THE PERCEIVED USEFULNESS OF MOBILE PHONE TECHNOLOGY FOR LEARNING BY DISTANCE EDUCATION STUDENTS AT THE UNIVERSITY OF ESWATINI

by

COSMAS MAPHOSA

Dissertation submitted in accordance with the requirements

for the degree of

MASTER OF EDUCATION

in the subject of

OPEN AND DISTANCE LEARNING

in the

COLLEGE OF EDUCATION

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROF G. VAN DEN BERG
CO-SUPERVISOR: DR. P. K MUDAU

JUNE 2021

DECLARATION

Name: Cosmas Maphosa

Student number: 10453083

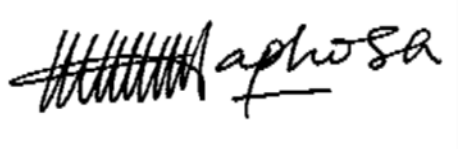
Degree: Master of Education in Open and Distance Learning

Title of the Study: THE PERCEIVED USEFULNESS OF MOBILE PHONE TECHNOLOGY FOR LEARNING BY DISTANCE EDUCATION STUDENTS AT THE UNIVERSITY OF ESWATINI

I declare that the above mini-dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the mini-dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.



22 June 2021

SIGNATURE DATE

DEDICATION

The study is dedicated to my late parents, Robson and Marble Mushayi. You remain forever treasured in my heart. For that tenacity of purpose and immense sacrifice to make me who I am today, may your dear departed souls continue to rest in eternal peace.

ACKNOWLEDGEMENTS

I thank God, the Almighty for the excellent health, immense wisdom and a sound mind that enabled me to undertake the study to completion, without any challenges. To God be the Glory!

I would like to register my most profound gratitude to my supervisors, Prof G. Van den Berg and Dr P. K Mudau for all the hard work in guiding the study from inception to the end. I was particularly impressed by the detailed comments and timeous feedback, which enabled me to complete the study in record time.

I also thank the University of Eswatini Executive Management for granting me the permission to conduct the study in the university, and all the support provided. I extend my profound gratitude to the UNESWA Institute of Distance Education staff members, namely; Prof C. Esampally (Coordinator – Academic Studies), Dr K. E. Mthethwa-Kunene (Coordinator – Research and Evaluation), Dr T.T. Rugube (Coordinator – Multi-Media), Ms N. Mabuza (Coordinator – Student Support Services), and Prof K. Ferreira-Meyers (Coordinator – Modern Languages and Literature) for all the assistance with the logistics of online questionnaire design and data collection. I particularly thank Dr K. E. Mthethwa-Kunene for the sound statistical assistance and advice.

I express my gratitude to the different programme coordinators, assistant tutors and course instructors at UNESWA, for facilitating the data collection exercise. I thank the Institute of Distance Education students at the University of Eswatini for the overwhelming response to the online-administered questionnaire.

I further extend my great appreciation to my family, my wife Tendai and my children Ropafadzo, Panashe and Kuzivakwashe, for all the support and encouragement which inspired me to complete the study, and yet another degree programme.

ABSTRACT

The use of mobile phone technology for learning is currently quite topical in higher education systems, globally. The current Covid-19 pandemic and the resultant restriction on gatherings have occasioned rapid transition of higher education programme offerings from face to face to online delivery. Mobile phone technology contributes to the flexibility and convenience of online learning, as students are able to learn on the go. The present study sought to establish the perceived usefulness of mobile phone technology for learning by distance education students at the University of Eswatini. The Technology Acceptance Model informed the study, which was located within a positivist research paradigm. A quantitative research approach was followed, and a descriptive research strategy was utilised. A stratified random sample of 337 students was selected to respond to a structured questionnaire that was administered online. Data were analysed using the SPSS software. Descriptive statistics were utilised in analysing data to respond to the main research question. The Chi-square test was used to respond to the research hypotheses. Results of each one of the six different sections of the questionnaire, with the six identified learning attributes, were presented. In the first section on communication, respondents were generally agreeable that mobile phone technology was useful for learning. On the issue of accessing content on the Moodle LMS, respondents were generally agreeable on most items except on the usefulness of mobile phone technology in allowing the respondents to join live lesson streaming through Zoom, and for games in learning. Overall, mobile phone technology was perceived as useful for accessing content on the Moodle LMS. On the issue of accessing information on the internet, the respondents were generally agreeable on most of the issues except that mobile phone technology enabled storage of information online using Google drive/Cloud. However, mobile phone technology was perceived as useful in accessing information on the internet. Most of the respondents perceived mobile phone technology as useful in interaction with the course instructors and with fellow students. Mobile phone technology was also perceived as useful for enabling students to learn collaboratively. The mean response provided for all the constructs led to the conclusion that mobile phone technology was perceived as useful for learning. Results on the four tested hypotheses revealed that there was no association found between gender and perceived usefulness, but there was an association between students' age and perceived usefulness. There was no association found between students' programme of study and perceived usefulness, and there was an association found between students' level of study and perceived usefulness.

Keywords: Mobile learning, Mobile phone technology, Affordances, Distance education, Student perceptions.

OPSOMMING

Die gebruik van mobielefoon-tegnologie vir leer, is tans ’n taamlik aktuele onderwerp in hoëronderwysstelsels wêreldwyd. Die huidige covid-19 pandemie en die voortspruitende beperkings op byeenkomste het die vinnige oorgang van hoëronderwysprogramme vanaf kontak- na aanlynlewering genoodsaak. Mobielefoon-tegnologie lewer ’n bydrae tot die buigsaamheid en gerieflikheid van aanlynleer aangesien studente in staat is om sommer daar waar hulle is, te leer. Die huidige studie het ten doel gehad om die persepsie dat mobielefoon-tegnologie nuttig is vir leer by afstandonderrigstudente aan die Eswatini Universiteit te bepaal. Die studie is deur die Tegnologie Aanvaardingsmodel (Technology Acceptance Model) geïnspireer wat in ’n positivistiese navorsingsparadigma gesetel is. ’n Kwantitatiewe navorsingsbenadering is gevolg en ’n beskrywende navorsingstrategie is aangewend. ’n Gestratifiseerde ewekansige steekproef van 337 studente is gekies om op ’n gestruktureerde vraelys te reageer. Die vraelys is aanlyn afgeneem. Data is deur middel van die SPSS programmatuur ontleed. Beskrywende statistiek is gebruik om die data te ontleed ten einde die hoofnavorsingsvraag te beantwoord. Die Chi-square-toets is gebruik om op die navorsingshipoteses te reageer. Die resultate van elk van die ses verskillende afdelings van die vraelys met die ses geïdentifiseerde leerattribute word aangebied. In die eerste afdeling wat oor kommunikasie handel, het die respondente oor die algemeen saamgestem dat mobielefoon-tegnologie nuttig is ten opsigte van leer. Oor die kwessie om toegang te verkry tot inhoud op die Moodle LBS (Moodle-leerbestuurstelsel), het die respondente oor die algemeen met die meeste items saamgestem, behalwe oor die nuttigheid van mobielefoon-tegnologie as dit kom by respondente in staat stel om by regstreekse videostroming van lesse sowel as leerspeletjies deur Zoom in te skakel. Mobielefoon-tegnologie is oor die algemeen as nuttig ervaar ten opsigte van toegangverkryging tot inhoud op die Moodle LBS. Ten opsigte van toegang tot inligting op die internet, was die respondente oorwegend in ooreenstemming oor die meeste van die kwessies behalwe dat mobielefoon-tegnologie die aanlynberging van inligting deur die gebruik van die Google-aandrywer/Cloud moontlik maak. Mobielefoon-tegnologie is egter as nuttig ervaar om toegang tot inligting op die internet te verkry. Die meeste van die respondente het mobielefoon-tegnologie nuttig gevind in hul interaksie met die kursusinstrukteurs en hul medestudente. Mobielefoon-tegnolgie is ook as nuttig ervaar om studente te help met koöperatiewe of samewerkende leer. Die gemiddelde respons wat vir al die konstrukte gebied is, het tot die gevolgtrekking gelei dat mobielefoon-tegnologie wel as nuttig vir leer ervaar word. Die resultate van die vier getoetste hipoteses het aan die lig gebring dat daar geen verband was tussen studente se geslag en die persepsie van nuttigheid nie, maar dat daar wel ’n verband was tussen studente se ouderdomme en die persepsie van nuttigheid. Geen verband is gevind tussen studente se studieprogramme en die

persepsie van nuttigheid nie, maar daar is wel ’n verband tussen studente se vlak van studie en die persepsie van nuttigheid gevind.

Sleutelwoorde: Mobiele leer, Mobielefoon-tegnologie, Veroorlowing, Afstandsonderrig, Studentpersepsies.

ISISHWANKATHELO

Ukusetyenziswa kobuchwepheshe beefowuni eziphathwayo ekufundeni ngumba osematheni kwiinkqubo zemfundo ephakamileyo ehlabathini jikelele. Ubhubhane ogqubayo weCovid-19 nodale ukulawula amanani eendibano zabantu, ubangele ukuba kubekho utshintsho olukhawulezileyo kwiinkqubo zokufundisa kumaziko emfundo ephakamileyo, kushenxwe ekufundiseni ubuso ngobuso, koko kufundiswe ngokusebenzisa amaza omoya. Ubuchwepheshe beefowuni eziphathwayo buyanceda ekuthambeni nasekufumanekeni lula kwezifundo, ngoba abafundi bafunda behamba. Esi sifundo sifuna ukuqiniseka ngeembono zabafundi ngoncedo lobuchwepheshe beefowuni eziphathwayo kubafundi abafunda bekude kwiYunivesithi yaseSwatini. Inkqubo yezifundo ekuthiwa yi*Technology Acceptance Model* ibe sisisekelo sesi sifundo, kwaye sibekelelwe kwixesha lokukholelwa kufundo ngokuqwalasela nokuzathuza, (i*positivist research paradigm*). Kuqhutywe uphando ngokuqwalasela ubuninzi bamanani nokucacisa. Kwakhethwa isampulu yabafundi abangama-337 nabanikwa uluhlu lwemibuzo eqingqiweyo neyaphendulwa kumaza eintanethi. Iinkcukacha zolwazi zahlalutywa ngokusebenzisa ubuchwepheshe ekuthiwa yi*SPSS software*. Kwasetyenziswa izibalo ezicacisayo xa kwakuhlalutywa iinkcukacha zolwazi ngenjongo yokuphendula umbuzo wophando ongundoqo. Uvavanyo oluyi*Chi-square* lwasetyenziselwa ukusabela kwizimvo zophando ezingekabi nabungqina. Kwanikezelwa iziphumo zecandelo ngalinye kwamathandathu oluhlu lwemibuzo, nelalineempawu ezintandathu lilinye. Kwicandelo lokuqala elingonxibelelwano, abaphenduli bavumelana ukuba ubuchwepheshe beefowuni eziphathwayo buluncedo ekufundeni. Kumba wokufumaneka kwezifundo kwi*Moodle LMS*, abaphenduli babevumelana kwimibuzo emininzi ngaphandle kwalo wokuba luncedo kobuchwepheshe beefowuni eziphathwayo ekuvumeleni ukuba abafundi bangenelele xa kufundiswa ngqo ngenkqubo yeZoom, nakwimidlalo ekufundeni. Ngokufutshane, ubuchwepheshe beefowuni eziphathwayo babonwa buluncedo ekufikeleleni kwizifundo kwi*Moodle LMS*. Kumba wokufikelela kulwazi ngamaza eintanethi, abaphenduli bavumelana kwimibuzo emininzi ngaphandle kwalo wokwazi ukugcina ulwazi ngokusebenzisa ubuchwepheshe be*Google drive/Cloud* kwiifowuni eziphathwayo. Noxa kunjalo, ubuchwepheshe beefowuni eziphathwayo babonwa njengobuluncedo ekufumaneni ulwazi kumaza eintanethi. Abaphenduli abaninzi baba noluvo lokuba ubuchwepheshe beefowuni eziphathwayo buluncedo ekunxibelelaneni nabahlohli kwanabanye abafundi. Ubuchwepheshe beefowuni eziphathwayo baphinda babonwa buluncedo ekwenzeni ukuba abafundi bakwazi ukufunda bencedisana. Umndilili weempendulo wakhokelela kwisigqibo sokuba ubuchwepheshe beefowuni eziphathwayo bubonwa buluncedo ekufundeni. Iziphumo zezimvo ezine, ezingekabi nabungqina zadiza ukuba akukho nxulumano phakathi kwesini nokubonwa njengoncedo kobu buchwepheshe, kodwa lwabakho unxulumano phakathi kobudala babafundi nokubonwa njengoncedo kobu buchwepheshe. Akubangakho nxulumano

phakathi kwenkqubo yezifundo nokubonwa njengoncedo, kanti lubekho unxulumano phakathi kwezinga lezifundo akulo umfundi nokubona njengoncedo obu buchwepheshe.

Amagama aphambili: Ukufunda uhamba, ubuchwepheshe beefowuni eziphathwayo, ukuba nemali, imfundo yabakude, iimbono zabafundi.

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LIST OF ACRONYMS

ACRONMYN	FULL MEANING
BYOD	Bring Your Own Devices
ICTs	Information and Communication Technologies
IDE	Institute of Distance Education
LLB	Bachelor of Laws
LMS	Learning Management System
ODL	Open and Distance Learning
ODeL	Open Distance and e-Learning
OERs	Open Educational Resources
PGCE	Postgraduate Certificate in Education
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
UNESWA	University of Eswatini
UNISA	University of South Africa

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CHAPTER ONE

ORIENTATION AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

There has been pervasive use of mobile phones in everyday life, mainly for social communication purposes. As noted by Rovithis, Floros, Moustakas, Vogklis and Kotsira (2019), the education sector has not been spared in the use of mobile-phone technology. Educational practices have been increasingly utilising mobile technology to enhance the efficiency of pedagogical approaches and prepare students to deal with the digital world and the knowledge economy. Furthermore, the current COVID-19 pandemic and the resultant restrictions on gatherings have compelled learning institutions to offer academic programmes online. There is however, a challenge of students' acquisition of the appropriate devices for use in online learning. This is despite observations by some scholars that most students own smartphones (Aarreniemi-Jokipelto, 2020:289; Alhasanat, 2020; Crompton, Burke & Gregory, 2017). Mobile learning should be deliberate and planned; and in instances where online learning has been forced on institutions by circumstances, possibly without adequate prior preparation, it would be interesting to study how students utilise mobile devices for learning. The issue of perceived usefulness of the mobile-phone technology is considered important because if students consider the mobile technology to be useful for their learning, the acceptance of it as useful makes them adopt and use the technology for enhanced learning (Alqahtani & Mohammad, 2015).

The utilisation of mobile-phone technology involves mobile learning which, according to Grant (2019), is the utilisation of mobile computing devices to facilitate learning, training and learning support. Furthermore, Reeves and Reeves (2015) note the importance of the utilisation of mobile devices in enhancing learning and the achievement of learning outcomes. As observed by Krotov (2015), the use of mobile technologies in learning affords flexible learning opportunities, which allow students to access learning any time, from any place, and in real-time. The issues of flexibility and convenience become important factors in the use of mobile-phone technology for learning. The University of

Eswatini is a dual-mode institution. The Institute of Distance Education (IDE) deals with the distance education part of the university programme offerings. At the time of conducting the study, the IDE had a total enrolment of close to two thousand students, making it the largest institute at the University of Eswatini in terms of student enrolment (University of Eswatini, 2021). The IDE offered twelve academic programmes at undergraduate level, in conjunction with full-time departments. However, it had few of its own programmes. The current policy allows the Institute to offer programmes in liaison with the full-time departments. This was considered a way of maintaining parity between programmes offered by the Institute and those offered by full-time departments.

It was noted that almost every distance education student at the University of Eswatini owns a smartphone (Mthethwa-Kunene & Maphosa, 2020). The Institute of Distance Education makes use of a blended learning approach. A fair share of the courses is partly offered online through the Moodle Learning Management System (LMS). As an Open and Distance Learning (ODL) practitioner, the researcher had a keen interest in establishing how the students who owned smartphones, utilised them for learning, especially in those courses that were offered through the Moodle LMS. Emerging technologies such as mobile phones are increasingly being utilised for learning in open and distance learning institutions. However, while ownership of smartphones is quite common for most university students, it is the effective use of the mobile devices for learning that is a cause for concern and worth investigating (Brown & Mayisela, 2015). Access to the devices alone, as Brown and Mayisela further note, does not guarantee effective and meaningful use of the technology for learning.

Mobile learning at the University of Eswatini is at its infancy and most of the initiatives to offer programmes online have been a response to the COVID-19 pandemic. Despite the University being in a rural environment, earlier studies have shown that students do possess mobile devices useful for learning (Mthethwa-Kunene & Maphosa 2020). However, as noted by the Ministry of Education and Training (2017) there are still challenges in higher education provisioning in Eswatini owing to technological and infrastructural challenges. The study, therefore, sought to establish students' perceptions of the usefulness of mobile phone technology in this seemingly deprived

environment. Perceptions are derived from knowledge and experiences as students utilise their mobile phone devices for learning.

1.2 BACKGROUND TO THE STUDY

The importance of the perceived usefulness of mobile devices for learning is considered worthy of investigation in education, particularly at university level. According to Chun (2019:34), the utilisation of mobile technologies for teaching and learning is at different levels in the education system as some course lecturers are pedagogically innovative while others are not. To this end, some institutions are at an advanced level of technology utilisation while others are just beginning. The type of students known as millennials enjoys making use of mobile devices which are connected to the internet (Ahmad, 2020). Some of the preferred devices include tablets and smartphones. Ahmad (2020) notes that developments in technology and Information and Communication Technologies (ICTs) have resulted in increased use of mobile-phone technology in higher education. The integration of mobile devices for enhancing teaching and learning has been on top of the agendas of most universities. The current COVID-19 pandemic and resultant restrictions on gatherings, have made mobile learning a requirement for most institutions of higher education. There are different types of mobile technology devices which include mobile phones, tablets and laptops (Ahmad, 2018). As noted by Moreira, Pereira, Durão and Ferreira (2018) mobile devices enable students to perform computer functions, which will assist in achieving and supporting educational objectives. There are numerous functions of the mobile devices and these include, among others, communication, interaction, information storage and retrieval, information recording as well as allowing discussions between and among students (Ahmad, 2020).

The higher education sector is increasingly utilising technology in teaching and learning. Developing and developed countries are all using Information and Communication Technologies (ICTs) to enhance teaching and learning. There are different ways in which institutions utilise technologies for teaching and learning. As noted by Sundgren (2017), some institutions utilise technologies in distance learning, some have full-fledged e-learning programmes while others utilise the Bring Your Own Devices (BYOD) concept. As observed by Ahmad (2020) some institutions have become more

advanced in using game-based learning, utilising the Web 2.0 tools and using simulation and virtual reality in teaching and learning.

According to Ahmad (2020), the developments in technology utilised for teaching and learning have been influenced by developments in pedagogical practices, which encourage online collaboration, communication and creativity. The pedagogical approaches enhance students' learning experiences. A study of students' perceptions of the use of mobile-phone technology is vital for understanding how students make use of the mobile devices, derive benefits and experience challenges. This assists in improving online learning.

Zhai and Shi (2020) consider perceived usefulness as one's awareness or sensitivity to the use of new technology and how the technology assists in enhancing one's learning. On the same note, Zhai, Li and Chen (2019) note perceived usefulness as a major determinant of the acceptance of technology, and opine that once the technology is accepted, it will be used and, invariably, learning performance will be enhanced. Perceived usefulness depends on the educational technologies offered for learning. Mobile technology allows enhanced communication between course instructors and students and between students (Alqahtani & Mohammad, 2015). Through online communication, learning happens remotely without any restrictions of place and time. However, as explained by Senaratne and Samarasinghe (2019), if learners have a negative perception of mobile technology, it negatively affects the adoption and utilisation of the technology in teaching and learning. To this end, perceived usefulness becomes an important indicator of the degree to which students accept mobile technology. In instances where students hold positive perceptions towards technology or consider it useful, they may consider the technology an important tool for their learning (Alqahtani & Mohammad, 2015). As further noted by Alqahtani and Mohammad (2015), once a technology is perceived to be useful, this would, invariably result in its increased use, increased productivity, and enhanced effectiveness. Similarly, Hartley, Bendixen, Gianoutsos and Shreve (2020) note that perceived usefulness results in higher learning efficiency since mobile technology allows students to engage in self-regulated and self-paced learning. It is only when the students have a positive feeling

about mobile devices for learning that they would consider the mobile technology worthwhile in enhancing their learning.

It is noted that though there are challenges that may be faced by institutions in mobile technology use, the use of mobile devices offers great opportunities for the enhancement of teaching and learning in higher education (Ahmad, 2020). Most of the current students in higher education institutions relate very well with mobile devices such as smartphones as they use them on a daily basis. It is significant to understand what students know about mobile devices in everyday use and how the knowledge and skills could be harnessed for teaching and learning by utilising the same mobile devices. However, students in rural environments may have challenges in mobile technology use which their urban counterparts may not have. The rural-urban disparity in higher education provisioning is further highlighted by Khan, Hwang, Abbas and Rehman (2018) who observe this as a cause of educational inequality. The use of mobile phone technology for learning in a deprived rural environment was an issue considered important in the present study.

The use of mobile phones may also be according to the students' age, academic levels of study, gender or disciplines of study. In chapter two of this study, the researcher interrogates studies which sought to establish if there was any relationship between gender, age, disciplines and level of study with the use of mobile phones for learning. As observed by Ozerbas and Erdogan (2016), learners of all ages have the need to use technology for learning for one reason or another. Similarly, Mustapha et al. (2020) note the importance of mobile technology for the learning of all students taking online courses, suggesting that students; regardless of age, gender, disciplines or levels of study, find mobile technology useful. In the current study, the researcher sought to test the hypotheses on whether the students' views on the usefulness of mobile technology for learning had any relationship with age, gender, programme and level of study.

There are policy imperatives for the implementation of online learning at the University of Eswatini such as the UNESWA teaching and learning policy, the ODL policy as well as the blended learning policy. The impact of the COVID-19 pandemic has also forced

the university to offer academic programmes online using the Moodle LMS. The UNESWA ODL policy, for example, notes the importance of the utilisation of available ICTs for teaching and learning. As noted by Patel, Kadyamatimba, and Madzvamuse (2017:101), students in rural-based universities often encounter challenges in acquiring the appropriate electronic devices for online learning. However, the smartphone is readily available for most students at the Institute of Distance Education at the University of Eswatini, and no study has been carried out on how students utilise mobile-phone technology for learning in the Eswatini context hence this study.

1.3 STATEMENT OF THE PROBLEM

The students' perceptions of usefulness of the mobile phone technology for learning are derived from their knowledge and experience of mobile phone use. In instances where such perceptions are positive, students are likely to utilise the mobile phone technology in learning and enhance the achievement of learning outcomes. Where the perceptions are negative, the implementation of mobile learning becomes a challenge.

Several studies have shown that many problems are militating against the usage of mobile devices for learning in higher education. For example, Gómez-García, Soto-Varela, Morón-Marchena and Pino-Espejo (2020) note that learning may or may not improve depending on how students utilise the mobile devices for learning. It is, therefore, important, in the context of distance education students at the University of Eswatini, to establish the utilisation of mobile-phone technology for learning. Liu and Huang (2015) observe that university students may own smartphones with the required internet connectivity but the effective use of the devices for learning may be negatively affected by lack of information literacy skills, which entails the ability to search and use the required information. The present study also sought to investigate this observation. One of the limitations to the effective use of mobile-phone technology for learning could be the lack of appropriate digital literacy skills. Brown and Mayisela (2015) note that communication literacy is important and students should be able to participate in social networks and communities of practice for enhanced learning. It was important to establish students' levels of communication literacy in the present study.

On another note, Darko-Adjei (2019) observes that while there are numerous benefits realised from mobile technology integration in learning, some mobile devices such as smartphones have certain limitations in their use, for learning. Furthermore, McLoughlin and Northcote (2017) and Domingo and Garganté (2016) note the pedagogical inadequacies the course instructors may have in integrating mobile technology in teaching and learning. Course instructors require pedagogical expertise in mobile learning, which they, in turn, can transfer to the students. Some of the challenges associated with mobile learning are pedagogical in nature and mere availability of technology does not result in effective teaching and learning (Al-Hariri & Al-Hattami, 2017). There are also certain functions a mobile device would not perform, which may negatively affect learning.

As noted by Karam (2015), mobile devices such as smartphones, have limitations and such of which relate to screen size. Some materials are not readable on the smartphone because of the small screen size. Storage and battery capacities may also be limiting factors on mobile devices. Very large video or audio clip files may not be appropriate for some mobile devices because of memory issues associated with the devices. There is, therefore, a need to adapt content for delivery through mobile devices. The course instructors may not be ready for the facilitation of mobile learning and may lack expertise and experience in delivering learning through mobile technology (Moreira, Pereira, Durão & Ferreira, 2018). This could be true of the University of Eswatini where online teaching and learning is still at an infancy stage. It will be interesting to establish how course instructors deliver learning through mobile technology, and whether students would attest to that. Students' use of learning technologies may be affected by their bad experiences in technology use (Khadija, 2019). The students' bad experiences may result in negative perceptions about mobile technology use resulting in challenges in how to collaborate with other students in mobile learning (Khadija, 2019). Students may possess the necessary smartphones but it is worth investigating how they find them useful in learning. No study has been carried out at the Institute of Distance Learning on students' use of mobile phones in learning. Thus, this study sought to establish the perceived usefulness of mobile devices for learning by students in the Institute of Distance Education, University of Eswatini.

1.4 MAIN RESEARCH QUESTION

The following research question was addressed:

What is the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini?

1.5 RESEARCH HYPOTHESES

As a follow up to the main research question, the following null hypotheses were tested:

Ho_1: There is no significant relationship between the students' gender and the perceived usefulness of mobile-phone technology by distance education students at the University of Eswatini.

Ho_2: There is no significant relationship between the students' age and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

Ho_3: There is no significant relationship between the students' programme of study and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

Ho_4: There is no significant relationship between the students' grade level of study and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

1.6. AIMS AND OBJECTIVES OF THE STUDY

In this section, the researcher states the aim of the study and the objectives. The aim is aligned to the main research question and the objectives are aligned to the hypotheses of the study.

1.6.1 Aim

The study aimed at establishing the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

1.6.2 Objectives

Specifically, the study sought to achieve the following objectives:

i. Find out if there is a significant relationship between the students' gender and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

ii. Ascertain if there is a significant relationship between the students' age and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

iii. Examine whether there is a significant relationship between the students' programme of study and perceived usefulness of mobile-phone technology by distance education students at the University of Eswatini.

iv. Establish whether there is a significant relationship between the students' grade level of study and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

1.7 RESEARCH PLAN OF ACTION

Table 1.1 provides a description of the research plan of action, whose details are provided in the third chapter of this study, which deals with research design and methodology.

Table 1.1: Research plan of action

Guiding Research Question	
What is the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini?	
Hypotheses Ho1: There is no significant relationship between the students' gender and the perceived usefulness of mobile-phone technology by distance education students. Ho2: There is no significant relationship between the students' age and the perceived usefulness of mobile-phone technology for learning by distance education students. Ho3: There is no significant relationship between the students' programme of study and the perceived usefulness of mobile-phone technology for learning by distance education students. Ho4: There is no significant relationship between the students' grade level of study and the perceived usefulness of mobile-phone technology for learning by distance education students.	
Paradigmatic Suppositions	
Epistemological Model	Positivist
Methodological Model	Quantitative
Theoretical Framework - Technology Acceptance Model (TAM)	
Research Strategy - Descriptive	
Selection of Respondents - Stratified Random Sampling	
Population size – 1685 students	Sample size – 337 students (20%)
Data Collection	
Method Used to Collect Data	Structured Questionnaire
Analysis and Interpretation of Data	
Methods Used to Analyse Data	Use of SPSS software Descriptive Statistics Chi-square test
Validity and Reliability	
Measures to enhance the validity	Expert opinion, pilot-testing
Measures to enhance reliability	Cronbach alpha calculation
Ethical Considerations	
Ethical Considerations adhered to	Ethical clearance, permission to conduct research, informed consent, confidentiality and anonymity.
Conclusions	
Recommendations	

The plan, as shown on Table 1.1, shows a clear pathway followed for this quantitative study.

1.8 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In this study, the researcher undertook an extensive review of literature germane to the study. A researcher needs to be familiar with issues and debates in a particular field before undertaking any research activity. As noted by Maggio, Sewell and Artino, (2016:297), by familiarising oneself with issues and debates in the field of study, the researcher 'joins the conversations' and can contextualise the study and avoid reinventing the wheel by repeating what other studies have already dealt with. The review of literature also allows the researcher to refine the objectives of the study and provides the researcher with possible methodologies of undertaking the study.

The issue of mobile learning is topical as higher education witnesses a phenomenal rise of mobile learning because most students are digital natives and seek high-quality information and learning experience in a more accessible format (West & Vosloo, 2013). The review of literature attempted to cover critical issues in the study; such as the benefits of the utilisation of mobile devices in learning, the mobile-phone technology affordances, as well as the prerequisites for effective utilisation of mobile-phone technology for learning. Literature was also reviewed on the relationship between age and mobile-phone technology use for learning, as well as gender and mobile-technology use.

The Technology Acceptance Model (TAM) by Davis (1989) served as the theoretical framework to underpin the study. The main tenets of the TAM model are that, the perceived ease of use and perceived usefulness are the important factors influencing one's attitudes about new technology, the behavioural intention to adopt and use the technology as well as the actual use of the technology (Zhu, Lin & Hsu, 2012). Similarly, according to Huang, Lin and Chuang (2007) the perceived usefulness and perceived ease of use are two important factors for the adoption of mobile technology. It was important, in the context of the present study, to establish how the students at the University of Eswatini perceived the usefulness and ease of use of

mobile-phone technology, and how such perceptions influenced their attitude, intention to use and actual use of the technology. Figure 1.1 captures the key tenets of the TAM model.

