

RESEARCH REPORT

The Perception of NUS Lecturers on the Impact of Covid-19 on Education

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Abstract

This paper documents the perceptions of lecturers from the National University of Samoa (NUS) with regard to the impact of COVID-19 on the use of online technologies in education in Samoa. The impact of the pandemic worldwide included effects on teaching and learning in Higher Education in Samoa. This research explored the perceptions of teachers about the benefits and challenges of using technology in teaching during COVID-19. The study's findings revealed that lecturers' perceptions were highly positive with high levels of motivation and satisfaction. Also evident was increased usage of technology to teach and deliver courses on online platforms. The findings also indicated both benefits and challenges of online learning as well as support a strong recommendation to continue using technology to provide learning in the event of a further lockdown.

Keywords: Covid-19, Pandemic, Online Teaching Tool, Online Learning

Introduction

The ongoing Coronavirus (Covid-19) pandemic is a major health crisis the world is facing and fighting since 2019. The virus which originated from Wuhan, China rapidly spread across the world to countries in Europe and North America and later in the Pacific Region. In an attempt to monitor and control the spread of this deadly virus, the World Health Organization (WHO) declared the outbreak as a pandemic on 11 Mar 2020 (WHO 2020). Governments of various nations placed restrictions on travel not only across borders but also within their territories to aid in controlling the spread of the Covid-19 virus, thereby resulting in a total shift in the lifestyle of many (Jena 2020). Consequently, this situation has brought challenges in many aspects of human life including education. According to UNESCO (2020), schools and higher education institutions (HEIs) were closed in 195 countries, affecting approximately 1.5 billion learners. By early May, a small percentage of schools and HEI had opened again when only a few countries began lifting containment measures after experiencing declining numbers of cases and deaths. This still left a large number of learners affected by schools being closed (Marinoni et al. 2020).

For Samoa, in response to the Covid-19 global crisis, its government declared a State of Emergency (SOE) that went into effect on 21 Mar 2020 with a decree to enforce restrictions on international and domestic travel, limit public transport, discourage large public gatherings, contain access to health facilities, and under section 8(1) "All schools are to close until further notice" (Tamaalii 2020). The SOE was intended for only two weeks but at the time, increasing cases were recorded in Australia, New Zealand, and Fiji. Thus, the Samoan government extended the SOE for 4 weeks as a precaution to protect Samoa from the deadly virus (Vai 2020). With the extension of the SOE enforced, all schools and HEIs remained closed. However, teaching and learning needed to continue during the lockdown period.

The use of Moodle for blended learning has been a priority at the National University of Samoa (NUS) for the last ten years and included the following developments. In 2017 – 2018, the installation

and upgrade of Moodle LMS through assistance from the Commonwealth of Learning (COL) as part of its Technology enabled learning (COLTEL) initiative (Chan Mow 2017). As well there had been ongoing staff workshops on using Moodle in 2017-2019 offered by various sections of the university. These were further enhanced by Instructional design workshops on Moodle (Chan Mow 2019), followed by an evaluative study on Moodle implementation under the COLTEL project implemented by the Faculty of Science Moodle team.

With the disruptions of classes in November and December 2019 due to the measles outbreak, natural disasters such as cyclones and flooding, and in January 2020 the impending and possible class disruptions due to the corona pandemic, there was an urgent need for NUS to act rapidly, to moving classes online and to the Moodle platform. Moodle was the preferred online platform because it was offered as open source without licensing and could be used both online and offline thus reducing issues of bandwidth.

In the light of the impending COVID-19 pandemic and the need to ensure continuity of programs, the NUS ICT and Computing sections were tasked, by management, with assisting lecturers by putting all courses online on Moodle (NUS 2020). Hence during the lockdown of 2020, NUS had to transition to online learning and the current study is an evaluation of this online learning experience by NUS lecturers.

Problem Statement

As mentioned earlier, the sudden closure of schools and HEIs allowed little time for planning or reflection upon the risks and opportunities the lockdown would bring to Samoa's education system. Teaching and learning had shifted from face-to-face to distance and online learning within a short period of time. To respond to the need to continue teaching activities and to engage and motivate students to adapt to distance learning, Duraku and Hoxha (2020), stated in their study that the best-suited alternative was the use of "technology". This shift, according to Yokozeki (UNESCO 2020) had been evaluated as a great opportunity for teachers and students to increase the level of communication and collaboration, become innovative, and welcome alteration in teaching and learning methodologies. In relation to UNESCO (2020), Ms Lurvnik stated that this has also brought the potential for rapid development in the field of digital education, which, under different circumstances, would have taken decades. Thus, the changes formerly assumed impossible to implement, were after all, achievable.

However, the sudden changes that were implemented quickly also brought about concerns related to technology use, the quality of education, lack of access to the necessary technology, limited knowledge on the use of technological tools, and poor internet connection. (Chan Mow 2019; Duraku and Hoxha 2020; Roy 2020). Henceforth, it is important to recognize the significance of technology on the learning process as well as teachers' motivation to adapt to new teaching environments prompted by the Covid-19 lockdown.

Motivation

The abrupt change in the learning environment experienced and practiced by schools around the globe during the outbreak of Covid-19 brings both benefits and challenges. The overwhelming value, the extent of need, and the dependency rate on technology were clear and apparent during lockdown

periods across the globe (Chazen 2019; Duraku and Hoxha 2020). Countries that declared the use of classroom technology to be extremely low long before present situations have identified difficulties frequently encountered by teachers when undertaking online learning. Such challenges have been found to be linked to several factors which include: availability of and access to technology, the extent of technological skills, and competence level in using technology (Chan Mow 2019; Duraku and Hoxha 2020; UNESCO 2020b). The willingness of teachers to accept change, in this case, the sudden shift from face-to-face teaching mode to online learning, vary and may differ depending on teachers' experiences.

To address this gap, the motivation behind this study was to explore and describe the experiences of teachers during the Covid-19 lockdown and their perspective concerning Covid-19 impact on education in Samoa. The motivation arose primarily from an interest in discovering perceptions of teachers at the National University of Samoa (NUS) during such unprecedented times. This research hopes to evaluate the impacts of Covid-19 on teaching at the NUS from a teacher's perspective.

