ZCAS UNIVERSITY

The Adoption Of Mobile-Devices In The Teaching-Learning Process: The Case Of ZCAS Faculty Staff And Students

BY

CHAPONGA NGULUWE

STUDENT NO: 001018817

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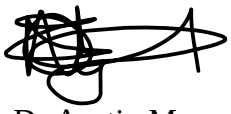
Declaration

I declare that this dissertation is exclusively my own work and that it has not been submitted anywhere else for the award of a degree or any other assessment, and that all protocols with regard to the standard Harvard referencing style have been complied with and that all sources accessed have been duly acknowledged.

Full Name: Chaponga Nguluwe

Signature: 

Supervisor: Dr Austin Mwange

Date: 31/03/2022

Dedications

I would like to dedicate this to my family, especially my parents, Clara Chellah and Martin J Nguluwe who have been my inspiration and even more importantly my foundation. To my siblings' thanks for all the support in a time when it was very difficult to move forward. Lastly to my friends and colleagues who supported me thank you.

Acknowledgements

Special thanks to my learned supervisor Dr Austin Mwange who has been guiding me directing me through the right paths and providing me with encouragement to finishing my research and make it even better as we went along your skill and knowledge was so invaluable I could not have asked for a better supervisor mentor. Thank you.

Dr Mweshi, Mr Mudenda, Mr Rolls and Mr Saidi thank you for your support and guidance it was greatly appreciated.

Abstract

The use of mobile devices in learning has grown exponentially over the last few years and continues to grow . This research was carried out in order to ascertain the adoption of mobile devices at ZCAS-U by students in the teaching-learning process. Through meticulous and detailed research which included literature reviews and data collection and analysis a conclusion was researched that ZCAS-U students have embraced mobile learning devices in their pursuit of higher education. Easy users' ability and navigation on mobile learning platforms has proven to be key in driving adoption as well as the inter-activeness that takes place between the student and lecturer. The results showed that the UTAUT model does a stellar job in highlighting that ZCAS-U students have accepted the use of mobile devices to a great degree.

Key Words and Acronyms

ICT	-	Information and Communications Technology
ZCAS-U	-	ZCAS University
UTAUT	-	Universal Theory of Acceptance and Use of Technology

Table of Contents

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This will be a research paper on the topic that was earlier presented in the individual presentation, the topic being, **"THE ADOPTION OF MOBILE-DEVICES IN THE TEACHING-LEARNING PROCESS: THE CASE OF ZCAS FACULTY STAFF AND STUDENTS".** The topic was chosen because the author of this paper recognized that the way learning is now occurring has significantly changed. This realisation came as a result of my job working with students, there were times when a dictionary was required and the students would not have a physical copy but they would access a digital one immediately on their smartphones or other mobile devices such laptops and tablets. Even the author themselves has often found themselves turning to the smartphone for quick information needed instantaneously.

To investigate the topic adequately research is going to be done at ZCAS University with the help of the students who are going to be engaged in structured interviews and focus groups as well as being asked to fill out a questionnaire.

The research design is going to incorporate mixed methods, incorporating both qualitative and quantitative methods. Whereas the research philosophy and approaches to theory development that are going to be incorporated are positivism and deduction, these have been chosen as the author believes they are the best suited to the type of investigation that is to be done.

It is also recognised that various tools will be required to collect data and analyse it and those to be used include IBM SPSS Statistics Software, Survey Monkey, Microsoft Excel and Facebook amongst others.

To maintain the highest ethical standards, confidentiality agreements shall be created and assurances shall be granted to all participants that their information shall be protected and kept confidential. The timescale of the research is expected to take no more than a semester (4-6 months).

1.3 Problem statement

ZCAS University provides partially blended learning using the Moodle Learning Management System (LMS). Further, lecturers are supported with prepaid internet service by the use of MiFi provided by Liquid Telecoms. It is worth noting that Mobile device adoption and usage in higher learning institutions have been on an increase in the 21st century. Most universities are providing blended learning and 100% e-learning or mobile learning. This pace of usage and adoption even accelerated during the Covid-19 era. Across the globe, depending on the rate of infections, countries went into full or partial lockdowns. This meant that face-to-face delivery of services such as education and other economic services were to be offered remotely.