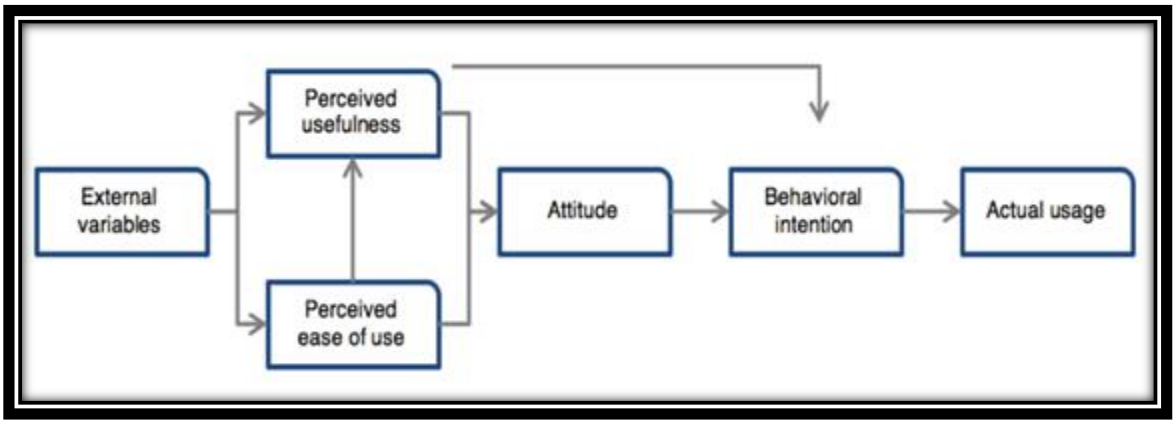


Figure 1.1: TAM for user behaviour of mobile learning (Huang, Lin & Chuang, 2007)

The full discussion of the theoretical framework is made in Section 2.9 of the second Chapter of this study. Zhu, Lin, and Hsu (2012) demonstrated the determinant of behavioral intention to use mobile learning, by using the TAM. Al-Ammary, Al-Sherooqi, and Al-Sherooqi (2014) showed that Perceived Mobility Value and Perceived Ease to Use positively affect Perceived Usefulness, while Perceived Usefulness positively affects Behavioural Intention. Perceived Usefulness was considered as the most variable to be studied in line with the TAM model. Furthermore, other variables in this study such as gender, age, study programme, and level of study were studied in establishing their relationship with the students' responses on perceived usefulness.

1.9 RESEARCH DESIGN

In this section, the researcher explains the research design adopted for the study. A research design is a 'conceptual blueprint' which guides the way the study is conducted and informs the methodological processes and procedures (Akhtar, 2016: 68). Similarly, Ram (2010) notes that a research design is a plan of the proposed research work. This shows that a research design is vital in establishing the carrying out of the study from the philosophical underpinnings of research to the research approach. In this section,

the research design entails the discussion of the research paradigm, research approach and research strategy. The research design aspects were listed on Table 1.1 which summarised the research plan of action.

1.9.1 Research Paradigm

The positivist research paradigm informed the study. As noted by Creswell (2013), a research paradigm provides the philosophical assumptions influencing how the researcher carries out a research study. The paradigm shows how the researcher views reality (ontology), knowledge (epistemology) and values (axiology), and this culminates in the methodological choices. In undertaking the study, the researcher was persuaded by the positivist view of reality as a concrete and objective phenomenon, which is external to the researcher and can be explained objectively (Major, 2017). This paradigmatic lens led to the utilisation of a quantitative approach for the study.

1.9.2 Research Approach

A research approach is defined as the structure of a study (Sileyew, 2019). The study followed a quantitative research approach. Quantitative studies utilise highly structured research instruments to collect numerical data which can be analysed statistically (Creswell, 2014). According to Leedy and Ormond (2013), a quantitative approach allows a researcher to consider a large number of variables in research. In the present study, the researcher considered the variables of perceived usefulness and learning, linking the two to gender, age, level and programme of study. Through the following of a quantitative approach, a researcher collects data from a carefully selected subgroup of the population and is able to generalise the findings to the whole group (Maree, 2014). The findings of the present study were generalised to the distance education students at the University of Eswatini, where the sample was drawn.

1.9.3 Research Strategy

In terms of research strategy, the study was descriptive. A descriptive study seeks to explain phenomena, without attributing causality to them (Creswell, 2014). The major purpose of a descriptive study is to describe the research subject and does not reveal why the descriptions would be the way they are explained, hence; there being no need

to establish cause and effect (Walker, 2005). However, Walker (2005) notes that descriptive designs allow the researcher to draw correlations from the described data. In the present study, the distance education students provided their perceptions on the usefulness of mobile-phone technology for learning, without providing any reasons. This could be a limitation as there was no holistic understanding of the phenomenon under study due to the reductionist nature of a quantitative approach. However, as noted by Babbie (2012), a descriptive design assists the researcher in obtaining a clear understanding of the state of affairs of the issue under investigation, by meaningfully quantifying responses.

1.10 RESEARCH METHODS

Sileyew (2019:1) defines research methods as the methodological processes and procedures the researcher utilises to carry out a study. A more comprehensive discussion of the research methods is undertaken in Section 3.3 of the third Chapter of the study. In this section, the researcher handles population and sampling, data collection and data analysis.

1.10.1 Population and sampling

A representative sample of the population was selected through the stratified random sampling technique. Quantitative studies utilise probability sampling techniques to ensure that the sample selected is representative of the population, to allow for generalisation of the results (Savela, 2018). The total number of students in the population was 1685 and twenty percent of the students was selected to give a sample size of 337 students. Details of the stratified random sampling technique and the sampling process are provided in Section 3.3.3 of the third Chapter.

1.10.2 Data Collection

Data were collected from three hundred and thirty-seven (337) distance education students selected using the stratified random sampling technique. A structured questionnaire was administered online. A detailed description and justification of the questionnaire is provided in section 3.3.2.1 of the third Chapter. The Google Forms was used to facilitate the administering of the questionnaire online. The respondents were

required to answer the items on a 4-point Likert rating scale, ranging from 4 to 1 as follows: Strongly Agree (SA) is 4 points, Agree (A) is 3 points, Disagree D is 2 points, and Strongly Disagree (SD) is 1 point. The respondents were required to mark against the options that reflected their opinions about the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini. In similar studies on mobile learning researchers utilised structured questionnaires which were validated before collection of data on students' perceptions (Halder, Halder & Guha, 2015; Shava, Chinyamurindi & Somdyala, 2016).

1.10.3 Data Analysis

The Statistical Package for the Social Sciences (SPSS) was used to aid the data analysis. Descriptive statistics were used to report the findings of the survey. Chi-square test was used to determine respondents' responses related to gender, age, programme or level of study. According to McHugh (2013), a Chi-square test is useful in analysing group differences in instances where the variable is measured at nominal level. In the present study, the researcher sought to establish if there were any differences or relationship between age, gender, level and programme of study and the perceived usefulness of mobile phone technology for learning. The calculated p-value of the Chi-square was tested at 0.05 significance level. If the p-value was less than or equal to the level of significance, the null hypothesis was rejected. If the p-value was higher than level of significance, then the hypothesis was retained.

1.11 ETHICAL CONSIDERATIONS

The issue of ethics is important in research. According to Fathelrahman, Mohamed, Mohamed and Kabbashi (2012), ethics in research is concerned about what is morally good in the conduct of the research. The researcher obtained research permission from the University of Eswatini authorities to carry out the study in the institution. Ethical clearance was also sought from the University of South Africa Research Ethics Committee. The data collection exercise only commenced after the institutional approval and ethical clearance was provided. The approval letters form part of the appendices and are attached as appendices.

Another aspect of the ethical considerations was informed consent. The respondents to the questionnaire were adult students who were requested to give consent to their involvement in the study. A carefully designed informed consent form was made available to the respondents before they completed the questionnaire. The informed consent form explained the conditions under which the respondents were involved in the study and indicated that there were no conditions tied to their participation. By signing the consent form, the respondents indicated their willingness to participate in the study.

The issues of anonymity and confidentiality were observed. The researcher protected the identity of the respondents on the questionnaire. Respondents were requested to respond anonymously and their responses were treated in the strictest confidence. Respondents were asked to participate in the study voluntarily, without coercion. Furthermore, they were free to withdraw from the study at any stage and for whatever reason.

The researcher was also able to deal with the issue of researching one's institution. Caruana (2015: 62) notes the challenge of researching in one’s own institution and the challenges of objectivity. In this study, the researcher did not have direct contact with the respondents. The questionnaire was administered online and the responses were captured on statistical software, without any bias from the researcher. The researcher was detached from the study hence, there was no possibility of misinterpreting the responses or the clouding of any judgement because of being a member of the institution in which the study was conducted.

1.12 VALIDITY AND RELIABILITY

Some measures were taken to enhance the validity and reliability of the research instrument. The details are provided in the third Chapter of the study. Taber (2013) defines validity as the extent to which a research instrument measures what it seeks to measure. The questionnaire was first sent to an expert on questionnaire designing for statistical research, to establish the structure and nature of question items and their

suitability in collecting statistical data. Furthermore, the questionnaire was sent to a mobile learning expert who checked how the question items related to the research question and hypotheses. The expert opinion validated the questionnaire in terms of face and content validity. The instrument was also pilot tested before full-scale implementation.

Reliability as explained by Taber (2023), is the extent to which a research instrument can produce the same measured result when the measurement is done repeatedly under the same conditions. The calculation of the Cronbach alpha coefficient of reliability was the main measure used to ensure the reliability of the questionnaire. The questionnaire consisted of six sections with different question items. There was a need to test for internal consistency, and this was achieved by the Cronbach alpha calculation as explained in detail in Section 3.4.2 of the methodology Chapter. To this end, several measures were employed to enhance the validity and reliability of the research instruments.

1.13 CLARIFICATION OF CONCEPTS

In this section, scholarly and operational definitions of the key concepts for the study are provided.

1.13.1 Mobile-phone technology - this is any form of mobile devices that include mobile phones, tablets, and personal laptops with internet connectivity, which allow learning and communication to take place regardless of place and time (Crompton, 2013). The devices are handheld and portable. In this study, mobile phone technology shall mainly refer to the smartphone and related devices such as tablets.

1.13.2 Usefulness – According to Webb et al. (2017), this refers to the utility, adequacy, handiness, and value or benefits the technology has in enhancing teaching and learning. Nistor (2019) talks of usefulness as the ways in which the new technology assists in improving the user's work.

1.13.3 Distance education - any mode of delivery in education in which the learners and the instructors are separated geographically and physically (Saykili, 2018).

Technology is utilised to reduce the pedagogical and physical distance between the learner and the instructor (Moore & Kearsley, 2012).

1.13.4 Mobile learning - According to Awadhiya and Miglani (2016: 35), m-learning aims at the removal of hindrances such as time and geographical barriers to learning by placing students in control of their learning. In this proposed study, mobile learning refers to any learning which takes place through the utilisation of hand-held devices.

1.13.5 Smartphone – Anshari et al. (2017: 3063) state that a smartphone "is a mobile phone that can perform many tasks and computations like a personal computer." The smartness is in performing personal computer functions such as information storage and retrieval, among others. The mobile phone referred to in this study is the smartphone, which has more functions than any other type of mobile phones.

1.13.6 Mobile phone affordances - Lloyd (2019: 37) defines affordances as the qualities the mobile phone technology can perform. This is about the different functions of aiding teaching and learning.

1.14 DIVISION OF CHAPTERS

The study is made up of five chapters as follows;

1.14.1 Chapter one – Orientation and overview of the study

In this Chapter, the introduction, background to the study, statement of the problem, research hypotheses, research purpose, and definition of key concepts were discussed. The researcher outlined the background of the study by contextualising the study. The background to the study provided a conceptual understanding of the issue under investigation by looking at what obtains in the different contexts. A look at the statement of the problem provided the reasons that triggered the research to undertake the study. In this Chapter, there was also a clear alignment of the research hypotheses to the research objectives and the main research question to the aim of the study. In this Chapter the researcher also briefly discussed the research design and research methods aspects of the study.

1.14.2 Chapter two – Literature review and Theoretical Framework

The Chapter focuses on the review of literature germane to the study, as well as the discussion of the theoretical framework underpinning the study. In this chapter, the researcher explains the importance of conducting a literature review as a vital aspect of 'joining the conversations' in one's study area. Relevant literature on the different aspects of mobile learning and the utilisation of mobile-phone technology for learning is reviewed. Among other issues, the researcher reviews the literature on what mobile learning is, the benefits of mobile learning, the affordances of mobile-learning technologies useful for learning, as well as the requirements for effective utilisation of mobile-phone technology for learning. The Chapter also reviews literature on the relationship between age, gender, programme and level of study and the utilisation of technology for learning. The researcher discusses the importance of theory in research and what a theoretical framework is. The technology acceptance model, which informs the study, is explained in detail in terms of its main tenets and the relationship between the tenets. In this chapter, the researcher links the theory to the study, showing how the theory informs the study.

1.14.3 Chapter three - Research Methodology

The Chapter focuses on the methodological processes and procedures of the study. In this chapter, the researcher discusses the research methodology in Section 3.2 by engaging in a detailed explanation and justification of the research paradigm, research approach, and research strategy. The researcher explicitly shows what a positivist paradigm entails and why the current study was located in positivism. The quantitative approach followed in the study was discussed, showing the strengths and weaknesses of quantitative research and why the present study followed a quantitative approach. The descriptive research strategy was also explained and justified. In Section 3.3 of the Chapter, the researcher deals with research methods. The researcher also tackles issues regarding the population and the sampling techniques, data collection instruments, instrument validation, data analysis as well as ethical issues.

1.14.4 Chapter four - Data presentation, analysis, and discussion

In this Chapter, the researcher presents and analyses the results of the study. The first part of the results Chapter presents the biographical details of the respondents. Results are presented on the age, gender, programme and level of study. Basic information on mobile phone ownership and access to data is also presented. In this quantitative study, data were statistically analysed and presented in the form of Tables and Figures. The results regarding the respondents' views on the perceived usefulness of mobile phone technology for learning were presented through descriptive statistics. The results centred on six identified areas on learning, namely; communication, access to content on the Moodle LMS, access to information on the Internet, communication with course instructors, communication with fellow students and collaborative learning. The overall results combining the six areas for learning were aggregated to determine whether the students held positive or negative views on the usefulness of mobile phone technology for learning. The second part of the results section deals with answering the set hypotheses which sought to establish the relationship of the respondents' responses to age, gender, level and programme of study. The findings of the study are also discussed against the main issues in literature and the theory, as they are presented.

1.14.5 Chapter five - Summary, conclusions, and recommendations

In this concluding Chapter of the dissertation, the researcher summarises the whole study and this includes the introduction and background, statement of the problem, literature review, theoretical framework, research methodology, research methods, ethical issues, data analysis and research findings. In this Chapter the researcher shows how the study answered the research objectives set in the first Chapter. A summary of the key findings is provided, conclusions are drawn from the findings, and some recommendations are made.

1.15. CONCLUSION

In this Chapter, the researcher provided the orientation and overview of the study. The study was placed in context by providing the detailed background to the study. The general background of mobile learning, leading to the specific Eswatini context in which

the study was carried out, was discussed. Discussion of the background to the study led to the statement of the problem. The researcher stated the main research questions, research hypotheses and the research objectives, which guided the study. The researcher explained the brief methodology of the study by addressing the research methodology, research methods and ethical considerations. The positivist research paradigm, quantitative research approach, and descriptive research strategy were briefly explained. The research methods issues were also briefly described. The researcher also briefly explained ethical issues attended to in the study as well as validity and reliability issues. The researcher also explained the key concepts of the study. In the next Chapter, the researcher discusses the theory underpinning the study and literature relevant to the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous Chapter provided an orientation and overview of the study by addressing the background of the study, leading to the statement of the problem. The Chapter further stated the research hypotheses, aim and objectives. In this second Chapter, focus is on the review of literature germane to the study and a discussion of the theoretical framework for the study. In this Chapter, the researcher explains the importance of conducting literature review as an aspect of 'joining the conversations' related to one's study and building on what others have done. Literature is reviewed on the different aspects of mobile learning and mobile phone technology for learning. The issues of gender, age, discipline and level of study in mobile use for learning, are discussed. The Chapter also discusses the importance of a theoretical framework in research and discusses the Technology Acceptance Model and how it informs the present study. The next section focuses on the review of literature related to the research problem.

2.2 LITERATURE REVIEW RELATED TO THE RESEARCH PROBLEM

This section of the Chapter is devoted to a critical review of the literature germane to the research problem. Literature is reviewed in the following areas: mobile learning and the current ODL generation, benefits of mobile learning, mobile-phone technology affordances, prerequisites for effective utilisation of mobile devices for learning, challenges in mobile-phone technology use, as well as previous studies on students' use of mobile devices for learning.

The next section discusses the importance of literature review in research.

The conceptual framework for carrying out the study is captured in Figure 2.1.

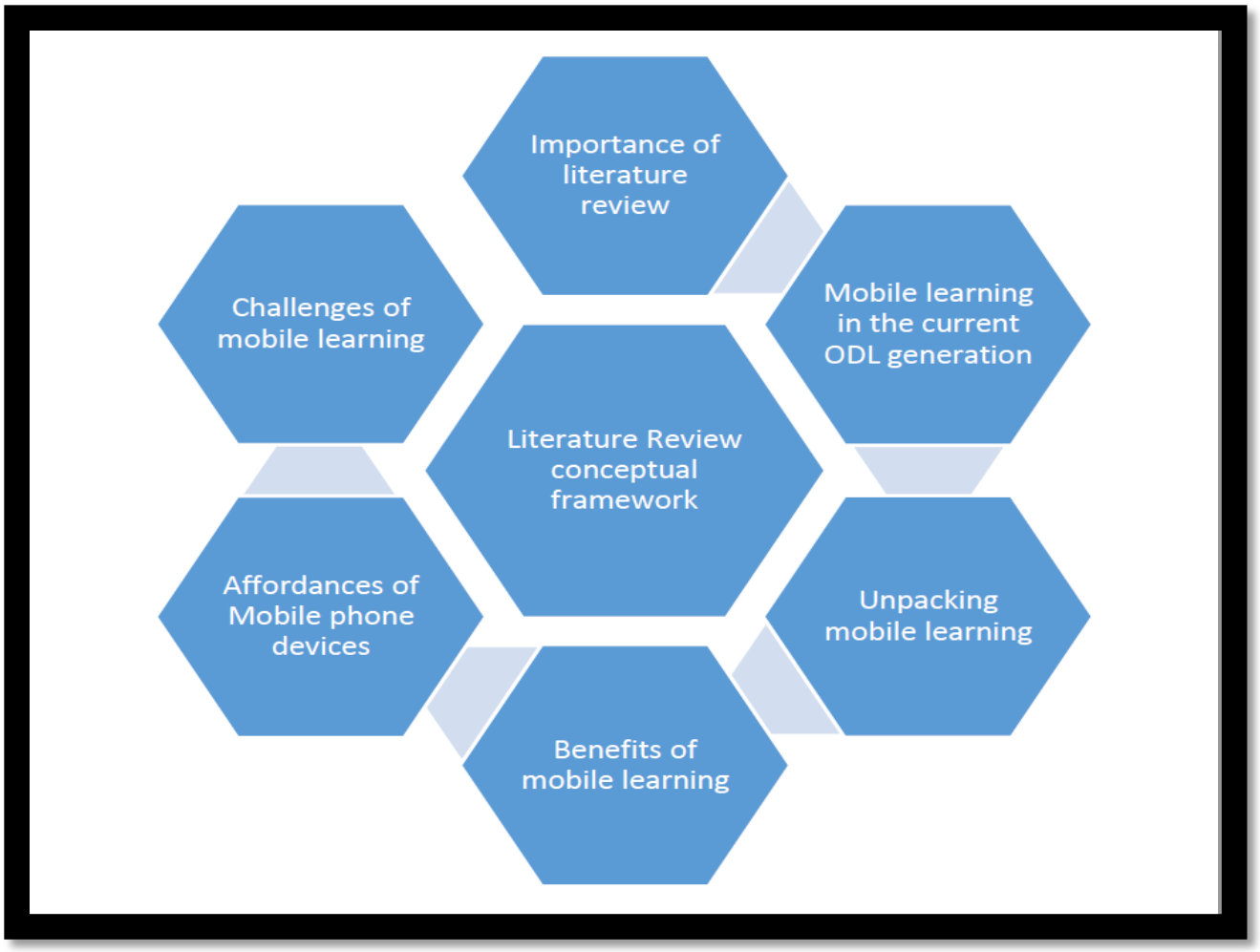


Figure 2.1: Literature review conceptual framework (Source: Researcher's own)

The conceptual framework above illustrates how the literature review was conducted in this section. It begins by discussing the importance of a literature review in a study and then reviews the relevant areas on mobile learning, such as the place of mobile learning in the current ODL generation, mobile learning and what it entails, the benefits of mobile learning, the affordances of mobile technologies, and associated challenges in learning.

2.2.1 The importance of literature review in research

Literature review is defined by Maggio, Sewell and Artino (2016) as an assessment and evaluation of what is known and unknown about the research topic. Similarly, Frank and Hatak (2014) note that a review of literature involves analysing and synthesising existing literature in an attempt to build a study, by linking it to what is already known. It is noted that any meaningful research activity is built by relating it to existing knowledge, and this is only possible by reviewing the literature related to one's study (Snyder, 2019). As observed by Fisch and Block (2018), the review of literature should be systematic to ensure that relevant sources are consulted and the areas for review are linked to one's study.

The importance of conducting a literature review in research is also in familiarising oneself with the prevailing debates in the study area. The familiarisation allows the researcher to challenge the existing knowledge by identifying gaps to be filled in by one's study (Fisch & Block, 2018). The identification of gaps in literature entails noting the missing pieces of information, which would create the focus of the research by filling in the gaps (Müller-Bloch & Kranz, 2015). Furthermore, Rowe (2014) notes that in critically analysing literature one is expected to identify knowledge, theory and methodological gaps to be bridged by the new research study. Review of literature is, therefore, not a mere narration of what literature says but a critique of what information is available and to identify gaps in literature. In the present study, it was important for the researcher to familiarise himself with debates and issues around the use of mobile phones for learning, specifically, and mobile learning in general. The review of literature assisted in fine-tuning the research question and hypotheses as well as in questionnaire construction.

As a preface to the review of literature, the next section attempts to place mobile learning within the developments of ODL generations.

2.2.2 Mobile learning and the current ODL generation

There has been significant development in the utilisation of technology in ODL delivery to date. According to Aoki (2012:1184), the classification of the ODL generations could be according to dominant technologies used in each one of the generations. It is important, at this point, to refer to the different generations of ODL according to Aoki (2012). The first generation, commonly referred to as the correspondence model, relied heavily on written and printed texts as well as postal services. This was long before the advent of the digital technologies in prevalent use today. The second generation is referred to as the industrial mode and according to Aoki (2012), it utilised radio and television in content delivery, complementing the print and text sources. The third generation of ODL, according to Aoki (2012), utilises information and communication technologies (ICT). The use of information and communication technologies provide for interaction between students and fellow students, and between students and course instructors. This generation brings in the use of mobile technology in learning. Mobile technology is utilised to enhance communication, interaction and content delivery in distance learning. The present study sought to establish how distance education students perceived the usefulness of mobile-phone technology for learning.

Anderson and Dron (2010) classify the evolution in ODL delivery in terms of the dominant pedagogies. According to Anderson and Dron (2010), the first generation drew heavily on the cognitive-behaviorist pedagogy, the second generation on the social-constructivist pedagogy, while the third one is informed by the connectivist pedagogy of distance education. In this third generation, students learn by building connections with others and participating in online communities of inquiry (Anderson & Dron, 2010). Mobile-phone technology also promotes the connectivist pedagogy as students can learn from anywhere and at any time, by interacting with each other in virtual spaces. In terms of the use of technology for learning, Anderson and Dron (2010) advance the view that connectivism puts the learner at the centre of learning, and allows the learner to connect and construct knowledge by making connections online. It was the focus of the present study to establish what the distance education students perceived as the usefulness of mobile-phone technology in making the connections and

construction of knowledge by utilising mobile-phone technology. In the next section, the concept of mobile learning is unpacked within the ODL context.

2.2.3 Defining mobile learning

According to Bai (2019), there is no uniformity in the definition of mobile learning as the definitions have different focus areas. On the issue of different focus areas, Grant (2019) identifies four focus areas of definitions of mobile learning. Some definitions focus on the relationship of distance education to e-learning, others on the utilisation of mobile devices and technologies, others on mediation with technology, and others on the mobile nature of learners and learning (Grant, 2019). For this study, the researcher adopted a definition that emphasises the role of technology in learning. McQuiggan, Kosturkon, McQuiggan, and Sabourin (2015: 327) define mobile learning as "leveraging mobile devices and empowering students to actively transact with the curriculum in ways that align with the science of how we learn best." The definition alludes to the fact that mobile technologies should allow students to derive the best in learning by making effective use of mobile devices.

Mobile learning emphasises the mobility of learners, the mobility of learning and the mobility of technology (Al-Adwan, Al-Madadha & Zvirzdinaite, 2018). The mobility of learners confirms the assertion by Boticki, Baksa, Seow, and Looi (2015:128) that mobile learning is a type of learning where students take control of their learning by deciding "what, where, when and whether to learn." Learning is no longer fixed to a place or time, and this flexibility in learning is made possible by the utilisation of portable and wireless technological devices, which rely on uninterrupted connectivity to the Internet. The mobility of learning means learning can take place 'on the go' as learners utilise mobile devices. The devices are easy to carry along, hence the portability.

Current definitions of mobile learning no longer focus on device-driven learning, and as Baran (2014) notes, the definitions now focus on the personal and social-driven nature of mobile devices in nature. There is an emphasis on how the individual derives benefits of learning from learning individually and collaboratively. The focus of the definition is

not on what the device can do but on what the individual can do with the mobile device to enhance learning. The benefits of mobile learning are discussed in the next section.

2.2.4 Benefits of mobile learning

There are numerous benefits of mobile learning. Some of the positives derived from mobile learning include convenience and flexibility in learning. Learning is not restricted to the classroom but goes beyond the four walls of the classroom. The anytime and anywhere approach to learning is convenient for students. As observed by Bere and Rambe (2019), one of the advantages of the use of mobile phone technology in learning is its ability to allow the sharing of knowledge and information, without the limitations of space and time. Learners can share information as long as the devices have an internet connection. Furthermore, Abidin and Tho (2018) note that mobile learning allows students to develop important lifelong communication skills, as they learn in interactive and participatory ways.

One of the benefits of the utilisation of mobile devices in learning is students' ability to share knowledge and information by overcoming the restrictions of time and space (Abidin & Tho, 2018). The course instructors can share knowledge and information with students. Students are also able to share knowledge and information among themselves. Information and knowledge related to the course studied can be shared at any given time and any given place. Sharing information and knowledge is a very important aspect of the learning process because learning is based on course content. Course instructors should access the course content without restrictions. Furthermore, Grant et al. (2015) observe that mobile technology has made living synonymous to learning, as students can access information where and when it is required.

As observed by Padmo, Idrus and Ardiasih (2019), mobile devices make it easy for students to access online learning material which is normally posted on a Learning Management System (LMS). Course instructors may avail learning material of different multi-modal formats on the LMS, and students may access the learning material easily from different locations, and at any time. The ability to access learning materials is of vital importance in teaching and learning. Therefore, if students can use their mobile

devices to access online learning material, it becomes an important learning function of the devices. The study looked at how distance education students utilised their mobile phones to access online learning material.

Mobile-phone technology promotes virtual learning interaction. Learners can learn by interacting with others virtually. According to Gómez-García, Soto-Varela, Morón-Marchena and Pino-Espejo (2020:2), mobile devices are powerful tools for social interaction. Learners are able to use their mobile-phone technology to participate in social networks using the available Web 2.0 tools. Communities of practice can be formed using the web tools, and learners can participate by working with others in knowledge creation and sharing. As noted by Kapucu (2012), through interacting with others, the learner is exposed to different interpretations of knowledge, and learning is enhanced.

Mobile-phone technology also assists in the promotion of critical thinking in the learners. Mobile learning makes learning student-centred. Through the utilisation of mobile technology, learners are provided with tasks that allow them to critique issues and give reasons to support their viewpoints (Ismail, Harun, Salleh, Aman & Zakaria, 2016). As further noted by Ismail et al. (2016), critical thinking is linked to problem-solving skills which are important twenty-first-century skills that should be inculcated in students. Students should be afforded opportunities to solve real-life social and economic problems within the technological context.

Mobile learning enables students to develop important life-long communication skills. The global environment with its knowledge economy requires higher education graduates to exhibit high levels of communication skills using online technologies (Bharathi, 2016). Communication is one of the important 21st-century skills and students should be able to communicate their thoughts. Yang, Li and Hua (2012) note that when students are actively involved in online discussion as part of the learning strategy, they learn how to communicate their thoughts to others, respond to others and 'netiquette' associated with dealing with others online. These are important life-long

skills required in the knowledge economy. However, there is a contrary view by Geertsema, Hyman and van Deventer (2011), that overreliance on text messages, often written in informal and truncated language formats, may negatively affect the development of formal language and formal ways of communication. Therefore, in formal academic activities such as online discussion forums, students should be encouraged to use formal language. Abidin and Tho (2018) state that mobile learning is vital in developing life-long communication skills in the learners. In the next section, the mobile-phone technology affordances are discussed, showing the functions relevant to learning.

2.2.5 Mobile-phone technology affordances

As noted in section 1.13.6 of the first Chapter, affordance refers to the manifest and actual functions of a mobile phone technology in learning. Affordances are defined as the special features of the device which allow it to perform different computational tasks (Hartson & Pyla, 2012). As explained by Orr (2010), the mobile phone plays an important function in gathering, managing, and storing information. Such an affordance is important in the learning process as the learner will have access to the required academic information through the mobile device. The affordances discussed include communication, collaboration, engagement, interaction, access to and storage of information. The affordances are discussed as they are the enablers of the mobile phone technology for learning, which makes them useful.