Context of Research

Several similar types of research have already been conducted in different countries on which this proposed research is based. ICT innovation and its use in educational systems have promoted constructivism, in which student engagement, involvement, and collaborative effort are highly encouraged; consequently, promoting lifelong learning. (Huang et al. 2010; Bindu 2016). The integration of ICT, particularly online teaching tools, in education systems has also allowed teachers to progress and improve professionally (Bindu 2016). A study by Verma & Priyamvada (2020), on teachers' perception of the use of online teaching tools during Covid-19, revealed that 44 percent of their participants found the use of online teaching as "more convenient to assign and revise the homework" and determined that "it is time-saving and convenient". According to Chan Mow (2019), the use of Moodle, learning management, or an online teaching tool in the National University of Samoa "...had a definite impact..." as it offered a different learning style to students and allowed them to access all course resources.

Research Question

This study aimed to explore and describe the experiences of teachers during pandemic lockdown and their perspective on the use of technology for distance learning. Teacher perceptions on technology use will help determine the changes and variations the Covid-19 pandemic has brought about in education in Samoa. The study aimed to answer the following question: What are teachers' perceptions of the impact of Covid-19 on education in Samoa?

Specifically, the objectives of the study were as follows:

1. Investigate the perceptions of teachers on the benefits of using technology in teaching during Covid-19.
2. Investigate the perceptions of teachers about the challenges in teaching during Covid-19.
3. Identify recommendations from teachers on ways to improve educational systems to better adjust to changes experienced during Covid-19.

The anticipation is that the results of this study will generate recommendations to help inform and contribute to preparations by the university should there be another lockdown in the future. The findings can help further any studies around the Pacific nations and particularly in Samoa.

Literature Review

With the sudden shift from face-to-face teaching mode to distance learning, the literature review hopes to identify and categorize how the rapid spread of the Covid-19 virus impacted the field of education around the world. In addition, the literature of this proposed paper hopes to anticipate the challenges universities endured, the benefits experienced by teachers, and finally, recommendations that can help improve adaptation methods adopted by universities.

Acquired from past research on teachers' perceptions of Covid-19 impact on education, the following have been identified and defined as the key terms used in this study are Covid-19: Refers to a disease caused by a new strain of coronavirus. 'CO' stands for corona, 'VI' for the virus, and 'D' for disease. Formerly, this disease was referred to as '2019 novel coronavirus' or '2019-nCoV.' Pandemic: Refers to the spread of contagious disease over several countries or the whole world. Online Teaching Tools: Refer to any program, app, or technology that can be accessed via an Internet connection and enhance a teacher's ability to present information and a student's ability to access that information. Online Learning: E-learning, also referred to as online learning or electronic learning, is the acquisition of knowledge which takes place through electronic technologies and media (Tamm 2020).

The next section provides a discussion of some major studies in the field of the proposed research. The range of studies in the literature review is categorized into two themes. One, benefits of online learning in education systems, and two, challenges prompted by Covid-19.

Benefits of online learning

Incorporating technology in the classroom has been increasingly promoted and accepted around the world in recent times. Research in the field of education has been exploring the impact of the use of technology in institutions which has been proven and revealed that technology can assist and have a positive impact on learning and teaching experiences (Dyson et al. 2015; Hung and Yuen 2010). Numerous studies have identified and discussed the benefits of online teaching for teachers and students. Bailey and Lee (2020) reported on the main benefits of online teaching for teachers which were: i) improved pedagogy methods (Riasati et al. 2012; Verma and Priyamvada 2020), ii) empowers teachers to grow and advance professionally (Ho et al. 2001; Bindu 2016), iii) improved flexibility (Riasati et al. 2012). In addition to these benefits, Chan Mow (2019) examined technology-enabled learning through the use of Moodle to achieve blended learning in the National University of Samoa, reported that teachers indicated positive experiences as it has reduced their workload and improved student-teacher interactions; learning experience for students is more flexible as they were able to contribute more to discussions given there was more time to participate in forums and discussions on Moodle.

Learning is no longer limited to cooperation within a single school between teachers and students but is now extended to experts across the globe, thus distance education (Bindu 2016; Mukhtar et al. 2020). Access to information can be done at any time and from anywhere allowing teachers to deliver what they need, when they need it, from where they need it (Bindu 2016; Duraku

and Hoxha 2020). In addition to being independent of location, the advantages of not having to travel long distances make online education a common alternative to traditional classrooms (Bailey and Lee 2020). This has changed the dynamics of learning for most universities, in which teachers incorporate methods to ensure students accentuate their critical thinking skills, collaborative skills, and problem-solving skills (Balanskat et al. 2006; Lunenburg 2011; Pourhossein 2014). In addition, this shift has encouraged teachers to upskill in the field of technology as it is a vital factor in piloting online learning (Bailey and Lee 2020).

