

Students' Perceptions of Factors Influencing the Adoption and Use of ICT in Learning during COVID-19 at One Rural Based South African University

^aEmile Mather, ^{*b}Martha Matashu, ^cJan Meyer

^aInformation Technology; ^bFaculty of Education; ^cNorth West University Business School, North West University, South Africa

*Corresponding Author e-mail: mmatashu@hotmail.com

Received: March 2022; Revised: April 2022; Published: July 2022

Abstract

This study examines students' perceptions of factors influencing the adoption and use of Information and Communication Technology (ICT) in learning during Coronavirus Disease (COVID-19) at one rural based South African University. To continue with learning under the COVID-19 pandemic conditions higher education institutions migrated to online teaching and learning platforms. The transition towards online learning took place in background where even prior COVID 19 most institutions were faced with the challenge of promoting students' adoption and use of ICT in their learning. The Technology Acceptability Model (TAM) is an information system theory that looks at various individual aspects that influence actual technology usage and acceptance. As such, there is a growing research interest to explore students' perceptions of factors that influence their use of ICT in their learning at higher education institutions subsequently studies that focuses on rural based context are still limited. Resultantly, guided by the theoretical constructs from the TAM this study applied a census approach and used a quantitative technique to examine the perception that affect students' acceptance and use of ICT in their learning. The study discovered a significant correlation between attitude towards use (U), perceived ease of use (PEOU), behavioural intention (BI), and perceived usefulness (PU), all of which have a substantial impact on students' perceptions and acceptance of ICT use in their learning. Nonetheless, the results showed that no significant correlations exist between external variables (EV) and ICT actual system uses. Based on these findings, this study concluded that insights from the findings on students' the adoption and use of ICT in learning is affected by several perceptions, behavioural intention, and perceived ease of use of technology. Such insights provide policy makers with an indication of students' perceptions that should be considered when designing strategies and policies aimed at enhancing student's adoption and use of technology in learning in rural based South Africa University during and post COVID-19 pandemic.

Keywords: Technology Acceptance Model (TAM); Students' perception; Information and Communication Technology (ICT); Teaching and Learning

How to Cite: Mather, E., Matashu, M., & Meyer, J. (2022). Students' Perceptions of Factors Influencing the Adoption and Use of ICT in Learning during COVID-19 at One Rural Based South African University. *Jurnal Penelitian Dan Pengkajian Ilmu Pendidikan: E-Saintika*, 6(2), 61-76. <https://doi.org/10.36312/esaintika.v6i2.660>



<https://doi.org/10.36312/esaintika.v6i2.660>

Copyright© 2022, Mather et al
This is an open-access article under the CC-BY-SA License.



INTRODUCTION

Over the last few decades Information and Communication Technology (ICT) has played a significant important role in teaching and learning (Comi et al., 2017). Many countries have made significant investments in the integration and maintenance of ICT in teaching and learning (Comi et al., 2017). ICT has improved the efficiency of

teaching and learning environments, allowing students and lecturers to collaborate more effectively (Akpabio & Ogiriki, 2017; Latif et al., 2018). Although, ICT plays an important part in learning, students are able to access education materials online, informative software, and the World Wide Web (WWW), among other things, through e-learning (Van de Bunt-Kokhuis & Sultan, 2012). Kladi-Kokkinou (2011) asserts that the usage ICT alleviate educational deficiencies in emerging countries. Teaching and learning using ICT allows students to access teaching materials from anywhere around the world.

Bora and Teki (2013) administered a research study in Mumbai, the results indicated that Students' perceptions of ICT-enhanced course modules, the use of ICT in teaching and learning influenced several affective components, including students' general attitude toward their studies, both positive and negative. Additionally, students' perceptions of ICT usage in their education spilled over into their overall sense of learning. Instructor's skill in using ICT, as well as the usage of applicable ICT resources to provide hands-on activities for students, are essential variables in successfully adopting ICT in course modules. A study conducted in South Africa by Mdlongwa (2012) indicated that integrating ICT into educational programme will help students, indicating that this would empower students to gain relevant exposure to build skills and gain a competitive edge as technology evolves in the workplace. Moreover, incorporating ICT into the educational programmes allow students to become ICT innovators. Students that are encouraged to utilise ICT will be able to develop an ethos of autonomous learning, communiqué skills, teamwork, and research knowledge, all of which are important in society. In South Africa students entering university come from diverse background, including rural schools and townships. Research has shown that the utilisation of ICT in educational institutions increases students' learning capability, particularly when it is combined with access to information, thoughts, ideas, as well as students' articulation (Hennessy et al., 2010).

According to MacGregor (2008) practically all universities in South Africa have implemented some method of e-learning coursework that are offered in educational institutions. For students to survive their years at university where ICT systems have become the standard, a student should have some knowledge of computers (Bhero, 2012). All classroom procedures, including teaching communication, are moving to a digital format (Boulton, 2008). MacGregor (2008) indicated that e-learning is used by the University of South Africa (UNISA) to provide resources and to allow online engagement with their students. On the other hand, students in rural areas face obstacles such as poor ICT skills and poor network access and bandwidth due to a lack of resources (Bhero, 2012). Unfortunately, the usage of ICT in teaching and learning has reap benefits to an advantage few in urban communities, whereas students from rural communities are denied access to quality education (Mlitwa & Nonyane, 2008). As a result, Mlitwa and Koranteng (2013) warn that the poor's ineptitude to access these resources binds them to deprivation and ignorance. According to Czerniewicz et al. (2006) the potential use of ICTs to disquisition teaching and learning needs in South Africa is demanding to substantiate. There are many different types of discrepancies that countries face, and South Africa is no exception. Many of the students in South Africa who come from disadvantaged households come from rural areas, where they are faced with lack of basic necessities. Students have been hampered by additional limits and the inability to access resources since the beginning of the pandemic.

Students' behaviour and perceptions of ICT in their learning are both influenced by ICT. Students who learn how to use this cutting-edge technology will have a huge advantage in their professions and education. However, fear and lack of confidence result from a lack of early exposure to ICT in teaching and learning. In a multilingual setting, these challenges breed unpreparedness for students (Makura, 2014). Moreover, some primary consumers, such as students, feel anxious about the use of ICT, but it has also been claimed that ICT is a convenient method in confronting ongoing teaching and learning difficulties. As previously stated, the factors that students encounter in rural locations places them at a drawback when entering universities when equated to their peers from urban areas. ICT should be introduced to students in rural areas at an early age, as this will increase their self-esteem and confidence. (Khan et al., 2021) proposed that students' perceptions of incorporating ICT adoption into teaching and learning during a pandemic at a higher educational level be investigated. This will aid in determining what the students perceive to be significant practices and what they consider to be significant in their learning, resulting in good performance.