2.2.5.1 Communication

The mobile-phone technology is considered as an effective means of communication (Chen & Katz, 2009). Learners can utilise the devices for communication with instructors and fellow learners. Furthermore, Clark (2013) notes that mobile phones allow for instant communication with other users through calls and text messages. In the context of the learning environment, the student can communicate with course instructors and fellow students through the mobile phone. The student is accessible anywhere and anytime, hence; learning takes place within flexible communication.

2.2.5.2 Collaboration

One of the mobile-phone technology affordances is collaboration. Collaboration entails learning by making connections with fellow learners. Students should be able to participate in communities of inquiry during knowledge construction and sharing. As noted by Xiangming and Song (2018), a student is expected to be meaningfully involved in working collaboratively with others online, and in the process, establish relationships with peers. The foregoing statement alludes to the importance of social presence in an online community of inquiry. In social presence students should see themselves as real and dealing with others in sharing ideas, exchanging ideas, and working together (Kear, Chetwynd & Jefferis, 2014). To this end, each member of the online learning community should contribute to the collective and their presence should be felt in the learning process.

2.2.5.3 Engagement

Mobile phone technology provides opportunities for enhanced student engagement with their studies. According to the National Survey of Student Engagement (2014), student engagement refers to the amount of time and effort that the students spend actively involved in learning and other educationally relevant activities. The fact that students generally enjoy using mobile phones makes the devices useful avenues for engagement in learning. Learning occurs anytime and anywhere since mobile phones are easy to carry around. Students are also able to receive alert messages anytime and remain focused on their studies. The use of mobile phones allows students, who spend more time on their phones, to invariably, spend more time on their studies.

The utilisation of different learning applications, popularly known as apps, also increases the chances of student engagement. In instances where learning applications are accessible on mobile phones with games, chances are high that students' engagement, interest, retention and academic achievement will be enhanced (Pechenkina, Laurence, Oates, Eldridge & Hunter, 2017). Students may always play games on their mobile phones and learning applications may bring in the gamification concept, which makes learning exciting and guarantees engagement. Applications with

gamified elements integrated into their design do not only facilitate learning but assist in engaging and motivating students (Hamari, Koivisto & Sarsa, 2014). Games become useful learning tools and bases for motivating and engaging activities.

2.2.5.4 Interaction

One of the affordances of mobile phone technology is how it enables students to interact with others. A mobile phone with internet connectivity allows an individual to join different social networks (Alhasanat, 2020). The existence of social networks such as WhatsApp and Facebook allow the student to interact virtually with peers. The interaction may involve sharing of knowledge and information related to the modules being studied. The Web 2.0 tools are important in enhancing interactivity in learning through the use of mobile-phone technology.

Mobile phone technology enhances teaching and learning through increased interactivity among the learners and between the learners and their course instructors. Students and instructors can use instant messaging and chat facilities to interact in academically purposeful ways (Kuznekoff & Titsworth, 2013). Learning is enhanced where there is communication and interaction of parties involved in the learning process. Hence, the purpose of the present study was to establish how the students perceived the usefulness of mobile-phone technology in enhancing communication and interaction for learning.

2.2.5.5 Accessing and storing information

Students can utilise mobile phones, especially smartphones to access and store academically relevant content in different formats. Students enhance learning by referring to the stored content. The special type of mobile phone called a smartphone, depending on memory capacity, can store large volumes of content in various multimedia formats such as "photographs, books, games, and videos, allowing users to retain preferred content in a convenient, mobile format" (Nakamura, 2014:70). The students may, therefore, be able to access content from a Learning Management System (LMS) or other sources and store it on the mobile phone (Kuznekoff & Titsworth, 2013). Such content becomes readily available for reading, listening or watching and learning takes place. Students may also utilise the mobile phones to access information and save it online on storage services such as Google Drive or Dropbox. As observed by Nickerson and Mourato-Dussault (2016) mobile devices such as smartphones have limited memory capacity hence the need for the users to access information and save it in other online retrievable storehouses.

The affordance of a mobile-phone technology to download and upload content becomes very useful in the learning process (Tessier, 2013). Course instructors would make content available and send it to students or students would download content from the LMS to their mobile phones. Similarly, students may perform assigned tasks on smartphones and upload the work onto the LMS for the instructor to assess (Shonola, Joy, Oyelere & Suhonen, 2016). As also noted by Pechenkina, Laurence, Oates, Eldridge and Hunter (2017) mobile phone technology allows students to create and share content with fellow students. Mobile-phone technology has become a very vital learning tool.

Having looked at the mobile-phone technology affordances and how they come in handy in promoting learning, the next section focuses on the prerequisites for the effective utilisation of mobile-phone technology for learning.

2.3 PREREQUISITES FOR EFFECTIVE UTILISATION OF MOBILE PHONE TECHNOLOGY FOR LEARNING

This section discusses some of the basic requirements that would enable students to make effective use of technology for learning. The basic requirements discussed include skills in digital literacy and information literacy, course instructors' mobile learning pedagogical expertise, participation in online social networks, participation in communities of inquiry and content creation and publishing.

2.3.1 Digital literacy skills

Digital literacy means that students should have more than the simple digital literacy skills if they are to profoundly utilise mobile devices for learning (Derounian, 2020). Digital literacy entails the student's ability to perform advanced tasks using the mobile devices and not performing the basic functions. Students should be able to use mobile devices to create and publish content, which they can share with others. As noted by Santos and Serpa (2017:91) in digital literacy the learner should display the ability to use digital tools "to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations ….". It would be important to establish how students utilise mobile-phone technology for learning by determining the digital literacy skills which they possess.

Digital literacy also involves students' ability to understand and utilise information in different digital formats (Chan, Churchill & Chiu, 2017). To this end, students should be able to read, make sense and communicate the meaning of the digital text, symbols and graphs. Such a skill is important in learning in higher education, and is a combination of media and information literacy. As students make use of mobile phones with internet connectivity, they access a lot of information in different digital formats. Hence, the need for the students to exhibit high media literacy skills.

2.3.2 Information literacy skills

To make meaningful use of mobile-phone technology for learning, the students should have high-level information literacy skills. According to Naik and Padmini (2014:92), information literacy 'is the process of knowing when and why information is required, where to find it, and how to evaluate, use and communicate it in an ethical way.' Students often utilise their Internet access through mobile devices to search for information. Some skills are required to search for information on the Internet. Jochmann-Mannak, Huibers, Lentz and Sanders (2010) note the difference between searching and browsing on the Internet, and stress the importance of teaching students skills in systematic search for relevant information. A student may possess a mobile device with internet connectivity but that does not guarantee the use of the mobile device for effective learning, if the student lacks information literacy skills.

According to Amarakoon and Sakunthala (2013), information literacy entails the student's ability to critically assess information for relevance, and use the information in meaningful ways for academic purposes. The Internet is awash with much information, and students should be able to sift through what they read and select what is useful for their purpose (Velandia, Leonardo, Torres & Alí, 2012). Critical analysis skills enable students to critique and question information, and desist from accepting everything as true. When working on academic tasks such as assignments, students should be able to critically analyse issues and support their viewpoints with relevant information.

2.3.3 Lecturers' mobile learning pedagogical expertise

The effective utilisation of mobile devices such as smartphones depends on the pedagogical expertise of the course instructors. As observed by Ozdamlia (2012), a new pedagogy is required for course instructors integrating mobile technology in teaching and learning. Furthermore, Ozdamlia (2012) argues that sound pedagogical decisions should be made to differentiate the utilisation of mobile technology for support or instructional purposes. In instances where mobile technology is used for support of communication purposes, the course instructors may merely use it to share resources

with students. However, when mobile technology is utilised for instructional purposes, students should be involved in learning through the different online activities. It should also be noted that, even in the use of technology for support purposes, course instructors require expertise on how to develop material suitable for dissemination through mobile phones.

2.3.4 Participation in online social networks

Students should be able to participate in social networks to enhance their learning. According to Kim (2013), social media provides opportunities for people to communicate and interact. Students should be engaged in Web 2.0 tools such as WhatsApp, Twitter and Facebook for educational purposes. As the students communicate and interact with other students using Web 2.0 tools, they exchange important ideas for the enhancement of the learning process. Social media promotes a participatory culture and immerses students in learning by participating and collaborating with others (Giaccardi, 2012).

The different Web 2.0 tools are known for their ability to transform pedagogical practices by allowing students to share content and work collaboratively (Zhou, 2011). Students, may, for example, create a class Facebook page. They can use the page to share content. Content in different multimedia formats such as print, photographs and videos can be easily shared through the Facebook page. Students may also use the same page to engage in robust discussion on particular related issues. There is a possibility of posing questions to peers and receiving answers.

2.3.5 Participation in communities of inquiry

An important aspect of online learning is the increase of interactivity through communities of inquiry. It is important to provide opportunities for students to work together in online activities to promote collaboration and a sense of belonging (Mthethwa-Kunene, Rugube & Maphosa, 2020). Similarly, Rugube, Mthethwa-Kunene and Maphosa (2020) observe that online learning is often associated with lack of interaction as obtains in a face-to-face contact environment, but mobile technologies can be utilised to promote interaction. In line with Moore's (1989) transactional distance theory, there is a deliberate need for course instructors to reduce the pedagogical distance by creating and sustaining communities of inquiry. As observed by Garrison (2011), in a community of inquiry, students work together on a common goal and with mutual understanding. Mobile-phone technology allows students to remain connected to their peers for learning purposes. Course instructors should, therefore, be pedagogically-equipped to engage students in communities of inquiry.

2.3.6 Content creation and publishing

Mobile-phone technologies are effectively utilised for learning in instances where the students can create content and share it. The constructivist view of learning avers that students should not be passive consumers of knowledge but, rather, they should be actively involved in learning and knowledge construction. To this end, Henry (2014) argues that online learning through the utilisation of mobile-phone technologies is effective if students are provided with opportunities to produce learner-generated content.

The highest level of Bloom's Revised digital taxonomy is creation (Anderson & Krathwohl, 2001) which means that through the utilisation of digital tools, students should be able to design, produce, construct, animate, videocast, podcast, publish, film and broadcast, among the many creative tasks. This is only possible if the course instructors are adequately prepared to understand the different levels of digital activities they can involve the students in. In the next section, an evaluation of some of the

challenges associated with the use of mobile-phone technology in learning is conducted.

2.4 CHALLENGES IN MOBILE LEARNING

As much as mobile phone technology has numerous advantages in teaching and learning, there are also some challenges. Some of the challenges associated with mobile-phone technology usage relate to the size of the device, screen resolution, and memory (Elias, 2011). Certain functions are negatively affected by the nature of the device. Students may also not be able to utilise the devices in pedagogically sound ways such as content creation and content sharing, which limits the functionality in learning outputs. Some of the challenges discussed in this section are affordability of mobile phones, internet connectivity, data costs, course instructors' lack of pedagogical expertise and the inherent limitations of mobile phones

2.4.1 Affordability of mobile phones

Mobile phones, especially smartphones, can be very expensive for an ordinary rural-based student to afford. In a study on the financial and academic implications of the use of smartphones by students in a South African university, Chukwuere, Mbukanma and Enwereji (2017) found that ownership of a smartphone was an extra expense for students, yet owning one was a necessity as it was useful for students in many ways. In addition, Chukwuere, Mbukanma and Enwereji (2017) observe that students normally ended up acquiring low-priced smartphones with more or less similar functions as the high-proceed were unaffordable. According to Kim, Chun and Lee (2014), students are major users of mobile-phone technology despite the cost factor. The view is also consistent with the finding by Mthethwa-Kunene and Maphosa (2020), that the majority of the students at the University of Eswatini owned smartphones. It is important to note that, while the issue of cost is a factor affecting students' acquisition and ownership of smartphones, the necessity of owning smartphones compels students to acquire the technological devices.

2.4.2 Internet connectivity

Smartphones function with internet connectivity, and access to the internet is sometimes a challenge to some students, and for those with internet access, data cost could be prohibitively high. Using the Ghanaian context, Kotoua, Ilkan and Kilic (2015) note that more than half of the students in Ghanaian universities did not have uninterrupted 24-hour connectivity to the Internet. Additionally, the transition to online learning by most universities in South Africa due to the Covid-19 pandemic, and the resultant restrictions on gatherings revealed the problems of internet connectivity in the country as students in remote areas of the country were left out of online learning (Mpungose, 2020). The same scenario existed in Eswatini where distance education students in some remote parts of the country struggled with internet connectivity. The effective use of smartphones for learning in instances where internet connectivity was a problem is a challenge. Course instructors should be aware of the challenges faced by some students regarding internet connectivity challenges, and make use of offline materials. As noted by Pugoy, Habito, and Figueroa (2016), institutions should consider developing learning materials that students can access and use offline.

2.4.3 Data costs

The use of mobile-phone technology for learning is dependent on the availability of data for use by students. As observed by Chukwuere, Mbukanma and Enwereji (2017), there were expenses to be borne by students as they utilised mobile devices for learning. These included airtime and data bundles. There is also an observation by Beger and Sinha (2012) that students would acquire low-cost smartphones but still need to incur expenses in buying data for operating the learning devices. The issue of data costs is a major cause for concern for distance education students at the University of Eswatini and there are demands by students for institutional support on the matter. Mpungose (2020) notes that the transition from face to face to online learning in South Africa, due to the COVID-19 pandemic, has resulted in educational inequalities. To this end, some universities in South Africa have mobilised resources to supply mobile devices and data to students from disadvantaged backgrounds. Students from low-income groups

require support with data if they are to meaningfully utilise their mobile devices for learning when they are off-campus.

2.4.4 Course instructors' lack of pedagogical expertise

The course instructors should have pedagogical expertise in utilising mobile technologies such as smartphones for teaching and learning. According to Hoffman (2017), once the focus of mobile learning is simply on the devices and not on the pedagogy, the usefulness of the devices for learning is not realised. In other words, the pedagogical soundness yields the positive results of the utilisation of mobile phone technology for learning. Mobile-phone technology should be used in inquiry-based learning where students access information using their mobile phones (Tessier, 2013). The mobile phone becomes an important accessory in inquiry-based learning.

The course instructors should also be able to customise and optimise course content so that it can be used and accessed on mobile-phone devices such as smartphones (Farley, et al. 2015). As observed by Traxler (2010), course instructors should be aware of how to deliver knowledge 'chunked' for easy access, through mobile phones. This necessitates structuring and connecting information in different formats from the ordinary books and lectures. Content should be in easily downloadable or playable formats. The course instructors should be trained in converting ordinary learning material to digital content, usable in smartphones. Content should be appealing to the students' mobile study habits (Schlenker, 2013).

2.4.5 Mobile phone limitations

There are inherent limitations associated with the nature of mobile-technology phones that may cause challenges in learning. The screen size of a smartphone is very small and this makes reading content on the phone difficult. The small screen size of smartphones makes it difficult for users to view text or images (Bryan, 2004). Shudong and Higgins (2006) note that due to the small screen sizes of smartphones, users may end up incurring more expenses by printing out content to read printed material. This is because of the challenges of reading from the phones. The content for mobile devices should also be developed taking into account the battery life as well as the memory capacity of devices. Mobile devices also have generally small keyboard sizes which make it difficult for users to type. However, despite the cited device limitations, the use of mobile devices remains popular with students because of their numerous useful functions (Carvalho & Ferreira, 2015).

The challenges associated with the use of mobile learning technology were discussed in this section. In the next section, the relationship between age, gender and mobile phone technology is discussed.

2.5 PERCEPTIONS OF MOBILE PHONE USEFULNESS AND LEARNING

The issue of the students' perceptions of mobile phone usefulness and the influence of such perception on learning is an important focus of the present study. As noted by Armstrong (2011), perceptions are views and beliefs derived from knowledge and experience. Students may use mobile phone technology formally or informally in their academic activities and in the process develop views, attitudes and beliefs regarding the usefulness of such technology for learning. Hence, the focus of the present study to establish distance students' perceived usefulness of mobile phone technology for learning, in a context where mobile learning is not formalised.

The importance of students' perceptions in learning cannot be overemphasised because when students hold positive perceptions about a particular mode of delivery or learning tool they are about to accept the mode of delivery (Khan, Vivek, Nabi, Khojah &Tahir, 2021). Conversely, in instances where the perceptions are negative, students

would not be motivated to use the learning tools or embrace the mode of learning delivery. To this end, perceptions are linked to acceptance or non-acceptance. In the context of the present study, it was important to establish the students' perceived usefulness of mobile phone technology for learning, given the pivotal role of mobile phone technology for mobile learning.

Positive perceptions about the tools of learning are further linked to the quality of participation in learning and resultant learning attainment (Vereijken, Van der Rijst, Van Driel & Dekker, 2018). It is important to note that when students value mobile phone technology and find it useful for learning, there is increased participation in learning and, invariably, high chances of achieving the set learning outcomes. In the present study, different aspects of learning were pursued namely communication, access to course content on the Moodle LMS, access to information on the internet, interaction with course instructors, interaction with peers as well as learning collaboratively. It was deemed important to establish how the distance education students found mobile phone technology in the different aspects of learning. The next section discusses age and mobile-phone technology for learning.

2.6 AGE AND MOBILE-PHONE TECHNOLOGY UTILISATION FOR LEARNING

It is also interesting to determine the relationship between age and the utilisation of mobile-phone technology for learning. A study by Ataş and Çelik (2019) sought to establish the patterns and purpose of the use of smartphones by university students in a Malaysian university. The study found that students in the 18 - 24-year-old group were more involved in mobile phone activities such as message texting, phone calls, video calls, participating in social networks and checking emails. The study further found that students in the said age group in the university spent more time on their smartphones than the other age groups. Similarly, Ahmad (2019:191) notes that in the Caribbean contexts, young adults were the fastest adopters and greatest users of mobile-phone technology. In the context of the present study carried out in Eswatini, it was important to establish if there was any relationship between age and the perceived usefulness of mobile-phone technology for learning. This was considered important in establishing

whether the use of mobile phones for learning was appealing more to other age groups than others.

In the South African context, a study by Shava, Chinyamurindi and Somdyala (2016) sought to investigate the usage of mobile phones by technical and vocational education and training students in the Eastern Cape Province of South Africa. The study found that the behavioural intention to use a mobile phone was not linked to age but to the mobile phone features that made the students use the phone for educational purposes. Some of the mobile phone features linked to the behavioural intention to use the phones included the mobile phone's battery life, or the presence of an mp3 player, video camera, Bluetooth and chatting facility. It is apparent that the cited studies did not establish any relationship between mobile phone usage or intention to use with age. In the next section, the link between gender and mobile phone technology utilisation is discussed.

2.7 GENDER AND MOBILE-PHONE TECHNOLOGY UTILISATION FOR LEARNING

Studies have been carried out to establish gender differences in the utilisation of mobile-phone technology for learning in higher education. A study was carried out by Hilao and Wichadee (2017) on the use of smartphones by university students taking a basic English language course as part of a degree programme. The study found that there were no significant differences in the way male and female students utilised their smartphones in specific activities. The specific activities included downloading content from websites, using smartphones on LMS, engaging other students on Facebook, making calls to lecturers and peers, sending messages to lecturers and peers, as well using a smartphone to check emails and share photos.

In a related study on the relationship between the use of a smartphone and academic performance of students in a Malaysian higher education institution, Ng, Hassan, Nor and Malek (2017) also found no gender disparities in the students' involvement in specific tasks using mobile phones. Such tasks included communicating with others by texting, accessing reference materials, reading news, viewing course videos, recording class lectures and recording class presentations. It was also important to note if there

was any relationship between gender and the students' views of the perceived usefulness of mobile-phone technology for learning in the present study, for the purpose of planning support services for students. Similarly, in a study on assessing the impact of mobile devices for learning in higher education institutions in Nigeria, Shonola, Joy, Oyelere and Suhonen (2016) found no gender differences in how male and female students perceived the importance of having course materials on mobile devices.

2.8 PROGRAMME OF STUDY/DISCIPLINE AND MOBILE PHONE TECHNOLOGY UTILISATION FOR LEARNING

Studies have not been conclusive on any significant difference in the use of mobile phone technology as linked to subject disciplines. In a study to establish the relationship between smartphone use and academic performance in a tertiary institution in Malaysia, Ng, Hassan, Nor and Malek (2017) found the highest use of smartphones by students in the Administrative Management discipline, followed by the Computer Science one. However, there was no statistically significant difference, suggesting that the use of smartphones could not be linked to one discipline more than to others. In the present study, the researcher tested a hypothesis on the relationship between the students' programme of study and the perceived usefulness of mobile-phone technology for learning. It was important to link any positive or negative perceptions of the usefulness of mobile devices for learning in a specific programme of study.

In another study on the use of mobile phones in a university context in India, Halder, Halder and Guha (2015) sought to establish the students' attitudes towards the use of mobile phones for educational purposes. The study found that there was no statistically significant difference between the attitudes of the Bachelor of Arts and the Bachelor of Science students towards the use of mobile phones for academic purposes. This finding further suggests that the use of mobile phones for learning, and associated attitudes and intentions for use, cannot be attributed to a subject discipline. Students in all subject disciplines desire to use mobile devices for learning.

Various studies investigated the use of mobile phones by university students in different disciplines. A study by Shava, Chinyamurindi and Somdyala (2016) looked at the

students' use of mobile phones in technical vocational institutions in South Africa. It built on the assertion that the use of mobile phones by higher education students or the intention to use cannot be attributed to any subject disciplines. It can safely be concluded that students from all academic disciplines consider the need to utilise mobile phones for learning. It was one of the intentions of the present study to draw a link between the students' views on the perceived usefulness of mobile phone technology for learning and their programme of study.

2.9 LEVEL OF STUDY AND MOBILE PHONE TECHNOLOGY UTILISATION FOR LEARNING

Studies have also not been conclusive on the relationship between levels of study and the utilisation of mobile phones for educational purposes. A study on the patterns, purposes, and situations of the students' use of mobile phones in Malaysian universities was carried out by Ataş and Çelik (2019). The study found that students in bridging courses, first and final year students, as well as postgraduate students, were all involved in the use of mobile phones for learning. In the present study, data on the perceived usefulness of mobile phone technology for learning were sought from students on all levels, and it was hypothesised that the views provided had no relationship to the students' level of study.

Similarly, Lau, Chiu, Ho, Lo and See-To (2017) conducted a study that sought to establish the differences in the usage of mobile devices for educational purposes by undergraduate and postgraduate students. The study found that, despite the differences in the learning patterns of the two groups, there was no statistically significant difference in the way they used mobile phones for learning. The cited study further confirmed the assertion that the way students utilised mobile phones for learning was not linked to their level of study. The present study's hypothesis on ascertaining the relationship between the students' perceived usefulness of mobile technology for learning and their level of study was also meant to prove or disprove the assertions in literature.

Having looked at the conceptual issues drawn from literature and linked to the research problem, the next section discusses the theoretical framework underpinning the study.

2.10 THEORETICAL FRAMEWORK

Every scientific study should be underpinned by a relevant theory which acts as a framework. Adom, Hussein and Adu-Agyem (2018:438) explain a theoretical framework as a blueprint drawn from an existing theory and utilised by the researcher “to build his /her own house or research inquiry.” Of importance is the realisation that the adopted theory provides a lens for understanding issues in the study. In support of this view of a theoretical framework as an important foundation for a study, Grant and Osanloo (2014:13) observe that a theoretical framework provides a pivotal structure upon which a researcher can "philosophically, epistemologically, methodologically and analytically approach the dissertation as a whole". It is important to note from the foregoing statement that theory informs the researcher on how to look at views and perspectives about knowledge in a study, ways of gathering and presenting knowledge, as well as the methodological processes and procedures, culminating in making sense of data gathered in a study.

As further noted by Collins and Stockton (2018), the utilisation of a theoretical framework in a research study allows the researcher to understand a complex issue under investigation from previously established ideas. Such an understanding provides the researcher with a better grasp of the research issue and how to go about the investigation. A theoretical framework provides a methodological and analytical lens to the researcher. Merriam and Tisdell (2016) describe a theoretical framework as an underlying structure, which is the scaffolding or frame of a study. Of importance is the important observation that a study is built or framed on a known theory. The view that a theoretical framework is derived from a known or published theory is supported by Ravitch and Riggan (2017). The TAM by Davis (1989) was selected as the theory informing the present study because of its relevance in explaining how and what makes students intend to and actually use new technology. In the context of the current study, the theory offered a deeper and clearer understanding into how students would utilise mobile phones for learning. The next section discusses the Technology Acceptance Model (TAM) by Davis (1989).

2.10.1 The Technology Acceptance Model (TAM).

The discussion of the TAM and how it frames the present study is summarised in Figure 2.2.

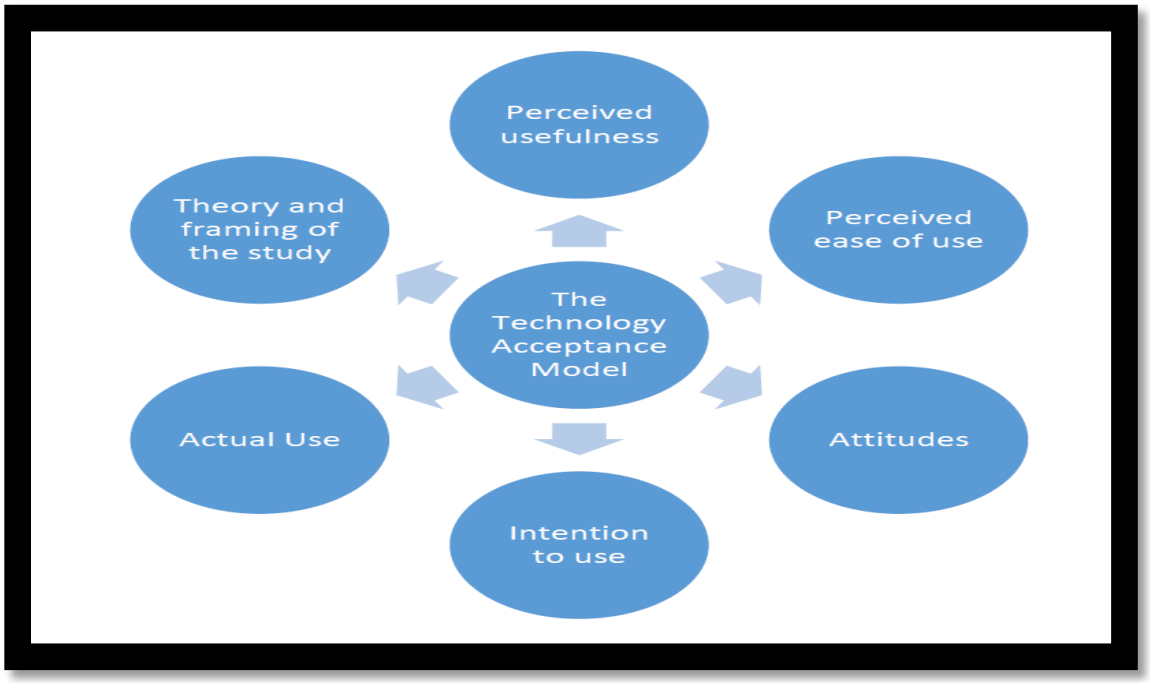


Figure 2.2: Summary of TAM main tenets (Source: Researcher's own)

The summary in Figure 2.2 brings together all the constructs of the TAM by explaining how the perceived usefulness and perceived ease of use of a technology influences attitudes, which in turn influence the behavioural intention to use, as well as the actual use of a technology.

The TAM theory is premised on interplay of the factors that contribute to the acceptance of new technology. In the context of the present study, it would be the acceptance of mobile-phone technology for learning. Acceptance entails a conscious decision by the user to use the new technology because it would have been perceived to be working (Mohammadi & Isanejad, 2018). Lee, Kozar, and Larsen (2003) note that the TAM "is considered the most influential and commonly employed theory for describing an individual's acceptance of information systems." Once the user accepts the new technology, what follows is adoption and actual use of the technology. The TAM model notes several factors affecting acceptance of new technology, namely; perceived ease

of use, perceived usefulness, attitude, intention to use, technology self-efficacy, technology anxiety, perceived enjoyment and user satisfaction (Venkatesh & Davis, 2000).

The TAM model considers two important factors as influencing the intention to use, and the actual use of new technology (Mohammadi & Isanejad, 2018). The first factor, as shown on Figure 2.2, is the perceived usefulness of a technology. Perceived usefulness is explained as the user's beliefs about the extent to which the new technology will assist in improving his/her work performance (Nistor, 2019). On the other hand, the perceived ease of use is explained by Mohammadi and Isanejad (2018) as the user's beliefs about how simple the technology is to use, in terms of the amount of effort required in manipulating the functions of the device. The nature and extent of the two variables; perceived usefulness and perceived ease of use, contribute to the user's attitude about the new technology (Nistor, 2019). The issue of attitude towards technology is also an important factor influencing technology adoption. The next section discusses how attitude informs the behavioural intention and actual intention to use technology.

According to TAM, the perceived usefulness and the perceived ease of use of technology result in some attitudes towards the technology. According to Hussein (2017), attitudes are characteristics within an individual, which reveal positive or negative disposition and feeling towards a concept. In the context of the present study, it would be how the students feel and behave towards mobile phone technology. A positive attitude emanates from positive views about the usefulness and ease of use of the technology and, invariably, influences a desire to use and the actual use of the technology. The TAM also has constructs such as the intention to use and the actual use of new technology. Having looked at the main tenets of the TAM, the focus of the next section is on how the theory frames the present study.

2.10.2 How the TAM frames the present study

The present study sought to establish students' views on the perceived usefulness of mobile phone technology for learning. The aim of the study was drawn from the TAM construct, and the assumption that the perceived usefulness of new technology is an important determinant of the user's intention to use and actual use of the technology. The TAM theory assisted in designing the research instrument for the study by gathering relevant points on learning, which would establish the respondents' perceived usefulness. The instrument gathered views on how the respondents viewed; the usefulness of technology in communication, accessing content on the Learning Management System, accessing the information on the internet, interacting with course instructors and peers, and learning collaboratively. All the issues in the instruments were informed by TAM and meant to elicit responses on perceived usefulness on various aspects of learning.