In the case of Zambia, President Lungu declared a partial lockdown in March 2020, and all schools and universities were closed. However, they were free to provide their services through eLearning. ZCAS was one of the first universities to switch to eLearning on all programmes within the first week of the lockdown. It is against this background that this study attempts to investigate the level of adoption and usage of mobile devices by ZCAS University, a possible resolution to the current problem would be to make information more easily accessible through full utilisation of ICT.

1.2 Research Aim Objectives and questions

The general objective of this research was to assess the key determinants of the adoption of mobile devices in the teaching-learning process at ZCAS University.

1.2.1 Specific Research

This research aims to investigate how ICT adoption in higher education and what can be done by institutions such as ZCAS University to fully harness its power through mobile devices to ensure are more comprehensive teaching-learning experience.

1.2.2 Research Questions

I. What are the determinants for the adoption of mobile devices in teaching and learning at ZCAS University?

II. What is the extent of mobile device usage archived in teaching and the learning process at ZCAS University?
III. Do demographic characteristics have an impact on the adoption of mobile devices in the teaching-learning process at ZCAS University?
IV. What effect did Covid-19 have on the usage of mobile devices in the teaching and learning process?

1.2.3 Research objectives

I. To identify determinants of mobile-devices adoption in the teaching and learning process at ZCAS University
II. To assess the extent to which actual use of mobile devices has been achieved in the teaching and learning process at ZCAS University
III. To determine the impact that the demographic characteristics have on the adoption of mobile devices in the teaching-learning process at ZCAS University
IV. To determine whether Covid-19 impacted the usage of mobile devices in the teaching and learning process

1.4 Significance of the study

The rationale of this study is based on the premise that taking into consideration how far technology has come and how crucial access to information for the student is it is necessary to look into the like hood of adoption of these developments by students at universities and see how better to serve and enhance the teaching-learning process.

1.5 Scope of this study/Delimitation

This study was carried out at ZCAS University in Lusaka Zambia. The study was restricted to ZCAS students only from the Law school. During the interview process only, the full-time students and distance were asked to respond for data collection purposes.

1.6 Key Literature and the Theoretical Background

One could argue that it is not an ambitious statement when it's said that ICTs particularly mobile technology has revolutionised what it means to be a researcher, student or just being a productive

individual. Tons of information is really at our fingertips and one only has to pick up a mobile device to find it and engage.

From the literature available the smartphone does not necessarily have one solid definition as Litchfield (2010) has noted it ranges from a mobile phone that is always connected to the internet, to one that has a non-physical keyboard but is a touchscreen or to one that has browsing capability and the open to extensions by use of applications (Apps). Clearly from the definition, one can deduce that there is a lot to the smartphone and its capabilities for it to be limited to just one definition.

The focus of this research is going to be the adoption of mobile devices in the teaching-learning process and a particular focus on students when it comes to using them in further education studies. This will be done by highlighting the classics and the current literature from scholars and academicians to see how a better understanding of such can help Universities serve their customers better.

1.7 Research Contribution

Whilst this area of research is relatively recent and rapidly growing, there is some published research on the adoption and use of ICT particularly mobile devices, however not much has focused on how ICT devices such as smartphones access to materials or information amongst university students. Therefore, this research will contribute to universities being able to serve their customer base better due to understanding their student needs.

1.8 Overview of Research Design

To be capable of satisfying the set objectives and questions stated the research will attempt to use both qualitative and quantitative methods. They will be a collection of data from primary as well as secondary sources to carry out a proper analysis. The collection of primary data will be through interviews and structured questionnaires to be conducted amongst the students and potentially the teaching staff.

1.8.1 Research approach and method

The paper will make use of both quantitative and qualitative research methods. Quantitative methods allow for numerical data to be analysed to see patterns and trends. According to Saunders quantitative analysis can be utilised when using primary data that can then be interpreted using graphs and tables. Furthermore, the will be some utilization of qualitative data but only in minor instances (2017, p.456-566).