Challenges of online learning

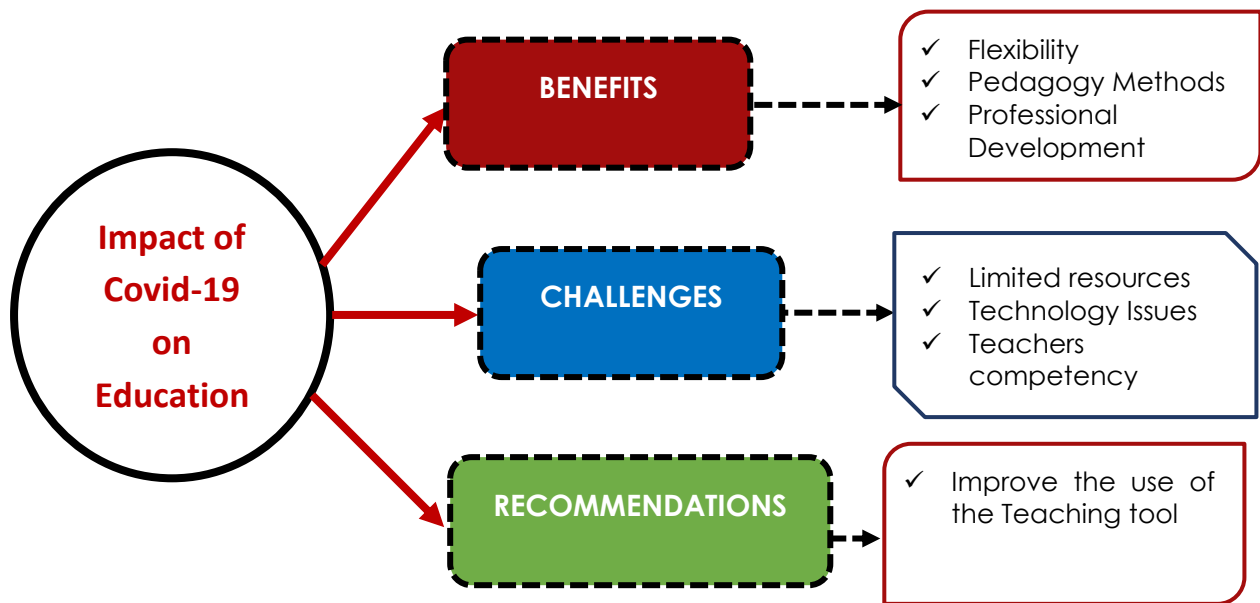
While online teaching has a broad range of advantages, when implementing online classes or learning activities, there are certainly challenges that must be considered. Various studies have reported and discussed the challenges associated with online teaching. An overview of findings reported by Duraku & Hoxha (2020) stated the following main challenges: i) technology-related issues (Ibrahim et al. 2013; UNESCO 2020b) and ii) teachers' attitude towards change (Flamholtz and Randle 2008; Ibrahim et al. 2013). Dhawan (2020) highlighted another common challenge in students learning during Covid, which was the lack of engagement. Findings from Chan Mow (2019), clearly stated the main challenges identified by teachers when teaching using online tools are: i) lack of access devices and ii) poor internet connection. Such challenges are the most common issues reported from developing countries (Aboagye et al. 2020; Duraku & Hoxha 2020; Mphahlele et al 2021; UNESCO 2020; Zalat 2021).

A common consequence of the rapid transition to online learning is that educators found themselves teaching and interacting with learners online with very little preparation, professional development and /or institutional support. Many educators lacked the formal training in online learning and were underprepared for what in many cases was a “forced transition” (Brooks and Grajek 2020). Despite such challenges experienced during the Covid-19 pandemic, educators will have to implement creative strategies based on best practices to ensure that academic learning objectives and expectations are met considering the difficulties associated with online learning (Bailey and Lee 2020).

From the scope of the literature, online teaching has both benefits and challenges, which vary in different countries. Education can greatly benefit from the use of online platforms for teaching especially during Covid-19. With the restrictions applied and enforced in many countries, the demand for use of technology to continue learning and teaching, online, has been abrupt and developed rapidly. This has encouraged teachers' professional development, change in pedagogy approach, and improved flexibility for learning and teaching to be happening anywhere, anytime.

Building from these lines of research, the purpose of this research study is to investigate the perceptions of NUS lecturers on the benefits and challenges of Covid-19 on education in Samoa. They will also be asked to provide any recommendations they may have to help inform policymakers, researchers, and communities on any methods to adopt and improve on should there be another lockdown in Samoa.

Figure 1: Framework



From the literature, both benefits and challenges are identified to be associated with distance learning before and during Covid-19. The challenges experienced by many during Covid-19 are noticeable and apparent particularly due to the sudden changes enforced for many to abide by and follow. This investigation is guided by research questions, the first of which explores perceptions of teachers about the benefits of using technology to teach during Covid-19, the second discusses challenges in teaching during Covid-19, and lastly, identify recommendations on ways to improve educational systems to better adjust to changes experienced during Covid-19. This study is focused on i) exploring the benefits of teaching during the Covid-19 pandemic, particularly: flexibility, professional development, and the opportunity to variate pedagogical approach in teaching, ii) discussing challenges experienced, in terms of teachers' attitudes towards change, competency, and level of comfort in using technology, and technology-related issues, and iii) identifying recommendations to improve teaching from a distance. Findings from this study will be of use and importance for future investigation.

Methodology

The study investigated the experiences of lecturers on benefits and challenges in teaching during Covid-19 using technology. This included identifying the types of technology lecturers used for teaching before the pandemic and during or after the six weeks lockdown Samoa faced. By identifying the challenges lecturers experienced, recommendations were also provided.

Research Design

The study is quantitative and exploratory in nature. "A survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population" (Creswell 2014). The study used a survey to collect data from teachers.

Sample

The target population of this study is the NUS lecturers. The university has three (3) campuses: i) the main campus at Toomatagi, ii) Motootua Campus, and iii) Ocean Campus. There are six (6) faculties (Faculty of Arts, Faculty of Business and Entrepreneurship, Faculty of Education, Faculty of Health Science, Faculty of Science and Faculty of Technical Education, one (1) school (School of Medicine), and three (3) centres (Centre of Samoan Studies, Oloamanu Centre, Centre of Excellence IT). The sampling method adopted by this study is convenience sampling to select participants teaching at the main campus.

Procedures

The lecturers selected for the sample, taught courses before the Covid-19 lockdown and during the lockdown. Before lockdown most of the courses at NUS were taught in face-to-face mode and with some courses taught using blended mode with the use of Moodle. Online teaching at NUS during the 2020 lockdown was by both asynchronous (use of lecture notes, recorded lectures uploaded to Moodle, the LMS), as well as synchronous (use of Zoom, Messenger) technologies supplemented by printed course readers, and Facebook.

A survey was carried out to collect data from the sample of lecturers and a consent form was given to participants to sign for approval for participation in this survey. The consent form implied voluntary involvement and gave assurance that all information obtained is confidential and not to be used to the detriment of the participants.

Data to be collected

The lecturer survey questionnaire consisted of three (3) sections. Section A: Demographics, Section B: Technology, and Section C: Benefits, Challenges, Recommendations

The questionnaire consisted of checkbox questions, a 5-point Likert scale ranging from strongly agree (1) to strongly disagree (5), and open-ended questions. The questionnaire aimed to capture information on technology usage by lecturers, their perception of the benefits and challenges in education that have emerged due to the Covid-19 pandemic, and recommendations for future improvement in online teaching.