The TAM also assisted the researcher in guiding the data analysis process. The main thrust of the study was to establish how the students perceived the usefulness of mobile phone technology for learning. In analysing the data, the researcher made sense of the quantified responses descriptively, to ascertain if the perceptions on each item of learning were positive or negative. Positive responses were concluded to be in line with the TAM observation, that the respondents would have the deliberate intention to use, and use the mobile devices for learning.

2.11 CONCLUSION

In this Chapter, the research engaged in a review of the literature related to the study. There was a deliberate attempt to align the areas of literature review to issues raised in the research question and research hypotheses. This was meant to streamline the review to ensure relevance. As a prelude to 'joining the conversations,' the concept of mobile learning was unpacked. The researcher went on to discuss the benefits of mobile learning, the mobile learning affordances, and prerequisites for effective mobile-phone technology utilisation for learning. Issues of the association between age and technology utilisation, as well as gender and technology utilisation, were explored. Challenges of mobile-phone technology use for learning were also discussed. The

Chapter also highlighted the TAM as the theory framing the study, identifying the main tenets of the theory and how the theory framed the study. The next Chapter focuses on the methodological aspects of the study.

CHAPTER THREE

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

In the previous Chapter, the researcher reviewed the literature germane to the study. The researcher reviewed literature on the concept of mobile learning in the context of the current ODL generation, the benefits of mobile learning and the affordances of mobile phone technology, the prerequisites for the effective utilisation of mobile phone technology for learning as well as the challenges associated with the use of mobile devices for learning, among other issues. The Chapter also discussed the theoretical underpinnings of the study by discussing the TAM and how it framed the study. In this Chapter, the research methodological processes and procedures for the study are discussed. As defined by Creswell (2014), research methodology is the methodological process and procedure the researcher utilises to carry out a study. In the next section, the research design adopted is discussed and the selected research paradigm as well as research approach explained and justified, in the context of the current study. The selected research strategy is also discussed.

3.2 RESEARCH DESIGN

As observed by McMillan and Schumacher (2014), a research design is a plan or roadmap to be followed by the researcher in conducting a research study. Furthermore, Rossman and Rallis (2012) note that a research design contains guidelines and instructions to be followed by the researcher in addressing the research problem systematically. Similarly, Polit and Beck (2012) state that a research design is a plan drawn up by the researcher to assist in answering the research question or testing the research hypothesis. The selected research paradigm, research approach, and research type are discussed and justified in this section. Figure 3.1 summarises the key components of the research design.

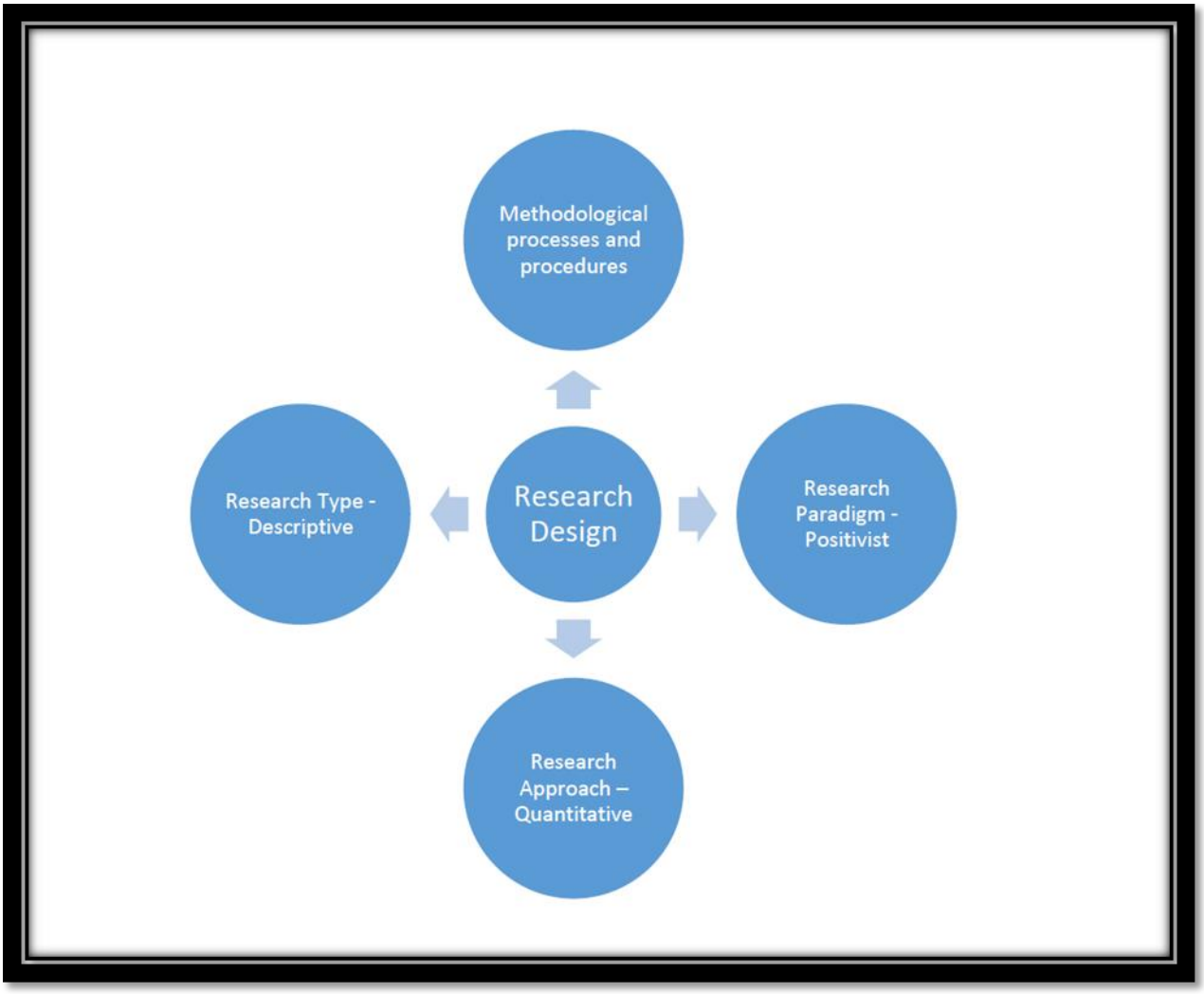


Figure 3.1: Components of the research design (Source: Researcher's own)

Figure 3.1 shows that in dealing with the methodological processes and procedures in this section, the researcher addresses the positivist research paradigm, the quantitative research approach and the descriptive research strategy. The components of the research design referred to in the figure above are discussed in detail next.

3.2.1 Research paradigm

A paradigm, from a philosophical standpoint, considers: ontology, which is the nature of reality; epistemology, the nature of knowledge and knowing; as well as methodology, the ways of generating knowledge (Taylor & Medina, 2013). The study is located in the

positivist research paradigm. Ontologically, positivism advances that a single tangible reality exists and can be identified and measured (Basri, 2019: Riyami, 2015). Positivism looks at objective reality and believes truth is quantifiable. According to Park, Konge, and Artino (2020), the positivist paradigm advances the view of a single and perceptible reality that can be tested and measured. It was the purpose of this study to establish the objective reality of ODL students on how they consider the usefulness of mobile phone technology for learning.

3.2.1.1 Justification for a positivist research paradigm

The researcher located the current study in the positivist research paradigm for several reasons. Ontologically, the researcher was fully persuaded that reality exists independent of the knower and can be measured (Scotland, 2012). To this end, truth is discoverable by the researcher (Kivunja & Kuyini, 2017). Hence, the adoption of a research philosophy that would quantify and measure the respondents' views on the perceived usefulness of mobile phone technology for learning was preferred. Epistemologically, the researcher also subscribed to the notion of objective truth. The study sought to pursue objective truth by utilising a highly structured instrument to collect data that could be analysed statistically, and allow for drawing conclusions from the statistical analysis. Axiologically, the researcher also believed in a research process that was value-free, hence; the need to maintain researcher-detachment from the research process. In the next section, the research approach informed by the positivist research paradigm is discussed.

3.2.2 Research approach

The study followed a quantitative research approach. Aliaga and Gunderson (2002), cited in Apuke (2017), note that a quantitative research approach assists in scientifically understanding a research issue by gathering and analysing statistical data. Similarly, Queirós, Faria and Almeida (2017) note that quantitative data is normally drawn from large samples, can be quantified and analysed statistically, and results are generalisable to the larger population. The collected numerical data on different aspects

of the usefulness of mobile-phone technology as perceived by the respondents and was statistically analysed.

Furthermore, Creswell (2014:4) notes that the quantitative research approach is used "for testing objective theories by examining the relationship amongst variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures." In the current study, the researcher sought to quantify the respondents' responses on the perceived usefulness of mobile phone technology for learning. The study further looked at the variables of gender, age, level and programme of study and related them to the perceived views. The views sought were statistically analysed in line with the requirements of the quantitative approach.

3.2.2.1 Advantages of the quantitative research approach

There are numerous advantages of following the quantitative approach in research. One advantage of the quantitative approach, as noted by Eyisi (2016), is that the use of statistical data in analysis reduces the researcher's time and effort in data analysis. Similarly, Connolly (2007) notes that there is scientific statistical software that can be utilised to aid analysis, further simplifying the process of analysis. With the use of statistical software for data analysis, the quantitative approach therefore, saves the researcher's time and energy.

As noted by Eyisi (2016), a quantitative research approach has an advantage of generalisation of the results. The researcher can generalise the results of a study to a larger population. In the context of the present study, the researcher made use of a representative sample of all the Institute of Distance Education students at the University of Eswatini and the results of the study were generalised to the entire population. The issue of generalising results is in contrast with qualitative studies which deal with small sample sizes and generate results that cannot be generalised to the entire population.

The quantitative research approach, as noted by Christensen and Johnson (2012), allows for researcher detachment. There is no researcher involvement in dealing with research participants, which may influence the research process in terms of bias. This is in contrast with the qualitative approach where the researcher is immersed in the research process. In the quantitative approach, the research instrument is developed and administered without contact with the respondents. The researcher neutrality associated with the quantitative approach reduces personal bias in the research process (Savela, 2018). In the current study, the questionnaire was administered online in compliance with the COVID-19 protocols restricting the physical contact of people.

3.2.2.2 Limitations of the quantitative research approach

In following the quantitative approach in the current study, the researcher was wary of the limitations of the quantitative approach. One of the limitations of the approach is that it does not allow for the understanding of the deeper meaning of the social phenomena. Eyisi (2016) notes how difficult it is to understand the issue under investigation holistically in the participants' natural setting. In the context of the present study, the researcher quantified students' responses on the perceived usefulness of mobile devices for learning, but the reasons behind the views were not explored. This is a limitation of the quantitative approach. However, the study was useful in gathering respondents' views on the usefulness of mobile phones for learning.

The issue of researcher detachment raised by Savela (2018) as an advantage of the quantitative approach in ensuring objectivity in research is also viewed as a limitation. According to Nighet (2016), it is the contention of the positivists that reality can be separated from the observer. However, Zubin and Sutton (2014) argue that a researcher is a research instrument and, therefore, cannot detach himself or herself from the researcher process. To this end, the research process should be humanistic and should consider the research participants as co-partners in research. However, the quantitative approach seeks to research people and not with people, hence; the research participants being viewed as research subjects. Choy (2014) notes that the

researcher should work closely and in partnership with the research participants, considering the context in which the study is carried out.

3.2.2.3 Justification for a quantitative research approach

The researcher opted to follow a quantitative approach as opposed to a qualitative or mixed-method approach for several reasons. The researcher was interested in quantifying students' views on the perceived usefulness of mobile phone devices for learning. As observed by Jongbo (2014), a quantitative research approach allows the researcher to apply statistical methods in research. The researcher also followed the quantitative research approach to maintain research objectivity. Wright, O'Brien, Nimmon, Law and Mylopoulos (2016) note that quantitative research ensures objectivity in research. Hegelund (2005) notes that objectivity in research entails the ability of the research to bring out a value-free research process where results are not influenced by the researcher's feelings or opinions. Unlike the qualitative approach which is value-laden, the quantitative approach ensured the researcher did not influence any aspect of the study.

The selection of the quantitative research approach also stemmed from the desire to conduct a research study that is easily replicable in other contexts under the same conditions. Leppink (2017) defines replicable studies as those that are easily repeatable and reproducible under similar conditions. The researcher utilised sampling techniques and a research instrument that could easily be utilised in other studies of the same nature. The quantitative approach was considered the ideal scientific approach to enable replication of a study. In the next section, focus shifts to the research strategy. The descriptive strategy is discussed and justified as the selected strategy for the study.

3.2.3 Research strategy

The research strategy was descriptive. A descriptive study involves answering questions like how, when, what, who, where, how many and how much (McMillan & Schumacher, 2014). A descriptive study utilises mostly descriptive statistics to describe phenomena. Aggarwal and Ranganathan (2019) state that a descriptive study enables

the researcher to describe the distribution of one or more variables in a study. Furthermore, descriptive studies are not concerned with causality or cause and effect, but merely describe the distribution of variables (Aggarwal & Ranganathan (2019). It allows the researcher to gather large quantities of data, which is then analysed statistically. Descriptive statistics assist the researcher to present the data clearly and richly through the utilisation of numerical calculations, graphs, or tables, and this makes the analysis and interpretation of the data manageable (McMillan & Schumacher, 2014). Descriptive and inferential statistics may be utilised. In a descriptive study, participants answer questions administered through interviews or questionnaires (Jamie Hale, 2018).

3.2.3.1 Justification for the utilisation of a descriptive research strategy

The utilisation of the descriptive research strategy was justifiable for several reasons. The researcher sought to establish the views of the selected distance education students on the perceived usefulness of the mobile-phone technology for learning. As noted by Sousa, Driessnack, and Mendes (2007: 504), a descriptive design allows the researcher to engage in a description of what exists and "determine the frequency with which it occurs, and categorizes the information." Through the use of descriptive statistics, the researcher was able to answer the main aim of the study of establishing the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

According to Bryman (2015), a descriptive research strategy is used when little is known about the issue under research. In the context of the current study, the researcher wanted to find out more about the distance education students' views about the perceived usefulness of mobile phone technology for learning. The descriptive research strategy was considered appropriate for gathering student views and making conclusions about them.

In utilising the descriptive design, the researcher did not intend to manipulate any variables in establishing cause and effect (Sousa, Driessnack & Mendes, 2007). Rather, the researcher considered the responses from the respondents in terms of their

relationship to variables such as age, gender, programme, and level of study. All this was meant to describe the issues without attributing any causality. In the next section, the research methods are discussed.

3.3 RESEARCH METHODS

This section considers the population, sampling techniques, data collection instruments, and how the collected data was analysed. Figure 3.2 summarises the aspects of the research methods.

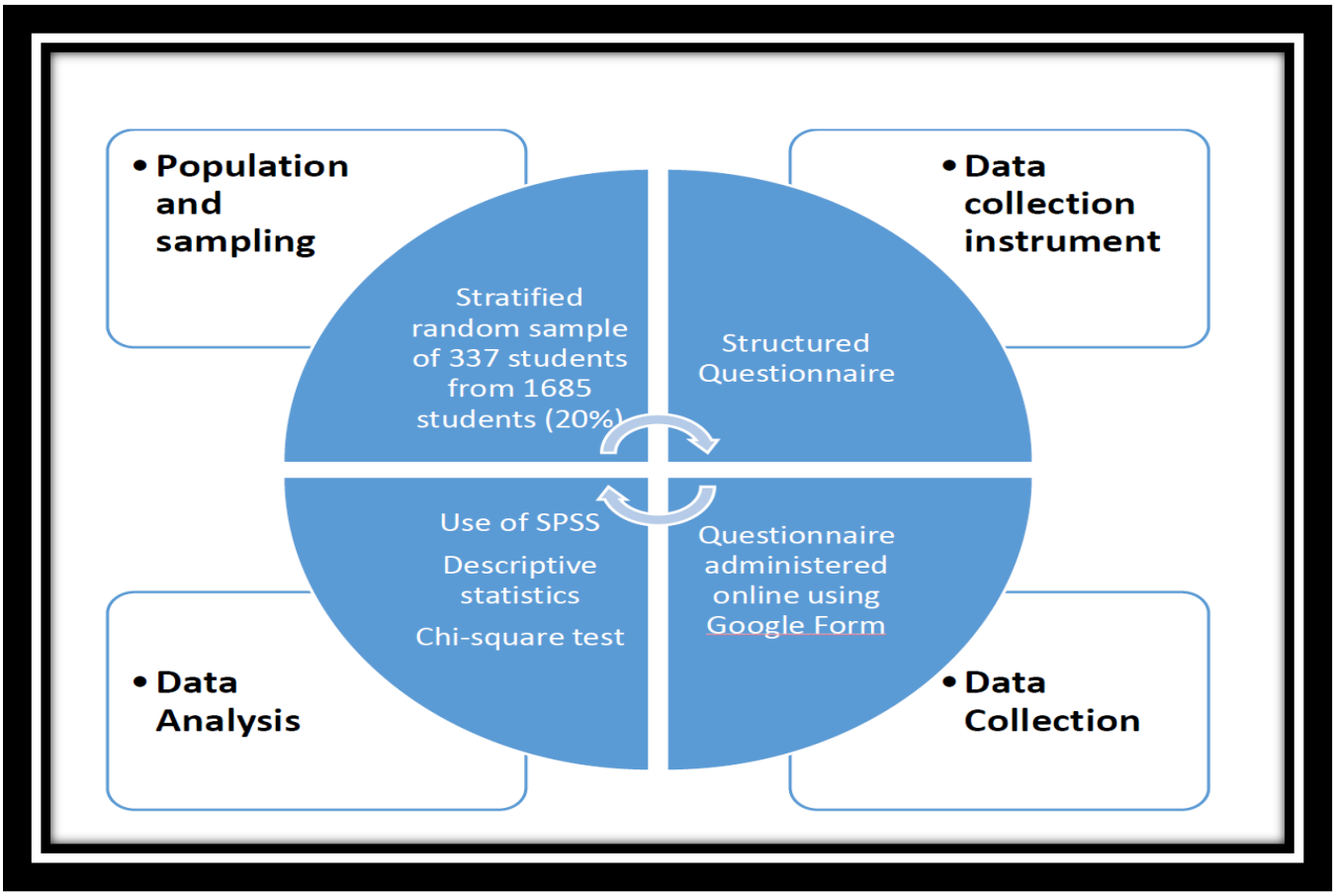


Figure 3.2: Research Methods (Source: Researcher's own)

Figure 3.2 shows that a 20% sample was drawn from the total population of 1685 students, using the stratified random sampling technique. The structured questionnaire was the sole data collection instrument utilised. The data collection process entailed administering the structured questionnaire online. Data analysis yielded descriptive

statistics generated from the SPSS software to answer the main research question and use of the Chi-square test to answer the hypotheses. The aspects of the research methods summarised in Figure 3.2 are discussed in detail below, starting with population and sampling.

3.3.1 Population and sampling

According to Banerjee and Chaudhury (2010), in statistics, a population refers to the entire group from which information is solicited. At the time of conducting the study, the entire student population at the Institute of Education was 1685 students. The sample for the study was selected from this population. A sample, as explained by Banerjee and Chaudhury (2010), is any part of the defined population. To generalise findings and make accurate inferences, the sample should be representative of the population (Banerjee et al. 2007).

The method of selection was stratified random sampling technique. Stratified random sampling, as a probability sampling technique, allows every item in a population to have an equal chance of being selected to be part of the sample (Babbie, 2012). In stratified random sampling, the population is subdivided into homogenous groups or strata, and from each stratum, a random sample is drawn. The population for the study was according to programmes, and selection was done from each programme. In selecting the sample size, the researcher referred to the sampling ratios by Ankrah (2014), who indicates that for a population size of between 1000 and 10 000 units, a sampling ratio of 10% is considered sufficient. The Institute of Distance Education at the University of Eswatini had 1685 registered students and 337 were selected for the study using the stratified random sampling method. This was 20% of the population size. The reason for targeting 20% was in view of the possibility of low return rate, and the need to achieve the 10% threshold if there was a low return of the questionnaire. Silva and Durante (2014) note some factors which may result in low response of the online questionnaire such as respondents' email checking habits, interest and length of the instrument.

There are twelve academic programmes in the Institute with varying numbers of students. The programmes, levels of study and gender constituted the strata. From each programme, 20% of the students were selected to be part of the sample through the following steps. Alphabetical lists for all enrolled students per programme of study, level of study and gender were obtained from programme coordinators. Within each programme list, simple random sampling was employed, using the random number table, to come up with the required number of students per programme, level and gender. This method ensured representation of all programmes, both gender, and all levels of study. Stratification was done by gender as well as by programme of study and level of study. The strata of the sample included gender, programme and level of study. The sample comprised male and female students in each programme and at each level of study. The proportionate stratification sampling procedure was utilised where the sample size of each stratum was proportionate to the population size of the stratum. Strata sample sizes were determined by the following equation:

nh = (Nh/N)*n.

nh is the sample size for stratum h

Nh is the population size for stratum h

N is total population size

n is total sample size

Table 3.1 summarises the proportionate population of the students by programme, gender and level of sturdy, from where the sample was drawn.

Table 3.1: Population size according to programme, level of study and gender

Programme	Level 1			Level 2			Level 3			Level 4			
	F	M	T	F	M	T	F	M	T	F	M	T	Grand Total
Bachelor of Arts (Humanities)	57	24	81	27	17	44	20	9	29	13	3	16	170
Bachelor of Commerce	81	63	144	50	32	82	71	48	119	34	30	64	409
Bachelor of Education (Adult Education)	4	2	6	3	0	3	12	5	17	12	7	19	45
Bachelor of Education (Primary)	13	3	16	8	5	13	14	5	19	28	10	38	86
Bachelor of Education (Secondary)	116	39	155	78	24	102	38	24	62	24	12	36	355
Bachelor of Nursing Science				53	20	73							73
Bachelor of Science (Information Technology)	22	61	83	17	39	56							139
Certificate in Psychosocial Support	76	12	88	72	12	84							172
Certificate in Portuguese	2	1	3										3
Diploma in Law	21	14	35	9	4	13	2	5	7				55
Bachelor of Laws (LLB)	15	11	26	9	10	19	10	5	15	18	16	34	94
Postgraduate Certificate in Education	55	29	84										84
Totals	**462**	**25**	**721**	**326**	**163**	**489**	**167**	**101**	**268**	**129**	**78**	**207**	**1685**

Key: F = Female; M = Male; T = Total

Table 3.2: Target proportionate sample size according to programme, level of study and gender

Programme	Level 1			Level 2			Level 3			Level 4			Total
	F	M	T	F	M	T	F	M	T	F	M	T	Grand total
Bachelor of Arts (Humanities)	11	5	16	6	3	9	4	2	6	2	1	3	34
Bachelor of Commerce	16	13	29	10	6	16	14	10	24	7	6	13	82
Bachelor of Education (Adult Education)	1	0	1	1	0	1	2	1	3	2	1	4	9
Bachelor of Education (Primary)	3	1	3	2	1	2	3	1	4	6	2	8	17
Bachelor of Education (Secondary)	23	8	31	16	5	21	8	5	12	5	2	7	71
Bachelor of Nursing Science				11	4	15							15
Bachelor of Science (Information Technology)	4	12	17	3	8	11							28
Certificate in Psychosocial Support	15	2	18	14	2	17							35
Certificate in Portuguese	1	0	1										1
Diploma in Law	4	3	7	2	1	3	0	1	1				11
Bachelor of Laws (LLB)	3	2	5	2	2	4	2	1	3	4	3	7	19
Postgraduate Certificate in Education	11	6	17										17
Totals	**92**	**52**	**144**	**66**	**33**	**98**	**33**	**20**	**54**	**26**	**16**	**41**	**337**

Key: F = Female; M = Male; T = Total

Table 3.1 shows the population size whereas Table 3.2 shows the targeted proportionate sample size at 20% of the population of the sample size. This was far above the 10% threshold suggested by Ankrah (2014). Given the likelihood of a lower return rate characteristic of an online-administered questionnaire (Silva & Durante, 2014), the 20% sample size enabled the researcher to meet the minimum 10% threshold. Faber and Fonseca (2014) notes that for generalisability, a sample size should not be lower than the ideal 10%. The next section discusses the data collection and addresses the type of instrument utilised, how it was constructed, as well as how the instrument was administered.

3.3.2 Data collection

In this section, the research instrument and the data collection process are explained in greater detail.

3.3.2.1 Research Instrument

A research instrument is defined as a data collection tool. A structured questionnaire was utilised to elicit the necessary information from the students. The researcher designed a questionnaire in line with issues to be tested in the hypotheses. An original questionnaire was preferred over adapting an existing one, which may have been used in a different context. According to Roopa and Rani (2012:273), a questionnaire is "a list of mimeographed or printed questions that is completed by or for a respondent to give his opinion." The main advantage of a questionnaire is that a list of similar items is provided to the respondents and the administration process is quick and easy (Youngshin, Youn-Jung & Doonam, 2015). The use of an online questionnaire in this study made the data collection process convenient and simple, by reaching the targeted respondents fast and in a cost-effective manner.

3.3.2.2 Construction and structure of the questionnaire

As already indicated, the sole data collection instrument employed in the study was a structured questionnaire. The questionnaire utilised in the study is shown in Appendix A. As noted by Youngshin, Youn-Jung and Doonam (2015), a questionnaire should be

designed in such a way that the selected question items assist in answering the research questions and hypotheses. The questionnaire contained two content sections. The first section required the biographical details of the respondent such as age, gender, programme and level of study. The second section contained sixty items which centred on six aspects of the usefulness of mobile phone technology for learning.

3.3.2.3 Distribution and collection of the questionnaire

The researcher administered the questionnaire online through Google Forms. Nayak and Narayan (2019) state that electronically administered questionnaires make sending and responding easy and cost-effective. The researcher selected email addresses of the required sample size per programme, sent a link to the questionnaire to the respondents' emails, and the respondents anonymously completed the questionnaire online. The respondents confirmed consent by clicking 'Yes' to the consent statement and proceeded to complete the form. Google Forms allowed the researcher to create a survey and to invite the respondents to complete the survey by email. The Google Forms limited respondents 'to one response' setting to ensure that each student responded only once. Of importance here was the issue of researcher detachment to guarantee reduced personal bias in the data collection process (Savela, 2018).

Respondents were able to use any browser and had the flexibility of utilising browsers on their mobile devices to respond to the questionnaire. The researcher selected email addresses of the required sample size per programme and sent a link to the questionnaire to the respondents' emails. Once the respondent accessed the questionnaire online, completion and submission were also done online. Furthermore, the Google Form 'Collect email addresses' function was deactivated to ensure anonymity. The respondents were not required to write their email addresses or names anywhere in the form. Hence, the responses could not be traced to the individual students. The respondents were required to answer the items on a 4-point rating scale, ranging from 4 to 1 as follows: Strongly Agree (SA) was 4 points, Agree (A) was 3 points, Disagree D was 2 points, and Strongly Disagree (SD) was 1 point. The respondents were also required to tick against the options that reflected their opinions about the perceived usefulness of mobile-phone technology for learning by distance

education students at the University of Eswatini. Google Forms was electronically set to accept responses for three weeks and the setting was disabled thereafter, to begin data analysis.

3.3.2.4 Alignment of research items

It was important to ensure that there was proper alignment of the research question/hypotheses, research objectives, unit of analysis, research instrument and nature of data collected. Such alignment is important in keeping the focus of the study within the desired approach and strategy. Table 3.3 shows the alignment of research questions, objectives, unit of analysis, research instruments, and nature of data.

Table 3.3: Alignment of research questions/hypotheses, aim/objectives, unit of analysis, instruments and nature of data

Research Question/Hypotheses	Research Aim/Objectives	Unit of analysis	Research instrument	Nature of Data
1. What is the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini?	1. Establish the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini	Students	Structured Questionnaire	Quantitative
2. There is no significant relationship between the students' gender and perceived usefulness of mobile-phone technology by distance education students at the University of Eswatini.	2. Find out if there is no significant relationship between the students' gender and perceived usefulness of mobile-phone technology for learning.	Students	Structured Questionnaire	Quantitative
3. There is no significant relationship between the students' age and perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.	3. Ascertain if there is no significant relationship between the students' age and perceived usefulness of mobile-phone technology for learning.	Students	Structured Questionnaire	Quantitative
4. There is no significant relationship between the students' programme of study and perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.	4. Examine whether there is no significant relationship between the students' programme of study and perceived usefulness of mobile-phone technology for learning.	Students	Structured Questionnaire	Quantitative
5. There is no significant relationship between the students' level of study and perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.	5. Establish whether there is no significant relationship between the students' grade level of study and perceived usefulness of mobile-phone technology for learning.	Students	Structured Questionnaire	Quantitative

As shown in the Table 3.3, the research question and hypotheses as well as research aim and objectives dove-tailed into unit of analysis, data collection instrument and nature of data collected. In the next section, a discussion of data analysis is undertaken.

3.3.3 Data analysis

The summary of the students' responses was accessed from the Google Form. The responses were downloaded as an Excel Sheet and exported to the Statistical Package of Social Sciences (SPSS) for further analysis, such as cross-tabulations and associations. The Statistical Package for the Social Sciences (SPSS) is the statistical software used to aid data analysis. Descriptive statistics were used to report the findings of the survey and the mean and standard deviation values were used to answer the research question. The response options for the questionnaire were: Strongly Agree = 4 points; Agree = 3 points; Disagree = 2 points; Strongly Disagree = 1 point. The criterion percentage for the checklist was 50%, while the criterion mean for the questionnaire was 2.50. This means that any item with the percentage of 50% or mean of 2.50 and above was accepted as representing 'Strongly Agree' or 'agree', while any item with a percentage or mean score less than 50% or 2.50 were not accepted as they represented 'Strongly disagree' or 'disagree.'

The Chi-square test was used to test the hypotheses at 0.05 level of significance. Moore, Notz and Flinger (2013) note that Chi-square is important in testing the association of variables. In the current study, for example, the Chi-square test was used to establish the relationship between the different variables as shown in the stated hypotheses. The biographical details of the respondents such as gender, age, the programme of study, and grade level were used to test the hypotheses with the question items of the perceived usefulness of mobile-phone technology for learning. The calculated probability (p-value) that was less or equal to the level of significance of 0.05 resulted in the null hypothesis being rejected, while the p-value that was higher than the level of significance of 0.05 resulted in the hypothesis being retained. The above methods enabled the researcher to determine the perceived usefulness of mobile-phone technology for learning by distance education students at the University

of Eswatini. In the next section, measures taken to address validity and reliability are explained.

