DOI:
UDC: 378.014

CONTRIBUTION OF INFORMATION TECHNOLOGY IN STRATEGIC IMPLEMENTATION OF DIGITAL LEARNING IN PUBLIC UNIVERSITIES IN SRI LANKA DUE TO COVID-19

Ramakrishnan Vivek
Assistant Lecturer
Sri Lanka Technological Campus, Sri Lanka
https://orcid.org/ 0000-0001-5691-6825; e-mail: arvivek46@gmail.com

Yogarajah Nanthagopan
Senior Lecturer
Vavuniya Campus, Sri Lanka
https://orcid.org/ 0000-0003-1055-072X; e-mail: ynanthagopan@yahoo.com

This study attempts to identify the contribution of information technology (IT) in the strategic implementation of digital learning and its impact on public universities in the Sri Lankan context due to COVID-19. This research further attempts to investigate the effectiveness of the digital learning that has been implemented, including in academics due to COVID-19, its connectivity implementation in public universities in Sri Lanka, and the challenges encountered by the lecturers and students. The objectives of this study were to recognize the positive and negative impacts of virtual studies and their adaptation and identify the opportunities for future digital learning in the academic educational system in public universities in Sri Lanka. This research was conducted at eight public universities in Sri Lanka. The methodology of this study was qualitative. The sample of this study was purposive. Data collection was held through an interview guide constructed with open-ended questions related to the study, and the data was analyzed thematically. This study's findings cover virtual learning implementation, blended learning and distance evaluation, and change adaptation. Based on the findings, the researcher

considered the recommendations made by academics when providing recommendations for further future studies.

Keywords: *Covid-19, Digital learning, Information Technologies, Public Universities, Strategic planning*

Це дослідження намагається визначити внесок інформаційних технологій (IT) у стратегічне впровадження цифрового навчання та його вплив на державні університети Шрі-Ланки через COVID-19. У цій роботі є подальша спроба дослідити ефективність цифрового навчання, яке було впроваджено, в тому числі в науковців через COVID-19, його імплементацію в державних університетах Шрі-Ланки та проблеми, з якими стикаються викладачі та студенти. Завдання цього дослідження полягали в тому, щоб розпізнати позитивний і негативний вплив віртуальних досліджень та їх адаптації, а також визначити можливості майбутнього цифрового навчання в академічній освітній системі державних університетів Шрі-Ланки. Це дослідження було проведено у восьми державних університетах Шрі-Ланки. Методика цього дослідження була якісною. Вибірка цього дослідження була цілеспрямована. Збір даних проводився за допомогою посібника з інтерв'ю, створеного з відкритих питань, пов'язаних з дослідженням, і дані аналізувалися тематично. Результати цього дослідження охоплюють впровадження віртуального навчання, змішане навчання та дистанційне оцінювання, а також адаптацію до змін. На основі отриманих висновків дослідники врахували рекомендації, зроблені науковцями, надаючи рекомендації для подальших досліджень.

Ключові слова: Covid-19, цифрове навчання, інформаційні технології, державні університети, стратегічне планування

Introduction. Information Technology (IT) is blooming, and it is defeating every area even before this COVID-19 situation. Learn, VLE, and Moodle was in the university systems before the pandemic. However, participation through these platforms was less from the student and the lecturers' sides. In the present and future, IT-related education will be more, and it will affect a lot for academic efficiency and effectiveness. The contribution of IT can be looked into two aspects. One is considered the academic discipline, and the second is to assist in other disciplines. The fundamental idea here is to integrate IT in academics and many industries. Therefore, the faculties involved in IT as the primary discipline have a huge responsibility to produce IT experts and provide awareness for those involved in other sectors. Even before the pandemic in all the degree programs, IT had the role; for example, lecturers conducted the class using PowerPoint presentations using a multimedia projector; lecture notes are shared in google groups and google classroom via the LMS. No matter the platform used for academic learning, IT is there. From every university's perspective, different digital systems are developed, being developed and will be developed in future. The present generation is innovative in using IT. When it comes to academics, students seem more active and advanced in IT relevant fields than highly

experienced lecturers. The reason is that the current generation appeared to live with IT in almost everything. Conventional study methods evolved little by little, and now study methods are changed to electronic presentations, online discussions and online study materials. The evolving teaching methods are becoming convenient to both lecturers and students. Even though the physical existence is more interactive, online teaching brings somewhat the lecturers and lectures rather than having no lecturers. It is because of the advanced IT that we have nowadays.

The main advantages of this teaching method with the support of Information Communication Technology helps the students to get the recorded video or audios to listen to the lecturers whenever they need it. It helps them listen to the lecturers and learn whatever they miss during the lectures. It is possible because of IT and a huge advantage for the students. However, there is some additional work pressure for the lecturers' side. Overall, IT is a vast advantage to uplift the academic educational system. It helps students and lecturers maximize their IT utilization to enhance their education. Introduction to IT was extracted from the interviewees' opinions on the emerging contribution of strategic management in digital learning. Every university and academic staff based in the faculties are finding new strategies, advancing their existing strategies, or implementing their planned strategies to fill the academic requirements in the given time frame. This pandemic delayed many academic-related activities. However, there were delays due to several internal and external factors even before this situation.