1.8.2 Data collection and analysis techniques

This researcher aims to collect primary data from the ZCAS University students, there are a variety of primary data collections methods including surveys, interviews, and focus groups two of which will be incorporated. Once that data has been collected there will be analysis will be conducted using various tools such as EXCEL, and SPSS where regression analysis will be carried out to see the impact of ICT on customer satisfaction.

1.9 Dissertation Layout

The following will be the breakdown of the structure of the final report according to the chapters to be included. It will be as follows:

Chapter One: This will be the introductory chapter that will include the background of the study.

Chapter Two: This will be the literature review relating to the topic selected.

Chapter Three: This chapter shall highlight the research methodology techniques and data collection tools that will be used in the investigation.

Chapter Four: During this portion of the investigation the findings and analysis of data that has been collected from the ZCAS students will be reviewed and analysed.

Chapter Five: This shall be the recommendation and conclusions section

References

Appendices

1.10 Chapter Summary

The above chapter has given a general overview of the research to be undertaken. It highlighted the problem statement, the research question, and objectives whilst stating how this will be achieved. The chapter also referred to the contribution in the knowledge that this research will add due to the knowledge gap in existence. The next chapter will be the literature review.

CHAPTER 2: LITERATURE REVIEW

1.1 Introduction

The following chapter will be a detailed literature review on the adoption of mobile-devices in the teaching-learning process within the parameters of higher learning institutions. The purpose of this review is to delve into the history of adoption of mobile devices in the teaching-learning process at university level. This is being looked at in order to achieve the objectives that have been stated in the previous chapter. It is therefore the intention and purpose of this chapter to give an outlook of the theoretical and conceptual frameworks that exist around the teaching learning process in higher education whilst also taking note of current literature that exists as well as a historical view of what has come before.

2.2 Theoretical Framework

The theoretical framework of any research document is essential as its acts as a guide and blueprint for actual research that is being undertaken(Adom et al., n.d.). There are a number of theories that are essential and those will be highlighted below and made use of in this research.

2.2.1 Definition of ICT and mobile devices

The term ICT has been around for some time now and it stands for “Information and Communication Technologies”. Whilst the term is relatively straight forward it could be described as all kids of electronic systems used for broadcasting telecommunications and mediated communications however the simpler definition is that it is convergence of electronics, computing and telecommunications and included are such things such as mobile phones laptops and desktop computers and projectors (K.M.P, 2018).

Mobile devices on the other hand can devices that allow you to access computer tools without having to worry about wires traditionally speaking they were seen as devices such as cellular phones and laptops as well as palmtops (Chlamtac and Redi, 1998). As of late 2010s these devices now include everything from smartphones to tablets to student focused laptops and smartwatches.

2.2.2 Major theories and models

ITCs have progressed at rapid speeds with improvements being made year on year, these technologies have penetrated most countries at a rate faster than any other technology in the history of the world (Eagle, 2005). In some countries, devices such smartphones are even more prevalent than other technologies, such as personal computers and landline telephones (Tossell *et al.* 2016).

In practically every nation those aged between 18 to 34 have shown more interest in using the powerful features included in smartphones a lot more than those who are aged 35 and over with this significant age gap being present in both progressive and emerging economies (Poushter 2016).

It is this prompt acceptance rate of mobile devices that has been a key contributing factor the devices becoming an essential component of a student's educational journey (Anderson and Blackwood 2004). The aids provided by these devices and capability of multifunctional connectivity with the added network of peers just open up an ideal world of possibilities in learning (Woodcock *et al.* 2012).

The features of these devices have really pushed the boundaries in making information available to individuals, particularly for the student, according to Williams and Pence (2011) the smartphone is more than a phone, it's more of a powerful portal computer combining web browsers, barcode scanner and apps to become a powerful education tool when used properly to the extent that they may even have more impact on students than the traditional personal computer. Student are using these devices constantly and it gives them access to instant information via web-browser in classroom or when carrying out research (Williams and Pence 2011).

The America Collage Student Cell Phone Survey by Emanuel (2013) examined the use of smartphones by students in higher education institutions, the figure below highlights those findings.