3.4 VALIDITY AND RELIABILITY

Some measures were taken to enhance the validity and reliability of the research instruments, as explained in this section.

3.4.1 Validity

Validity refers to the technical soundness of a study (Creswell, 2014). According to Kenny (2019), the validity of an instrument refers to the extent to which it measures what it is supposed to measure. To ensure construct and content validity, the questionnaire was given to an expert in mobile learning for content validation. According to Fernández-Gómez et al. (2020), content validation of a research instrument through expert judgement entails the utilisation of an expert in the research field to make an independent assessment of the instrument in terms of content accuracy, content coverage and usability of the instrument. A mobile learning expert in one of the universities in South Africa assessed the questionnaire for content validity.

To ensure internal and external validity, the questionnaire was pilot-tested. Majid, Othman, Mohamad, Lim and Yusof (2017) define a pilot test as a pre-testing exercise to ascertain the strengths and inadequacies of a research instrument before full-scale implementation in the actual study. The questionnaire was administered to twenty students who were not part of the sample. Some of the improvements to the questionnaire after the piloting exercise are shown in Table 3.4.

Table 3.4: Improvements on the questionnaire after pilot study

Questionnaire section	Nature of correction effected	Item before pilot testing	Item improvement after pilot testing
Section A: Biographical details	Consistency in age range	No consistency in age ranges	The four-year age range was maintained consistently
	Additional gender option	Included Male and Female only	Added 'Other'
	Additional levels of study	Had levels 1 to four	Added five and six for Bachelor of Commerce
	Removal and replacement of question item	Question asked the type of phone.	Added two questions on smartphone ownership and another one on data access
Section Bi: Communication	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four; Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Content coverage	Initially the section had five items	Added five more items
	Spelling error corrected		
Section Bii: Access to content on the Moodle LMS	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four; Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Consistency in terms	The term smartphone was used interchangeably with mobile-phone	Used the term mobile-phone consistently
Section Biii: Access to content on the Internet	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four; Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Consistency in terms	The term smartphone was used interchangeably with mobile-phone	Used the term mobile-phone consistently
	Spelling error corrected	Questionnaire item 28 had wrong spelling 'serve' instead of 'save'	Spelling error was corrected.
	Removal of technical term	Removed the open educational resources (OERs)	The question item used the term free educational resources.
Section Biv: Interaction with course instructors	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four; Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Question item expression	Questionnaire items did not show	Adjusted question items on the section Interaction with course lecturer to show reciprocity

		reciprocity in interaction	
	Repetition of question	Questionnaire item 30 and 34 were identified to be the same	Question 34 was rephrased to read “I am able to use my phone to seek clarification from course instructor.”
Section Bv: Interaction with course fellow learners	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four; Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Word replacement	The word ‘peers; was replaced with ‘fellow learners’	The section title read ‘Interaction with fellow learners’ instead of ‘interaction with peers.’
	Question item expression	Questionnaire items did not show reciprocity in interaction	Adjusted question items on the section Interaction with course lecturer to show reciprocity.
	Word replacement	Questionnaire item 42 had word ‘classmates’	The word ‘classmates’ was replaced with fellow learners
	Word replacement	Questionnaire items 46 and 47 had the word ‘peers’	The word ‘peers’ was replaced with ‘fellow learners’
Section Bvi: Learning collaboratively	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four; Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Question item expression	Some statements used ‘my’ to refer to the respondent’s mobile phone	Dropped the term ‘my’ when referring to mobile phone on some of the statements
	Word replacement	Questionnaire items 54 and 55 had the word ‘peers’	The word ‘peers’ was replaced with ‘colleagues’

Table 3.4 above shows that the pilot exercise assisted greatly in improving and fine-tuning the research instrument before full-scale implementation of data collection. The next section discusses reliability and measures taken to enhance the reliability of the research instrument.

3.4.2 Reliability

Reliability is defined as the degree to which a research can be repeated while obtaining consistent results (Noble & Smith, 2015). Babbie (2012) explains reliability as the degree to which an assessment tool produces stable and consistent results. In this study, the Cronbach's alpha coefficient was calculated to measure the internal consistency reliability of the different sections of the structured questionnaire administered to the students. According to Tang, Cui and Babenko (2014), internal consistency of a research instrument indicates the extent to which the question items in the instrument produce dependable scores or are correlated. The Cronbach's alpha is the reliability of a test score showing the difference between the true and the observed score (Taber, (2018). The Cronbach's alpha coefficient is normally stated as a number between 0 and 1, and the tolerable standard of an internally consistent instrument has values ranging from 0.70 to 0.95 (Tavakol & Dennick, 2011). Khalid, Khan and Mohd-Zain (2012) present detailed categories of Cronbach's alpha reliability values as rules of the thumb, namely; 0.9 = excellent, 0.8 = good, 0.7 = acceptable, 0.6 = questionable, and 0.5 = poor or unacceptable. In the current study, the researcher used a four-point Likert scale and the questionnaire items were in six sections, namely; communication, access to content on the Moodle LMS, accessing the information on the Internet, interaction with course instructors, interaction with peers, and learning collaboratively. The Cronbach's alpha coefficient was then used to determine whether items were consistent with one another (Barbera, Naibert, Komperda & Pentecost, 2021). In other words, the coefficient alpha means a prediction of correlation between two samples drawn randomly from the total items.

In the current study, there were six thematic areas of learning to explore the distance education students' views on the perceived usefulness of mobile-phone technology for learning. Cronbach's alpha was calculated by the use of the SPSS for each one of the thematic areas on the questionnaire as shown in Table 3.5.

Table 3.5: Cronbach's alpha reliability of internal consistency for the structured questionnaire sections

SECTION B	Thematic area of learning	Type of respondents	Cronbach's Alpha	Number of items
i	Communication	Students	0.72	10
ii	Access to content on Moodle LMS	Students	0.72	10
iii	Accessing information on the Internet	Students	0.80	10
iv	Interaction with course instructors	Students	0.82	10
v	Interaction with peers	Students	0.82	10
vi	Learning collaboratively	Students	0.80	10

The Cronbach alpha calculation for the main section of the questionnaire, section Bi of the questionnaire (combined value for questions 1- 10) was 0.72, for section Bii (combined value for questions 11 - 20) was 0.72, for section Biii (combined value for questions 21 - 30) was 0.80, for section Biv (combined value for questions 31- 40) was 0.82, for section Bv (combined value for questions 41- 50) was 0.82, and for section Bvi (combined value for questions 51- 60) was 0.80. The Cronbach alpha values for all 60 questionnaire items of were above 0.70. The scales used with the sample were good according to the classification by Khalid, Khan and Mohd-Zain (2012) and, therefore, considered internally reliable.

The measures used to address the validity and reliability of the research instrument employed in the study were explained in this section and the instrument utilised was

considered valid and reliable for the purpose. The next section deals with the ethical considerations for the study.

3.5 ETHICAL ISSUES

The issue of ethics is important in research. According to Simelane-Mnisi (2018), ethics in research revolve around the researcher's moral responsibility in the treatment of research participants. Furthermore, Banks et al. (2013) state that it is standard practice that any research endeavour which includes human participants or animals should obtain clearance and approval by an institutional ethical review committee before it is conducted. The clearance and approval are hinged on the protection of participants in the research process. Ethics in research is concerned with what is morally good in the conduct of the research. The researcher attended to the several ethical issues in the study, as discussed below.

3.5.1 Research permission

The researcher obtained ethical clearance from the UNISA College of Education Ethics Review Committee before collecting data. The researcher also sought explicit permission from the UNESWA management to conduct a study on the IDE students. The permission was granted. The UNISA ethical clearance certificate is shown in Appendix B and the UNESWA permission letter is shown in Appendix D.

3.5.2 Informed consent

Manti and Licari (2018) explains voluntary confirmation by a participant as his or her willingness to participate in the study after being informed of what the study entails as well as the conditions of participation explain informed consent. In a way, the participant makes an informed decision about participation in the study. Informed consent in the current study was sought at two levels. The researcher designed an informed consent form which was provided to the respondents and the respondents signed to consent to participating in the study with no conditions tied to their participation. Since data were collected electronically through a Google Forms questionnaire, a consent section was included on the electronic questionnaire. The first section of the Google Forms

described the study and its purpose. The section also informed respondents that participation was voluntary and further assured them of confidentiality and anonymity. After reading the consent statement, the respondents were asked to click ‘Yes’ to confirm consent and then proceeded to fill out the form. Any respondent who clicked on ‘No’ was deemed to have declined consent and the system automatically denied them further access to completing the form. Therefore, only respondents with positive confirmation to consent proceeded to complete the questionnaire and their responses were captured for analysis.

3.5.3 Anonymity and confidentiality

The researcher undertook to protect the identity of the respondents to the questionnaire. Wiles, Crow, Heath and Charles (2008) observe that confidentiality entails the non-disclosure of any identifiable information linking the respondent to the research information supplied. Similarly, Kaiser (2009) notes that confidentiality is about keeping all the research information hidden from everyone except the researcher. Anonymity, however, as explained by Saunders, Kitzinger and Kitzinger (2015), is an aspect of confidentiality that entails keeping the research participants' identities secret. In the current study, the questionnaire was administered online through Google Forms. The respondents were requested to respond anonymously and their responses were treated in strict confidence. Furthermore, the Google Forms 'Collect email addresses' function was deactivated to ensure the anonymity of the respondents. The respondents were not required to write their email addresses or names anywhere in the form. Hence, the responses could not be traced to individual students.

3.5.4 Voluntary participation and withdrawal

Respondents participated in the study freely, without coercion. According to Edwards (2005), issues of voluntary participation and withdrawal from a study are part of informed consent. As research participants accede to participate in a study, it has to be clear that they do so voluntarily and will be free to withdraw from the study at any stage, and for any reason. As already alluded to, in the present study, consent was sought at two levels and on both levels, it was explicitly stated that participation was voluntary,

and that respondents were free to withdraw from the study at any stage and for whatever reason.

3.5.5 Harm

According to Favaretto, De Clercq, Gaab and Elger (2020), the research process or the research outcomes should not expose the research participants to any form of harm. Harm entails any form of discomfort which may include physical or emotional harm. The current study was on students' views on the perceived usefulness of mobile phone technology for learning. The content of the study did not expose the respondents to any harm. The process of collecting data through an online administered questionnaire did not cause any form of harm to the respondents, directly or indirectly.

3.6 CONCLUSION

In this Chapter, the researcher focused on the methodological processes and procedures selected for the study. The positivist research paradigm, which informed the study as the research philosophy, was discussed and justified in terms of its ontological, epistemological and ontological positions in research. The quantitative research approach and the descriptive strategy were also discussed. The researcher then explained the research methods by highlighting population and sampling as well as instrumentation and data analysis. Issues of validity and reliability, as well as ethical considerations for the study, were discussed. The next Chapter deals with the presentation, analysis and discussion of results.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

The purpose of this study was to explore distance education students' perceived usefulness of mobile phone technology for learning by distance education students at the University of Eswatini. The study further hypothesised the relationship or lack of it between age, gender, level and programme of study; and the perceived usefulness of the mobile phone technology for learning. In the previous Chapter, the methodological processes and procedures were discussed. The research paradigm in which the study is located was explained and justified, followed by the research approach and research strategy. The chapter also explained, in detail, the research methods by addressing research instrument, sampling, data analysis, validity, reliability and ethical issues.

A structured questionnaire was administered to selected students. The questionnaire had two sections. Section A covered biographical variables of the respondents. Section B of the questionnaire contained question items which focussed on mobile learning. There were six sections in total, namely; communication, access to content on the Moodle LMS, access to content on the Internet, interaction with course instructors, interaction with fellow learners and learning collaboratively. Each section contained ten items. A total of 337 questionnaires were administered to the students online using Google Forms and 287 of the 337 were completed and submitted. This was an 85% return rate of the questionnaire, which was higher than the 50% which is considered acceptable for online-administered questionnaires (Fan & Yan, 2010). The high return rate in this study could be attributed to the online administration being convenient for students as they could access the questionnaire online using their mobile devices. The next section presents results on the biographical details of the respondents.

4.2 BIOGRAPHICAL CHARACTERISTICS OF RESPONDENTS

In order to understand respondents' responses, it was deemed important to be clear of their biographical characteristics which include their gender, age, level and programme of study. The biographic characteristics provided the context in which information was gathered. The biographical details are shown in Table 4.1.

Table 4.1: Distribution of the biographical characteristics of the respondents (N=287)

Biographical variable	**Variable description**	**Frequency**	**Percentage%**
Gender	Male	107	37.3
	Female	180	62.7
Total		**287**	**100**
Age	18 - 22	44	15.3
	23 - 27	47	16.4
	28 - 32	64	22.3
	33 - 37	69	24.0
	38 and above	63	22.0
Total		**287**	**100**
Programme of Study	Bachelor of Arts (Humanities)	22	7.7
	Bachelor of Education (Adult Education)	9	3.1
	Bachelor of Education (Primary)	17	5.9
	Bachelor of Education (Secondary)	71	24.7
	Bachelor of Laws	19	6.6
	Diploma in Law	11	3.8
	Bachelor of Commerce	53	18.5
	Bachelor of Nursing Science	15	5.2
	Bachelor of Science (Information Technology)	22	7.7
	Postgraduate Certificate in Education	17	6.0
	Certificate in Portuguese	0	0
	Certificate in Psychosocial Support	31	10.8
Total		**287**	**100**
Level of Study	1st year	97	33.8
	2nd year	57	19.8
	3rd year	39	13.6
	4th year	94	32.8
Total		**287**	**100**

On the issue of gender, the majority of the respondents 62.7% (n=180) were female and 37.3 (n=107) were male. The gender disparity in the responses was consistent with the population and sample numbers in the frames discussed in Section 3.3.1 in the previous chapter. The highest number of respondents was from the 33 – 37 age group, 24% (n=64) and the lowest was from the 18 – 22 age group, 15.3% (n=44). This distribution in terms of age confirms the long-held view of ODL being for mature working adults. It is also important to note the presence of young people in ODL programmes. On the programme of study, the majority of the respondents were from the Bachelor of Education (Secondary) 24.7% (n=71), followed by the Bachelor of Commerce 18.5% (n=53), and the Certificate in Psychosocial Support 10.8% (n=31). There was no respondent from the Certificate in Portuguese programme, 3.1% (n = 9) from the Bachelor of Education (Adult Education) programme, as well as 3.8% (n=11) from the Diploma in Law programme. The number of respondents to the questionnaire was consistent with the stratified random sampling employed as indicated in the population frame on Table 3.1 in Section 3.3.1 in the previous chapter. The programmes with the largest number of students yielded more responses than the programmes with fewer numbers. The majority of the respondents were in the first year group 33.8% (n=97), and the lowest was in the third year group. In terms of the population frame discussed in Section 3.3.1 of the previous chapter, enrolment numbers differed as per year level. The next section presents results on the type of smartphone owned by the respondents.

4.2.1 Type of smartphone owned

As part of the background information solicited, respondents were requested to indicate the type of smartphone owned. The purpose was to establish if the mobile phones owned were the appropriate type in line with the affordances necessary for learning. Table 4.2 below summarises the responses.

Table 4.2: Type of smartphone owned (N=287)

Type of smartphone owned	Frequency	Percentage%
iPhone	14	4.9
Android	267	93
Windows	2	0.7
Don't know	2	0.7
Other	2	0.7
Total	**287**	**100**

As shown in Table 4.2, the majority of the respondents 93% (n=267) owned Android phones, suggesting that the type of smartphones that students owned were appropriate for the affordances required for learning. The next section reports results on the respondents' access to data.

4.2.2 Access to data for Internet browsing

The respondents were also requested to indicate how accessible data for internet browsing was for them. The purpose was to establish if the issue of data was an issue of concern in mobile phone utilisation for learning. Table 4.3 below summarises the respondents' responses on access to data.

Table 4.3: Access to data for internet browsing (N=287)

Access to data	Frequency	Percentage%
Always	105	36.6
Very Often	81	28.2
Often	77	26.8
Rarely	24	8.4
Never	0	0
Total	**287**	**100**

Table 4.3 shows that in terms of access to data for internet browsing, the majority of the respondents 36.6% (n=105) always had access to data and 26.2% (n=81) and the next highest group very often had access to data. This shows that access to data was not an issue of concern to the respondents. The finding is contrary to findings by Kotoua, Ilkan and Kilic (2015), that in Ghana, university students had serious challenges with data for educational purposes. In South Africa, Mpungose (2020) notes the initiatives by some universities in supplying data to students so that they could access online learning

4.3 RESULTS

This section presents data on the students' views on the perceived usefulness of mobile phone technology for learning. The section solicited data on six different aspects of mobile learning and results are presented on the different aspects. In interpreting results in all the six sections, the decision rule below was followed;

Decision Rule

If the mean score is 2.50 and above, it was accepted as representing 'Strongly Agree' or 'agree'. The mean would be interpreted to mean that the item was perceived useful for learning. Items with mean score less than 2.50 were not accepted as they represented 'Strongly disagree' or 'disagree' and the mean interpreted to mean that the item was perceived not useful for learning.

In the next section, results of the perceived usefulness of mobile phone technology in communication as an important aspect of learning are presented.

4.3.1 Communication

In this section, results of the respondents' views on the usefulness of mobile phone technology in communication are presented. There were ten items on communication which sought to establish the respondents' views of how they perceived the usefulness of mobile phone technology in the communication aspect of their learning. The results are summarised in Table 4.4.

Table 4.4: Responses on the perceived usefulness of mobile phone technology for communication in learning (N=287)

Communication	SA	A	D	SD	T	M	ST.D	Remarks
I am able to send text messages related to my studies	88 (30.7%)	188 (65.5%)	10 (3.5%)	1 (0.3%)	287 (100%)	3.26	0.54	PU
I am able to receive text messages related to my studies	91 (31.7%)	183 (63.8%)	11 (3.8%)	2 (0.7%)	287 (100%)	3.26	0.56	PU
I am able to respond to text messages related to my studies	89 (31%)	179 (62.4%)	17 (5.9%)	2 (0.7%)	287 (100%)	3.24	0.59	PU
I am able to send voice/ audio messages related to my studies	68 (23.7%)	167 (58.2%)	50 (17.4%)	2 (0.7%)	287 (100%)	3.05	0.66	PU
I am able to receive voice/ audio messages related to my studies	89 (31%)	172 (59.9%)	23 (8%)	3 (1%)	287 (100%)	3.21	0.62	PU
I am able to send emails on issues related to my studies	99 (34.5)	154 (53.7%)	30 (10.5%)	4 (1.4%)	287 (100%)	3.21	0.68	PU
I am able to receive emails on issues related to my studies on my mobile phone	98 (34.1%)	156 (54.4%)	29 (10.1%)	4 (1.4%)	287 (100%)	3.21	0.67	PU

I am able to make calls related to my studies	90 (31.4%)	153 (53.3%)	40 (13.9%)	4 (1.4%)	287 (100%)	3.15	0.70	PU
I am able to receive calls related to my studied	89 (31%)	156 (54.4%)	39 (13.6%)	3 (1%)	287 (100%)	3.15	0.68	PU
I am able to receive notifications on issues related to my studies	89 (31%)	160 (56.7%)	34 (11.8%)	4 (1.4%)	287 (100%)	3.16	0.68	PU
Average Mean						**3.20**		**PU**

Key: SA – Strongly Agree; A- Agree; D- Disagree; SD – Strongly Disagree; T – Total; M- Mean; ST.D-Standard Deviation; PU – Perceived Useful; PNU – Perceived Not Useful

On the issue of communication as an aspect of learning by which the students used their mobile phones, the majority of the respondents indicated that the mobile phone technology was useful for different communication aspects related to one's studies, such as: sending text messages 96.2% (n=276), mean, 3.26; receiving text messages 95.5% (n =274), mean, 3.26; responding to text messages 93.4% (n=268), mean, 3.24; sending voice/ audio messages 81.9% (n=235), mean, 3.05; receiving voice/ audio messages 90.9% (n=261), mean, 3.21; sending emails 88.2% (n=253), mean, 3.21; receiving emails 88.5% (n=254), mean, 3.21; making calls 84.7% (n=243), mean, 3.15; receiving calls 85.4% (n =245), mean, 3,15; as well as receiving notifications 87.7% (n=249), mean, 3.16). The average mean of 3.2 on aspects of communication suggested that the respondents perceived mobile phone technology as useful for communication in learning. This finding is consistent with related findings in literature as Bere and Rambe (2019) note the importance of mobile phone technology in enhancing communication between students and between learners and lecturers. As discussed in Section 2.2.5.1 of the second Chapter, communication is one of the affordances of mobile phone technology. The means of communication through the use of mobile phones such as text messages, calls, emails, audio, video and photo sharing are well-elaborated in literature (Clark, 2013; Alqahtani & Mohammad, 2015; Grant, 2019; Reeves & Reeves, 2015). The perceived usefulness of mobile phone technology for communication in learning further buttresses views by Matyokurehwa, Rudhumbu and Mlambo (2020), that institutions of higher learning should leverage on students' intention to use smartphones as important learning tools. The next section presents results on the perceived usefulness of mobile phone technology in accessing content on the Moodle LMS.

4.3.2 Accessing content on the Moodle LMS

In this section, results on the perceived usefulness of mobile phone technology in accessing content on the Moodle LMS are presented. There were ten items on accessing content on the Moodle LMS, which sought to establish the respondents' views on how they perceived the usefulness of mobile phone technology in accessing content on the Moodle LMS. Table 4.5 summarises the results.

Table 4.5: Accessing content on the Moodle LMS (N=287)

Access to content on the Moodle LMS	SA	A	D	SD	T	M	ST.D	Remarks
I am able to access course content on Moodle content using a mobile phone	104 (36.2%)	164 (57.1%)	16 (5.6%)	3 (1%)	287 (100)	3.29	0.62	PU
I am able to download material from the Moodle LMS using a mobile phone	90 (31.4%)	149 (51.2%)	44 (15.3%)	4 (1.4%)	287 (100)	3.13	0.71	PU
I am able to participate in live lessons through Zoom from a mobile phone	17 (5.9%)	98 (34.1%)	110 (38.3%)	62 (21.6%)	287 (100)	2.24	0.87	PNU
I am able to access assignment questions on Moodle using a mobile phone	99 (34.5%)	162 (56.4%)	24 (8.4%)	2 (0.7%)	287 (100)	3.22	0.63	PU
I am able to upload assignments using my mobile phone	85 (29.6%)	165 (57.5%)	32 (11.1%)	5 (1.7%)	287 (100)	3.08	0,70	PU
I am able to access test questions on Moodle using a mobile phone	88 (30.7%)	174 (60.6%)	21 (7.3%)	4 (1.4%)	287 (100)	3.21	0.63	PU
I am able to write tests on Moodle using a mobile phone	69 (24%)	168 (58.5%)	44 (15.3%)	6 (2.1%)	287 (100)	3.05	0.70	PU
I am able to access some links to content posted by the instructors	67 (23.3%)	182 (63.4%)	33 (11.5%)	5 (1.7%)	287 (100)	3.08	0.64	PU
I am able to access some free educational resources on Moodle using a mobile phone	75 (26.1%)	177 (61.7%)	33 (11.5%)	2 (0.7%)	287 (100)	3.13	0.62	PU
I am able to access some games useful to my studies using my mobile phone.	22 (7.7%)	111 (38.7%)	113 (39.4%)	41 (14.3%)	287 (100)	2.40	0.82	PNU
Average Mean						**3.00**		**PU**

Key: SA – Strongly Agree; A- Agree; D- Disagree; SD – Strongly Disagree; T – Total; M- Mean; ST.D-Standard Deviation; PU – Perceived Useful; PNU – Perceived Not Useful

On the issue of accessing learning materials on the Moodle LMS, the respondents found mobile phone technology useful in their ability to performs several academic tasks such as: accessing course content on Moodle content 93.3% (n=268), mean, 3.29; downloading material from the Moodle LMS 82.6% (n=239), mean, 3.13; accessing

assignment questions 90.9% (n=261), mean, 3.22; uploading assignments 87.1% (n=250), mean 3.08; accessing test questions 91.3% (n=262), mean, 3.21; taking tests on the Moodle LMS 82.5% (n=237), mean 3.05; accessing some links to content posted by the instructors 86.7% (n=249), mean 3.08; and accessing some free educational resources on Moodle 87.8% (n=252), mean 3.13. However, 59.9% (n=172) of the participants indicated that they did not perceive mobile phone technology as useful for participating in live lessons through Zoom. With a mean response of 2.24, it shows that this function of mobile technology was not adequately explored. On the issue of accessing games for learning, 53.7% (n=154) indicated that they did perceive mobile phone technology as useful for this function. With a mean response of 2.40, it also shows that game-based learning through mobile phone technology required exploration. This section had an average mean of 3.6, showing that the respondents were agreeable that mobile phone technology was useful in facilitating educational activities in the Moodle LMS. This finding corroborates related findings in literature on the importance of mobile devices for online learning (Halder, Halder & Guha, 2015; Mthethwa-Kunene & Maphosa, 2020). As noted by Krotov (2015), the utilisation of mobile devices for learning allows students to access course content and course materials from a learning platform without the restriction of time and space. The access to course content and learning materials online through the LMS is also consistent with the connectivist learning theory which postulates that learning may reside in non-human appliances (Siemens, 2005). Computers and mobile devices are the non-human appliances utilised to form networks for learning. The next section presents results on the perceived usefulness of mobile phone technology in accessing information on the Internet.

4.3.3 Accessing information on the Internet

In this section, results on accessing information on the Internet are presented. There were also ten items on accessing information on the Internet, which sought to establish the respondents' views on how they perceived the usefulness of mobile phone technology in accessing information on the Internet. The results are summarised in Table 4.6.

Table 4.6: Responses on the perceived usefulness of mobile phone technology on accessing information on the Internet (N=287)

Accessing information on the Internet	SA	A	D	SD	T	M	SD	Remarks
I use a mobile phone to access information on the Internet	123 (42.9%)	149 (51.9%)	15 (5.2%)	-	287 (100)	3.38	0.58	PU
I am able to access information on the Internet conveniently using a mobile phone	98 (34.1%)	160 (55.7%)	29 (10.1%)	-	287 (100)	3.24	0.62	PU
I am able to access different websites	88 (30.7%)	165 (57.5%)	32 (11.1%)	2 (0.7%)	287 (100)	3.18	0.64	PU
I able to download information from the internet	92 (32.1%)	166 (57.8%)	28 (9.8%)	1 (0.3%)	287 (100)	3.22	0.62	PU
I am able to select relevant information on the internet using my mobile phone	83 (28.9%)	178 (62%)	25 (8.7%)	1 (0.3%)	287 (100)	3.20	0.60	PU
I am able to store information it online using Google drive/Cloud using a mobile phone	11 (3.8%)	106 (36.9%)	123 (42.9%)	47 (16.4%)	287 (100)	2.28	0.78	PNU
I am able to read information found on the internet on a mobile phone	89 (31%)	177 (61.7%)	21 (7.3%)	-	287 (100)	3.24	0.57	PU
I am able to save important information on my phone for future reference	82 (28.6%)	162 (56.4%)	40 (13.9%)	3 (1%)	287 (100)	3.13	0.67	PU
I am able to enjoy the flexibility of accessing information on the go using a mobile phone	86 (30%)	162 (56.4%)	36 (12.5%)	3 (1%)	287 (100)	3.15	0.67	PU
I am able to access some free educational resources on the Internet using a mobile phone	59 (20.6%)	168 (58.6%)	50 (17.4%)	10 (3.5%)	287 (100)	2.96	0.72	PU
Average Mean						**3.10**		**PU**

Key: SA – Strongly Agree; A- Agree; D- Disagree; SD – Strongly Disagree; T – Total; M- Mean; ST.D-Standard Deviation; PU – Perceived Useful; PNU – Perceived Not Useful

On the issue of accessing information on the Internet using mobile phone technology, the majority of the respondents indicated the usefulness of the technology for: accessing information on the Internet 94.8% (n=272), mean, 3.38; accessing information on the Internet conveniently 89.8% (n=258), mean, 3.24; accessing different websites 88,2% (n=253), mean, 3.18; downloading information from the internet 89.9% (n=258), mean, 3.22; selecting relevant information on the internet 90.9% (n=261), mean, 3.20; reading information found on the internet 92.7% (n=266), mean, 3.24; saving important information on the phone for future reference 85% (n=244), mean, 3.13; enjoying the flexibility of accessing information on the go 86.4% (n=248), mean, 3.15; as well as accessing some free educational resources on the Internet 79.2% (n=227), mean, 2.96. However, on storing information online using Google drive/Cloud, 59.3% (n=170), mean, 2.28, suggested that the majority of the respondents was not

aware of online information saving functions of mobile phone technology. This section had an average mean response of 3.1. Therefore, it is concluded from this section that mobile phone technology was considered useful in accessing information on the Internet. The findings were consistent with findings in studies on mobile learning which found access to information on the internet an important aspect in knowledge acquisition (Apuke & Iyendo, 2018; Devi & Roy, 2012). As noted by Apuke and Iyendo (2018), Internet search engines such as Google have become very popular with higher education students in accessing information related to their learning. Furthermore, Ayub, Hamid and Nawawi (2018) state that access to the Internet makes it possible for students to access information, download the information, and save it for future reference. The next section presents results on the perceived usefulness of mobile phone technology in interaction with the course instructor.

4.3.4 Interaction with course instructors

In this section, respondents' responses on how they perceived mobile phone technology's usefulness in interacting with course instructors are presented. The questionnaire contained ten items on interaction with the course instructor which sought to establish the respondents' views of how they perceived the usefulness of mobile phone technology on interaction with the course instructors. Table 4.7 summarises the responses.