Traditional methods of teaching and learning have unquestionably weathered the test of time. According to research, classes have been transcribed around textbooks for decades (Das, 2019). Lectures and presentations have been paired with tutorials, rehearsing of knowledge and consolidation of material by lecturers. However, curriculum that encourage total performance and competency are becoming more popular in modern contexts, particularly during the pandemics. In recent years, the use of ICT has increased dramatically. This study looks at several factors such as internal and external factors that could hinder students entering universities. Internal factors include the availability of computers/laptops for students, proper ICT equipment training for students, and how lecturers interact with ICT in classrooms or online lectures, as well as how they communicate with students. Prior ICT experiences and exposure, as well as the readiness and access to infrastructure in remote communities, such as internet connection and electricity, are considered as external factors that affect students entering universities to advance their academic careers. Since the first lockout, students have had to rely on limited resources, prompting management to step in and help with some of the resources they could supply.

Although it is debatable if the decision to utilise ICT is a remedy for educational shortcoming for educational restructuring; nonetheless, it may be considered as a tool for directing learning and improving higher education quality (Makoe & Nsamba, 2019). An understanding of how students perceive their own needs is critical for placing the student at the centre of ICT use and achieving the intended goals in education. Das (2019) mutes that traditional teaching and learning methods are challenging, and to simplify it, ICT has revolutionized traditional teaching and learning techniques; the author suggests that the entire academic system be reformed. The Technology Acceptance Model (TAM), which was established by Davis (1989) provides a way to examine external factors on attitude, behavioural intentions to use and inner beliefs about technology. The TAM model is a framework that describes a way to tackle challenges with technology system adoption (Obinkyereh, 2017). TAM was utilized to discover and define perceived ease of use (PEOU) and perceived usefulness (PU) in relation to an individual notion or intention to utilise technology systems (Dawson, 2015). The TAM explains PEOU and PU as a

determinant of an individual's behavioural intention of utilising ICT in teaching and learning (Macharia & Nyakwende, 2010). Although TAM explain the actual usage, it can also be used to elucidate to explain the usage, acceptance and or rejecting of ICT by individuals, such as students for learning (Jung et al., 2008).

The TAM can help us comprehend the usage of ICT and students' adoption behaviour by considering the principles that underpin interactions. Hayashi et al (2020) explain that PU influence user's perception about the benefit of technology in terms of increasing process performance (i.e., completing task quicker or present timely information). Personal attitude to use and a behavioural intention to utilize are two more constructs in TAM (Hayashi et al., 2020). According to the authors, attitude to use refers to a consumer's evaluation of the usefulness of a certain information system. PEOU variable has been widely used in the study of educational settings and technology adoption (Huang et al., 2020). A study done in a university in Taiwan indicated that the use of PEOU has a considerable influence on students' attitudes and the use of ICT in English learning (Huang et al., 2012). PEOU has a strong correlation with students' attitudes for utilising an online learning platform in Brazil (Moreno et al., 2017). External variables such as prior computer experience, ICT training and infrastructure are used as predictive variables in this study to determine students' perceptions of ICT. Other researchers have classified these factors as external variables in the TAM model (Tagoe, 2012). This study considers prior experience as an important variable in implementing ICT in students' learning. Age and gender can influence prior technical abilities or computer skills, as well as the behavioural intention to utilize ICT (Pituch & Lee, 2006). Students, for example, will utilise ICT systems if they discern it would improve their all-inclusive performance (Saade et al., 2007).

The central gap that arises from the foregoing discussion that this study seeks to fill in literature is: What are the students' perceptions of factors influencing the adoption and use of ICT in learning during COVID-19 at one rural based South African University. Understanding of the factors affecting students' perception of the usage of ICT in higher learning institution is necessary for fostering a positive perception about the benefits of the use of ICT in student learning during and post the pandemic. The forced shift to online learning took place against a background where the use of educational technologies was not only its nascent stage but at time when research on student's perceptions of the use of ICT in their learning in rural based contexts was limited if none existent. Khan et al. (2021) further found that although students that are enrolled with online courses are satisfied with the means for learning there are perceptions that impede student's acceptance and use of ICT in their learning. By this cause, traditional means for teaching and learning has been affected, such as one-on-one interaction with students and lecturers. Khan et al. (2021) found that factors such as age, gender, prior computer experience, individual learning styles are vital predictors for technology acceptance by students.

This study aims was to investigate students' perceptions of factors influencing the adoption and use of ICT in learning during COVID-19 at one rural based South African University. Khan et al. (2021) elucidates that the disruptions of traditional learning methods due to the pandemic has compelled universities to adapt to online learning. Literature review show that the unprecedented demand to use ICT in learning during the pandemic prevailed against a background where there is a surging quest to understand students' perception and their expectation towards ICT

in teaching and learning (Biswas et al., 2020; Pérez-Pérez et al., 2020; Shrestha et al., 2019). Khan et al. (2021) observed that the contagious nature of COVID-19 demanded isolation and containment, affecting personal interaction between students and lecturers tremendously. Ankamah et al. (2018, p. 2) postulated that students' perception and their attitudes towards technology influence their adoption of ICT in their learning at higher academic institutions. Empirical evidence reveal that students' perception are affected by numerous factors (Pérez-Pérez et al., 2020; Shrestha et al., 2019). The TAM proposed by Davis (1989) was used to determine factors that influence students' perceptions and their use of ICT in learning. Davis et al. (1989) is of the view that further research should be conducted to identify other necessary components to extend the TAM model. Various studies have used the TAM to forecast individual adoption of ICT systems. The researchers believe that, the TAM model was suitable for this study since it looked at students' perception of factors influencing the adoption and use of ICT in learning at a context of one rural area based South Africa University.

METHOD

Research design

Research design is considered as the architectural blueprint, which connects all processes to ensure that the method is supported with the necessary rigor, fostering definitive conclusions and preferred recommendations (Bickman & Rog, 2008). This study followed a research design as narrated by (Saunders et al., 2007). According to Saunders et al. (2012) when using a research onion, one should begin at the outer layer and work their way inward. Every layer of the onion describes a particular degree of the research process when viewed from the outside. This study employed a research onion technique to collect data from potential participants, using a quantitative positivism paradigm approach and a census survey strategy.

Participants

This research was carried out at one rural based South African university. The selected site is considered to be a semi-rural town, most of the students who attend this institution come from disadvantage backgrounds. The Faculty of Economic and Management Sciences (FEMS) is the largest of the university's eight faculties. The FEMS faculty was of a size that allowed it to adequately represent the entire population. The study was ethically cleared and approved by the necessary stakeholders. Data on the total number of first-year students on campus was provided by the faculty. There were 1190 first-year students enrolled in total. The target sample size was 291 people.