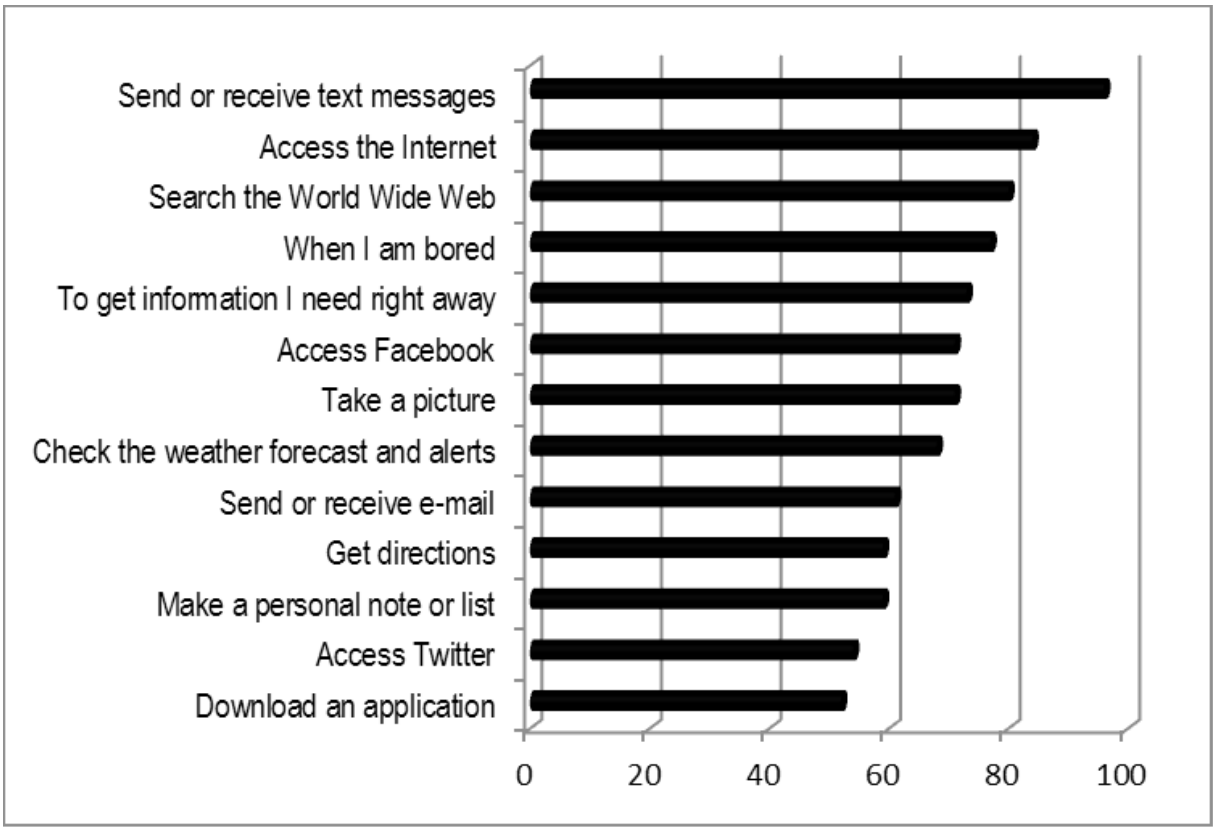


Figure 1: Student's Smartphone Use (Emanuel 2013)

The rich features of smartphones and their potential use in lecture rooms has grown at an exponential rate, the fact that its more portable than other traditional Information and Communication Technologies (ICTs) such as laptops and personal computer and cheaper make it an ideal device for students and lectures when their potential is harnessed and used correctly (Bashir *et al.* 2014).

A quick glance at the three major mobile operating system (OS) app stores (i.e. Microsoft, Apple and Google) it can be seen that productivity apps are amongst the most popular apps found and are always in the recommended sections, these include the Microsoft suite for productivity apps such a Word, Edge and Excel which helps students with assignments, Apple has Pages, Keynote and Numbers whilst Google has Sheets and Docs and that's just for starters (Microsoft 2018, Google 2018, Apple 2018).

Linking this to Emanuel's (2013) findings highlighted in *figure 1* it more than likely the students used these apps when checking the internet for information they needed immediately. It can also

be deduced that these companies have recognised the power of the smartphone in assisting students with higher education that they have even started developing University specific apps such as iTunes U and Moodle which provides access to materials.