Objectives. Study objectives define the precise aims of the study and will be clearly stated within the introduction of the research protocol. The study objective is a positive statement about how the study answers the precise research question. Objectives can (and often do) state exactly which outcome measures are getting to be used within their statements. They are vital because they help to guide the event of the protocol and style of study and play a task in sample size calculations and determining the facility of the study. A research project can fail if the objectives and hypothesis are poorly focused and underdeveloped. (Farrugia, Petrisor, Farrokkhyar, & Bhandari, 2010)

This study investigates the effectiveness of the strategical implementation on digital learning where the possibility was made through advanced Information Technology in public, academic-industry during the Covid-19. The purpose is to see the challenges encountered by the lecturers and students due to the peak use of IT in public universities of Sri Lanka. Below mentioned objectives are to fulfil the purpose of this study.

Objectives of the study are the following:

1. to recognize the positive and negative impacts of virtual studies and their adaptation in the public universities in Sri Lanka
2. to identify the opportunities for future digital learning of the academic educational system in public universities in Sri Lanka.

Literature Review. The COVID 19 outbreak is highly impacting all the processes in the whole world. It has been nearly one year since the pandemic, and still going on with rapid spreading. The function of the world education system has been impacted highly by the outbreak (Dwivedi et al., 2020). A global pandemic has caused large-scale institutional and behavioural 'shock effects' in various areas, including education. The impact on learners is unprecedented; according to UNESCO, over 1,500,000,000 students worldwide from primary to tertiary level cannot attend school due to this pandemic situation. Massive and unexpected closures, affected countries and communities are forced to hunt quick fixes in several digital learning platforms. These rapid moves from classroom to online teaching have put aside the more profound questions about national educational policies and theoretical grounds and premises. How can the tutorial systems and individual learners deal with an exceptional situation? Research (Hodges, Moore, Lockee, Trust, & Bond, 2020). Thus, the need for the strategic implementation of the different actions in the education sector for better development facing the COVID 19 is a must. Therefore, many countries practise digital methods in learning and e-learning practices in schools and university premises (Aristovnik et al., 2020). Digital learning and e-learning actions are highly applicable in every country and even in Sri Lanka to provide the students' education with the pandemic. The pandemic lasts for a longer time, and as per the requirements in mobility avoidance, the best method to learn has been decided as digital learning (Jena, 2020).

The epidemic of action demonstrates how educational institutions and teachers across the world's educational systems transfer their work from classrooms and lecture halls to digital platforms almost overnight. This immediate transition created gaps and shortcomings with the adaption of online learning (Teräs, Suoranta, & Teräs, 2020). Efforts on covering gaps have created an influx of different sorts of support like drop-in sessions, free webinars and blog posts, emergency policy documents (Doucet, Tuscano, Timmers, & Netolicky 2020) and even lessons learned from earlier university lockdowns (Czerniewicz, 2020). The application of digital learning has both pros and cons. When it comes to the university education system, applying strategic plans in learning is crucial. Some actions can be done with digital applications, and at the same time, there are some educational categories in which digital education is not successful (Toquero, 2020). Perhaps more importantly, a replacement market opportunity for commercial digital learning platforms providers was brought. Emergency online learning is being criticized for failing to stick to sound pedagogical principles, best practices, and earlier research (Hodges, Moore, Lockee, Trust, & Bond, 2020).

In a study conducted by Teräs, Suoranta, & Teräs (2020), they said that during the Covid-19 pandemic, educational institutions have strived to seek out means to make sure students can continue their studies despite the crisis and social distancing. In many cases, to ensure the continuation of studies, educational institutions have sought out quick fixes with ed-tech. It has created a sellers' market, where ed-tech companies have eagerly jumped on the chance to supply their services. Some are willing to supply their services and platforms for free during the instant of crisis. Still, when watching recent ed-tech platform

developments, free will not be only for charity. At the same time, the results in the study of Campus Off, Education On: UAEU Students' Satisfaction and Attitudes Towards E-Learning and Virtual Classes During COVID-19 Pandemic, conducted by Malkawi, Bawaneh, & Bawa'aneh (2021), confirm that the students' satisfaction level and attitudes towards e-learning and virtual classes are high and positive during the pandemic. It demonstrates proper procedures and provision of all necessary education and e-learning taken at the university, Enhancing students' learning and maintaining their safety at an equivalent time. With this, the study recommends supporting the efforts taken by the university and therefore the continuous work to supply all the needs of education via e-learning and virtual classes like suitable infrastructures and technical support additionally to the continual updating of the teaching and learning platforms in line with developments and training for faculty members, instructors, and students for future updates regarding this online teaching and learning. The long-term impact of e-learning on education still need further proper investigation. It is possible that long-term e-learning could harm learners and educators. Future studies should tackle this issue, maybe through future monitoring of graduates and thru alumni or employers' surveys (Malkawi, Bawaneh, & Bawa'aneh, 2021).