In Section A, data collected is general information such as age, gender, village, program, and type of mobile phone owned by the student. In Section B, data collected is focused on the type of technology used by teachers before and during Covid-19, as well as the devices they needed to successfully carry out online lessons. Section C aims to collect the perception of teachers on the benefits and challenges of the Covid-19 pandemic on education along with any recommendations for improvement.

Instrument

As mentioned earlier in the methodology, this study used a questionnaire that was distributed to teachers (Refer to Appendix 1 for a copy of the Lecturer Questionnaire). These items have been adapted from studies by Bailey and Lee, (2020) and Verma and Priyamvada (2020).

Data Analysis

Data collected from the survey were analyzed using SPSS. All items in the survey were analyzed using descriptive statistics to identify the frequency, means, central tendency, and standard deviation and are presented in the form of frequency tables and column graphs. Independent test and non-parametric tests such as chi-square, Kruskal Wallis were used and a confidence level of 95 percent is used for all statistical tests performed.

Results

The results and discussion of this study are reported by question and divided into the following sections: i) nature of participants, ii) technology use, and iii) perceptions towards benefits and challenges of teaching using technology during a pandemic.

Nature of Participants

Participants who completed the survey consisted of a total of 56 lecturers from the six faculties. They were of the age of 23 to 65, with an average of 36.68. There were 30 females and 26 males, and 24 reside in urban areas of Upolu while 32 reside in rural areas. Figure 2 displays the response rate from each Faculty and Figure 3 shows the number of participants and the number of years they have been teaching at the university.

Figure 2: Faculty response rate

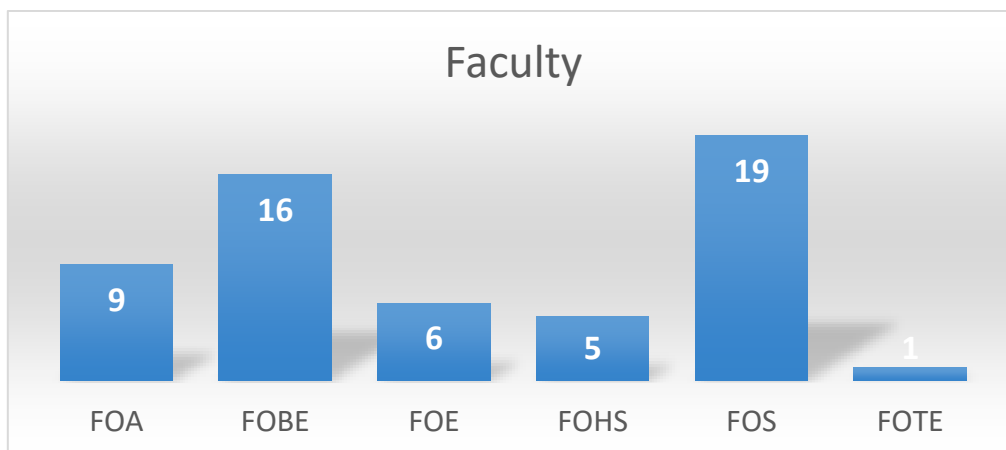


Figure 3: Years of Experience as a Lecturer

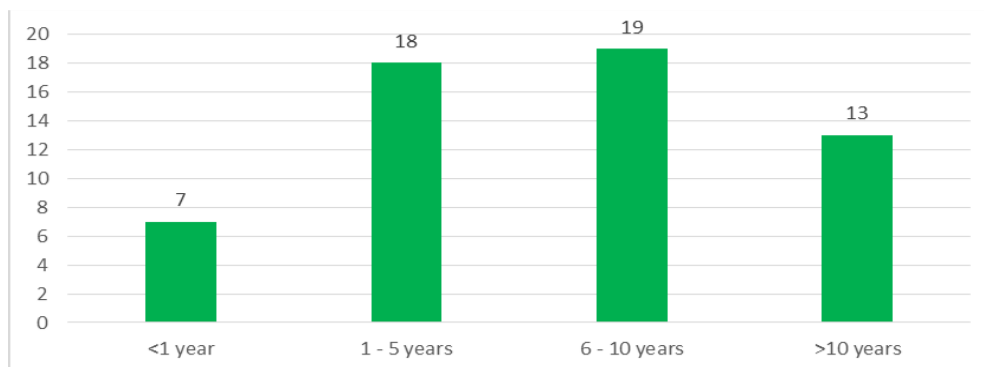
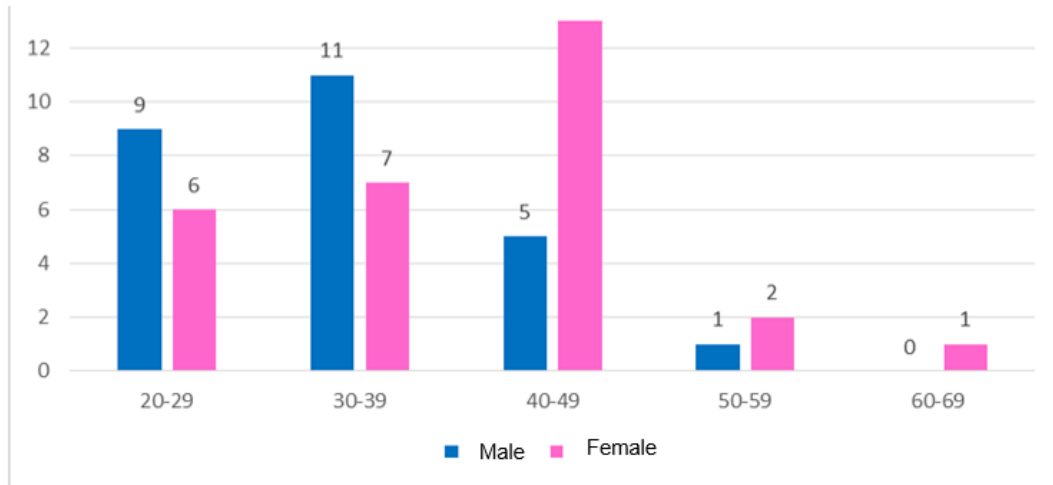


Figure 3 below displays a cross tabulation between gender and age indicating the variance in the number of responses by their age and gender. For age groups 20-29 years and 30-39, more males dominated compared to females; while more female lecturers are of the age group 40 years and above.