Table 4.7: Responses on the perceived usefulness of mobile phone technology on interaction with the course instructors (N=287)

Interaction with the course instructor	SA	A	D	SD	T	M	ST.D	Remarks
I am able to use a mobile phone to ask questions to my course instructor	51 (17.8%)	162 (56.4%)	66 (23%)	8 (2.8%)	287 (100)	2.89	0.71	PU
I am able to receive important notifications from my lecturers on a mobile phone	66 (23%)	187 (65.2%)	28 (9.8%)	6 (2.1%)	287 (100)	3.09	0.64	PU
I am able to receive questions from my course instructor	62 (21.6%)	188 (65.5%)	32 (11.1%)	5 (1.7%)	287 (100)	3.07	0.63	PU
I am able to use a mobile phone to seek clarification from my course instructor	60 (20.9%)	164 (57.1%)	51 (17.8%)	12 (4.2%)	287 (100)	2.95	0,74	PU
I am able to use a mobile phone to respond to questions from my course instructor	63 (22%)	186 (64.8%)	31 (10.8%)	7 (2.4%)	287 (100)	3.06	0.65	PU

I am able to send important information to my course instructor	66 (23%)	170 (59.2%)	44 (15.3%)	7 (2.4%)	287 (100)	3.03	0.69	PU
I am able to receive learning material from my course instructor	74 (25.8%)	172 (59.9%)	37 (12.9%)	4 (1.4%)	287 (100)	3.10	0.66	PU
Interaction with my course instructor is made easy using a mobile phone.	65 (22.6%)	148 (51.6%)	66 (23%)	8 (2.8%)	287 (100)	2.94	0.75	PU
Interaction with my course instructor is made convenient using a mobile phone	55 (19.2%)	158 (55%)	66 (23%)	8 (2.8%)	287 (100)	2.91	0.73	PU
I am able to stay in constant touch with my course instructor because of a mobile phone.	62 (21.6%)	147 (51.2%)	66 (23%)	12 (4.2%)	287 (100)	2.90	0.78	PU
Average Mean						**3.00**		**PU**

Key: SA – Strongly Agree; A- Agree; D- Disagree; SD – Strongly Disagree; T – Total; M- Mean; ST.D-Standard Deviation; PU – Perceived Useful; PNU – Perceived Not Useful

The aspect of interaction with the course instructor saw the majority of the respondents indicating that they were agreeable that mobile phone technology was useful for them to: ask questions to the course instructor 74.2% (n=213), mean, 2.89; receive important notifications from the course instructor 88.2% (n=253), mean, 3.09; receive questions from the course instructor 87.1% (n=250), mean, 3.07; seek clarification from the course instructor 78% (n=224), mean, 2.95; respond to questions from my course instructor 86.8% (n=249), mean, 3.06; send important information to the course instructor 82.2% (n=236), mean, 3.03; and receive learning material from my course instructor 85.7% (n=246), mean, 3.10. Furthermore, through the use of mobile phone technology, the majority of the respondents indicated that interaction with the course instructor was made easy 74.2% (n=213), mean, 2.94, interaction with the course instructor is made convenient 74.2% (n= 213), mean, 2.91 and the ability to stay in constant touch with the course instructor 72.8% (n=209), mean, 2.90. With an average mean of 3.0, it is concluded, from this section, that mobile phone technology was considered useful for interaction with course instructors. The findings in this section corroborated the benefits of mobile learning noted in literature as discussed in Section 2.2.4 of the second Chapter. As noted by Shonola, Joy, Oyelere and Suhonen (2016), the use of mobile phones makes it possible for students to communicate with course instructors for educational purposes. Similarly, Twum (2017) notes the importance of smartphones in supporting teaching and learning by ensuring the interaction between lecturers and students. The Community of Inquiry framework, as noted by Anderson (2017), underscores the importance of three presences; social, cognitive and teaching, all of

which are facilitated through the use of mobile phones, as students interact with course instructors.

The next section presents results on the perceived usefulness of mobile phone technology in interaction with fellow learners.

4.3.5 Interaction with fellow learners

In this section, results on the perceived usefulness of mobile technology in interaction with fellow learners are presented. The questionnaire also had ten items on interaction with peers which sought to establish the respondents' views of how they perceived the usefulness of mobile phone technology on interaction with the fellow learners. Table 4.8 summarises the results,

Table 4.8: Responses on the perceived usefulness of mobile phone technology on interaction with fellow learners (N=287)

Interaction with fellow learners	SA	A	D	SD	T	M	ST.D	Remarks
I am able to share learning material with classmates using a mobile phone	137 (47.7%)	132 (46%)	15 (5.2%)	3 (1%)	287 (100)	3.40	0.64	PU
I am able to engage in discussion on course content with my classmates using a mobile phone	108 (37.6%)	146 (50.9%)	25 (8.7%)	8 (2.8%)	287 (100)	3.23	0.72	PU
I am able work together with my colleagues on some assigned tasks using a mobile phone	93 (32.4%)	152 (53%)	33 (11.5%)	9 (3.1%)	287 (100)	3.15	0.74	PU
I am able to share some useful educational/learning applications (apps) with my colleagues using a mobile phone	84 (29.3%)	161 (56.1%)	34 (11.8%)	8 (2.8%)	287 (100)	3.12	0.71	PU
I am able to create content for sharing with my colleagues using a mobile phone	17 (5.9%)	48 (16.7%)	149 (51.9%)	73 (25.4%)	287 (100)	1.71	0.81	PNU
Interaction with my fellow learners is made easy by use of a mobile phone	98 (34.1%)	154 (53.7%)	32 (11.1%)	3 (1%)	287 (100)	3.21	0.67	PU
Interaction with my fellow learners is made convenient by use of a mobile phone.	100 (34.8%)	151 (52.6%)	31 (10.8%)	5 (1.7%)	287 (100)	3.21	0.70	PU
I am able to exchange ideas with my colleagues using a mobile phone	99 (34.5%)	165 (57.5%)	18 (6.3%)	5 (1.7%)	287 (100)	3.25	0.65	PU
I am able to exchange information with my colleagues using a mobile phone	102 (35.5%)	165 (57.5%)	14 (4.9%)	6 (2.1%)	287 (100)	3.26	0.65	PU
I am able to interact with my colleagues in educational matters while on the go using a mobile phone.	97 (33.8%)	164 (57.1%)	22 (7.7%)	4 (1.4%)	287 (100)	3.23	0.65	
Average Mean						**3.10**		**PU**

Key: SA – Strongly Agree; A- Agree; D- Disagree; SD – Strongly Disagree; T – Total; M- Mean; ST.D-Standard Deviation; PU – Perceived Useful; PNU – Perceived Not Useful

The majority of the respondents were agreeable that mobile phone technology was useful in enabling them to: share learning material with classmates 93.7% (n=269), mean, 3.40; engage in discussion on course content with fellow learners 88.5% (n=254), mean, 3.23; work together with colleagues on some assigned tasks 85.4% (n=245), mean, 3.15; as well as share some useful educational/learning applications (apps) with colleagues 85.4% (n=245), mean, 3.12. In addition, the majority of the respondents also indicated that through the use of mobile phone technology, interaction with fellow learners was made easy 87.8% (n=252), mean, 3.21; and interaction with fellow learners was made convenient 87.4% (n=251), mean, 3.21.

The majority of the respondents also indicated that mobile phone technology was useful in their ability to: exchange ideas with colleagues 92% (n=267), mean, 3.25; exchange information with colleagues 93% (n=267), mean, 3.26; as well as to interact with colleagues on educational matters while on the go 90.9% (n=261), mean, 3.24. However, on creating content for sharing with colleagues 77.3% (n=222), mean, 1.71 indicated that they did not perceive mobile phone technology as useful in this regard. It can be concluded that respondents were not aware of content creation as an aspect of learning which could be facilitated through mobile phone technology. This section had an average mean of 3.2, and so it was concluded from this section that mobile phone technology was useful in interaction with peers.

The findings in this section are also consistent with findings in similar studies in literature. Sections 2.2.5.2 and 2.2.5.4 of the second Chapter discussed collaboration and interaction respectively as important affordances of mobile phone technology for learning. The two affordances are confirmed by the respondents in the present study as students are provided with opportunities to work together through the utilisation of their smartphones. Twum (2017) notes that lecturers confirmed the importance of mobile phones in enhancing collaboration and interaction in learning. Online learning is often associated with lack of student interaction. However, as noted by Gómez-García, Soto-Varela, Morón-Marchena and Pino-Espejo (2020), mobile devices are useful tools to aid social interaction. The next section presents results on the perceived usefulness of mobile phone technology on learning collaboratively

4.3.6 Learning collaboratively

In this section, results on the perceived usefulness of mobile phone technology on learning collaboratively are presented. The questionnaire had ten items on learning collaboratively, which sought to establish the respondents' views of how they perceived the usefulness of mobile phone technology on learning collaboratively. Table 4.9 summarises the results.

Table 4.9: Responses on the perceived usefulness of mobile phone technology on learning collaboratively (N=287)

Learning collaboratively	SA	A	D	SD	T	M	ST.D	Remarks
I am able to belong to a social network group using a mobile phone	95 (33.1%)	165 (57.5%)	24 (8.4%)	3 (1.0%)	287 (100)	3.23	0.64	PU
I am able to participate in social networks for educational purposes using a mobile phone	90 (31.4%)	169 (58.9%)	24 (8.4%)	4 (1.4%)	287 (100)	3.20	0.64	PU
I am able to participate in social networks for improved learning	78 (27.2%)	174 (60.6%)	29 (10.1%)	6 (2.1%)	287 (100)	3.13	0.67	PU
I am able to ask questions to my colleagues in my social groups	81 (28.2%)	185 (64.5%)	18 (6.3%)	3 (1%)	287 (100)	3.20	0.59	PU
I am able to respond to questions from my colleagues in my social network	82 (28.6%)	179 (62.4%)	23 (8%)	3 (1%)	287 (100)	3.18	0.61	PU
I work together with my colleagues on some assigned tasks	78 (27.2%)	179 (62.4%)	26 (9.1%)	4 (1.4%)	287 (100)	3.15	0.63	PU
I am able to create study mates to work with in my studies	76 (26.5%)	175 (61%)	33 (11.5%)	3 (1%)	287 (100)	3.13	0.64	PU
I am able to learn from my colleagues	82 (28.6%)	176 (61.3%)	26 (9.1%)	3 (1%)	287 (100)	3.17	0.63	PU
My colleagues are able to learn from me	71 (24.7%)	176 (61.3%)	37 (12.9%)	3 (1%)	287 (100)	3.10	0.64	PU
I am in constant touch with my colleagues as we learn together	80 (27.9%)	170 (59.2%)	31 (10.8%)	6 (2.1%)	287 (100)	3.13	0.67	PU
Average Mean						**3.16**		**PU**

Key: SA – Strongly Agree; A- Agree; D- Disagree; SD – Strongly Disagree; T – Total; M- Mean; ST.D-Standard Deviation; PU – Perceived Useful; PNU – Perceived Not Useful

On the aspect of learning collaboratively, the majority of respondents was agreeable that through the use of mobile phone technology, they were able to: belong to a social network group 90.6% (n=260), mean, 3.23; participate in social networks for educational purposes 90.3% (n=259), mean, 3.20; participate in social networks for improved learning 87.8% (n=252), mean, 3.13; ask questions to colleagues in social groups 92.7% (n=266), mean, 3.20; respond to questions from colleagues in a social group 91% (n=261), mean, 3,18; work together with colleagues on some assigned tasks 89.6% (n=257), mean, 3.15; create a study group with my colleagues to work

together in different courses 87.5% (n=251), mean, 3.13; learn from other colleagues 89.9% (n=258), mean, 3.1; and learn from each other 86% (n=247), mean, 3.10. Furthermore, through mobile phone technology, the respondents were constantly in touch with each other, as they learnt together 87.1% (n=250), mean, 3.13. With an average mean of 3.16, it is concluded from this section that mobile phone technology was considered useful in learning collaboratively. The findings in this section corroborated findings in literature on collaboration in online learning. Section 2.2.5.2 of the second Chapter discussed collaboration as one of the affordances of mobile devices in learning. Xiangming and Song (2018) show the importance of collaboration in online learning by allowing students opportunities to build relationships with peers for the enhancement of learning. In line with the Community of Inquiry framework, the mobile phone technology allows students to have their social presence felt in the learning process. As noted by Kear, Chetwynd and Jefferis (2014), social presence in learning allows students to see themselves as real, and participate in learning through sharing ideas. The issue of participating in social networking groups through the use of Web 2.0 tools whose applications are downloadable on mobile phones, is another important aspect of learning collaboration raised in the present study and confirmed in literature. As noted by Alhasanat (2020), a student with a smartphone with internet connectivity is able to join and participate in different social networks. Activities in the social network may be for the enhancement of learning through discussion and performance of joint learning tasks. The next section provides a summary of the responses from the six areas identified as important for learning.

4.3.7 Summary of the responses on the perceived usefulness of mobile phone technology for learning

In this section, a summary of responses from the six different sections is provided in order to derive a conclusion on whether or not mobile phone technology was perceived as useful for learning. Table 4.10 summarises the responses from the six areas.

Table 4.10: Results of each construct on the perceived usefulness of mobile phone technology for learning.

Aspects of the utilisation of mobile phone technology for learning	Mean	Perceived Usefulness
Communication	3.20	Perceived Useful
Accessing content on Moodle LMS	3.00	Perceived Useful
Accessing information on the Internet	3.10	Perceived Useful
Interaction with the course instructor	3.00	Perceived Useful
Interaction with fellow learners	3.10	Perceived Useful
Learning collaboratively	3.16	Perceived Useful
Average Mean	**3.10**	**Perceived Useful**

Table 4.10 shows that mobile phone technology was perceived useful in all the aspects of learning, namely; communication, access to content on the Moodle LMS, access to information on the Internet, interaction with course instructors, interaction with fellow learners and learning collaboratively. All the six sections recorded mean responses above 2.5. It is, therefore, concluded that mobile phone technology was perceived as useful for learning. This finding is consistent with findings in similar studies in the literature. Ahmad (2020) found that students held positive perceptions about mobile phones as important learning tools. Similarly, Zhai and Shi (2020) found that students had positive perceptions about the use of mobile technologies in the learning of Physics, actually used the devices, and there was a positive impact on learner achievement. Alhasanat (2020) also found that students revealed that mobile phones were useful in their learning of the Arabic language. The positive perceived usefulness of mobile phone technology for learning in the present study is not unique to this study, but simply affirms similar findings in literature. The next section responds to the research hypotheses raised in section 1.5 of the first Chapter.

4.4 HYPOTHESES RESULTS

Results for the four research hypotheses stated in section 1.5 of the first chapter are presented in this section using the Chi-square test. In calculating the Chi-square results, the researcher created a new variable "overall perceived usefulness" by computing a mean score for each respondent for all 60 items. This computation changed the mean scores to a categorical (nominal) variable by using 2.50 as a threshold (2.50 and below = Perceived Not Useful; above 2.50 = Perceived useful) as explained in Section 3.3.3 'Data analysis' in the third Chapter. The researcher then ran the Chi-square tests for the categorical (nominal) variables of gender, age, programme of study, and level of study in order to establish if there was any relationship between gender, age, programme and level of study and the perceived usefulness of mobile phone technology for learning. Section 4.4.1 presents the results.

4.4.1 Results on the relationship between gender, age, level of study and programme of study and the perceived usefulness of mobile phone technology for learning

The study sought to establish if there was any relationship between the students' gender, age, level of study and programme of study; and the perceived usefulness of mobile phone technology for learning.

Decision Rule

If the calculated chi-square (p-value) was greater than the level of significance of 0.05, the null hypothesis was retained; and if the p-value was less than the level of significance of 0.05, the hypothesis was rejected.

Table 4.11 provides results of the hypotheses.

Table 4.11: Relationship between gender, age, programme and level of study and the perceived usefulness of mobile phone technology for learning

Biographical variable	Perceived usefulness of mobile phone technology for learning				
		Perceived Not Useful	**Perceived Useful**	**Total**	**Chi-square test (x^2)/ Decision**
Gender	Male	4	103	107	(X^2 = 0.478 (1), p = 0.490). p> 0.05 Null Hypothesis is retained
	Female	10	170	180	
	Total	**14**	**273**	**287**	
Age	18 - 22 years	7	37	44	(X^2 = 14.363 (4), p = 0.006). p<0.05 Null hypothesis is rejected
	23 – 27 years	1	46	47	
	28 – 32 years	3	61	64	
	33 – 37 years	2	67	69	
	38 and above	1	62	63	
	Total	**14**	**273**	**287**	
Programme of study	Bachelor of Arts (Humanities)	3	19	22	**(**X^2 = 14.015 (10), p = 0.172). p>0.05 Null Hypothesis is retained
	Bachelor of Education (Adult Education)	0	9	9	
	Bachelor of Education (Primary)	0	17	17	
	Bachelor of Education (Secondary)	1	70	71	
	Bachelor of Laws	2	17	19	
	Diploma in Law	2	9	11	
	Bachelor of Commerce	4	49	53	
	Bachelor of Nursing Science	0	15	15	
	Bachelor of Science (Information Technology)	1	21	22	
	Postgraduate Certificate in Education	0	17	17	
	Certificate in Psychosocial Support	1	30	31	
	Total	**14**	**273**	**287**	
Level of Study	Level 1	4	93	**97**	(X^2 = 14.501 (5), p = 0.013). p<0.05 Null hypothesis is rejected
	Level 2	3	54	**57**	
	Level 3	6	33	**39**	
	Level 4	1	93	**94**	
	Total	**14**	**273**	**287**	

As shown in Table 4.11, there was no association between gender and perceived usefulness (X^2 = 0.478 (1), p = 0.490). The p- value was greater than the chosen p-value = 0.05 hence the null hypothesis was retained. The finding is consistent with findings in the study by Hilao and Wichadee (2017) which concluded that there was no significant difference in the way male and female students utilised their smartphones in specific activities. Similarly, Ng, Hassan, Nor and Malek (2017) established that there

were no gender disparities in the students' involvement in specific tasks, using mobile phones.

Table 4.11 shows that there was an association found between students' age and perceived usefulness (X^2 = 14.363 (4), p = 0.006). The p-value was less than the chosen p-value = 0.05 hence the null hypothesis was rejected. The finding is consistent with issues raised in Section 2.5 of the second chapter which found that young students utilised mobile phones more than students of other ages. The findings in the present study are further inconsistent with what was established by Ataş and Çelik (2019) that students in the 18 – 24 age group utilised mobile phone technology more than others. Similarly, Ahmad (2019) found that in the Caribbean contexts, young adults were the fastest adopters and greatest users of mobile-phone technology.

There was no association between students' programme of study and perceived usefulness (X^2 = 14.015 (10), p = 0.172). The p-value was greater than the chosen p-value = 0.05 and the null hypothesis was retained. On the issue of disciplines or programmes of study, as discussed in Section 2.7 of the second Chapter, there was no relationship between disciplines and mobile phone usage. The present study confirms findings by Halder, Halder and Guha (2015) who found that in the Indian context, the use of mobile phone technology for learning could not be attributed to any programme of study.

There was an association found between students' level of study and perceived usefulness (X^2 = 14.501 (5), p = 0.013). The p-value was less than the chosen p-value = 0.05 and the null hypothesis was rejected. As shown in Section 2.8 of the second Chapter, studies have not established any relationship between mobile technology use and level of study. The present study refutes the view by Lau, Chiu, Ho, Lo and See-To (2017), there was no statistically significant difference in the way students at different levels of study utilised mobile phones for learning.

In the next section, the findings of the study are discussed using the TAM that framed the study.

4.5 DISCUSSION ON TECHNOLOGY ACCEPTANCE MODEL

The study was informed by the Technology Acceptance Model (TAM), which posits that the perceived usefulness and perceived ease of use of a technology is positive result in equally positive attitudes towards a technology and behavioural intention to use as well the actual use of a technology. In the context of the present study, the findings indicated that the respondents found mobile phone technology useful for communication in online distance learning. If students held positive views about the use of mobile phone technology regarding communication, this would positively influence their intention to use, and the actual use of the technology mobile technology. The perceptions of usefulness are associated with the benefit of using the technology (Portz et al., 2019). Strong and positive perceptions of the usefulness of the mobile phone technology for communication in learning will, invariably, influence the desire to use as well as the actual use of the technology.

The study also found that the respondents were agreeable that mobile phone technology was useful in accessing content on the Moodle LMS. Accessing content from a learning management system is an integral component of online learning because without access to the course content and learning materials, learning becomes a challenge. Park (2009:152) states that perceived usefulness is all about the extent to which the students believe the use of technology will enhance their learning. By showing positive views about the usefulness of mobile phone technology for accessing content on the learning platform, the respondents revealed the importance of the technology for their learning.

It was further established in the study that mobile phone technology was perceived useful in accessing information on the internet. As noted by Apuke and Iyendo (2018), higher education students' learning is dependent on access to internet sources of information for research and learning purposes. Hence, the importance of internet search engines such as Google, Yahoo and other open access journal sites. There is also a plethora of open educational resources (OERs) sites that make it possible for students to access information for academic purposes. The fact that students considered mobile phone technology useful in accessing information on the internet

would, according to the TAM, positively influence their attitudes towards the phones, the behavioural intention, and actual use of the phones for the purpose of internet searches for educational purposes.

The study also found that mobile phone technology was perceived as useful for interaction with the course instructors. In line with the Community of Inquiry theory, the teaching presence is one of the important three 'presences' for effective online learning (Garrison, 2006). The teaching presence is enhanced through meaningful interaction between students and course instructors. Students are able to make use of their mobile phones to interact with course instructors in different ways that improve their learning. Similarly, the connectivist learning theory advances the view that students learn by making connections (Siemens, 2005). One important connection is with the course instructor through the available technology. In line with the TAM, positive views on the usefulness of the technology invariably influence the desire to use, and the actual use of the technology. Therefore, with positive views on the usefulness of mobile phone technology for interaction with course instructors, students are bound to utilise the devices for this purpose.

The study further established that mobile phone technology was perceived as useful for interaction with fellow learners. Mobile devices could be utilised in the type of learning known as mobile-assisted seamless learning (MSL) (Tashfeen, 2020). Such learning takes care of the student's context, and it is flexible, highly collaborative, and socially engaging (Lynch, 2020). Interaction with fellow learners is important in bringing out the social presence, as one of the important 'presences' in the community of inquiry theory (Garrison, 2006). Students need to participate effectively in group activities by interacting with others. The positive views held by the respondents on the usefulness of mobile phone technology for interaction with fellow learners predisposes them for the use of the devices for the same purpose.

It was also established in the study that mobile phone technology was perceived as useful in assisting students to learn collaboratively. Participating in social network groups and discussion forums is considered significant for enriching students' learning experiences on online learning. As observed by Faja (2013), rich online learning

experiences are possible when students are involved in numerous virtual collaborative activities, which keep them engaged and active in online learning communities. In line with the TAM theory, positive views on the usefulness of mobile phone technology for collaborative learning are important in the adoption and use of the technology.

4.6 CONCLUSION

In this Chapter, the researcher presented the results of the study. First, results pertaining to the main research question on the perceived usefulness of mobile technology for learning were presented. Results for each one of the six different sections of the questionnaire, with the six identified attributes in learning were presented. The respondents were generally agreeable that mobile phone technology was useful for communication in learning. It was concluded that mobile phone technology was perceived useful for communication in learning. On the issue of accessing content on the Moodle LMS, respondents were generally agreeable on most items except on the item that mobile phone technology was useful in allowing the respondents to join live lesson streaming through Zoom and for games in learning. On the whole, mobile phone technology was perceived useful for accessing content on the Moodle LMS. On the issue of accessing information on the Internet, the respondents were generally agreeable on most of the issues except that mobile phone technology enabled the storing of information online using Google drive/Cloud. However, it was concluded that mobile phone technology was perceived as useful in accessing information on the Internet. The majority of the respondents agreed that mobile phone technology was perceived as useful in interaction with the course instructors and with fellow learners. Mobile phone technology was also perceived as useful in enabling students to learn collaboratively. Cumulatively, the mean responses supported the conclusion that mobile phone technology was perceived as useful for learning. Results on the four tested hypotheses revealed that there was no association between gender and perceived usefulness, there was association between students' age and perceived usefulness, there was no association between students' programme of study and perceived usefulness, and there was association between students' level of study and perceived usefulness.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 INTRODUCTION

In the previous Chapter, the researcher presented and analysed the results of the study. The findings of the study were then discussed against extant literature and the theory informing the study. In this Chapter, the researcher presents an overview of the whole research study, draws conclusions from the findings, and provides recommendations. Furthermore, the research briefly reviews all the chapters that constituted the study. In line with the findings of the study, the researcher also shows how the research objectives were answered. In this Chapter, the researcher also handles the limitations of the study.

5.2 SUMMARY OF THE LITERATURE

The review of literature germane to the study, carried out in the second Chapter of the study, provided a solid foundation for the study conceptually, theoretically and methodologically. The review of literature traced the different generations of ODL technologically and pedagogically. The current generation, which makes use of mobile devices for learning, was discussed; drawing from the connectivist learning theory, which stresses the importance of connection with technology and other people in learning. The literature review also unpacked the mobile learning concept, showing how mobile learning has transcended the physical boundaries of learning by ensuring that learning happens anywhere and anytime. The numerous benefits of mobile learning were discussed and the affordances of mobile technology, which make it useful for learning, were explored. The review of literature also discussed the prerequisites for the effective utilisation of technology for learning. The prerequisites included digital literacy and information literacy skills, among others. Section 2.4 of the second Chapter discussed some of the challenges in mobile learning. Issues of age, gender, discipline and level of study were also discussed concerning mobile technology use for learning. Section 2.9 of the second Chapter was devoted to a detailed discussion of the theory

underpinning the study. A summary of the methodological processes and procedures of the study is provided in the next section.

5.3 SUMMARY OF THE METHODOLOGICAL PROCESSES AND PROCEDURES FOR THE STUDY

The third Chapter of the study was devoted to a discussion and justification of the methodological processes and procedures for the study. The study was located in the positivist research paradigm, which is scientific and, ontologically views reality as objective and measurable. A quantitative research approach was followed and the study utilised a descriptive strategy. In terms of the research methods, quantitative data were elicited from a stratified random sample of 337 students using a highly structured questionnaire. The sample was 20% of the population hence, representative enough to make conclusions on the population. Out of the 337 administered questionnaires, 287 were completed and returned for analysis. This was an 85% return rate. The structured questionnaire allowed the researcher to collect data that could easily be quantified. The questionnaire was administered online using Google Forms. Measures to enhance the reliability and validity of the research instrument included the use of expert opinion, pilot testing and calculation of the Cronbach's alpha coefficient. Data were analysed by use of the SPSS software. Descriptive statistics were utilised in analysing data to answer the main research question, and the Chi-square test was utilised to answer the research hypotheses. Ethical issues such as research permission, ethical clearance and informed consent were attended to as explained in Section 3.5 of the third Chapter.

The fourth Chapter of the study presented, analysed and discussed the results of the study. Section 4.2 of the chapter presented results on the biographical details of the respondents. Section 4.3 presented results on the main research question on the perceived usefulness of mobile phone technology for learning as perceived by distance education students. Results were presented on the different aspects of learning namely communication, access to course content on the Moodle LMS, access to information on the internet, interaction with course instructors, interaction with peers as well as learning collaboratively. The study found that the perceived usefulness of mobile phone technology for communication, access to course content on the Moodle LMS, access to

information on the internet, interaction with course instructors, in interaction with peers, as well as learning collaboratively, was confirmed by the respondents. To this end, mobile phone technology was confirmed useful for learning. The composite results on the six elements were aggregated to determine the conclusion that mobile phone technology was perceived as useful for learning. Section 4.4 of the chapter presented results in answer to the four hypotheses. The study found that there was no association between gender and perceived usefulness of mobile phone technology for learning. However, there was an association between students' age and perceived usefulness. There was also no association between students' programme of study and perceived usefulness, but there was an association between students' level of study and perceived usefulness of mobile phone technology for learning.

5.4 SYNTHESIS OF THE RESEARCH FINDINGS

In the previous section, the research methodology, data analysis, and interpretation were attended to. In this section, the similarities and differences between the literature review and the findings of the empirical study are examined. There were several similarities between the findings of the empirical study and the literature reviewed. The similarities were on the usefulness of mobile phone technology for communication, accessing content on the Moodle LMS, accessing information on the internet, interacting with fellow learners, interacting with course instructors, and learning collaboratively.

Section 2.2.4 of the second chapter discussed the benefits of mobile learning and raised some issues similar to what was established in the empirical study. Abidin and Tho (2018) see mobile phones as important communication tools in online learning. With an overall mean response of 3.20, the respondents in the empirical study were agreeable that mobile phone technology was useful for communication in learning. The aspect of the benefit of mobile phone technology as important in communication in learning was corroborated in the empirical study, as the majority of the respondents perceived mobile phone technology as useful for communication in learning.

Several studies in literature reviewed in section 2.2.4 of the second chapter, revealed how useful mobile phone technology cited assisting students to access content on the LMS. As noted by Padmo, Idrus and Ardiasih (2019), mobile devices made it easy for students to access online learning material which is normally posted on a LMS. The empirical study confirmed this aspect as the overall mean response of 3.0 indicated that the majority of the respondents perceived mobile phone technology as useful in helping students to access content on the Moodle LMS. A difference in the aspect of accessing content on the LMS came when the respondents did not perceive mobile phone technology as useful in assisting them to connect to live lecture streaming through Zoom. Another difference was also noted when respondents in the empirical study did not perceive mobile phone technology as useful in accessing games meant to improve their learning.

Sections 2.5, 2.6, 2.7, and 2.8 of the second Chapter discussed issues contained in the hypotheses of the empirical study. The empirical study sought to establish if there was any relationship between age, gender, programme and level of study and the perceived usefulness of mobile technology. It was established that there was no association found between gender and perceived usefulness. This was consistent with findings in the study by Hilao and Wichadee (2017), which concluded that there was no significant difference in the way male and female students utilised their smartphones in specific activities. There was an association between students' age and perceived usefulness. This corroborated the assertion by Ahmad (2019), that young adults were the fastest adopters and greatest users of mobile-phone technology. There was also no association found between students' programme of study and perceived usefulness, confirming findings by Halder, Halder and Guha (2015) that the use of mobile phone technology for learning could not be attributed to any programme of study. There was an association between students' level of study and perceived usefulness of mobile phone technology for learning. The findings refuted the views by Lau, Chiu, Ho, Lo and See-To (2017) that there was no statistically significant difference in the way students at different levels of study utilised mobile phones for learning.