Digital learning and e-learning actions are highly applicable in every country and even in Sri Lanka to provide the students' education with the pandemic. The pandemic lasts for a longer time, and as per the requirements in mobility avoidance, the best method to learn has been decided as digital learning (Jena, 2020). For several current platforms, datafication, or leveraging user-generated data for profit-making, has become the business model (Teräs, Suoranta, & Teräs, 2020). In mind that strategic planning is a process that gives the business direction. It provides the best planning actions as per the prevailing situations. In this regard, strategic planning is essential to overcome unexpected challenges and situations (Tsiakkiros & Pashiardis, 2012). The uncertainty is there in every business action. Therefore, it is necessary to make sure that the proper plans are plying to overcome the sudden challenges in the business environment (Chang, 2008).

The contingency plans are a part of the strategic planning actions. The success of strategic management and planning is implementing the planned strategies with the support of managers, administrators, employees and their organizations' or institutions' culture (Hu et al., 2018). It is questionable whether such service providers can develop better learning opportunities intrinsically. Instead, the motivation could also be to develop and optimize ed-tech platforms that leverage datafication as a business model. Getting their platform to use and users to get data is, therefore naturally, their aim. If education is seen as a conveyer to make graduates for capitalism, then education might appear as if something is to be fixed with technology to be more efficient. On the other hand, if education is seen as promoting holistic human growth for a more democratic and just society, leveraging digital technologies might look somewhat different: connecting people to debate, learn, and tackle shared problems. A critical examination of technology makes us think about what online learning should

appear like within the Covid-19 world. Therefore, Teräs, Suoranta , & Teräs , (2020)

The open system theory explains that the survival of organizations depends on their relationship with the external environment, and the external environment greatly influences them as per Amrollahi & Rowlands (2017), the application of the strategic actions relevant with the open systems in the organizations resulting from achieving the best results. Considering all the above factors, strategic planning and strategic thinking are critical to overcoming the obstacles in the education system as per the COVID 19 pandemic (Shammi et al., 2020). On Post-Covid-19 Education and Education Technology' Solutionism': Seller's Market." urges educational leaders to think twice on their study about the choices they are currently making during the Covid-19 crisis and if they indeed are the most straightforward thanks to proceeding for the longer term. The realm of digitalization is not neutral but one with a worth dimension oriented towards objectives decided by the citizenry. Remembering these values, aims, and orientations that influence ed-tech decision-making. (Teräs, Suoranta, & Teräs, 2020)

The limited mobility is there in the functions as per the COVID 19 pandemic. Therefore, the education system has faced a considerable drawback in every country with no difference in Sri Lanka. School education and university education has faced drawbacks and challenges in the current era (Chen et al., 2020). In the study on "Campus off, Education On: UAEU Students' Satisfaction and Attitudes Towards E-Learning and Virtual Classes During COVID-19 Pandemic", conducted by Malkawi, Bawaneh, & Bawa'aneh (2021), the surprising result was explained through several factors that have existed before or been implemented throughout the time of the pandemic. One important factor would be the vital infrastructure that supports e-learning at UAEU, including a robust bandwidth, a stable and reliable Blackboard platform, and IT support played a crucial role during the web classes. Another essential factor is that nearly all faculty members, instructors, and students at UAEU have experience with many functions and tools of the Blackboard platform long before the pandemic (Malkawi, Bawaneh, & Bawa'aneh, 2021).

There are many challenges in digital learning practices. The challenges are different from country to country and region to region. The developed countries face less burden from the digital learning applications as these countries are familiar with the technology applications (Blundell et al., 2016). The industrialized countries have more room for the facilities in digital learning. On the other hand, the countries like Sri Lanka is in the developing stage, and every part of the country is not developed to have technological applications. The university systems have been adapted the digital learning applications in Sri Lanka, where the mobility of the students have been limited (Karunanayaka et al., 2019). The students are facing numerous challenges and difficulties due to this fact.

Sri Lanka is a country with less interaction with the technological facilities by the majority of the citizens (Karunanayaka et al., 2019; Irsad et al., 2019). Thus, the application of digital learning in the country has faced these challenges and difficulties in implementing e-learning practices. The global impact of COVID 19

in the education system is significant. As per the reports of UNESCO, there are more than 1.5 billion students in more than 165 nations who have been impacted by the world pandemic (Franchi, 2020). Many of the schools and universities have moved the online learning and e-learning practices rather than the onsite teaching in order to avoid the impact of COVID 19. The following figure provides the data until March 2020, showing how the impacted number of students has increased globally (UNESCO, 2020).