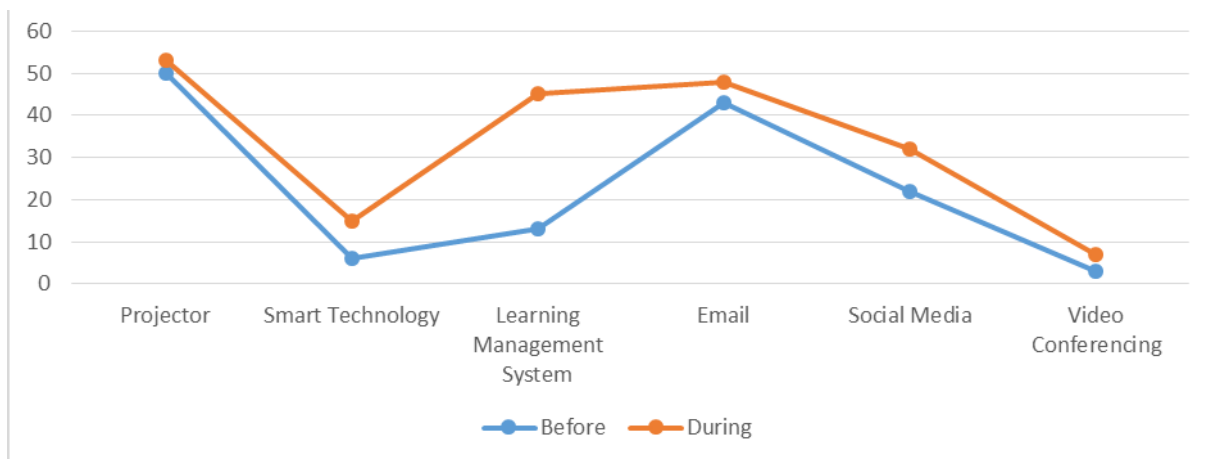
Figure 4: Age and Gender Cross tabulation



Technology use of Lecturers

A comparison between lecturers' use of technology before the Covid-19 pandemic and their current usage shows (Figure 5) that after the lockdown, lecturers' usage of technology has increased. As UNESCO (2020a), stated in their finding, the situation of Covid-19 has instigated the rapid growth and use of technology to achieve learning from a distance.

Figure 5: Comparison of technology use before and during Covid-19



Perceptions on Benefits and Challenges

The statements in this section captured the views of lecturers on how beneficial the use of technology has been for teaching. The 5-point Likert-scale statements ranged from 1= Strongly Disagree to 5=

Strongly Agree. A reliability test was conducted to check the internal consistency of the Likert scale items and the results as shown in the table below indicate a value of 0.934.

Table 1: Cronbach Reliability Test

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.934	.935	16

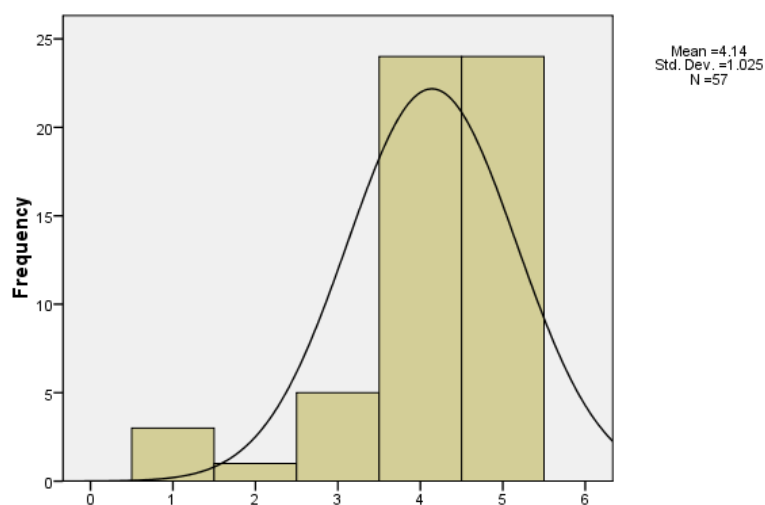
Technology use has increased since Covid-19

84.2 percent of the participants indicated that since the pandemic, their use of technology has increased. The response rate shows a mean of 4.14 and a standard deviation of 1.025 with the skewness value of -0.163 indicating the data is highly skewed to the right.

Table 2: Technology use has increased since Covid-19

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	3	5.3	5.3	5.3
Disagree	1	1.8	1.8	7.0
Neutral	5	8.8	8.8	15.8
Agree	24	42.1	42.1	57.9
Strongly Agree	24	42.1	42.1	100.0
Total	57	100.0	100.0	

Figure 6: Technology use of lecturers



Lecturers' technical skills have increased since Covid-19

There was a mix of responses from participants with 66 percent agreeing their technical skills have increased due to their increase in the use of technology. The response rate shows a mean of 3.75 and a standard deviation of 0.987 with the skewness value of -0.98 indicating the data is moderately skewed to the right.

Table 3: Lecturer's technical skills have increased

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	5.3	5.3	5.3
	Disagree	1	1.8	1.8	7.0
	Neutral	15	26.3	26.3	33.3
	Agree	26	45.6	45.6	78.9
	Strongly Agree	12	21.1	21.1	100.0
	Total	57	100.0	100.0	

Printing Requirements have decreased since the use of online teaching

The majority of participants (61.4 percent) indicated that their printing requirements for their courses have decreased since the use of online teaching tools. 22.8 percent felt their printing requirement has not changed and 14 percent did not agree with this statement. The mean response was 3.84 with a standard deviation of 1.075.