Research Instrument

A descriptive survey strategy was used to collect data. The survey was administered on an online platform that students and lecturers use for communication, and to distribute teaching material. The questionnaire was centred on students' perception of ICT in their learning, internal and external factors that they are faced with. The survey design had two sections, A and B. The first section was centred on the demographic, self-awareness, and if student had any exposure or experience using a computer/laptop, and if they received any training to use ICT as a first-year student. The second section design was four-point Likert scale, the information presented was examined to address the objective of this study. The

information collected was analysed using the Statistical Product and Service Solutions (SPSS) model 26. The survey instrument validity and reliability were analysed by a professor that has a Ph.D. in statistics.

Data Collected and Analysis

The data that was collected confirmed that 388 participants started the online survey, 152 dropout and only 236 of the participants completed. The response rate of 60.8% was calculated using the sample size of 388 and the 236 responders. Given the quantity of variables in the data, it was confirmed necessary to examine whether the sample was appropriate because the researcher selected to employ 60.8% of the research data. The results were confirmed using the Kaizer Meyer Oklin (KMO) test of sample adequacy to determine the sample's adequacy. KMO was 0.876, which is greater than 0.7, was found for this study, thus concluded that the observations are adequate, given the set of variables that were used.

RESULTS AND DISCUSSION

Results – Section A

Table 1 of the survey. The demographic question in the survey allows the researcher to learn about the characteristics of their respondents for instance in terms of gender, age, level of education, ICT experience, etc.). The demographic data collected save the purposes of only giving context survey data collected, allowing researchers a better analysis data.

Table 1. The demographic attributes of the participants

		Frequency	Percentage (%)
1. Gender	Male	107	45.3
	Female	129	54.7
	Total	236	100.0
2. Age Group	18 – 24 years	210	89.4
	25 – 34 years	23	9.8
	35 – 44 years	1	0.4
	45 years and above	1	0.4
	Total	235	100.0
3. Highest Qualification	Diploma	41	17.4
	Certificate	13	5.5
	Degree	178	75.4
	Honours	1	0.4
	Masters	2	0.8
	PhD	1	0.4
	Total	236	100.0
4. Self-awareness level about ICT	Very high	26	11.0
	High	107	45.3
	Not aware	60	25.4
	Low	11	4.7
	Very low	32	13.6
	Total	236	100.0
5. Owns a device (PC or laptop)	Yes	150	63.6
	No	86	36.4

		Frequency	Percentage (%)
	Total	236	100.0
6. Has prior experience of using computers or laptops before enrolment at the university	Yes	152	64.4
	No	84	35.6
	Total	236	100.0
7. Received training on how to use ICT as a means for learning	Yes	80	33.9
	No	156	66.1
	Total	236	100.0
8. Rating of one's confidence in using ICT	Very high	31	13.1
	High	53	22.5
	Not aware	121	51.3
	Low	28	11.9
	Very low	3	1.3
	Total	236	100.0

In the Table 1, contains the demographic attributes of the participants. It comprises of eight questions, i.e., gender, age, qualifications, self-awareness about ICT, owning a device, prior experience, received any training and rating their confidence. Gender (45.3% = males and 54.7% = females). Age group (89.4% = age group 18-24 years, 9.8% = ages 25-34, 0.4% = age 35-44, 0.4% = 45 and above). Highest quality (5.5% = certificates, 17.4% = diploma, 75.4% = degree, 0.4% = honours, 0.8% = masters, 0.4% = PhD). Self-awareness level (11% = Very high, 45.3% = High, 25.4% = Not aware, 4.7% = Low, 13.6% = Very low). Own a device (63.6% = Yes, 36.4% = No). Prior experience (64.4% = Yes, 35.6% = No). Received any training (33.9% = Yes, 66.1% = No). Confidence Level (13.1% = Very high, 22.5% = High, 51.3% = Not aware, 11.9% = Low, 1.3% = Very low).

The sample indicates that most of the respondents were females 54.7% which provided a balance response rate from the participants. Most of the age group 89.4% were between the ages of 18-24 years. The results shows that 75.4% of the participants have degrees and are educated. Most of the respondents had a degree followed by 17.4 that have diplomas in the faculty followed by a few of the respondents that were highly educated. The respondents were indicated to rate their self-awareness of using ICT, 45.3% rated their self-awareness as high, following 11% of the participant rated their self-awareness as very high. Most of the participant are self-aware on how to use ICT systems. 63.6% of the participant have their own devices and 36.4% do not have any device which is no small percentage. 64.4% of the participant rate that they have prior experience using ICT systems such as a computer or laptop. However, 35.6% do not have any prior experience which indicates a concern. Furthermore, 66.1% of the respondents have not received any training, 33.9% indicated that they have received training. Lastly, most of the participants rated their confidence level on ICT, 51% indicated that they were not aware, 22.5% which is moderately high to 13.1% indicating very high.

Section B

Figure 1 demonstrates that most participants agreed to strongly agree on all the measures of attitude toward use (U) with SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree. The usage of ICT influences students to become more autonomous in learning, according to the first statement (46% = A; 45% = SA), however, 9% of those polled disagreed with this statement. The next statement indicates that most participants agreed that the use of ICT helps in understanding more easily what was taught in classrooms (22% = SA; 60% = A; 14% = D; 4% = SD). The results as follows, most of the participants believe that using ICT helps them recall what they have learned (12% = SA; 61% = A; 21% = D; 16% = SD). When asked if they believe that using ICT in the classroom helps them concentrate better on their studies (9% = SA; 58% = A; 26% = D; 7% = SD). In the following statement, participants were asked to rate whether ICT in teaching and learning methods were more effective than traditional classroom teaching methods (21% = SA; 39% = A; 30% = D; 10% = SD). The following proposition indicates that most of the participants agreed that ICT may increase educational quality (42% = SA; 43% = A; 11% = D; 4% = SD). Participants agree that ICT has a substantial impact on end-user performance (22% = SA; 63% = A; 11% = D; 3% = SD). Accepting this assertion, with 86 percent believing that and 87 percent believing that ICT enhance their learning experience. ICT also helps their learning and performance, according to 87 percent of the respondents. ICT aid in learning and improves my schooling (30% = SA; 57% = A; 9% = D; 4% = SD). Lastly, ICT improve learning and performance (28% = SA; 59% = A; 8% = D; 5% = SD).