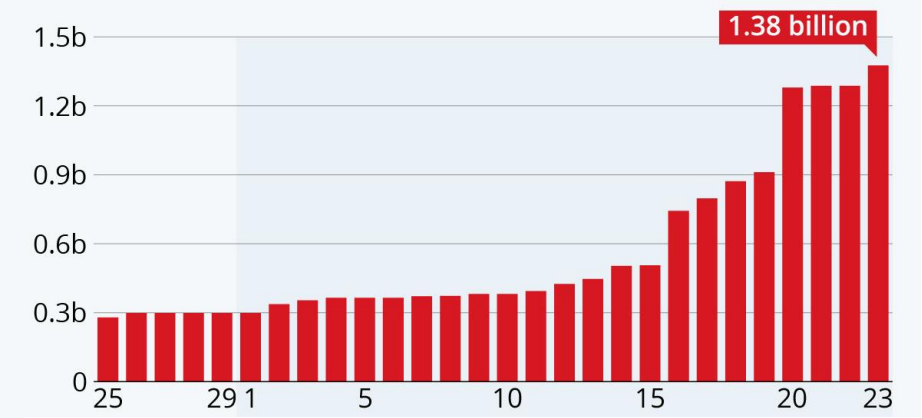

Figure 1: Impact of COVID 19 on global education

Source: UNESCO

The study of Malkawi, Bawaneh, & Bawa'aneh (2021) shows that the switch to a wholly online experience has added extra pressure to find a few new tools within Blackboard. However, that was manageable to the effort of the university to conduct online training and workshops for all teachers and students. Several instructional and technical issues associated with the new features of Blackboard were explained through a group of recorded videos that were posted publicly on YouTube. However, technical support was available throughout the teaching period offering immediate help and support. Also, several faculty members and students were familiar with online practices through blended courses implemented throughout UAEU before the pandemic. In the lockdown, students were pressured to rely more on themselves within the learning process than before. However, one would expect that students will acquire better endurance and independence, contributing to their positive attitudes toward the new experience. Another point they pointed was those female and male students were merged within the same classes during the web switch, which can create a more competitive environment that elevated the experience of scholars. Needless to say, that each extreme measure was taken for the security of the teaching and learning community at UAEU (Malkawi, Bawaneh, & Bawa'aneh, 2021).

One of the main difficulties is the technological facilities. Many low-income families in Sri Lanka have no facilities for laptops, computers, the internet, and mobile technology. At the same time, the reluctance to adopt e-learning methods is a huge challenge faced by the education sector (Karunanayaka, 2019). The students have less contact with society, which is a considerable drawback for their future actions. At the same time, poor connection with the teacher and students,

the poor management in the time, and the reduction of the interest in learning can be challenges in the digital learning practices (Premawardhena, 2018)

Research Methodology. This study was conducted as qualitative research. Qualitative research is said to find the answers to questions that begin with why, how, and how. Qualitative research develops explanations for social phenomena while, on the other hand, quantitative research is more related to the questions on what percentage, how much, how often, and to what extent. Qualitative research may be an inductive approach to developing theory, while quantitative research is deductive. It tests theories that are already developed (Creswell, 2003)

The methodology should justify the choices by showing that the chosen methods and techniques are the most precise fit for the research aims and objectives and provide valid and reliable results. An honest research methodology provides scientifically sound findings, whereas a poor methodology does not. We will check out the most design choices below (Jansen & Warren, 2020)

Data Sources Used. In research, there are primary and secondary data. Primary data sources are collected from direct sources of information. These data are more reliable and have more confidence level of decision-making with the trusted analysis having direct intact with the occurrence of the events. Secondary data are to gather data from several secondary sources through desk research. It includes reports, project documents from literature manuals, and a few management documents, which can be included under the desk review. Dependable journals, books, different articles, periodicals, proceedings, magazines, newsletters, newspapers, websites, and other sources can also be considered secondary data. (Sileyew, 2019)

Under this study, data was collected through the primary data collection method. It was conducted through an open-ended questionnaire. The researcher collected rich data under this qualitative study to identify the contribution of Information Technology(IT) in the strategic implementation of digital learning and its impact in public universities in the Sri Lankan context. The questions are included to identify the IT's contribution in the university system, specifically in the academic side; changes happening in the government universities due to this COVID-19 situation with IT; issues faced by lecturers in this situation; issues faced by the student side; challenges in conducting the practical sessions virtually; different modes of assignment submission; availability of infrastructure for students and lecturers; the desire of conducting blended learning mode in future due to pandemic; quality and challenges in virtual training; future IT changes and expectation for public universities from government.