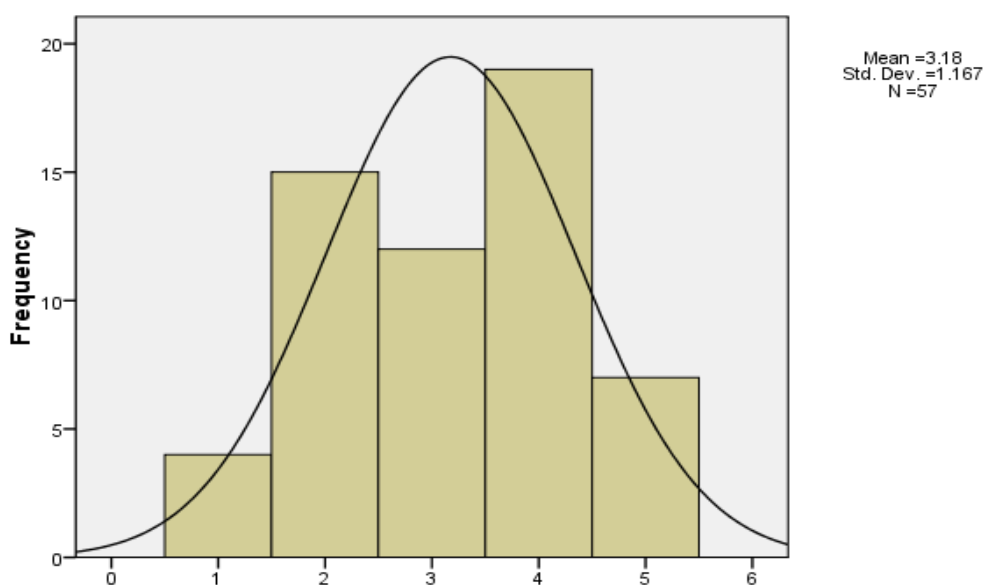
Table 4: Printing requirements has decreased since the use of online teaching tool

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	14.0	14.3	14.3
	Neutral	13	22.8	23.2	37.5
	Agree	15	26.3	26.8	64.3
	Strongly Agree	20	35.1	35.7	100.0
	Total	56	98.2	100.0	
Missing	Missing	1	1.8		
Total		57	100.0		

Workload has decreased since the use of online teaching

Although a high percentage of participants indicated their printing requirements had decreased, a mixed response was reported on their experience with workload. 45.6 percent felt their workload had decreased, 21.1 percent felt their workload was the same and 33.3 percent felt their workload had increased since the use of technology to teach.

Figure 7: Reduced workload since Covid-19



Motivation and satisfaction to use technology

Table 5: Lecturers motivation to use technology for teaching

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	3	5.3	5.3	5.3
Neutral	12	21.1	21.1	26.3
Agree	26	45.6	45.6	71.9
Strongly Agree	16	28.1	28.1	100.0
Total	57	100.0	100.0	

Lecturers were asked to rate their motivation towards the use of technology for teaching and the majority (73.7 percent) of the participants responded positively. 66.7 percent rated they were satisfied to use technology for teaching. These findings are consistent with findings by (Bindu 2016; Wright and

Wilson 2011; Zalut et al. 2021) that teacher satisfaction and motivation increases with the use of technology to teach at higher institutions.

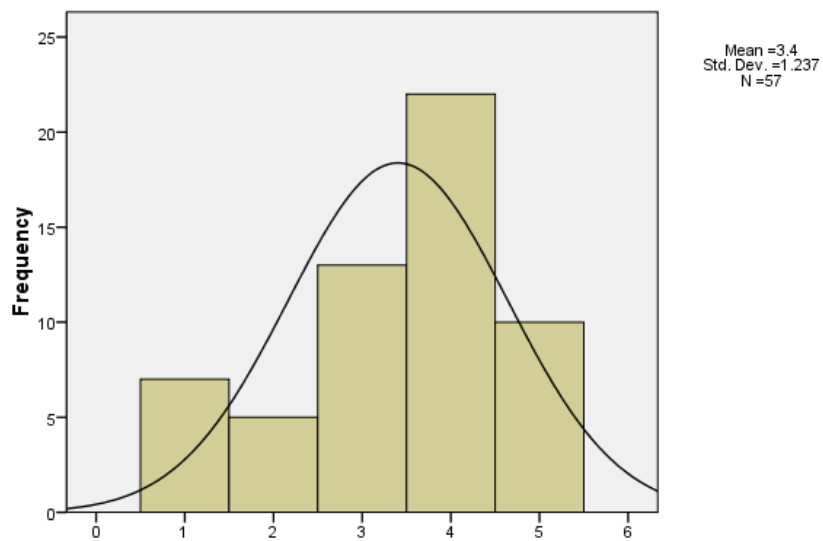
Table 6: Satisfaction rate with the technology used for teaching

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	4	7.0	7.0	7.0
Disagree	3	5.3	5.3	12.3
Neutral	12	21.1	21.1	33.3
Agree	31	54.4	54.4	87.7
Strongly Agree	7	12.3	12.3	100.0
Total	57	100.0	100.0	

Preference for Online Tools for teaching

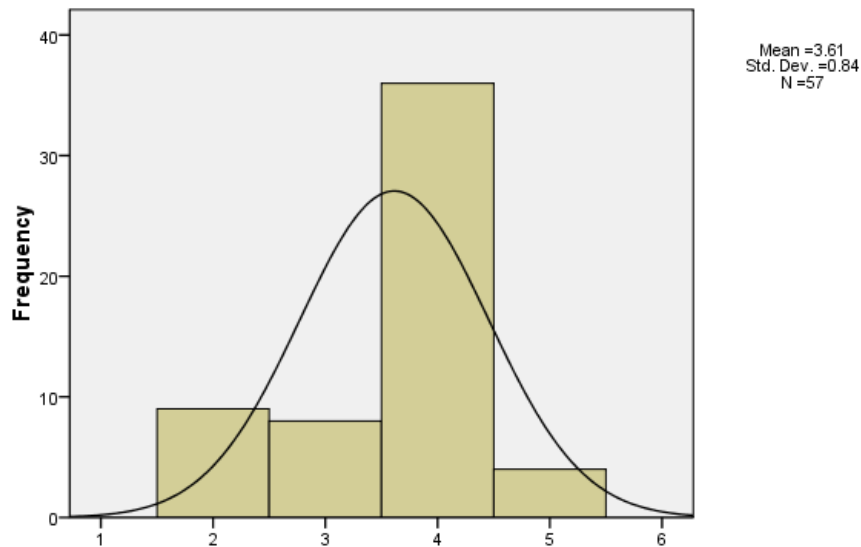
The majority of lecturer responses (70 percent) indicated a preference for online tools for teaching, with a mean response of 3.4 and SD = 1.237.