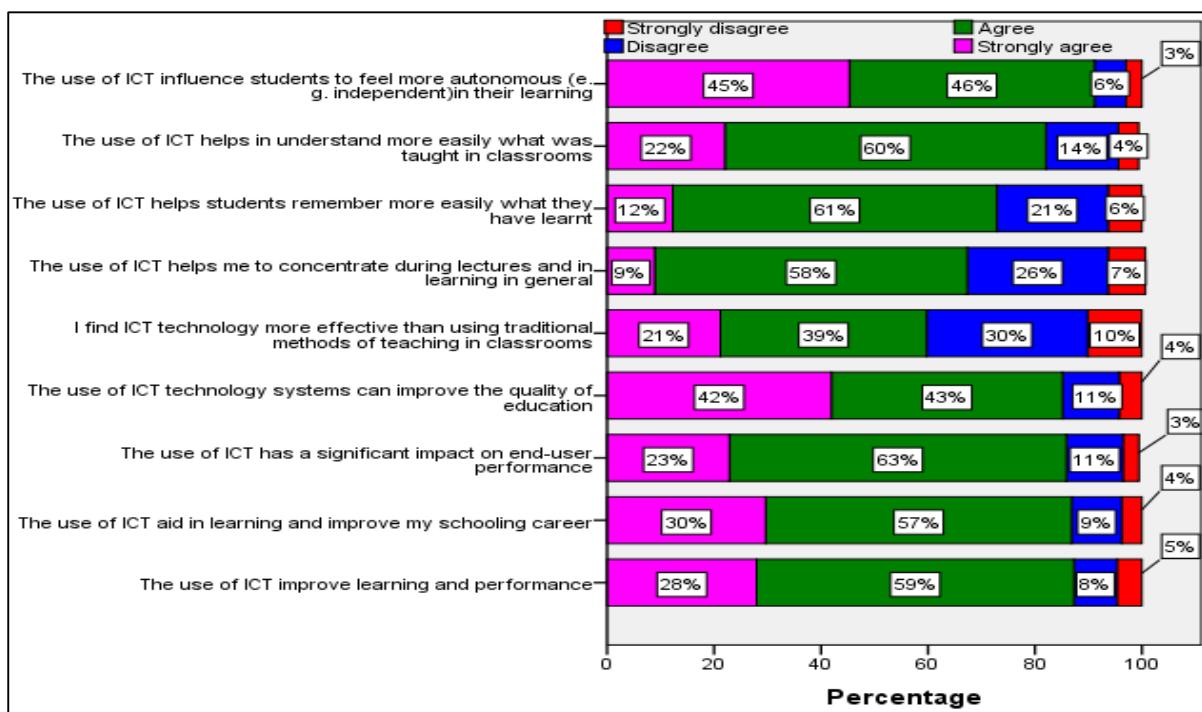


Figure 1. Measuring attitude towards use (U)

Figure 2 demonstrates that the participants agreed on all measures of external variables (EV). To use ICT, there is mandatory infrastructure in place (7% = SA; 52% = A; 30% = D; 11% = SD). Electricity is steady in our area to use ICT equipment (9% = SA; 35% = A; 31% = D; 25% = SD). Most students agreed that on the stability and availability of internet connection (33% = SA; 48% = A; 13% = D; 6% = SD). Most participant indicated that the implementation ICT model are implement effortlessly

(11% = SA; 59% = A; 23% = D; 7% = SD). Having prior experience in computer (47% = SA; 45% = A; 5% = D; 3% = SD). Lastly, exposure and training to boost confidence (36% = SA; 53% = A; 8% = D; 3% = SD).

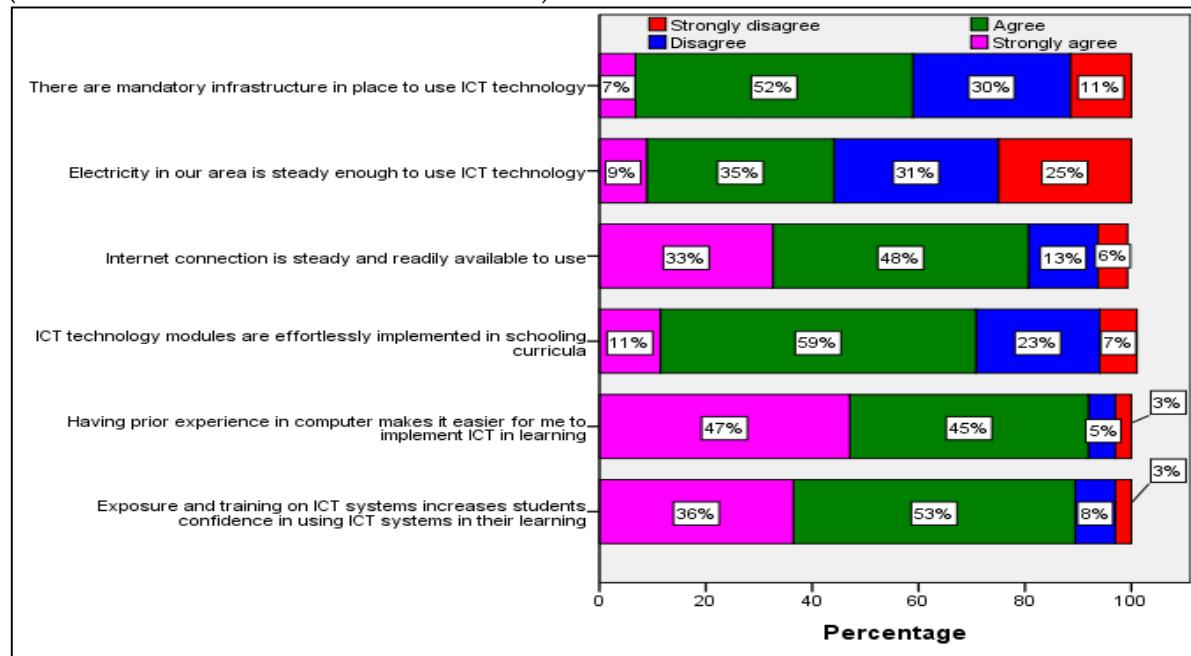


Figure 2. Measuring external variables (EV)

Figure 1-3 illustrates that the respondents agreed on all the perceived usefulness (PU) criteria. The data show that when compared to traditional teaching and learning techniques, most respondents favour ICT tools such as e-learning (26% = SA; 34% = A; 27% = D; 13% = SD). Most participants agree that to the possibility without ICT their studies would have been challenging (32% = SA; 49% = A; 15% = D; 4% = SD). This is in line with most respondents, who stated that usage of ICT technology systems fits their requirements and expectations as university students (25% = SA; 55% = A; 16% = D; 4% = SD). The next statement, most participants indicated that ICT increases productivity (31% = SA; 50% = A; 14% = D; 5% = SD). Lastly, most participants believe that they can accomplish task quicker (30% = SA; 55% = A; 10% = D; 5% = SD).