Sample. Scientific research is essential to search or investigate exhaustively. However, populations about which inferences must be made are maybe quite extensive, costly or inaccessible to reach. It makes it physically impossible to conduct a census. In such cases, selecting a representative sample may be the only way to get the information required about the population. Researchers may choose different sampling methods. Choice of the sampling method to be used depends on research goals and whether or not the researcher wants to generalize the findings from the sample. It is vital to be aware of possible errors due to the chosen sampling method so that the study is valid. It is a

literature review of what sampling is, how to create a sample, and highlights the advantages and disadvantages or limitations of the sampling techniques. To understand population characteristics, it is essential to select a sample. Sampling is an essential component of any piece of research because of the significant impact that it can have on the quality of research findings. The main reasons for sampling to obtain a sample rather than a complete enumeration (a census) of the population are; economy, timeliness, the large size of many populations, inaccessibility of some of the population and destructiveness of the observation accuracy. To conclude populations from samples, we use inferential statistics, which enables us to determine a population's characteristics by directly observing only a portion or sample of the population. (Mujere, 2016)

The sample of this study was taken from eight public universities in Sri Lanka. This sample included Head of Department, Senior Lecturers, Lecturers and Professors, from Department of computer sciences, Faculty of Applied Sciences, Department of Physical Sciences, Department of Computing and Information Systems, Department of Statistics and Computer Science, Faculty of Science and Department of Computer Science and Engineering, Faculty of Engineering. It was taken as a purposive sample. The sample had academic experience from 3 years to 28 years.

University Position	Age	University	Interview Duration
Head of Department and Senior Lecturer	45-50	Moratuwa University	45 Mins
Senior Lecturer	45-50	UWA Wellasa University	30 Mins
Professor	50-55	Jeyawardena University	25 Mins
Lecturer	35-45	Peradeniya University	30 Mins
Strategic Director	45-50	Jaffna University	40 Mins
Registrar	45-50	Jaffna University	20 Mins
Lecturer	50-55	Rajarata University	45 Mins
Lecturer	30-35	Vavuniya University	50 Mins

Data Analytical Technology. Collected data were thematically analyzed. Thematic analysis shares many of the principles and procedures of content analysis; indeed, in the conceptualization of thematic analysis, the terms' code' and 'theme' are used interchangeably. The topic refers to a selected pattern found within the data one is curious about. an extra distinction in terms of what constitutes a 'theme' (or coding category) lies in whether it is drawn from existing theoretical ideas that the researcher brings to the info (deductive coding) or from the raw information itself (inductive coding). Within the thematic analysis, existing theories drive the questions one asks and one's understanding of the answers so that one does not 'reinvent the wheel'. It is often essential since qualitative work, to a greater degree than quantitative research, can underplay evidence that contradicts the assumptions of the researcher. Therefore, it is

advantageous to carry a model of `testing' in mind regarding taking counter-evidence seriously, and it is only in quantitative work that the researcher `tests' theories in a statistical sense (Joffe & Yardley, 2004).

The researcher transcribed the interviews from voice recordings to textual, and then from the transcript, data was carefully analyzed to code and researcher-developed themes based on the codes.

Findings and Discussion

Implementation of virtual learning. It is a tremendous improvement in the IT sector these days. Before Covid-19, IT was not effectively used in academic learning; however, after the pandemic, the primary teaching method was online learning. The findings of this study show that there was uncertainty to conduct academic sessions online. However, the initiation began to conduct online lectures and other educational related activities in public universities. The conventional teaching methods were teacher-centred, but now it changed to student-centred teaching and learning. The lectures are conducted through Learn, Zoom Google Meet, Microsoft Teams and other different video conferencing applications to conduct online sessions. Teaching methodologies have drastically changed from offline to online. The studies and department and faculty meetings are also conducted through digital platforms. One of the interviewees stated, "*Some people like Google Classroom have used some online teaching platforms. Work from home is becoming more trend in these days. People are setting up their personal computers with an adequate internet connection, software and hardware. People are using a shared platform for practical sessions. Recording videos, uploading laboratory practical sessions to YouTube, which the staff and YouTube materials are becoming popular these days*". Therefore, according to the interviewees, the government has provided accessible facilities, so data free Zoom links have been provided for most lecturers, so students do not have to worry too much. They only need an internet connection to participate in only lectures. Participants of this study revealed that the students who have the IT infrastructure are privileged to have better connectivity.

On the other hand, students who have not had any infrastructure or connectivity in the long term will be affected due to this virtual implementation. Similarly, students who have good connectivity but do not have the infrastructure. Students who use their smartphones sometimes live in more minor coverage strength areas. Hence bandwidth is not sufficient. Even if the students have all these facilities, they need to purchase data for learning. Those who have facilities benefit, and others cannot get whatever they deserve. The interviews further show that the assignments are collected, evaluated and send the marking of assignments through Moodle. This study finds that the continuous assessment marks are provided through Moodle, which is strategically implemented to teach and evaluated smartly through Moodle. This electronic mode of studying reduces papers to the environment. UGC circular allows the universities to conduct final assessments through online platforms, which is still under discussion to find a strategy to have final exams online. Online interactions were possible only because of IT, according to the participants. LMS and different information systems were tested to have enthusiastic applications. Regardless of the consequences, everyone was forced to use IT for learning, business and other

activities due to Covid-19. All around the world, due to the peak usage of IT, many IT professionals lost their jobs or were half paid for their jobs. However, in universities, through these data, it is evident that everyone stood up to the challenges and is working online now.