According to Liu and Hwang (2010) there are three types of leaning that occur with mobile devices such as smartphones, there is mobile leaning, electronic learning and context aware ubiquitous learning, of the three though it is the mobile learning type that related to what the author will be investigating with smartphone use and adoption.

Furthermore, mobile learning has been built around three core concepts, mobility of, technology, learners and the leaning process, with mobility of technology focusing on the hardware and software (i.e. smartphone being the hardware and apps being the software), whilst mobility of learners focuses on the freedom that the student has and lastly mobility of the learning process focuses on a combination for freedom for the student and the technology they have to use (Yu 2012).

These devices are starting to push the boundaries on what is possible with m-leaning using mobile devices, whilst their potential is limitless adoption of their use in higher education is still in in early stages and but it given the staff members at higher education centres the opportunities to revolutionize m-learning and teaching due to the features they have (Cheon *et al*. 2011).

Some of the concerns that have been highlighted is the cost of some of the educational apps that are available, the issue being that not all of them are freely available which means that there are going to be limitations as to who can afford these amongst the students and even the amount of storage on these devices has been seen to be a potential problem for larger apps (Bashir et al. 2014).

The smartphone has been perceived to be a distraction to students in majority of higher learning institutions and they are mostly banned in in lecturer rooms, however even thought that has been the case others have argued that it needs to be a controlled tool made suitable for class (Bataineh *et al*, 2014).

2.2.3 Unified theory of acceptance and use of technology

In the process of the research being carried three major theories and models were discovered, this included the Unified Theory of Acceptance and Use of Technology (UTAUT), The Technological Acceptance Model (TAM) and lastly the Theory of Planned Behaviour (TPB) however focus will be on the UTAUT model as it is not possible to consider three in one study. The UTAUT theory has been selected because it is currently the most utilised of the above mentioned and it ties very closely to the objective in chapter one (Rataj and Wójcik, 2020).

Initially developed and conceptualised by Venkatesh (2003) the models major factors take into consideration, performance expectancy, social influences, effort expectancy, behavioural intention and facilitation conditions. Since its inception the theory has grown to have significant impact in the studies revolving around the adoption of new technologies and it's now recognised as one of the most complete and comprehensive models developed to assess the adoption and acceptance of new technologies therefore it is wholly and massively relevant to the study that is being carried out in this research(Momani, 2020). When applied in various studies the model has often demonstrated that there is a strong willingness to accept the use of mobile devices in the learning process especially from the student perspective (Nassuora, 2013). It has demonstrated that there are behavioural patterns that can be noticed amongst students based on their experience as well as the application resulting in robust boldness towards accepting mobile devices in the teaching learning process (Briz-Ponce et al., 2017). A diagrammatical illustration of the model is seen in figure(Venkatesh et al., 2003).

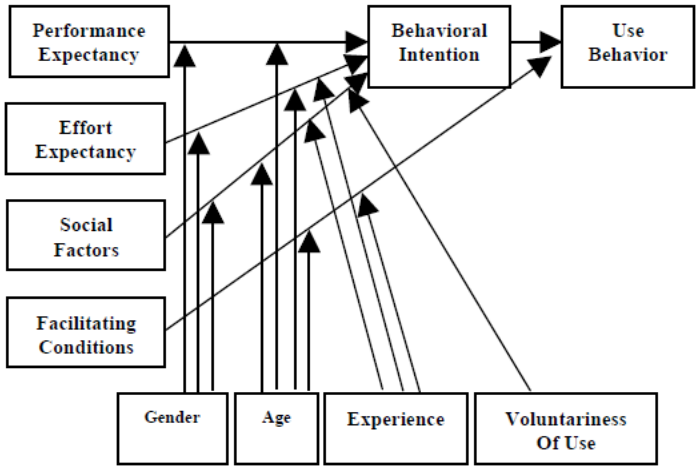


Figure 2 UTAUT Framework Model

Performance expectancy

This focuses on the influences on the behavioural intention and is demonstrates a correlation that is affected by age and gender with vary results in men and women. In other words it looks at the ability said technologies can benefit and improve the overall performance of the use in their user experience in line with expectations (Momani, 2020).

