Recommendations*

It is possible to recommend to provide students with opportunities to use E – learning and incorporate the use of electronic devices at the school from primary level, under observation and with limitations was revealed as a response to the open-ended question. Designing tailored interventions to encourage E-Learning adoption among all students might help with an understanding of the components affecting familiarity with it. The findings also imply that educational institutions and policymakers should keep funding and supporting projects in e-learning while also attending to the requirements of the minority population that is still inexperienced with these techniques. As laptops are comparatively with more options such as receiving documents sent to the zoom chat box, use of MS 365 easily, turning on camara, undergraduates may find E – learning, complex which can affect the sustainability of it. As a recommendation, the government and private sector, facilitating undergraduates with discounts to buy a laptop can be depicted. To promote computer aided learning, usage of computers in the school level for education, can be recommended. It is beneficial if the teachers are trained on task-based language teaching, interactive websites and activities that could be used in the lessons to address the issue of less motivation due to lack of interaction in online learning. Also, the teachers keeping the practice of updating the LMS in an efficient manner can also be depicted as a recommendation to higher up the usage of LMS. As in Sri Lanka, Google not being added in E – learning internet packages, can be seen as an issue to the sustainability of E – learning. It would be beneficial if there was an unlimited internet plan for surfing the internet as it is very much significant in promoting autonomous learning which was indicated in the answers to the open-ended questions. As other recommendations, providing basic learning materials such as quizzes, lecture notes, padlets, recordings, developing high-quality, interactive e-learning content that is engaging and relevant to learners and utilize multimedia elements such as videos, animations, and gamification techniques to enhance the learning experience can be illustrated as responds to the open-ended question.

- *Conclusion*

The study's results have demonstrated the feasibility of increasing and advancing the use of digitalization in education to provide students with a better educational experience during a pandemic or emergency period. The pupils' usage and understanding of utilizing digital gadgets were therefore on a reasonable level even before the outbreak, but their knowledge of their use was in a superior position. Having issues obtaining data through digital

devices and various internet access methods was one of the main difficulties. Furthermore, strong infrastructure, teacher preparation programs, and continuing technical assistance are needed investments to maintain sustainability. In order to continuously enhance and evolve digital education to satisfy the shifting demands of students and educators, collaborations between governments, educational institutions, and technology suppliers are essential for long-term success.

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