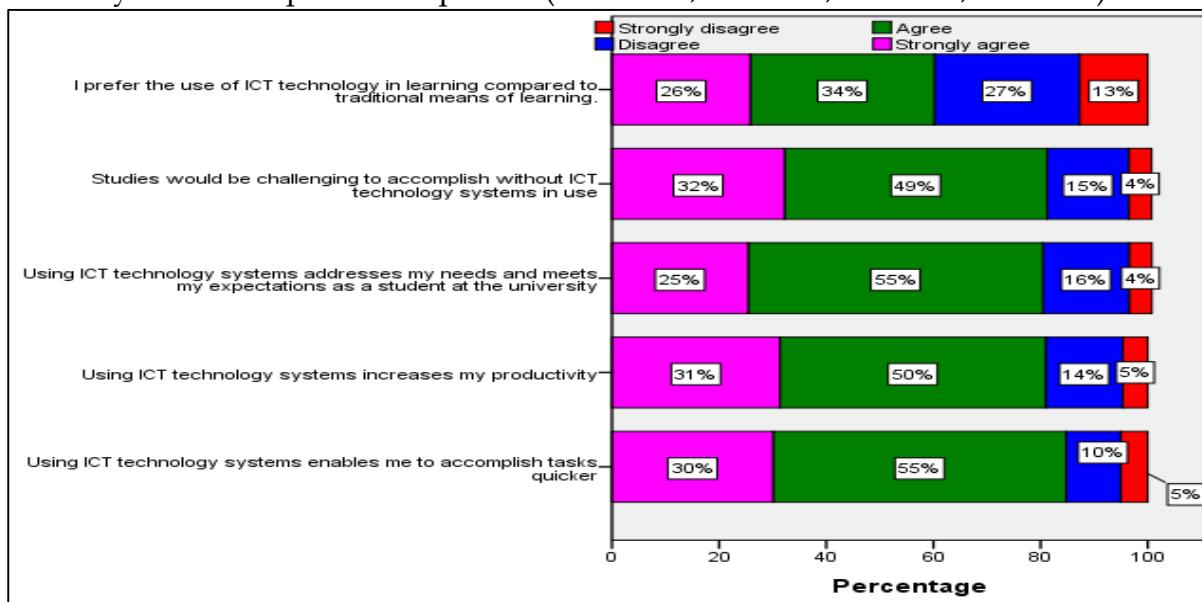


Figure 3. Measuring perceived usefulness (PU)

Figure 4 demonstrates that the respondents agreed on all parameters of perceived ease of use (PEOU). In the first proposition, required participant to indicate if they find it difficult to use ICT systems in classrooms (10% = SA; 29% = A; 50% = D; 11% = SD). The next proposition, do they ask for assistance when using ICT systems (22% = SA; 43% = A; 29% = D; 6% = SD). Most participant agreed that they found it easy to understand when using ICT systems (24% = SA; 46% = A; 25% = D; 5% = SD). Furthermore, do they find content clear and understandable when using ICT systems (22% = SA; 50% = A; 22% = D; 6% = SD). Lastly, do they find the usage of ICT systems as making their learning easier (22% = SA; 46% = A; 25% = D; 7% = SD).

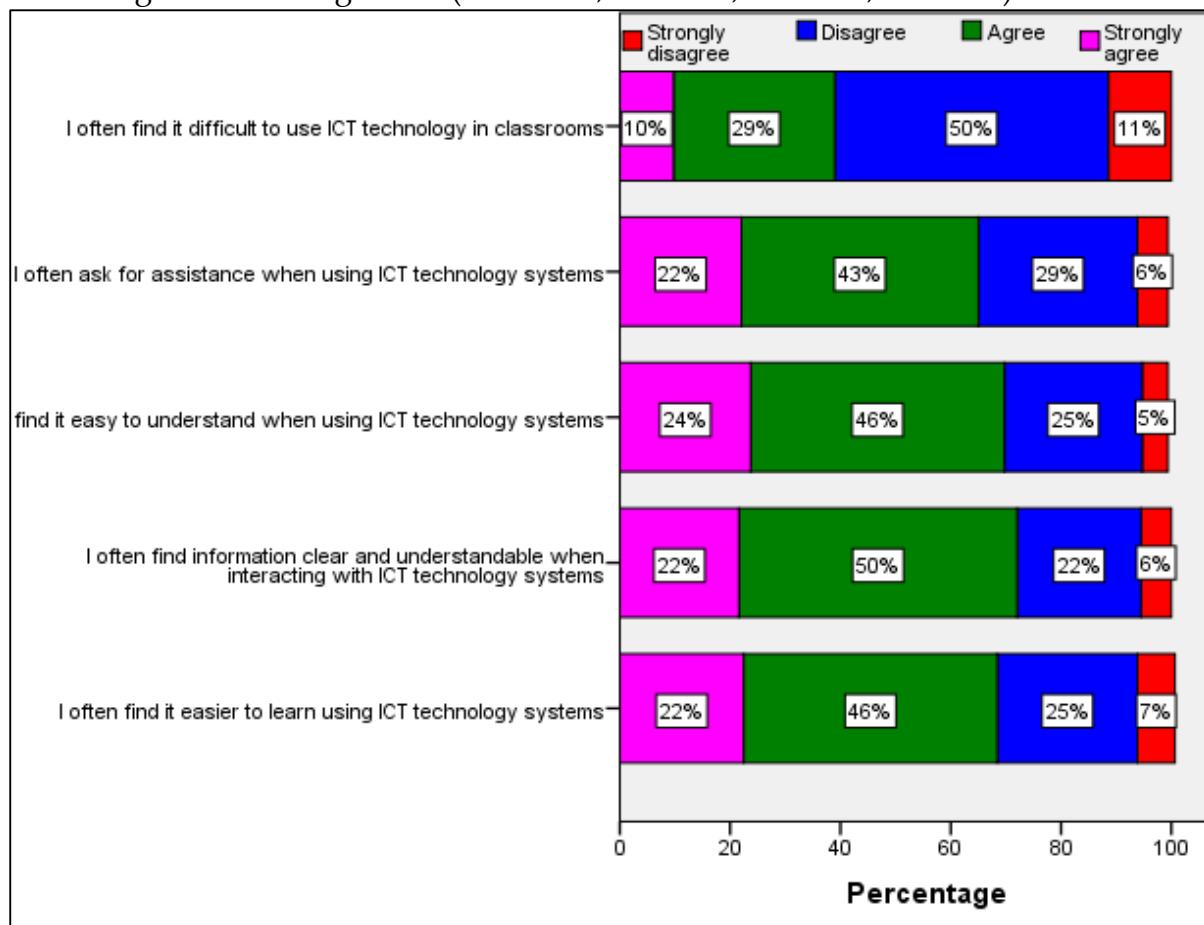


Figure 4. Measuring perceived ease of use (PEOU)