5.5 CONCLUSIONS ON THE HYPOTHESES AND THE MAIN RESEARCH QUESTION

The study sought to establish the perceived usefulness of mobile phone technology by distance education students at the University of Eswatini. The main research question and four hypotheses were stated in Chapter 1 (Sections 1.4 and 1.5). In this section, the researcher attends to the conclusions from the findings on the hypotheses and main research question.

Ho1: There is no significant relationship between the students' gender and the perceived usefulness of mobile-phone technology by distance education students at the University of Eswatini.

The null hypothesis was retained and the conclusion was that there was no association found between gender and perceived usefulness of mobile phone technology for learning.

Ho2: There is no significant relationship between the students' age and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

The null hypothesis was rejected and the conclusion was that there was association between age and perceived usefulness of mobile phone technology for learning.

Ho3: There is no significant relationship between the students' programme of study and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

The null hypothesis was retained and the conclusion was that there was no association found between students' programme of study and the perceived usefulness of mobile phone technology for learning.

Ho4: There is no significant relationship between the students' grade level of study and the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

The null hypothesis was rejected and the conclusion was that there was an association found between students' level of study and perceived usefulness for learning.

Main Research Question: What is the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini?

In line with the six elements linked to learning, namely; communication, accessing content on the Moodle LMS, accessing the information on the internet, interaction with course instructors, interaction with fellow learners and learning collaboratively; the study makes the following conclusions;

- mobile phone technology was perceived as useful for communication in learning by the distance education students at the University of Eswatini,
- the distance education students also perceived mobile phone technology as useful in accessing content on the Moodle LMS,
- the students, however, did not perceive mobile phone technology ass useful in allowing them to connect to live lecturers through Zoom and also access games useful for learning,
- mobile phone technology was also perceived as useful in accessing the information on the Internet though did not perceive it as useful in saving information online,
- the students perceived mobile phone technology was useful in interacting with course lecturers and fellow learners as well as learning collaboratively. However, the students did not perceive mobile phone technology as useful in their creation of content for sharing with others.

5.6 LIMITATIONS

The study had some limitations. The study was quantitative and did not obtain reasons behind some of the responses provided by the respondents. The study also focused on one institution of higher learning hence the results may not be generalisable to all distance education institutions.

5.7 RECOMMENDATIONS

It was clear from the findings that mobile phone technology was perceived as useful for learning. Recommendations are made on leveraging the positive perceptions of the students about mobile phone technology by enhancing the actual use of the technology for learning.

5.7.1 Recommendations to managers in ODL institutions

- Given the finding from the study that distance education students find mobile phone technology useful for learning there is a need for managers in ODL institutions to invest in mobile phone technology. In deprived rural environments it should not be left to students to acquire their own mobile devices but the institution should support students with the appropriate type of mobile phones or related mobile devices.
- The managers should formalise and institutionalise mobile learning, taking advantage of the students' desire and willingness to utilise mobile phone technology for learning. The teaching and learning policy of the institution should explicitly define mobile learning and how it is implemented.

5.7.2 Recommendations to ODL course instructors

- Course instructors should develop course content that can be accessed easily by students using mobile phone technology. The course instructors should be aware of device limitations such as screen size and storage capacity in their development of tailor-made content and learning activities suitable for mobile phone technology.
- Course instructors should utilise mobile phone technology to communicate with students. Constant communication is important for distance education students as they stay connected to their course instructors and fellow learning in enhancing their participation in learning.

- Course instructors should embrace mobile learning pedagogies in order for students to fully utilise all the affordances of mobile phone technology, enhance participation in learning and the learners' attainment of learning outcomes.

5.7.3 Recommendations to ODL course developers

- In developing distance education courses and course materials, the course developers should plan for the use of mobile phone technology by students in communication, accessing content, partaking in learning activities as well as interaction with fellow learners and course instructors.

5.7.4 Recommendations to distance education students

- Distance education students should explore all the affordances of mobile phone technology and make full utilisation of the mobile devices. The students should be involved in high order academic activities such as content creation and content sharing using mobile phone technology.

Figure 5.1 provides a recommended framework, including the needed elements for the enhanced utilisation of mobile phone technology for learning.

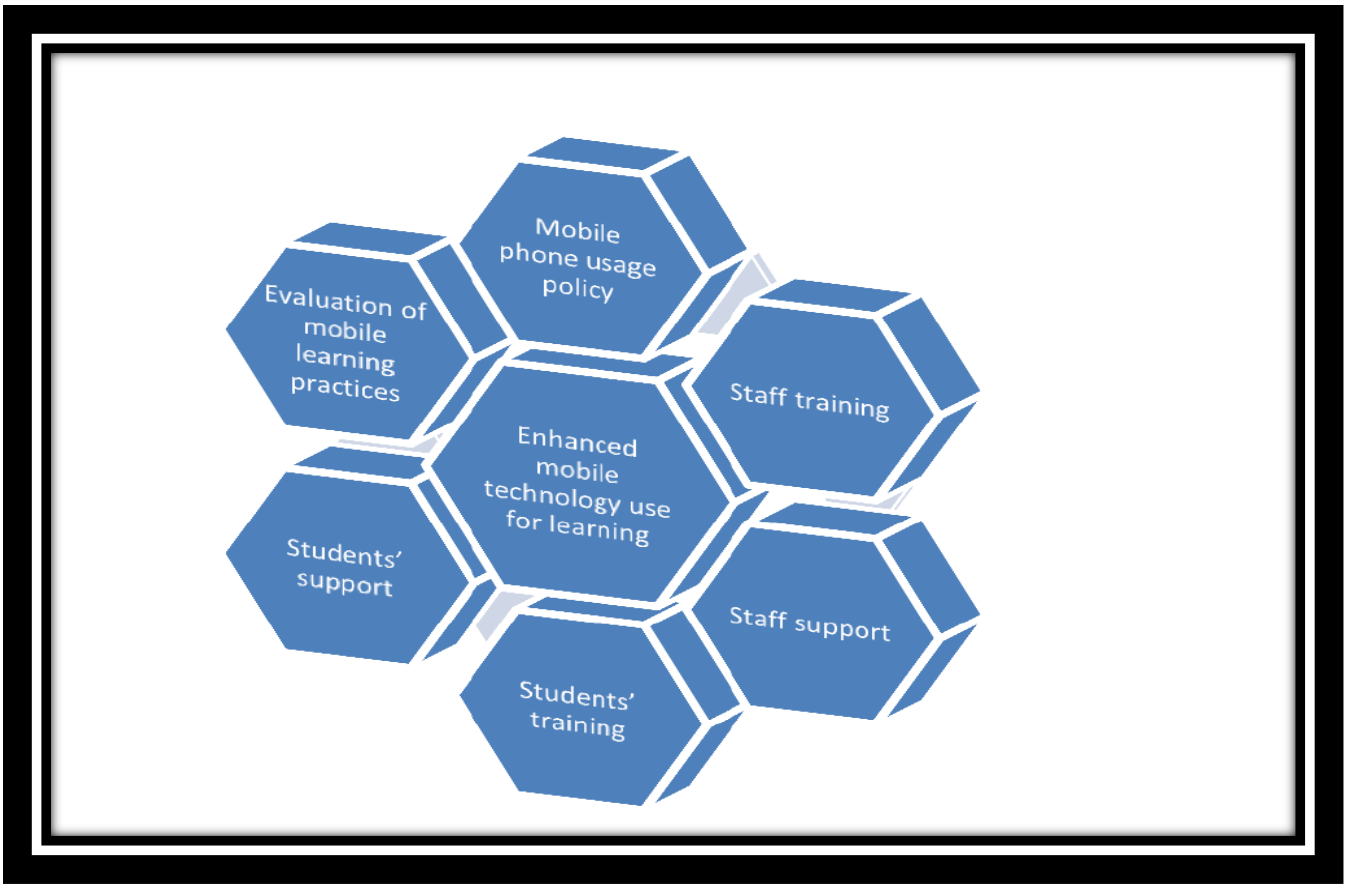


Figure 5.1 Recommended Framework for mobile phone technology use for learning (Researcher's own)

The actual use of mobile phone technology for learning should be guided by an institutional policy. McKenna (2018) observes that a policy on technology use spells out how the technology is utilised and standardises its use. It is, therefore, imperative for an ODL institution to have a policy on mobile phone usage for learning, to guide the process of technology integration into learning. Course instructors should be trained on the use of mobile phone technology for learning, by attending to issues such as mobile learning pedagogy and learning material development for mobile phone use. The training will assist in bringing all course instructors on board in the proper use of mobile phone technology for teaching and learning. Training is not sufficient and it should be followed up by constant and sustained support.

Students also require systematic training on effective technology use for learning. It should not just be assumed that students are able to utilise technology for learning. Alzahrani (2017), for example, notes that students may need information on how they make effective use of online discussion for learning. Training should be planned, implemented and evaluated to ensure effectiveness. Furthermore, students require support for technology troubleshooting as they utilise mobile phone technology for learning. The use of mobile phone technology for learning in an ODL institution should be monitored and evaluated.

5.8 SUGGESTION FOR FURTHER RESEARCH

A larger study that focuses on different study contexts and a plurality of methodologies should be conducted to generate wider views of the same subject. The mixed methods approach could be utilised to generate qualitative and quantitative data in order to have a holistic understanding of the issue under investigation. The study may be carried in other institutions in different contexts for comparison purpose,

5.9 CONCLUSION

The study sought to establish the perceived usefulness of mobile phone technology by distance education students at the University of Eswatini. Four hypotheses were also pursued to be tested. Informed by the Technology Acceptance Model by Davis (1989), the study was wholly quantitative located in the positivist research paradigm. A descriptive strategy was followed. A structured questionnaire was administered online to a stratified random sample of 337 students at the Institute of Distance Education, University of Eswatini. Data were analysed statistically using the SPSS version 25 software. Results indicated that the respondents perceived mobile phone technology as useful for learning. Results on the four tested hypotheses revealed that there was no association found between gender and perceived usefulness, there was an association found between students' age and perceived usefulness, there was no association found between students' programme of study and perceived usefulness and there was an association found between students' level of study and perceived usefulness.

REFERENCES

Aarreniemi-Jokipelto, P. (2020). The Landscape of Mobile Learning in Brazil: From Distance Learning to On- and Offline Mobile Learning. *Journal of Educational Multimedia and Hypermedia*, 29(4), 289 - 297.

Abidin, N. Z., & Tho, S. (2018). The development of an innovative resonance experiment using smartphones with free mobile software applications for tertiary education. *International Journal of Educational Development,* 14, 164 -176.

Adom, D., Hussein, E. K. & Adu-Agyem, J. (2018). Theoretical and conceptual framework: mandatory ingredients of a quality research. *International Journal of Scientific Research,* 7(1), 438 – 441.

Aggarwal, R. & Ranganathan, P. (2019). Study designs: Part 2 – Descriptive studies. *Perspectives in Clinical Research*, 10, 34 - 36.

Ahmad, T. (2020). Student perceptions of using cell phones as learning tools: Implications for mobile technology usage in Caribbean higher education institutions. *PSU Research Review,* 4(1), 25 - 43.

Ahmad, T. (2019). Undergraduate mobile phone use in the Caribbean: Implications for teaching and learning in an academic setting. *Journal of Research in Innovative Teaching & Learning*, 13(2), 191 - 210.

Ahmad, T. (2018). Mobile phones as a learning tool: a lecturer's viewpoint, *Society and Business Review*, 13(2), 132-139.

Akhtar, M. I. (2016). *Research Design. Research in Social Science: Interdisciplinary Perspectives*, 68 - 84.

Al-Ammary, J. H., Al-Sherooqi, A. K., & Al-Sherooqi, H. K. (2014). The acceptance of social networking as a learning tool. *International Journal of Information and Education Technology,* 4(2), 208 - 214.

Al-Adwan, A., Al-Madadha, A. & Zvirzdin Site, Z. (2018). Modelling students' readiness to adopt mobile learning in higher education: An empirical study. *International Review of Research in Open and Distributed Learning*, 19 (1), 221-241.

Alhasanat, I. K. (2020). Using Smartphones in Learning Arabic by AOU Students. *Higher Education Studies*, 10(1), 48 – 59.

Al-Hariri, M. T. & Al-Hattami, A. A. (2017). Impact of students' use of technology on their learning achievements in physiology courses at the University of Dammam. *Journal of Taibah University Medical Sciences*, 12(1), 82 – 85.

Aliaga, M. & Gunderson, B. (2002). *Interactive Statistics*. Thousand Oaks, CA: Sage Publications.

Alqahtani, M. & Mohammad, H. (2015). Mobile applications' impact on student performance and satisfaction. *Turkish Online Journal of Educational Technology-TOJET,* 14(4), 102 - 112.

Alzahrani, M. G. (2017). The effect of using online discussion forums on students' learning. *Turkish Online Journal of Educational Technology*, 16(1), 164 -176.

Ankrah, E. (2014). The impact of information systems strategy on bank performance in Ghana. (Unpublished Doctoral Thesis). Department of Information Studies, University of Ghana.

Amarakoon, L. R. & Sakunthala, K. (2013). Information Literacy Training Modules Developed for the University of Bolton WCMT Campus Sri Lanka: Case Study and Best Practices. Presented to International Conference on Qualitative and Quantitative Methods in Libraries (QQML 2013) Rome, Italy, 4-7 June 2013.

Anderson, T. (2017). How communities of inquiry drive teaching and learning in the digital age. *Contact North*. Available from: https://teachonline.ca/sites/default/files/pdf/enewsletters/how_communities_of_inquiry_drive_teaching_and_learning_in_the_digital.pdf. Accessed 20 April 2021.

Anderson, T. & Dron, J. (2010). Three generations of distance education pedagogy. *The International Review of Research in Open and Distance Learning.* 12(3), 80 - 97.

Anderson, L. W. & Krathwohl, D. (Eds.) (2001). *A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives.* New York: Longman.

Anshari, M., Almunawar, M.N., Shahrill, M., Wicaksono, D. K. & Huda, M. (2017). Smartphones usage in the classrooms: Learning aid or interference? *Educational Information Technology* 22, 3063 – 3079.

Aoki, K. (2012). Generations of Distance Education: Technologies, Pedagogies, and Organizations. *Procedia - Social and Behavioral Sciences* 55, 1183 – 1187.

Apuke, O. D. (2017). Quantitative Research Methods A Synopsis Approach. *Arabian Journal of Business and Management Review*, 6(10), 40 – 47.

Apuke, O. D. & Iyendo, T. O. (2018). University students' usage of the internet resources for research and learning: forms of access and perceptions of utility. *Heliyon* 4, 1 – 34.

Armstrong, D. (2011). Students' perceptions of online learning and instructional tools: A qualitative study of undergraduate students' use of online tools. *Turkish Online Journal of Educational Technology*, 10, 222 - 226.

Ataş, A. H. & Çelik, B. (2019). Smartphone Use of University Students: Patterns, Purposes, and Situations. *Malaysian Online Journal of Educational Technology*, 7(2), 59 -70.

Awadhiya, A. K. & Miglani, A. (2016). Mobile learning: Challenges for teachers of Indian open universities. *Journal of Learning for Development -JL4D*, 3(2), 35 - 46.

Ayub, A. F. M., Hamid, W. H. W. & Nawawi, M. H. (2018). Use of Internet for Academic Purposes Among Students In Malaysian Institutions Of Higher Education. *The Turkish Online Journal of Educational Technology*, 13(1), 232 – 241.

Babbie, E. R. (2012). *The practice of social research* (12th ed.). Belmont, California: Wadsworth Cengage Learning.

Bai, H. (2019). Pedagogical Practices of Mobile Learning in K-12 and Higher Education Settings. *TechTrends*, 63, 611 – 620.

Banerjee, A. & Chaudhury, S. (2010). Statistics without tears: Populations and samples. *Industrial Psychiatry Journal*, 19(1), 60 – 65.

Banerjee, A., Chaudhury, S., Singh, D. K., Banerjee, I., Mahato, A. K. & Haldar S. (2007). Statistics without tears - inputs for sample size calculations. *Industrial Psychiatry Journal*, 16, 150 - 152.

Banks, S., Armstrong, A., Carter, K., Graham, H., Hayward, P., Henry, A., Holland, T., Holmes, C., Lee, A., McNulty, A., Moore, N., Nayling, N., Stokoe, A. & Strachan, A. (2013). Everyday ethics in community-based participatory research. *Contemporary Social Science*, 8(3), 263 – 277.

Baran, E. (2014). A review of research on mobile learning in teacher education. *Educational Technology & Society*, 17(4), 17 - 32.

Barbera, J., Naibert, N., Komperda, R. & Pentecost, T.C. (2021). Clarity on Cronbach's Alpha Use. *Journal of Chemical Education*, 98(2), 257 – 258.

Basri, B. (2019). Legal reasoning pattern based on transcendental values: a reflection on legal reasoning based on positivism values. *Journal of Transcendental Law,* 1(1), 58 – 70.

Beger, G. & Sinha, A. (2012). South African mobile generation Study on South African young people on mobiles. United Nations Children's Fund (UNICEF). https://www.unicef.org/southafrica/SAF_resources_mobilegeneration.pdf. Accessed 16 February 2021.

Bere, A. & Rambe, P. (2019). Understanding mobile learning using a social embeddedness approach: a case of instant messaging. *International Journal of Education and Development using Information and Communication Technology*, 15, 132 - 153.

Bharathi, A. V. (2016). Communication skills–core of employability skills: Issues and concerns. *Higher Learning Research Communications*, 6(4), 1 – 12.

Boticki, I., Baksa, J., Seow, P. & Looi, C. K. (2015). Usage of a mobile social learning platform with virtual badges in a primary school. *Computers & Education*, 86, 120 - 136.

Brown, C. & Mayisela, T. (2015). Digital Literacies. In: Kilfoil, W.R. (Ed.). *Moving beyond the hype: A contextualised view of learning with technology in higher education*. Pretoria: Universities South Africa, pp. 16-18.

Bryan, A. (2004). Going nomadic: Mobile learning in higher education. *Educause*, 39(5), 28 - 35.

Bryman, A. (2015). *Social Research Methods*. Oxford: Oxford University Press.

Caruana, S. (2015). Ethical Considerations when Carrying Out Research in One's Own Academic Institution. *Symposia Melitensia*, 10, 61 – 71.

Carvalho, L. & Ferreira, M. J. (2015). Mobile Devices in School in Teaching / Learning Process – The Roadmap. Proceedings of EDULEARN15 Conference 6th-8th July 2015, Barcelona, Spain (pp 4623 – 4634).

Chan, B. S. K., Churchill, D., & Chiu, T. K. F. (2017). Digital Literacy Learning In Higher Education through Digital Storytelling Approach. *Journal of International Education Research*, 13(1), 1-16.

Chen, Y. F. & Katz, J. E. (2009). Extending family to school life: College students' use of the mobile phone, *International Journal of Human-Computer Studies*, 67, 179 - 191.

Choy, L. T. (2014). The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches. *Journal of Humanities and Social Science*, 19, 99 - 104.

Chun, K. M. (2019). Pedagogical innovation through mobile learning implementation: an exploratory study on teachers' extended and emergent use of mobile learning systems (Doctoral dissertation). Northeastern University, Boston, MA.

Chukwuere, J. E., Mbukanma, I. & Enwereji, P. C. (2017). The Financial and Academic Implications of Using Smartphones among Students: A Quantitative Study. *Journal of Economics and Economic Education Research*, 18(1), 1 – 26.

Clark, B, (2013). Cellular Phones as a primary communications device: What are the implications for a global community? *Global Media Journal*, Fall, 1 – 12.

Collins, C. S. & Stockton, C. M. (2018). The Central Role of Theory in Qualitative Research. *International Journal of Qualitative Methods*, 17, 1–10.

Connolly, P. (2007). *Qualitative Data Analysis in Education: A critical introduction using SPSS*. London: Routledge.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks: Sage.

Creswell, J. W. (2013). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications. Thousand Oaks, CA: Sage.

Crompton, H., Burke, D. & Gregory, K. H. (2017). The use of mobile learning in PK-12 education: A systematic review. *Computers & Education*, 110, 51 - 63.

Darko-Adjei, N. (2019). The Use and Effect of Smartphones in Students' Learning Activities: Evidence from the University Of Ghana, Legon. *Library Philosophy and Practice (e-journal).* 1 - 37.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13(3), 319 - 340.

Derounian, J. G. (2020). Mobiles in class? *Active Learning in Higher Education*, 21(2), 142 – 153.

Domingo, M. G. & Garganté, A. B. (2016). Exploring the use of educational technology in primary education: Teachers' perception of mobile technology learning impacts and applications' use in the classroom. *Computers in Human Behavior*, 56, 21-28.

Edwards, S. J. L. (2005). Research Participation and the Right to Withdraw. *Bioethics*, 19 (2), 112 – 130.

Elias, T. (2011). Universal Instructional Design Principles for Mobile Learning, *International Review of Research in Open and Distance Learning*, 12, 2 - 4.

Eyisi, D. (2016). The Usefulness of Qualitative and Quantitative Approaches and Methods in Researching Problem-Solving Ability in Science Education Curriculum. *Journal of Education and Practice*, 7(15), 91 – 100.

Faber, J. & Fonseca, L. M. (2014). How sample size influences research outcomes. *Dental Press Journal of Orthodontics*, 19(4), 27- 29.

Faja, S. (2013). Collaborative learning in online courses: Exploring students' perceptions. *Information Systems Education Journal,* 11(3), 42 – 51.

Fan, W. & Yan, Z. (2010) Factors Affecting Response Rates of the Web Survey A Systematic Review. *Computers in Human Behavior*, 26, 132 – 139.

Farley, H., Murphy, A., Johnson, C., Carter, B., Lane, M., Midgley, W., Hafeez-Baig, A., Dekeyser, S. & Koronios, A. (2015). How Do Students Use Their Mobile Devices to Support Learning? A Case Study from an Australian Regional University. *Journal of Interactive Media in Education*, 1(14), 1 – 13.

Fathelrahman A., Mohamed O. B., Mohamed E, S. M. & Nassereldeen A. K. (2012). Why ethics in research are crucial? *Advances in Natural and Applied Sciences*, 6(5), 660 – 663.

Favaretto, M., De Clercq, E., Gaab, J. & Elger, B. S. (2020). First do no harm: An exploration of researchers' ethics of conduct in Big Data behavioral studies. *PLoS ONE* 15(11), 1 – 23.

Fernández-Gómez, E., Martín-Salvador, A., Luque-Vara, T., Sánchez-Ojeda, M. A., Navarro-Prado, S. & Enrique-Mirón, C. (2020). Content Validation through Expert Judgement of an Instrument on the Nutritional Knowledge, Beliefs, and Habits of Pregnant Women. *Nutrients*, 12 (1136), 1 – 13.

Fisch, C. & Block, J. (2018). Six tips for your (systematic) literature review in business and management research. *Management Review Quarterly*, 68, 103 – 106.

Frank, H. & Hatak, I. (2014). Doing a research literature review. In: Fayolle A, Wright M (eds) How to get published in the best entrepreneurship journals. Edward Elgar, Cheltenham, pp 94 -117.

Garrison, D. R. (2006). Online collaboration principles. *Journal of Asynchronous Learning Networks,* 10(1), 25 - 34.

Garrison, D. R. (2011). *E-Learning in the 21st Century: A Framework for Research and Practice* (2nd Ed.). London: Routledge/Taylor and Francis.

Geertsema, S., Hyman, C. & van Deventer, V. (2011). Short message service (SMS) language and written language skills: educators' perspectives. *South African Journal of Education*, 31, 475 – 487.

Giaccardi, E. (2012). *Heritage and social media: Understanding heritage in a participatory culture*. London & New York: Routledge.

Gómez-García, M., Soto-Varela, R., Morón-Marchena, J. A. & Pino-Espejo, M. J. D. (2020). Using Mobile Devices for Educational Purposes in Compulsory Secondary Education to Improve Student's Learning Achievements. *Sustainability*, 12, 1 – 12.

Grant, M. M. (2019). Difficulties in defining mobile learning: analysis, design characteristics, and implications. *Educational Technology Research and Development*, 67, 361 – 388.

Grant, C. & Osanloo, A. (2014). Understanding, Selecting, and Integrating a Theoretical Framework in Dissertation Research: Creating the Blueprint for Your "House". *Administrative Issues Journal: Connecting Education, Practice, and Research*, 4(2), 12-26.

Grant, M. M., Tamim, S., Brown, D. B., Sweeney, J. P., Ferguson, F. K., & Jones, L. B. (2015). Teaching and learning with mobile computing devices: Case study in K- 111 12 classrooms. *Tech Trends*, 59(4), 32 - 45.

Halder, I., Halder, S. & Guha, A. (2015). Undergraduate students' use of mobile phones: exploring the use of advanced technological tools for educational purposes. *Journal of Media and Communication Studies*, 7(4), 81 – 87.

Hamari, J., Koivisto, J. & Sarsa, H. (2014). Does gamification work?-A literature review of empirical studies on gamification. In System Sciences (HICSS) Proceedings: 2014 47th Hawaii International Conference on IEEE. (pp. 3025–3034).

Hartley, K., Bendixen, L. D., Gianoutsos, D. & Shreve, E. (2020). The smartphone in self-regulated learning and student success: clarifying relationships and testing an intervention. *International Journal of Educational Technology in Higher Education* 17(52), 1 – 14.

Hartson, R. & Pyla, P. S. (2012). T*he UX Book: Process and guidelines for ensuring a quality user experience*. Waltham, MA: Elsevier.

Hegelund, A. (2005). Objectivity and Subjectivity in Ethnographic Method. *Qualitative Health Research.* 15(5), 647- 668.

Henry, P. D. (2014). Using Mobile Apps and Social Media for Online Learner-Generated Content. 10th International Conference on Mobile Learning, 243 – 246.

Hilao, M. P. & Wichadee, S. (2017). Gender Differences in Mobile Phone Usage for Language Learning, Attitude, and Performance. *Turkish Online Journal of Distance Education,* 18(2), 68 – 79.

Hoffmann, M. (2017). An exploratory study: Mobile device use for academics. *Research in Social Sciences and Technology*, 2(1). https://www.learntechlib.org/p/187551/

Huang, J. H., Lin, Y. R. & Chuang, S. T. (2007). Elucidating user behavior of mobile learning (a perspective of the extended technology acceptance model). *The Electronic Library,* 25(5), 585-598.

Hussein, Z. (2017). Leading to Intention: The Role of Attitude in Relation to Technology Acceptance Model in E-Learning. *Procedia Computer Science*, 105, 159 -164.

Ismail, N. S., Harun, J., Salleh, S. M., Aman, M. & Zakaria, Z. M. (2016). Supporting Students' Critical Thinking with a Mobile Learning Environment: A Meta-Analysis. Proceedings of INTED2016 Conference 7th-9th March 2016, Valencia, Spain pp 3746 - 3755

Jamie Hale, M. S. (2018). The 3 Basic Types of Descriptive Research Methods. https://psychcentral.com/blog/the-3-basic-types-of-descriptive-research-methods/

Jochmann-Mannak, H., Huibers. T., Lentz, L. & Sanders, T. (2010). Children searching information on the Internet: Performance on children's interfaces compared to Google. Workshop on Accessible Search Systems, SIGIR '10, July 23, 2010, Geneva, Switzerland.

Johnson, B. & Christensen, L. (2012). *Educational research, qualitative, quantitative and mixed approach*. (4th ed.). California: SAGE Publication.

Jongbo, O. C. (2014). The role of research design in a purpose driven enquiry. *Review of Public Administration and Management*, 3(6), 87 - 94.

Kaiser, K. (2009) Protecting respondent confidentiality in qualitative research. *Qualitative Health Research,* 19(11), 1632 -1641.

Kapucu, N. (2012). Classrooms as Communities of Practice: Designing and Facilitating Learning in a Networked Environment. *Journal of Public Affairs Education*, 18(3), 585 - 610.

Karam, A. M. (2015). A Comparison of the Effects of Mobile Device Display Size and Orientation, and Text Segmentation on Learning, Cognitive Load, and User Perception in a Higher Education Chemistry Course. Unpublished Doctor of Philosophy Dissertation. The University of Texas at Austin.

Kear, K., Chetwynd, F. & Jefferis. H. (2014). Social presence in online learning communities: the role of personal profiles. *Research in Learning Technology*, 22, 1 – 15.

Kenny, D. A. (2019). Enhancing validity in psychological research. *American Psychologist,* 74(9), 1018 - 1028.

Khadija, A. (2019). Four Ways Technology Has Negatively Changed Education. *Journal of Educational and Social Research*, 9(4), 10 – 20.

Khalid, K., Khan, R. A. & Mohd-Zain, S. (2012). Determination of diffusion coefficient activation energy of selected organic liquids using reversed-flow gas chromatographic technique. *Sains Malaysian* 4(9), 1109 -1116.

Khan, S., Hwang, G. J., Abbas, M. A. & Rehman, A. (2018). Mitigating the urban–rural educational gap in developing countries through mobile technology-supported learning. *British Journal of Educational Technology*, 50(2), 735 – 749.

Khan, M. A., Vivek, V., Nabi, M. K., Khojah, M. & Tahir, M. (2021). Students' perceptions towards e-Learning during COVID-19 pandemic in India: An empirical study. *Sustainability*, 13(57), 1 - 14.

Kim, S. (2013). Facebook and creative teaching methods of seeking new possibilities in the way of Christian education. *Sinang Hakmun*, 18(3), 37 - 73.

Kim, D., Chun, H. & Lee, H. (2014). Determining the factors that influence college students' adoption of smartphones. *Journal of the Association for Information Science and Technology*, 65(3), 578 – 588.

Kivunja, C. & Kuyini, A. B. (2017). Understanding and Applying Research Paradigms in Educational Contexts. *International Journal of Higher Education*, 6(5), 26 – 41.