Figure 8: Preference to online teaching tools



Online learning tools provide more opportunities for learning

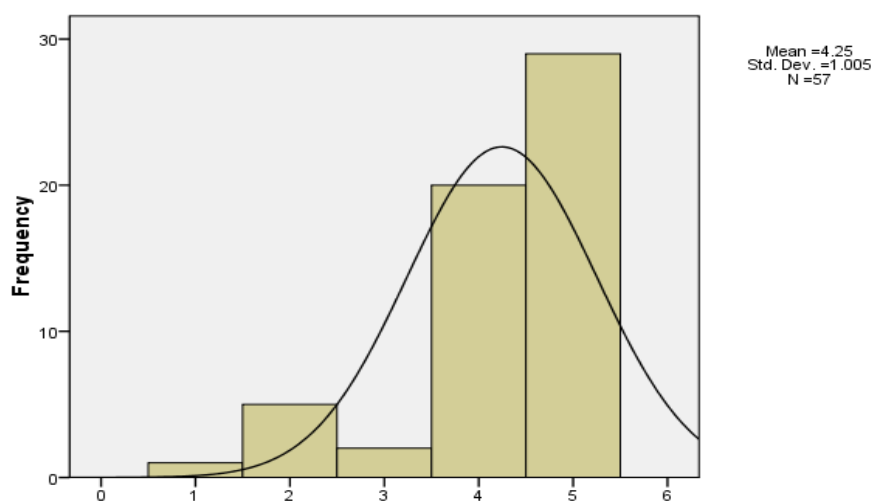
Figure 9: Online teaching tools provide more opportunities for learning



The majority of lecturers also indicated that the value of online tools was that they provide more opportunities for learning.

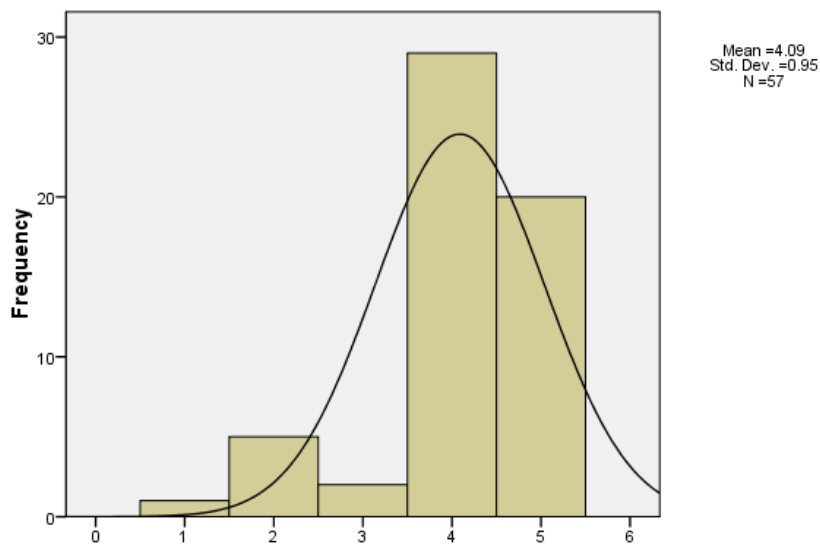
Technology is an alternative for education to continue if there is another lockdown

Figure 10: Technology is an alternative for education during lockdowns



When lecturers were asked to rate their response to the statement "Technology is the alternative for education to continue if there is another lockdown" 86 percent replied positively to this statement with a mean response of 4.25. A high response rate of 86 percent was captured when participants were also asked to rate their overall positive experience of using technology to teach since Covid-19.

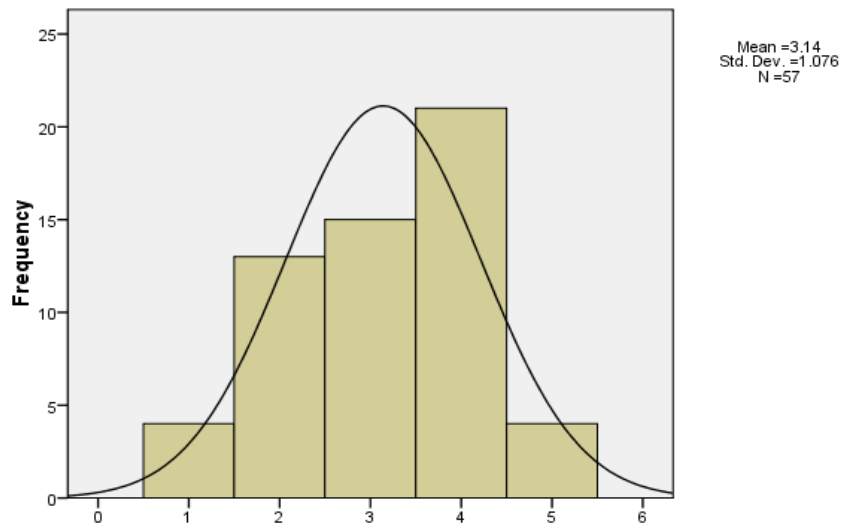
Figure 11: Positive experience of using technology to teaching since Covid-19



Reliability of Internet service

When participants were asked about how reliable their internet service was while working online, there was a mixed response from lecturers but mostly answered positively with a mean of 3.14 and SD of 1.076.

Figure 12: Reliable internet connection



In summary, the perceptions of lecturers on the impact of COVID on their use of technology were quite positive (likert scale responses ranged from 1 = strongly disagree to 5 = strongly agree with a midpoint of 3) with average responses for each item ranging from 3.13 to 4.24.