Figure 1-5 demonstrates that the participants agreed on all the behavioural intension (BI). The results demonstrate that a large percentage of respondents prefer blended learning for teaching and learning (36% = SA; 40% = A; 19% = D; 5% = SD). The findings demonstrate that most respondents use ICT to complete their assignments and tasks (40% = SA; 49% = A; 10% = D; 1% = SD). Most participants agreed that use ICT evaluate, arrange and how information is used (27% = SA; 62% = A; 9% = D; 2% = SD). The use of ICT systems in the classroom to work on information processing (34% = SA; 51% = A; 12% = D; 3% = SD). Finally, most respondents agreed with the assertion, I frequently use ICT in the learning process as a vital competence (15% = SA; 64% = A; 19% = D; 2% = SD).

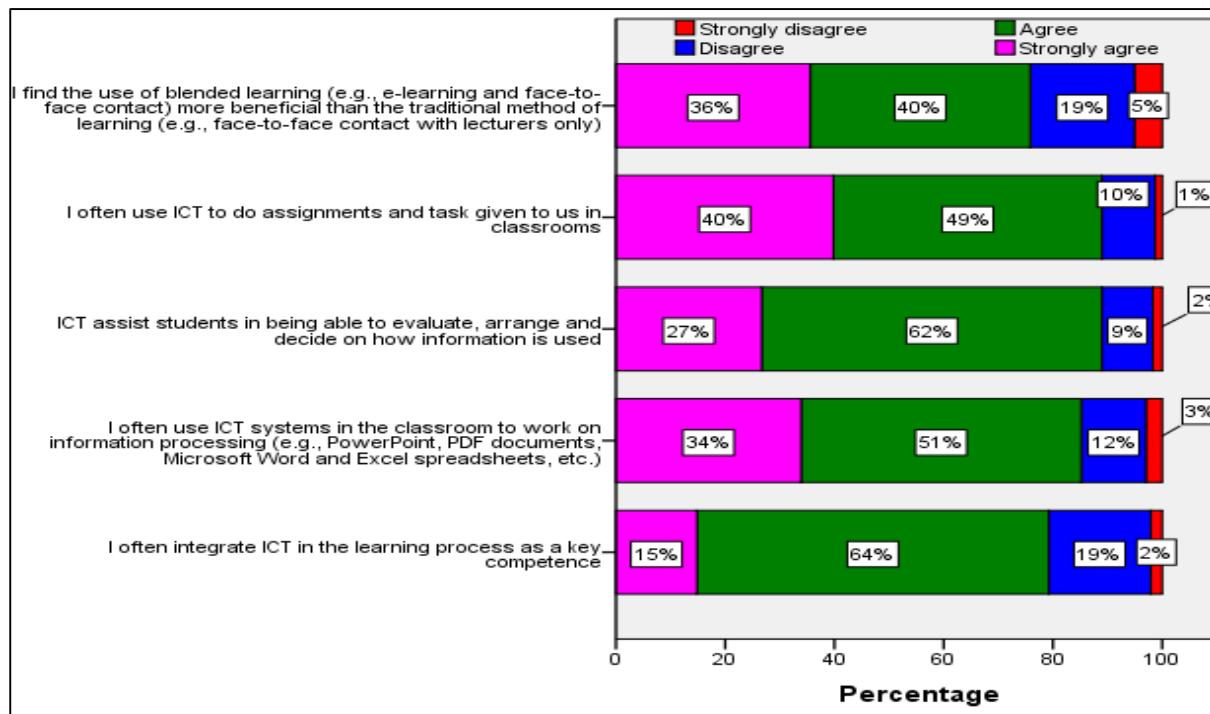


Figure 5. Measuring behavioural intention (BI)

Figure 1-6 demonstrates that the most participants agreed on all metrics of ICT actual system us. The results of monitoring actual ICT system use revealed that most students are enthusiastic about utilizing ICT, whether in the classroom, on campus, or at home. This proposition was supported by (46% = SA; 44% = A; 9% = D; 1% = SD). Most participant also expressed an interest in using ICT to communicate with instructors and students, (47% = SA; 44% = A; 8% = D; 1% = SD). Most participants agreed that knowing how to use ICT technology in their studies is important to them (47% = SA; 49% = A; 4% = D). Overall, the findings reveal that, the majority of the respondents were keen on learning to use ICT technology in their studies (37% = SA; 48% = A; 12% = D; 3% = SD). Overall, the findings demonstrate that students are enthusiastic about using ICT.