Blended learning and distance evaluation. Following the finding of this study was given here states that "*…..Earlier, we had those conventional thoughts that CA is this much and End semester is that much, and also all the examiners supervised examinations. Now everything is changing, and we are seeking new methods of assessment, new methods of teaching.*" Lectures and discussions are conducted through Zoom and other Video Conferencing platforms.

Nevertheless, several problems are still encountered in conducting exams and practical sessions. These are recognized as very difficult to conduct. Especially in Engineering courses, it is tough to conduct practical sessions online. There were opinions to start the blended courses after Covid-19, which will allow students to take part in practicals at laboratories and study online. UGC and the authorities like to do this change to have a better chance with these strategy implementations. A participant stated that "*……at least the computing-based faculties and departments can go for the blended learning model. There are many opportunities, and even the semester is not over, now our students are in the industry and working from home. The 4th year students are following lectures, doing the research, and working for organizations. Earlier, we did not have that flexibility. We can apply the same thing at least for our 4th-year students*". Other participants validated this flexibility.

On the other hand, the university does not have academics only, and students will be missing their extra-curricular activities, team interactions and other personality development. However, the pattern was identified that all participants said learning from home would be much more relaxing. Similar to the advantages, the researcher identified expressed disadvantages as well. When it comes to blended learning, distance learning has some backlogs that the students cannot control, such as frequent power failures, strengths of networks, and additional costs for data packages. The researcher further noticed that participants stated that students could not afford to buy laptops, desktops and smartphones to continue this distance blended learning. The researcher recognized some relaxation in specific rules through virtual learning, which also can be adapted to blended learning. A participant confirmed that "*we too relax in many of our styles, I am very strict on attendance, I expect 100% attendance.*

Nevertheless, online I do not expect attendance. So, I think, slowly and slowly I am also adjusting to that technique. Nowadays I'm not looking for 100%. So, from a different point of view, we relax some certain concepts of teaching and specific styles. In another way used to virtual lectures too. We have given up some specific aspects, and also students used to so with virtual lectures." In blended learning, regardless of the environmental challenges, the student can learn from wherever they are. If this is a physical classroom, there may be distractions depending on the weather. Students can have recoding of online sessions during the blended learning. Therefore they can repeat the sessions and take notes if they miss any area. It will reduce the time of lecturing.

Further, adopting the new culture brought difficulties into the students' lives. It was deeply mentioned during the interview. The researcher noted,

concerned with cost-effective methods, this slowly and slowly also, cI ambe a strategy to reduce the university overheads. *"……in the private sectors, you don't have to invest a lot on buildings, air conditioning, power and internet. You can be given laptops and some increments for internet and infrastructure facilities and working from home is very easy from the company point of view. Some of these things have to work well from online mode will be a good thing to learn during the online lectures."* The researcher further identified that participants desired the blended learning due increased number of university intakes will be exhausting for lecturers and faculty. Therefore, blended learning will be prioritized in future to reduce overheads, exhaustive teaching and effective learning if implemented strategically.

Adoption to a change. One of the central areas identified here was that the public university system was not ready for the drastic change due to Covid-19. *"….one main concern is "We were not ready"… do government universities/ government set-up notionally. We are kind of behind in the industry or the private sector. Our infrastructure was not ready. Our networks were not enough in university times, and our Wi-Fi set-up was inadequate. For example, we need to conduct some Operating Systems modules and MATLAB modules to show the students how to install Windows, Ubuntu, some configurations, and admin configurations. However, sharing such a big file, there are many ways in the world, but the university infrastructures are not ready to share these kinds of bigger files, like 8GB files."* The researcher identified the attitude of reluctance to change to the new environment, and the strategies were in the planning stage, which was not implemented effectively to face these challenges and to change the attitude of learning.