Table 7: Summary of means for each statement

Item	Mean (likert scale)	Std. Deviation	N
Technology use has increased	4.13	1.037	55
Technical skill has increased	3.73	.990	55
Received training	3.84	.996	55
Receiving support	3.84	.918	55
Printing requirements have decreased	3.84	1.085	55
Workload has decreased	3.24	1.138	55
Motivated to use technology	3.91	.986	55
Satisfied with technology for teaching	3.60	1.029	55
Preference of Online Tool for teaching	3.40	1.256	55
Reliable internet service	3.13	1.090	55
technology is an alternative	4.24	1.018	55
online learning tools provide more opportunities for learning	3.62	.850	55
the positive experience of using technology to teach	4.07	.959	55

An independent t- test to evaluate gender differences of lecturer perceptions of the impact of Covid-19 on their use of technology indicated no significant differences.

An independent t test to evaluate regional differences (urban versus rural) of lecturer perceptions of the impact of Covid 19 on the use of technology showed significant differences in two of the probes: “workload has decreased” ($t = -2.168, df = 54, p = 0.035$) and “Preference of online tool for teaching” ($t = -2.842, df = 52.492, p = 0.006$). In both cases, lecturers from rural showed less positive perceptions for these statements when compared to lecturers from urban areas. One possible reason for this difference could be the lack of familiarity with technology of lecturers from rural areas.

A Kruskal Wallis test to examine the relationship between age and perception on the impact of Covid-19 on their use of technology indicated that there is no statistically significant difference of age on lecturer perceptions on all statements except “Overall, I have a positive experience using technology to teach during Covid-19” ($\chi^2 = 9.673, df=3, p = 0.022$). In general, the younger lecturers showed more positive perceptions to technology than older lecturers, possibly due to less digital awareness and digital skills of the older lecturers. This is in line with findings of studies such as Fischer et al, (2014).

Benefits of teaching using technology

What benefits do you appreciate the most about the change in teaching mode since the Covid-19 pandemic?

Lecturers were asked to state benefits they experienced during the change in teaching modes during Covid-19 and the majority identified i) reduced workload, ii) convenient, iii) easy and improved method to communicate with students, and iv) change in learning style as the main benefits of using technology to teach. Below are common responses from the lecturers:

"Using Moodle LMS has created an alternative way to communicate and relay information and course content and materials to students. This has allowed students to learn at their own pace and having all course material available and accessible for students all the time"

"I appreciate working from anywhere at any time during Covid-19 lockdown and it is a lot easier for me to communicate with students at any time"

"Online collaboration with students has increased. Less printing jobs are needed as notes are now uploaded online for students to access anytime. The increase in online training available from different academies all over the world"

"Online teaching culture and acceptance has improved for all educators, courses, and disciplines"

"Easier communication between students and myself compared to face to face because students can frequently ask questions online"

"Technology for learning has now become a major part of learning"

Challenges of teaching using technology

Lecturers were asked to state the challenges they experienced during the change in teaching modes during Covid-19 and the majority identified i) lack of access devices for teachers and students and ii) poor internet connection which are similar to findings by Chan Mow, 2019, on the study on "the impact of technology-enabled learning implementation at the National University of Samoa". Similarly, Gillis and Krull (2020), OECD (2020) and Zalat et al., (2021) identified the availability and management of infrastructure as the most challenging during COVID lockdown. Other issues included iii) difficulty in creating online materials for specific courses and iv) plagiarism. Below are common responses from the lecturers:

"Slow internet and no access to the internet at times during the lockdown"

"My course is difficult to teach using online tools as direct face to face communication is highly recommended for effective teaching and learning"

"Students had a lot of issues with internet connection causing a delay in submitting their assignments."

"Internet connection and lack of resources such as laptop"

Conclusion

This research intended to explore and describe the experiences of teachers about the impact of using technology for teaching during the Covid-19 pandemic. In summary, the findings have provided several insights on the benefits, challenges, and recommendations prompted from lecturers' experience during the pandemic. A comparison between the number of technology lecturers used before and after the Covid-19 lockdown Samoa faced indicated an increase in usage. 84.2 percent of participants indicated their technology use for teaching has increased and so has their technical skills. (Riasati et al. 2012). With the use of technology to implement teaching, the workload in general and printing requirements have decreased. (Bindu 2016; Chan Mow 2019). Since the Covid-19 pandemic, positive feedback from lecturers indicated they were satisfied with using technology to teach their course and are motivated to continue using technology, hence; more teachers agree that online teaching tools provide more learning opportunities. (Bailey and Lee 2020). Thus, should there be another lockdown; 86 percent agreed that technology is an alternative to use to continue teaching and learning from a distance. (Riasati et al, 2012). The overall positive perceptions to online learning are similar to the findings of studies by Hampton et al. (2020), Stickney et al. (2019), and Wang et al. (2021).

The major benefits indicated by teachers were: i) increased flexibility, ii) convenience, iii) easy and improved method to communicate with students, and iv) change in learning style and were consistent with the findings of Bailey and Lee (2020), Bindu (2016), Chan Mow (2019), and Donelan (2016). An overall insight of lecturers showed positive perception on their experiences in using technology to continue the teaching process during Covid-19 lockdown. Challenges commonly experienced by lectures were: i) lack of access devices for teachers and students and ii) poor internet connection and were consistent with the findings of Chan Mow (2019), Gillett-Swan, (2017), Mukhtar et al. (2020), and Zalat et.al (2021). Other issues included: iii) difficulty in creating online materials for specific courses and iv) plagiarism.

The findings of this study indicate that, overall, lecturers have a positive attitude towards the use of technology for teaching during the Covid-19 pandemic with more positive perceptions to technology and workload from urban lecturers and more positive attitudes towards technology from younger staff. These are similar to the findings by Duraku and Hoxha (2020).

In the light of the findings, the researcher makes two recommendations for improvement: (1) There is a need to address the lack of access devices to achieve successful learning using technology and (2) there is a need to address the issue of lack of or quality of internet. In terms of future lockdowns, the findings of this study indicate positive affirmation by lecturers of the use of technology and online learning during these disruptions due to pandemics and disaster.

Limitations of the study

This study is not without limitations. Perhaps the main limitation of this study is the sample selected. It would be beneficial if all the NUS lecturers from all three campuses were surveyed as well as a larger sample. Furthermore, this is a cross sectional study and perceptions can change with time and with the use of new online technologies. Hence, there is a need for the repetition of this study over time to gauge changes as the online teaching environment evolve.

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