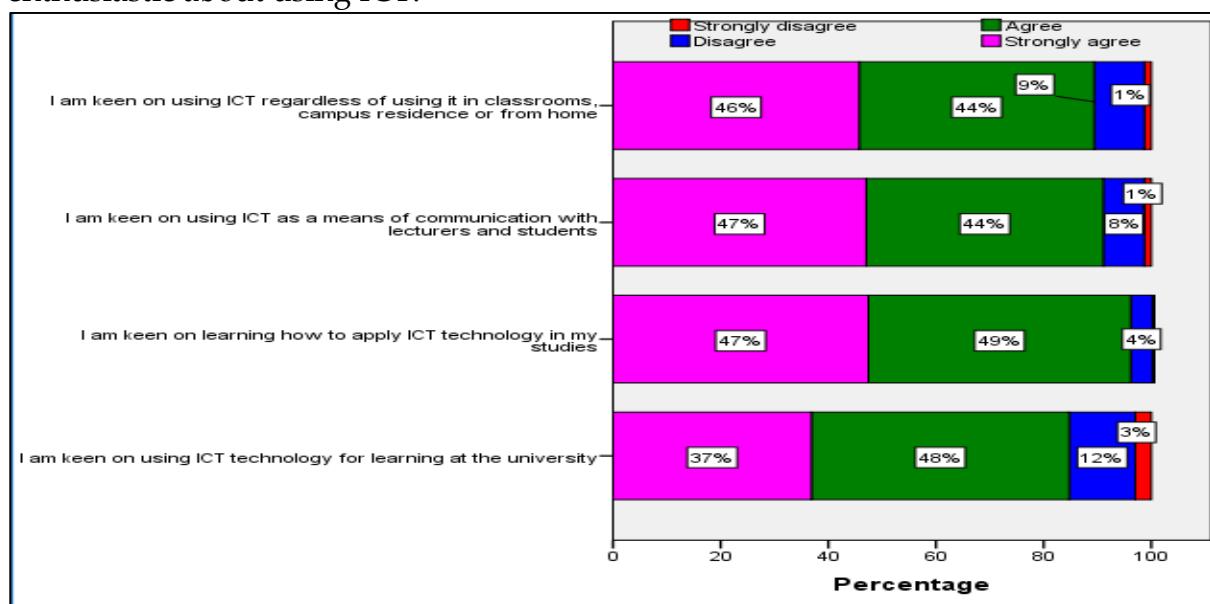


Figure 6. Measuring ICT actual system use

Discussion

The findings of the data analysis include students' perceptions, use of ICT in the classroom, and their competencies as higher education technology users. The findings revealed a correlation between attitudes toward use (U) and actual ICT system use. This study builds upon Mdlongwa (2012) advocacy for research on ICT that focuses on the South African context as critical for enabling student to develop skills and gain a competitive edge on the use of technology. Incorporating ICT into the educational curriculum also encourages students to become innovators in the field. Students who are encouraged to use ICT create a culture of learning independently, communication skills, teamwork, and research experiences, which are all crucial.

The study investigated the external factors (EV). According to Bhero (2012) students residing in remote areas encounter challenges such as a shortage of resources, a lack of ICT skills, a lack of ICT infrastructure, and a poor bandwidth connectivity. The finding affirmed that certain students face challenges such as inadequate ICT infrastructure and access to electricity.

Turning to the perceived usefulness (PU) of ICT in their learning. According to the findings, there is a correlation between perceived usefulness (PU) and ICT actual system use. The findings support Davis (1989) findings, the author was of the view that PU is a major determinant of an individual's willingness to adapt ICT technology systems. It follows therefore that, if a user believes that about the valueness of ICT, affect their attitude toward utilizing it. However, some respondents hold opposing viewpoints, so this may need to be improved.

With regards the. According to the findings, there is a correlation between perceived ease of use (PEOU) of ICT in education actual system use. The findings support Davis (1989) findings, according to which PEOU is a strong indicator of an individual's willingness to adopt ICT technology systems. The study also found that, PEOU assesses an individual's idea that something may be used without exerting effort. According to the findings, some pupils have difficulty using ICT systems and require support. According to the findings, some students have difficulty using ICT systems and require support. Huang et al., 2020) observed that students struggle in their studies when they must complete several tasks and assignments as part of their learning in a variety of areas. It is acceptable to expect that if students perceive ICT technology to be a simple task to use, they will be influenced to use it in their learning.

Lastly, possible strategies for influencing students' perceptions of the role of ICT in student learning, as measures of behavioural intension (BI) were also investigated. The finding shows that there is a correlation between BI and ICT actual system use. The study's major finding is that blended learning strategies significantly influence students' perceptions and behavioural intentions to use ICT in their learning. (Sharpe et al., 2006) indicated that Students took part in a blended learning study, and the results suggest that they were overwhelmingly pleased about this method of teaching and learning. However, some respondents prefer traditional teaching and learning techniques. This group of students' value conventional face-to-face contact teaching, even though it is necessary for them to recognize the importance of ICT in classroom settings.

Limitation

This study is not without limitations. The study examined factors that influence students' perceptions of factors influencing the adoption and use of ICT in learning during COVID-19 at one rural based South African University. Due to limited time

only first-year students in one selected largest faculty were counted in this study, though it would have been interesting to hear the perceptions of the more senior students. This is because unlike first years, second, third and fourth year have stayed in the university for longer time perhaps their perceptions on the ICT has significantly changed. Because of the study's limitations, future may consider broadening the scope of the study to include other faculties, students beyond first year and other universities. This study was designed to examine students' perceptions of ICT and how it affects their learning; however, the researchers was unable to control some aspects of the study.

Future Research

Future research may apply mixed research techniques to extend the findings of this quantitative study. A mixed-method approach, which includes both qualitative and quantitative research, will be more advantageous for expanding on the subject. This will combine the strengths of both study approaches; this may broaden and deepen our understanding of students' perceptions of the use of ICT in their learning.

CONCLUSION

The study was centred on investigate students' perceptions of factors influencing the adoption and use of ICT in learning during COVID-19 at one rural based South African University and this was prompted by the observed lack context specific studies that focus on this phenomenon. Based on the literature, it was determined that academics in South African higher educational institutions have conducted few research on students' perceptions of ICT in their learning. It was also discovered in literature that ICT can be used to improve educational quality by strategically employing many levels of training. Students believe that using ICT in their learning has several benefits such as improving their performance, improve critical learning in higher education. The study also concluded that, the perception of the students on the role of ICT in their learning, which is measured by external variables (EV) is influenced the challenges they face such as mandatory ICT infrastructure and electrical connection challenges. Prior experience, exposure, and training are all elements that greatly influence students' perceptions of using ICT in their learning, according to the students. The findings leads to the conclusion that there is a correlation between perceived usefulness (PU) of ICT in learning and a positive increase in ICT actual system use based on an analysis of perceived usefulness (PU) of ICT in learning. It was also observed that a user considers that something is valuable, such as ICT, this will alter their attitude toward utilizing ICT. Finally, based on the findings of the perceived ease of use (PEOU) of ICT in learning, the conclusion was reached that there is a correlation between PEOU and a rise in ICT actual system use. Overall, it is acceptable to expect that if students perceive ICT technology to be a simple task to use, they will be influenced to use it in their learning.

RECOMMENDATION

Without a thorough grasp of the factors that influence students' perception to accept and use ICT in their learning, the successful deployment of ICT in higher education may be hampered. It is recommended that providing students with the opportunity to make use of ICT it may have the potential to influence their perception and attitude about its use. To address these issues, the government and all key stakeholders will need to work together to launch awareness campaigns and better

assist rural development ICT resources. However, some respondents hold opposing viewpoints, so this may need to be improved. The findings indicate that some kids are having difficulties. Finally, factors adversely influencing first year students' perception about ICT have been identified and policy makers may focus of addressing these in bid to enhance the acceptance of educational technology in learning.

ACKNOWLEDGEMENT

The researcher would like to acknowledge the participant for taking the time to complete the online survey. There was no grant received for this research from any funding source in the public, private, or non-profit sectors.

DECLARATION OF INTEREST

There are no conflicts of interest declared by the authors.

REFERENCES

Akpabio, E., & Ogiriki, I. B. (2017). Teachers use of information and communication technology (ICT) in teaching English language in senior secondary schools in Akwa Ibom state. *Equatorial Journal of Education and Curriculum Studies*, 2(2), 28-23.