Commitment from the students is also lacking, and the researcher identified that it seems the students' responsibility is far less than in previous days. Commitment to education and finding solutions to problems are far behind. The students' soft skills yet need to be developed apart from academic learning. Evident to this finding, a participant stated, *"……If you are going to study a 4-year engineering program, the government will spend a lot on you. Whatever program you are going to follow, after 3 or 4 years, students are done, because of that student's whole life will change, and the student will be stable. In 10 years the students will have a good job. So, a student is given many things. So, I would prefer, the students should find possibilities, there are enough ways for a student to earn money nowadays. There are enough payment schemes, and you may need around 100,000 to buy a fair-enough laptop and even cheaper than that, you can find a second-hand PC. So, in my personal opinion, when they are 18 to 19 years old, and if they do not know how to make 50,000LKR to 100,000LKR for something that is going to change their life, how the student is going to live in the company later? How are they doing to live in an institute later? how they are going to work for a company?"*

A pattern of lectures is not readily adopting these changes, also notified by the researcher. *"…..there are many courses like IELTS, Toffle, CCNA, Microsoft exams, are even doing lots of practical sessions online and even exams were conducted online. We should not overthink. There are difficult technologies delivered online nowadays, even though we are still reluctant to change small changes. In my opinion, one of the difficulties we face is attitude."* A positive pattern in virtual learning is that students interact relatively high via chatting where they do not raise questions or answer questions

in the physical classrooms. So this provides kind of feedback to the lectures to understand the student's level of understanding of the lectures. However virtual environment has challenges to adapt because it was revealed that *"it is not like sitting and looking at the lectures and lecturer. While working from home, the disturbance might be there, and they will put their microphones in mute and switch off their videos, and go here and there, so that reduce the concentration on the lecture."* Ultimately gained knowledge at the end of the semester or in the academic year virtually will be far less than the physical lecturers. Long hours lectures have consequences and exhausting for both lecturers and students. "*……Conducting lectures online is time-consuming compared to physical lectures. We need to ask every student whether they are online or hear the lecturer. So, time is taken to sort out these kinds of things. It is very time-consuming compared to the physical lectures.*

Moreover, face-to-face communication is lacking. There some cognitive factors decide the relationships between students and lecturers; like the emotional attachments of students and lecturers are lacking; organizing quizzes and examinations are very hard; previously materials and everything didn't allow the students to copy." This virtual teaching adaptive culture may result in the new approach of inducing students to copy at a higher rate. The researcher further recognized that when the students do not have speedy typing skills, it causes additional stress. The researcher further noticed that if the staff are not experienced, staff can be capacitated to learn and adapt to the upcoming technologies.

Another critical point was adapting to virtual also not possible consequences. As evident to that, a participant said, "*……From my point of view, if we are conducting practical sessions using ICT technology, ……., It is difficult but possible. I'm saying that just consider the chemistry practical, and if a lecturer carries out whatever the experiment in the laboratory while someone is recording it for creating a video, then uploading the video for students to view and learn. That is what I said, "Not Possible". Because students watch the video and learning experiment is not highly recommended. However, it is only a possible solution. However, even that is possible, and there are other aspects also, the other things are, just say, there are field-oriented courses, training oriented courses; for example, industrial training, field visits, and those kinds of things. Field visits are not possible at this moment. In the case of industrial training, at the moment, the only possibility is work-from-home. Then what happens is, we lost the objective of this industrial training. The main objective of industrial training is to give our students industrial exposure. They have to work within the industrial environment, and they have to observe how this management, the intermediate level officers and the lower-level officers, how they work, how they interact with each other and all these things. However, those are not achievable with these work-from-home / train-from-home like situations. Those are the factors we cannot address under this particular situation, and even we have fewer ICT technologies.*"

Limitations. There are several difficulties in choosing the most appropriate research methodology and methods best suited to a given study. This work intends to offer a crucial contribution during this decision process by systematically analysing several research methods to stress its strengths and limitations. (Almeida, Faria, & Queirós, 2017). Considering this in mind researcher choose qualitative methodology as it gives a wide range of understanding the context of the problem; the researcher can widely study the

problem at the proximal distance; the qualitative study will allow the wide range of group studies; and the higher range of flexibility and exploratory analysis. However, in a qualitative study, the scope of the study time is comparatively more extended than in a quantitative study. Moreover, researchers' views are internal, and theoretical framework & hypotheses are less structured. Therefore, sample selection was restricted only to the computer sciences and applied sciences department faculties. Interviews were also limited only to the academic staff's perspective as this study did not include the students' perspectives under this. Time and financial constraints were also considered as a limitation in this study.

Recommendation. Refraining from practice and policy recommendations in primary educational research articles, mainly because primary research journals are not acceptable for such recommendations, the evidence provided by one research article is typically not sufficient, and making bold statements about practice in primary research underestimates the challenges of practice implementations. Moreover, providing such recommendations in primary educational research journals is not grounded theoretically and practically. Nevertheless, contributions to the discourse on practice and theory are an inherent and productive part of educational research, even if some recommendations may end up being oversimplified or may be wrong in further research. Nevertheless, there is an agreement that we should not formulate general, sweeping recommendations. More diminutive and, therefore, legitimate practice recommendations are proposed, and conditions are discussed when such recommendations in primary research journals seem to be justified (Renkl, 2013).