Kotoua, S., Ilkan, M. & Kilic, H. (2015). The Growing Of Online Education in Sub Saharan Africa: Case Study Ghana. *Procedia - Social and Behavioral Sciences*, 191, 2406 – 2411.

Krotov, V. (2015). Critical success factors in m-learning: A socio-technical perspective. *Communications of the Association for Information Systems*, 36(1), 105 -126.

Kuznekoff, J. & Titsworth, S. (2013). The Impact of Mobile Phone Usage on Student Learning. *Communication Education,* 62(3), 233 – 252.

Maggio, L. A., Sewell, J. L. & Artino, A. R. (2016). The Literature Review: A Foundation for High-Quality Medical Education Research. *Journal of Graduate Medical Education*, 1, 297 – 303.

Lau, K. P., Chiu, D. K. W., Ho, K. K. W., Lo, P. & See-To, E. W. K. (2017). Educational Usage of Mobile Devices: Differences between Postgraduate and Undergraduate Students. *The Journal of Academic Librarianship*, 43, 201 – 208.

Lee, Y., Kozar, K. A. & Larsen, K. R. (2003). The technology acceptance model: Past, present, and future. *Communications of the Association for Information Systems*, 12(1), 752 - 780.

Leedy, P. D. & Ormrod, J. E. (2013). *Practical Research: Planning and Design*. 10th Edition, Boston: Merrill/Prentice Hall.

Leppink, J. (2017). Revisiting the quantitative-qualitative-mixed methods labels: Research questions, developments, and the need for replication. *Journal of Taibah University Medical Sciences*, 12(2), 97 – 101.

Liu, Z. & Huang, X. (2015). Information behavior in the mobile environment: A study of undergraduate smartphone users in China. *Journal of Data and Information Science*, 7, 1 – 15.

Lloyd, M. (2019). Imagining the affordances of mobile devices as a mechanism in teaching and learning. *International Journal of Educational Technology*, 5(1), 37- 48.

Maggio, L. A., Sewell, J. L. & Artino, A. R. (2016). The Literature Review: A Foundation for High-Quality Medical Education Research. *Journal of Graduate Medical Education*, 1, 297 – 303.

Lynch, M. (2020). E-Learning during a global pandemic. *Asian Journal of Distance Education*, 15(1), 189 - 195.

Majid, M. A. A., Othman, M., Mohamad, S. F., Lim, S. A. H & Yusof, A. (2017). Piloting for Interviews in Qualitative Research: Operationalization and Lessons Learnt.

International Journal of Academic Research in Business and Social Sciences, 7(4), 1073 -1080.

Major, M. J. (2017). Editorial: Positivism and “alternative” accounting research. *Revista Contabilidade & Finanças*, 28(74), 173 -178.

Manti, S. & Licari, A. (2018). How to obtain informed consent for research. *Breathe*, 14, 145 -152.

Matyokurehwa, K., Rudhumbu, N., & Mlambo, C. P. (2020). Intentions of First Year University Business Students to use Smartphones as learning tools in Botswana: Issues and challenges. *International Journal of Education and Development using Information and Communication Technology*, 16(1), 27 – 43.

Maree, K. (2014). *First Steps in Research*. Pretoria: Van Schaik.

McHugh, M. L. (2013).The Chi-square test of independence. *Biochemia Medica* 23(2),143 -149.

McKenna, K. (2018). *Technology Policies and Practices in Higher Education.* New York: IGI Global Publishers.

McLoughlin, C. & Northcote, M. (2017). What skills do I need to teach online? Researching experienced teacher views of essential knowledge and skills in online pedagogy as a foundation for designing professional development for novice teachers. Paper presented at the International Study Association of Teachers and Teaching (ISATT) Biennial Conference, Salamanca, Spain.

McMillan, J. H. & Schumacher, S. (2014). *Research in education – Evidence-based inquiry (7th ed.). International Edition*. Boston: Pearson Education Inc.

McQuiggan, S., Kosturkon, L., McQuiggan, J. & Sabourin, J. (2015). *Mobile learning: a handbook for developers, educators and learners*. Hoboken: N. J. Wiley.

Merriam, S., & Tisdell, E. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: John Wiley & Sons.

Ministry of Education and Training (2017). Reforming Swaziland’s Secondary Education System: What structure, curriculum, and assessment reflect our nation’s needs best? Mbabane [Consultant (Jaap Kuiper) Report].

Mohammadi, S. & Isanejad, O. (2018). Presentation of the Extended Technology Acceptance Model in Sports Organizations. *Annals of Applied Sport Science*, 6 (1), 75 – 86.

Moreira, F., Pereira, C. S., Durão, N. & Ferreira, M. J. (2018). A comparative study about mobile learning in Iberian Peninsula universities: are professors ready? *Telematics and Informatics*, 35(4), 979 - 992.

Moore, M. G. (1989). Three types of Interaction. *American Journal of Distance Education*. 3(2), 1 - 7.

Moore, M. G. & Kearsley, G. (2005). Distance education: A systems view. *Journal of Information and Communication Technology Education*, 1(4), 70–72.

Moore, D. S., Notz, W. I, & Flinger, M. A. (2013). *The basic practice of statistics* (6th ed.). New York, NY: W. H. Freeman and Company.

Mpungose, C. B. (2020). Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic. *Humanities and Social Sciences Communications*, 7(113), 1 – 9.

Mthethwa-Kunene, K. E. & Maphosa, C. (2020). An Analysis of Factors Affecting Utilisation of Moodle Learning Management System by Open and Distance Learning Students at the University of Eswatini, *American Journal of Social Sciences and Humanities* 5(1), 17 – 32.

Mthethwa-Kunene, K. E., Rugube, T. & Maphosa, C. (2020). Creating students' communities of Inquiry (COI) in online learning using the Moodle LMS. *Journal of Education and Practice*, 11(30), 143 – 150.

Müller-Bloch, C. & Kranz, J. (2015). A Framework for Rigorously Identifying Research Gaps in Qualitative Literature Reviews. Thirty-Sixth International Conference on Information Systems, Fort Worth.

Mustapha, A., Mohammed, A., Egigogo, A. R., Kutiriko, A. A. & Dokoro, A. H. (2020). *The Role of Technology in Education*. London: IntechOpen.

Naik, M. M. & Padmini, M. (2014). Importance of Information Literacy. *International Journal of Digital Library Services*, 4(3), 92 – 100.

Nakamura, T. (2014). The action of looking at a mobile phone display as nonverbal behavior/communication: A theoretical perspective. *Computers in Human Behavior,* 43(1), 68 – 75.

National Survey of Student Engagement. (2014). National Survey of Student Engagement. Retrieved January 29, 2021, from http://nsse.iub.edu/html/about.cfm.

Nayak, M. S. D. P. & Narayan, K. A. (2019). Strengths and Weakness of Online Surveys. *Journal of Humanities and Social Science*, 24(5), 31 – 38.

Ng, S. F., Hassan, N. S. C., Nor, H. M. & Malek, N. A. A. (2017). The Relationship between Smartphone Use and Academic Performance: A Case of Students in a Malaysian Tertiary Institution. *Malaysian Online Journal of Educational Technology*, 5(4), 58 – 70.

Nickerson, R. C. & Mourato-Dussault, F. B. (2016). Selecting a Stored Data Approach for Mobile Apps. *Journal of Theoretical and Applied Electronic Commerce Research*, 11(3), 35 – 49.

Nighet, N.R. (2016). *The interpretivist paradigm*. Edinburgh: University of Scotland: University Press.

Nistor, C. G. (2019). An Extended Technology Acceptance Model for Marketing Strategies in Social Media. *Review of Economic and Business Studies*, 12(1), 127-136.

Noble, H. & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence Based Nursing*, 18(2), 34 – 35.

Orr, G. (2010). A Review of Literature in Mobile Learning: Affordances and Constraints. Proceedings of 6th IEEE International Conference on Wireless, Mobile and Ubiquitous Technologies in Education (WMUTE), 107-111. IEEE.

Ozdamlia, F. (2012). Pedagogical framework of m-learning. *Procedia - Social and Behavioral Sciences*, 31(1), 927 – 931.

Ozerbas, M. & Erdogan, B. (2016). The effect of the digital classroom on academic success and online technologies self-efficacy. *Journal of Educational Technology & Society*, 19(4), 203 - 212.

Padmo, D., Idrus, O. & Ardiasih, L. S. (2019). The Utilization Of Mobile Devices For Improving Access To Online Learning For Distance Education's Students. *Turkish Online Journal of Distance Education,* 20(2), 147 - 161.

Patel, N. M., Kadyamatimba, A. & Madzvamuse, S. (2017). Investigating factors influencing the implementation of e-learning at rural-based universities. *Information Technology Journal*, 16, 101-113.

Park, S. Y. (2009). An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. *Educational Technology & Society*, 12(3), 150 -162.

Park, Y. S., Konge, L. & Artino, A. R. (2020). The Positivism Paradigm of Research. *Academic Medicine*, 95(5), 690 – 694.

Pechenkina, E., Laurence, D., Oates, G., Eldridge, D. & Hunter, D. (2017). Using a gamified mobile app to increase student engagement, retention and academic achievement. *International Journal of Educational Technology in Higher Education*, 14(31), 1 – 12.

Polit, D. F. & Beck, C. T. (2012). *Nursing Research: Generating and Assessing Evidence for Nursing Practice*, 9th ed. Philadelphia: Wolters Klower Health, Lippincott Williams & Wilkins.

Portz, J. D., Bayliss, E. A., Bull, S., Boxer, R. S., Bekelman, D. B., Gleason, K. & Czaja, S. (2019). Using the Technology Acceptance Model to Explore User Experience, Intent to Use, and Use Behavior of a Patient Portal Among Older Adults With Multiple Chronic Conditions: Descriptive Qualitative Study. *Journal of Medical Internet Research,* 21(4):e11604, 1 – 12.

Pugoy, R. A. D. L., Habito, C. D. L. & Figueroa, R. B. (2016). Hybrid online/offline mobile solutions for accessing open educational resources in areas with poor internet connectivity. *Asian Association of Open Universities Journal,* 11(2), 182-196.

Queirós, A., Faria, D. & Almeida, F. (2017). Strengths and Limitations of Qualitative and Quantitative Research Methods. *European Journal of Education Studies,* 3(9), 369 – 387.

Ram, A. (2010). *Research Method*. New Delhi: Rawat Publication.

Ravitch, S. M & Riggan, M. (2017). *Reason & Rigor: How Conceptual Frameworks Guide Research*, 2nd Edition Thousand Oaks, CA: SAGE Publications.

Reeves, T. C. & Reeves, P. M. (2015). Reorienting educational technology research from things to problems. *Learning: Research and Practice*, 1(1), 91 - 93.

Riyami, T. A. (2015). Main Approaches to Educational Research. *International Journal of Innovation and Research in Educational Sciences*, 2(5), 412 – 416.

Roopa, S. & Rani, M. S. (2012). Questionnaire Designing for a Survey. *Journal of Indian Orthodontic Society,* 46(4), 273 - 277.

Rossman, G. B. & Rallis, S. F. (2012). *Learning in the Field: An Introduction to Qualitative Research*. 3rd Edition, Los Angeles: Sage.

Rovithis, E., Floros, A., Moustakas, N., Vogklis, K. & Kotsira, L. (2019). Bridging audio and augmented reality towards a new generation of serious audio-only games. *The Electronic Journal of e-Learning*, 17(2), 144 -156.

Rugube, T., Mthethwa-Kunene, K. E. & Maphosa, C. (2020). Promoting interactivity in online learning – towards the achievement of high-quality online learning outcomes. *European Journal of Open Education and E-learning Studies*, 5(2), 120 – 133.

Santos, A. S. & Serpa, S (2017).The Importance of Promoting Digital Literacy in Higher Education. *International Journal of Social Science Studies*, 5(6), 90 – 93.

Savela, T. (2018). The advantages and disadvantages of quantitative methods in schoolscape research. *Linguistics and Education*, 44, 31- 44.

Saunders, B., Kitzinger, J. & Kitzinger, C. (2015). Anonymising interview data: challenges and compromise in practice. *Qualitative Research*, 15(5), 616 – 632.

Saykili, A. (2018). Distance education: Definitions, generations, key concepts and future directions. *International Journal of Contemporary Educational Research*, 5(1), 2-17.

Schlenker, L. (2013). Mobile Pedagogy. Proceedings of the International Conference on Mobile Learning. 14 – 16 March 2013. Lisbon, Portugal.

Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English language teaching*, 5, 9 -16.

Senaratne, S. I. & Samarasinghe, S. S. (2019). Factors Affecting the Intention to Adopt M-Learning. *International Business Research*, 12 (2), 150 -164.

Shava, H., Chinyamurindi, W. & Somdyala, A. (2016). An investigation into the usage of mobile phones among technical and vocational educational and training students in South Africa. *South African Journal of Information Management*, 18(1), a716. 1 – 8. http://dx.doi.org/10.4102/sajim.v18i1.716.

Shonola, M. S., Joy, M. S., Oyelere, S. S. & Suhonen, J. (2016). The Impact of Mobile Devices for Learning in Higher Education Institutions: Nigerian Universities Case Study. *International Journal of Modern Education and Computer Science*, 8, 43 – 50.

Shudong, W. & Higgins, M. (2006). Limitations of Mobile Phone Learning. *The JALT CALL Journal*, 2(1), 3 -14.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, *2*(1). Retrieved from http://www.itdl.org/. Accessed 20 February 2021.

Sileyew, K. J. (2019). *Research Design and Methodology.* London: IntechOpen.

Silva, S.C., & Durante, P. (2014). Suggestions for international research using electronic surveys. *The Marketing Review*, 14(3), 297- 309.

Simelane-Mnisi, S. (2018). Role and Importance of Ethics in Research. In Ensuring Research Integrity and the Ethical Management of Data (p 1 – 13).

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333-339.

Sousa, V. D., Driessnack, M. & Mendes, I. A. C. (2007). An Overview of Research Designs Relevant To Nursing: Part 1: Quantitative Research Designs. *Rev Latino-am Enfermagem*, 15(3), 502-507.

Sundgren, M. (2017). Blurring time and place in higher education with bring your own device applications: a literature review. *Educational Information Technology*, 22, 3081 - 3119.

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education, *Research in Science Education,* 48, 1273 - 1296.

Tang, W., Cui, Y. & Babenko, O. (2014). Internal consistency: Do we really know what it is and how to assess it? *Journal of Psychology and Behavioural Science* 2(2), 205 - 220.

Tashfeen, A. (2020). Student perceptions of using cell phones as learning tools: Implications for mobile technology usage in Caribbean higher education institutions. *PSU Research Review* 4(1), 25 – 43.

Tavakol, M. & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education,* 17, 253-255.

Taylor, P. C. & Medina, M. N. D. (2013). Educational research paradigms: From positivism to multiparadigmatic. *Journal for Meaning Centered Education*,1. http://www.meaningcentered.org/journal/volume-01/educational-research-paradigms-from-positivism-tomultiparadigmatic/. Accessed 2 March 2020.

Tessier, J. (2013). Student impressions of academic cell phone use in the classroom. *Journal of College Science Teaching*, 43(1), 25 - 29.

Traxler, J. (2010). The 'learner experience' of mobiles, mobility and connectedness, Background paper to presentation ELESIG Symposium: Digital Futures, 21 Jan iLab, Innovation Works, University of Reading, UK. http://cloudworks.ac.uk/cloud/view/3472. Accessed 10 February 2021.

Twum, R. (2017). Utilization of Smartphones in Science Teaching and Learning in Selected Universities in Ghana. *Journal of Education and Practice*, 8(7), 216 – 228.

University of Eswatini (2021). Institute of Distance Education Quarterly Report (unpublished). Kwaluseni: UNESWA

Velandia, M. R., Leonardo, A., Torres, P. & Alí, M. N. (2012). Using Web-Based Activities to Promote Reading: An Exploratory Study with Teenagers. *Profile*, 14(2), 11-27.

Venkatesh, V. & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies, *Management Science*, 46(2), 186 - 204.

Vereijken, M. W. C., Van der Rijst, R. M., Van Driel, J. H. & Dekker, F. W. (2018). Student learning outcomes, perceptions and beliefs in the context of strengthening research integration into the first year of medical school. *Advances in Health Science Education*, 23, 371–385.

Walker, W. (2005). The strengths and weaknesses of research designs involving quantitative measures. *Journal of Research in Nursing*, 10(5), 571-582.

Webb, L., Clough, J., O'Reilly, D., Wilmott, D. & Witham, G. (2017). The utility and impact of information communication technology (ICT) for pre-registration nurse education: A narrative synthesis systematic review. *Nurse Education Today*, 48,160 - 171.

West, M. & Vosloo, S. (2013). Policy guidelines for mobile learning. Paris: UNESCO. http://unesdoc.unesco.org/images/0021/002196/219641E.pdf. Accessed 20 February 2021

Wiles, R., Crow, G., Heath, S. & Charles, V. (2008). The Management of Confidentiality and Anonymity in Social Research. *International Journal of Social Research Methodology*, 11(5), 417- 428.

Wright, S., O'Brien, B. C., Nimmon, L., Law, M. & Mylopoulos, M. (2016). Research Design Considerations. *Journal of Graduate Medical Education*, 1, 97 – 98.

Xiangming, L. & Song, S. (2018). Mobile technology affordance and its social implications: A case of "Rain Classroom". *British Journal of Educational Technology* 49(2), 276 – 291.

Yang, Y., Li, C., & Hua, F. (2012). An introduction to spoken English in colleges and universities. *Advanced Materials Research*, 433 – 440.

Youngshin, S., Youn-Jung, S. & Doonam, O. (2015). Methodological Issues in Questionnaire Design. *Journal of Korean Academy of Nursing*, 45(3), 323 – 328.

Zhai, X., Li, M. & Chen, S. (2019). Examining the uses of student-led, teacher-led, and collaborative functions of mobile technology and their impacts on physics achievement and interest. J*ournal of Science Education and Technology*, 28(4), 310 – 320.

Zhai, X. & Shi, L. (2020). Understanding How the Perceived Usefulness of Mobile Technology Impacts Physics Learning Achievement: a Pedagogical Perspective. *Journal of Science Education and Technology*, 29, 743 – 757.

Zhou, X. (2011). "The research on network collaborative learning based on the blog and blog group," in Proc. IEEE International Conference on Electrical Engineering and Control Applications. Sept. 2011, pp. 4181 - 4183.

Zhu, D. S., Lin, C. T. & Hsu, Y. C. (2012). Using the technology acceptance model to evaluate user attitude and intention of use for online games. *Total Quality Management*, 23(7-8), 965 - 980.

Zubin, A. & Sutton, J. (2014). Qualitative Research: Getting Started. *Canadian Journal of Hospital Pharmacy,* 67(6), 436 – 440.

APPENDIX A: QUESTIONNAIRE

Mobile Phone Technology Perceived Usefulness for Learning Questionnaire (MTPULQ)

Dear Respondent

This research is in partial fulfilment of requirement for the award of Master of Education in Open and Distance Learning. It is aimed at obtaining information on “the perceived usefulness of mobile-phone for learning by students in the Institute of Distance Education, University of Eswatini”. The success of the information obtained depends greatly on your full co-operation. Your response will be used for research purpose only. Thanks for your co-operation.

Informed Consent Statement

I do hereby give my consent to participate in the research study entitled: THE PERCEIVED USEFULNESS OF MOBILE-PHONE TECHNOLOGY FOR LEARNING BY DISTANCE EDUCATION STUDENTS AT THE UNIVERSITY OF ESWATINI.

I am aware that my participation is voluntary and I can withdraw when I no longer feel comfortable to continue with the study. I am aware that the information I give will be only used for the study. I understand that the information will be treated with privacy and kept confidential and my name will not be revealed.

Electronic Consent

Clicking on the ‘agree’ option below indicates that:

- You have read the above information
- You voluntarily agree to participate

If you do not wish to participate in the research study, please decline participation by clicking on the ‘disagree’ option.

- Agree
- Disagree

SECTION A

a) Personal Information

Please, put a tick (√) in the appropriate box.

Gender	Male	Female	Other			
Age	18 - 22	23 - 27	28 - 32	33 - 37	38 and above	
Programme of Study	B.A Humanities	B.Ed Adult Education	B.Ed Primary	B.Ed Secondary	LLB	Bachelor of Commerce
	Diploma in Law	Bachelor of Nursing Science	PGCE	Bachelor of Science in IT	Certificate in Psychosocial Support	Certificate in Portuguese
Level of Study	1st year	2nd year	3rd year	4th year		

b) Mobile phone type and data access

i) What type of smartphone do you have?

1. iPhone	2. Android	3. Windows	3. Don't know	4.Other (state)

ii) How often do you have access to data for your Mobile Phone

1. Always	2. Very Often	3. Often	4. Rarely	5. Never

SECTION B

Please put a tick (√) in the appropriate column regarding your opinion on the perceived usefulness of mobile phone for learning by students in the Institute of Distance Education.

Key for Rating: SA: Strongly Agree, **A:** Agree, **D:** Disagree, **SD:** Strongly Disagree

S/NO	PERCEIVED USEFULNESS OF MOBILE-PHONE FOR LEARNING	SA	A	D	SD
Bi	**Communication**				
1.	I am able to send text messages related to my studies				
2.	I am able to receive text messages related to my studies				
3.	I am able to respond to text messages related to my studies				
4.	I am able to send voice/ audio messages related to my studies				
5.	I am able to receive voice/ audio related to my studies				
6.	I am able to send emails on issues related to my studies				
7.	I am able to receive emails on issues related to my studies on my mobile phone				
8.	I am able to make calls related to my studies				
9.	I am able to receive calls related to my studied				
10.	I am able to receive notifications on issues related to my studies				
Bii	**Access to content on the Moodle LMS**				
11.	I am able to access course content on Moodle content using a mobile phone				
12.	I am able to download material from the Moodle LMS using a mobile phone				
13.	I am able to participate in live lessons through Zoom from a mobile phone				
14.	I am able to access assignment questions on Moodle using a mobile phone				
15.	I am able to upload assignments using my mobile phone				
16.	I am able to access test questions on Moodle using a mobile phone				
17.	I am able to write tests on Moodle using a mobile phone				

18.	I am able to access some links to content posted by the instructors				
19.	I am able to access my assessment scores on Moodle using a mobile phone				
20.	I am able to access some games useful to my studies using my mobile phone.				
Biii	**Accessing information on the Internet**				
21.	I use a mobile phone to access information on the Internet				
22.	I am able to access information on the Internet conveniently using a mobile phone				
23.	I am able to access different websites				
24.	I able to download information from the internet				
25.	I am able to select relevant information on the internet using a mobile phone				
26.	I am able to store information it online using Google drive/Cloud using a mobile phone				
27.	I am able to read information found on the internet on a mobile phone				
28.	I am able to save important information on my phone for future reference				
29.	I am able to enjoy the flexibility of accessing information on the go using a mobile phone				
30.	I am able to access some open educational resources (OERs) on the Internet using a mobile phone				
Biv	**Interaction with the course instructor**				
31.	I am able to use a mobile phone to ask questions to my course instructor				
32.	I am able to receive important notifications from my course instructor on a mobile phone				
33.	I am able to receive feedback on the mobile phone of any work assigned by my course instructor				
34.	I am able to use a mobile phone to seek clarification from my course instructor				
35.	I am able to use a mobile phone to respond to questions from my course instructor				
36.	I am able to send important information to course instructor using a mobile phone				
37.	I am able to receive learning material from my course instructor using a mobile phones				
38.	Interaction with my course instructor is made easy using a mobile phone.				
39.	Interaction with my course instructor is made convenient using a mobile phone				

40.	I am able to stay in constant touch with my course instructor because of a mobile phone.				
Bv	**Interaction with fellow learners**				
41.	I am able to share learning material with classmates using a mobile phone				
42.	I am able to engage in discussion on course content with my classmates using a mobile phone				
43.	I am able work together with my colleagues on some assigned tasks using a mobile phone				
44.	I am able to share some useful educational/learning applications (apps) with my colleagues using a mobile phone				
45.	I am able to create content for sharing with my colleagues using a mobile phone				
46.	Interaction with my fellow learners is made easy by use of a mobile phone				
47.	Interaction with my fellow learners is made convenient by use of a mobile phone.				
48.	I am able to exchange ideas with my colleagues using a mobile phone				
49.	I am able to exchange information with my colleagues using a mobile phone				
50.	I am able to interact with my colleagues in educational matters while on the go using a mobile phone.				
Bvi	**Learning collaboratively**				
51.	I am able to belong to a social network group using a mobile phone				
52.	I am able to participate in social networks for educational purposes using a mobile phone				
53.	I am able to participate in social networks for improved learning				
54.	I am able to ask questions to my colleagues in my social groups				
55.	I am able to respond to questions from my colleagues in my social network				
56.	I work together with my colleagues on some assigned tasks				
57.	I am able to create a study group with my colleagues to work together in different courses				
58.	I am able to learn from my colleagues				
59.	My colleagues are able to learn from me				
60.	I am in constant touch with my colleagues as we learn together				

APPENDIX B: ETHICAL CLEARANCE CERTIFICATE

UNISA university of south africa

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2021/04/14

Ref: **2021/04/14/10453083/26/AM**
Name: Dr C Maphosa
Student No.:10453083

Dear Dr C Maphosa

Decision: Ethics Approval from 2021/04/14 to 2024/04/14

Researcher(s): Name: Dr C Maphosa
E-mail address: maphosacos@yahoo.com
Telephone: +268 7632 2340

Supervisor(s): Name: Prof G. van den Berg
E-mail address: vdberg@unisa.ac.za
Telephone: 012 429 4895

Name: Dr. P. K Mudau
E-mail address: mudaupk@unisa.ac.za
Telephone: 0829532090

Title of research:

THE PERCEIVED USEFULNESS OF MOBILE-PHONE TECHNOLOGY FOR LEARNING BY DISTANCE EDUCATION STUDENTS AT THE UNIVERSITY OF ESWATINI

Qualification: MEd ODL

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2021/04/14 to 2024/04/14.

*The **low risk** application was reviewed by the Ethics Review Committee on 2021/04/14 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date **2024/04/14**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number **2021/04/14/10453083/26/AM** *should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,

Prof AT Motlhabane
CHAIRPERSON: CEDU RERC
motlhat@unisa.ac.za

Prof PM Sebate
EXECUTIVE DEAN
Sebatpm@unisa.ac.za

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

APPENDIX C: LETTER TO UNESWA REGISTRAR

House No. 5 Kwaluseni Street
University of Eswatini
Kwaluseni Campus
Kwaluseni

20 April 2021

The Registrar
University of Eswatini
Kwaluseni Campus
Kwaluseni
Eswatini

Dear Sir,

RE: PERMISSION TO CONDUCT RESEARCH

I am kindly requesting permission to conduct research study on students at the Institute of Distance Education, University of Eswatini. The study is titled: THE PERCEIVED USEFULNESS OF MOBILE PHONE TECHNOLOGY FOR LEARNING BY DISTANCE EDUCATION STUDENTS AT THE UNIVERSITY OF ESWATINI.

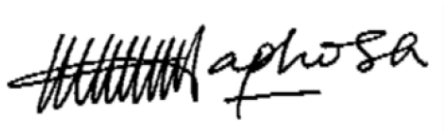
The study seeks to gather students' views on the perceived usefulness of mobile phone technology for learning. The specific objectives are: The specific objectives of this inquiry are to:

1. To establish the perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.
2. Find out if there is a significant relationship between the students' gender and perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.
3. Ascertain if there is a significant relationship between the students' age and perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.
4. Examine whether there is a significant relationship between the students' programme of study and perceived usefulness of mobile-phone technology by distance education students at the University of Eswatini.
5. Establish whether there is a significant relationship between the students' grade level of study and perceived usefulness of mobile-phone technology for learning by distance education students at the University of Eswatini.

A structured questionnaire shall be administered online to a sample of about 380 students.

I hope my request will meet your consideration. Thanking you advance for your cooperation.

Yours Sincerely,



Prof Cosmas Maphosa
76322340 (cell)
Email: maphosacos@yahoo.com

APPENDIX D: PERMISSION LETTER FROM UNESWA

UNIVERSITY OF ESWATINI
Private Bag No 4, Kwaluseni M201, Eswatini
Tel: (+268) 2517 0000 Ext 70108 Fax: (+268) 2517 0001
E-Mail: registrar@uniswa.sz
Website: www.uniswa.sz
REGISTRAR'S OFFICE

23rd April, 2021

Prof. C. Maphosa
C/o University of Eswatini
House No.5 Kwaluseni St.
Kwaluseni
Email: maphosa@yahoo.com

Dear Prof. Maphosa

Re: PERMISSION TO CONDUCT RESEARCH

Your letter of 20th instant refers.

You are granted permission to conduct research among students in the Institute of Distance Education on a topic bearing the title: "The Perceived Usefulness of Mobile Phone Technology for Learning by Distance Education Students at the University of Eswatini."

We understand that you will administer a questionnaire to about 400 students. In this connection, we hope that you will safeguard against disclosure of the identities and confidential information about the informants.

We wish you well in your study.

Yours sincerely

Dr. S.S. Simelane
REGISTRAR

APPENDIX E: LANGUAGE EDITOR'S CERTIFICATE

Dr Jabulani Sibanda
Senior Lecturer: English Education
School of Education
Tel: (053) 491-0142
Email:Jabulani.Sibanda@spu.ac.za
Alternate e-mail: jabusbnd@gmail.com
Website: www.spu.ac.za
Cell: 0845282087

20 June 2021

RE: CERTIFICATE OF LANGUAGE EDITING

To whom it may concern

I hereby confirm that I have proof read and edited the following Master's thesis using Windows 'Tracking' System to reflect my comments and suggested corrections for the author(s) to action:

The Perceived Usefulness of Mobile Phone Technology for Learning by Distance Education Students at The University of Eswatini

Reference

- Author(s): Cosmas Maphosa
- Student No: 10453083
- Affiliation: University of South Africa

Although the greatest care was taken in the editing of this document, the final responsibility for the product rests with the author(s).

Sincerely

20.06.2021

SIGNATURE

APPENDIX F: SIMILARITY CHECKING REPORT

Complete Dissertation

ORIGINALITY REPORT

16%	13%	7%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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