Ankamah, S., Akussah, H., & Adams, M. (2018). Postgraduate Students' perception Towards the Use of ICT in Research in Ghanaian Public Universities.

Bhero, S. (2012). *Barriers to information and communication technology use* University of Johannesburg].

Bickman, L., & Rog, D. J. (2008). *The SAGE handbook of applied social research methods*. Sage publications.

Biswas, B., Roy, S. K., & Roy, F. (2020). Students Perception of Mobile Learning during COVID-19 in Bangladesh: University Student Perspective.

Bora, S. P., & Teki, S. (2013). Students' Perception on Use of ICT in Higher Education with Reference to North Coastal Districts of Andhra Pradesh. *International Journal of Academic Research in Economics and Management Sciences*, 2(5), 156.

Boulton, H. (2008). Managing e-Learning: What Are the Real Implications for Schools? *Electronic Journal of E-learning*, 6(1), 11-18.

Comi, S. L., Argentin, G., Gui, M., Origo, F., & Pagani, L. (2017). Is it the way they use it? Teachers, ICT and student achievement. *Economics of Education Review*, 56, 24-39.

Czerniewicz, L., Ravjee, N., & Mlitwa, N. (2006). ICTs and the South African higher education landscape.

Das, K. (2019). The Role and Impact of ICT in Improving the Quality of Education: An Overview. *International Journal of Innovative Studies in Sociology and Humanities*, 4(6), 97-103.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science*, 35(8), 982-1003.

Dawson, H. G. (2015). *Clearing the clouds: Factors of technology adoption and their relationship to cloud computing adoption in United States higher education-An extended TAM study* Capella University].

Hayashi, A., Chen, C., Ryan, T., & Wu, J. (2020). The role of social presence and moderating role of computer self efficacy in predicting the continuance usage of e-learning systems. *Journal of Information Systems Education*, 15(2), 5.

Hennessy, S., Onguko, B., Harrison, D., Ang'ondi, E. K., Namalefe, S., Naseem, A., & Wamakote, L. (2010). Developing the use of information and communication technology to enhance teaching and learning in East African schools: Review of the literature. *Centre for Commonwealth Education & Aga Khan University Institute for Educational Development-Eastern Africa Research Report*, 1.

Huang, F., Teo, T., & Scherer, R. (2020). Investigating the antecedents of university students' perceived ease of using the Internet for learning. *Interactive Learning Environments*, 1-17.

Huang, Y.-M., Huang, Y.-M., Huang, S.-H., & Lin, Y.-T. (2012). A ubiquitous English vocabulary learning system: Evidence of active/passive attitudes vs. usefulness/ease-of-use. *Computers & Education*, 58(1), 273-282.

Jung, M.-L. L., Loria, K., & Saha, R. M. P. (2008). E-Learning: Investigating University Student s Acceptance of Technology. *European Journal of Open, Distance and e-learning*, 11(2).

Khan, M. A., Nabi, M. K., Khojah, M., & Tahir, M. (2021). Students' Perception towards E-Learning during COVID-19 Pandemic in India: An Empirical Study. *Sustainability*, 13(1), 57.

Kladi-Kokkinou, M. (2011). Information and Communication Technologies (ICT) in education. Factors which contribute to a sustainable use of ICT in education. *6th ICODL 2011*,

Latif, Z., Latif, S., Ximei, L., Pathan, Z. H., Salam, S., & Jianqiu, Z. (2018). The dynamics of ICT, foreign direct investment, globalization and economic growth: Panel estimation robust to heterogeneity and cross-sectional dependence. *Telematics and informatics*, 35(2), 318-328.

MacGregor, K. (2008). South Africa: Universities not far behind the curve. *University World News*, 10.

Macharia, J., & Nyakwende, E. (2010). Influence of university factors on the students' acceptance of internet based learning tools in higher education.

Makoe, M., & Nsamba, A. (2019). The gap between student perceptions and expectations of quality support services at the University of South Africa. *American Journal of Distance Education*, 33(2), 132-141.

Makura, A. H. (2014). Students' perceptions of the use of ICT in a higher education teaching and learning context: The case of a South African University. *Mediterranean Journal of Social Sciences*, 5(11), 43.

Mdlongwa, T. (2012). Information and communication technology (ICT) as a means of enhancing education in schools in South Africa. *Policy Brief, Africa Institute of South Africa*.

Mlitwa, N. B., & Nonyane, J. N. (2008). The status of ICT access and use in South African schools: comparing the rural and urban schools in the Mpumalanga Province. *Retrieved January, 12, 2011*.

Mlitwa, N. W., & Koranteng, K. (2013). Integration of ICT into curricula in Western Cape schools: The activity theory perspective. *The Journal of Community Informatics*, 9(4), 7-8.

Moreno, V., Cavazotte, F., & Alves, I. (2017). Explaining university students' effective use of e-learning platforms. *British Journal of Educational Technology*, 48(4), 995-1009.

Obinkyereh, W. T. (2017). *Cloud computing adoption in Ghana: A quantitative study based on technology acceptance model (TAM)* Colorado Technical University].

Pérez-Pérez, M., Serrano-Bedia, A. M., & García-Piqueres, G. (2020). An analysis of factors affecting students perceptions of learning outcomes with Moodle. *Journal of Further and Higher Education*, 44(8), 1114-1129.

Pituch, K. A., & Lee, Y.-k. (2006). The influence of system characteristics on e-learning use. *Computers & Education*, 47(2), 222-244.

Saade, R., Nebebe, F., & Tan, W. (2007). Viability of the" technology acceptance model" in multimedia learning environments: a comparative study. *Interdisciplinary Journal of E-Learning and Learning Objects*, 3(1), 175-184.

Saunders, M., Lewis, P., & Thornhill, A. (2007). Research methods. *Business Students 4th edition Pearson Education Limited, England*.

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research philosophy in the 'research onion'. In: Pearson Education Limited.

Sharpe, R., Benfield, G., Roberts, G., & Francis, R. (2006). The undergraduate experience of blended e-learning: a review of UK literature and practice. *The higher education academy*, 1-103.

Shrestha, E., Mehta, R. S., Mandal, G., Chaudhary, K., & Pradhan, N. (2019). Perception of the learning environment among the students in a nursing college in Eastern Nepal. *BMC medical education*, 19(1), 1-7.

Tagoe, M. (2012). Students' perceptions on incorporating e-learning into teaching and learning at the University of Ghana. *International Journal of Education and Development using ICT*, 8(1), 91-103.

Van de Bunt-Kokhuis, S., & Sultan, N. (2012). Servant-Leadership: The Online Way! E-Learning Where Community Building Is Key. *European Journal of Open, Distance and e-learning*.