This study contributes to the role of Information Technology(IT) in the strategic implementation of digital learning and its impact on public universities in the Sri Lankan context. As the study advanced, a few areas appeared as suggested areas for future studies. The recommendations are as follows:

i. Bridging the gap on digital infrastructure and connectivity inequality needs to be considered to provide online education for all.

ii. Opportunities to be provided with all faculty students to access the IT facilities and their departments. At the same time to enhance the IT fundamental technical capacity of the academic staff will reduce the challenges both parties face when using the digital platforms for virtual classes.

iii. Provide well equipped IT laboratories with multimedia laboratories and strength connectivity; conference rooms with IT facilities; bright lecture halls were to conduct online and offline lectures like a blended learning mode, and lecture content can be automatically recorded and uploaded to the source.

iv. Provide own servers to each university and repositories where they can upload everything to expand their education network, where it is connected when logged in with the students and staff credentials with accessible networking facilities. A cloud facility also recommended teaching and learning methods to create a virtual environment for both parties.

v. Identify the best possible blended training methods and online evaluation methods to evaluate students prominently. For example, consider the final exam at a low ratio and create a monitoring and evaluation system to assess the students proximal to bring the best from them throughout the courses.

vi. Merge libraries as virtual libraries that have only physical library access. Substitute PCs with laptops in the IT centres to have practical labs and to maximize internet connectivity and space

vii. Conduct further studies related to this field with other academic staff and students to further understand this study.

Conclusion. Results of this study to identify the contribution of Information Technology(IT) in the strategic implementation of digital learning and its impact on public universities in the Sri Lankan context due to covid-19 shows exciting findings, and the researcher attempted to investigate the effectiveness of the digital learning which implemented including in academics due to Covid-19; its connectivity of implementation in public universities in Sri Lanka and the challenges encountered by the lecturers and students. The finding of this study discussed implementing virtual learning, blended learning and distance evaluation, and adaptive to change. Based on the findings, the researcher considered the recommendation made by academics when providing recommendations for further future studies. However, due to time and financial restrictions researcher restricted the study only to the lecturers. This study further explains that there is a gap in implementing the planned activities strategically in the Sri Lankan public universities. The strategies are developed every year or for a certain period, but they lack implementation. That is why a drastic change came on study platforms, and they face many challenges in conducting virtual lessons and organizing practicals.

References:

Almeida, F., Faria, D., & Queirós, A. (2017). Strengths and Limitations of Qualitative and Quantitative Research Methods. *European Journal of Education Studies*, 3, 369-387. doi:10.5281/zenodo.887089

Creswell, J. (2003). *A framework for design. Research design: Qualitative, quantitative, and mixed methods approaches*, 9-11.

Czerniewicz, L. (2020). What we learnt from "going online" during university shutdowns in South Africa. *Phil on EdTech,* . Retrieved from https://philonedtech.com/what-we-learnt-from-going-online-during-university-shutdowns-in-south-africa/.

Doucet, A., Tuscano, Timmers, K., & Netolicky, T. (2020). *Thinking about pedagogy in an unfolding pandemic: And independent report on approaches to distance learning during COVID19 school closures.* Retrieved from https://issuu.com/educationinternational/docs/2020

Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., . . . Prashant, P. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work a. *International Journal of Information Management,* 55, p.102211.

Farrugia, P., Petrisor, B., Farrokkhyar, F., & Bhandari, M. (2010). Research questions, hypotheses and Objectives. *Canadian Journal of Suregry,* 53(4), 278–281.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *EDUCAUSE Review*. Retrieved from https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-lea

Jansen , D., & Warren, K. (2020, June). *What (Exactly) Is Research Methodology? A Plain-Language Explanation & Definition (With Examples).* Retrieved from CardCoach: https://gradcoach.com/what-is-research-methodology/

Joffe , H., & Yardley, L. (2004). *Content and thematic analysis. Research methods for clinical and health psychology*. London: Sage., 56-68.

Malkawi, E., Bawaneh, A., & Bawa'aneh, M. (2021). Campus Off, Education On: UAEU Students' Satisfaction and Attitudes Towards E-Learning and Virtual Classes During COVID-19 Pandemic. *Contemporary Educational Technology*, 13(1), 283. doi:https://doi.org/10.30935/cedtech8708

Mujere, N. (2016). *Sampling in Research*. doi:10.4018/978-1-5225-0007-0.ch006.

Renkl , A. (2013). Why Practice Recommendations Are Important in Use-Inspired Basic Research and Why Too Much Caution Is Dysfunctional. *Educational Psychology Review*, 25, 317-324.

Sileyew, K. (2019). *Research Design and Methodology*. DOI: 10.5772/intechopen.85731

Teräs, M., Suoranta , J., & Teräs , H. (2020). Post-Covid-19 Education and Education Technology 'Solutionism': Seller's Market. *Postdigit Science Education*, 2, 863-878. doi:https://doi.org/10.1007/s42438-020-00164-x