Effort expectancy

This is all about the users hopes in relation to how easy the technology is going to be for the user to interact with it. It is in relation to how easy is it going to be for the user to learn the system in use and how quickly they could become skilled experts in the use of the said technology as Venkatesh (2003) points out " the influence of the effort expectancy on behavioural intention will be moderated by gender, age and experience, such that the effect will be stronger for women, particularly younger women and particularly at early stages of the experience".

Behavioural intention

With regards to this factor it's about the user's intentions when it comes to the usage of technologies to carry out task related to their work, for instance how much they intent to use the technology, will they perform tasks with it and decision they will make based of it. It is expected that this will have an encouraging influence on adoption of the technology or its usage(Venkatesh et al., 2003).

Social influences

This focuses on the expected influence that others will have over the user in relation to the initial usage and continued usage of the said technology, it will be a noted that this is an inspiring or reassuring influence on the user , some have even pointed out that there are sign that indicate the more social influence around technology the more its likely to be adopted and utilised (Brata and Amalia, 2018).

Facilitating conditions

According to Venkatesh (2003) facilitating condition is in regards to the extent to which a user has faith that the institution that they are part has the requisite organisational structure and the

technological infrastructure is present and available to support their use of the technology in question.

2.2.4 Justification for use of UTAUT model

There is currently no model that is more widely used nor widely respect as Venkatesh's model, it is seen as the leading and most robust model to examine the adoption of technology in new areas or organizations(Hoi, 2020). The theory itself was actually developed after consideration of eight previous existing models in relation to information systems and adoption of new technologies before and its it time it has been utilised by many and has undergone some minor modification to it therefore in line with what has been researched it is the view of this author that said theory should be utilised to study the adoption of mobile devices in the teaching learning process at ZCAS-U(Momani, 2020).

The biggest justification for the us if this model is that this model has been utilised in many adoption researches in various fields including but not limited to banking (Rachmawati et al., 2020) medical information systems (Zhou et al., 2019) and private higher education (Rataj and Wójcik, 2020). Therefore, its only logical that the model be utilised in this research. There are a number of advantages that UTAUT has over the one previous common TAM model, one of the biggest advantages is that the UTAUT includes demographics and user experience in which means it becomes very suitable in a service orientated research such as this one because it can highlight results in line with the adoption of mobile devices in the teaching learning process and furthermore this model narrows down over 30 variable in other models into t just four(Mr, n.d.2016).

Another advantage identified is that UTAUT is full-bodied and translate a great deal of information especial in the adoption of technology researches. It is a powerful model because it can be applied in many field and because it allows for use across countries apart from its country of origin and insight in cross cultural technology adoption trends and behaviours (Oshlyansky and Thimbleby, 2007).

A third advantage of according to Venkatesh and his team (2003) the model had the uppermost power and ability to provide an explanation with regards to behavioural intention and adopt or

usage of technology when put side by side with other models. In other words, it gave the most comprehensive insight into adoption of technologies and usages.

Lastly the model is currently cited more than 5000 times and only comparable to the TAM model based on impact and adoption. This view has been supported by the many including the likes of Owolabi, Niel and Mhlongo (2016) and Momani (2020) noted that the model can come up with 70% of the difference in user's adoption and acceptance and 50 % in technological acceptance. Therefore, based on those factors' credibility and acceptance of the model appear at an all-time high which in turn validates its selection for this study.

2.3 Recent developments in UTAUT

It has been almost 20 years since the theory was first set upon the world in 2003 and since that time there has been reflection and some additions to it that refined the model and made it even more suitable. Some of the recent developments surrounding the model shall now be considered below.

Cheng-Min Chao

The UTAUT model was applied in a research to study behavioural intention of students with regards to using mobile learning however it was extended upon with the addition of additional factors such as satisfaction, mobile self-efficacy as well as perceived enjoyment. The research survey over 1500 students and showed that user satisfaction had a positive effect on behavioural intention of the students and mobile self-efficacy had a great impact on the perceived enjoyment of the student. This highlighted that there are additional factors that have a positive impact on results(Chao, 2019). Figure 3 below shows Chao's extended model with new factors added.

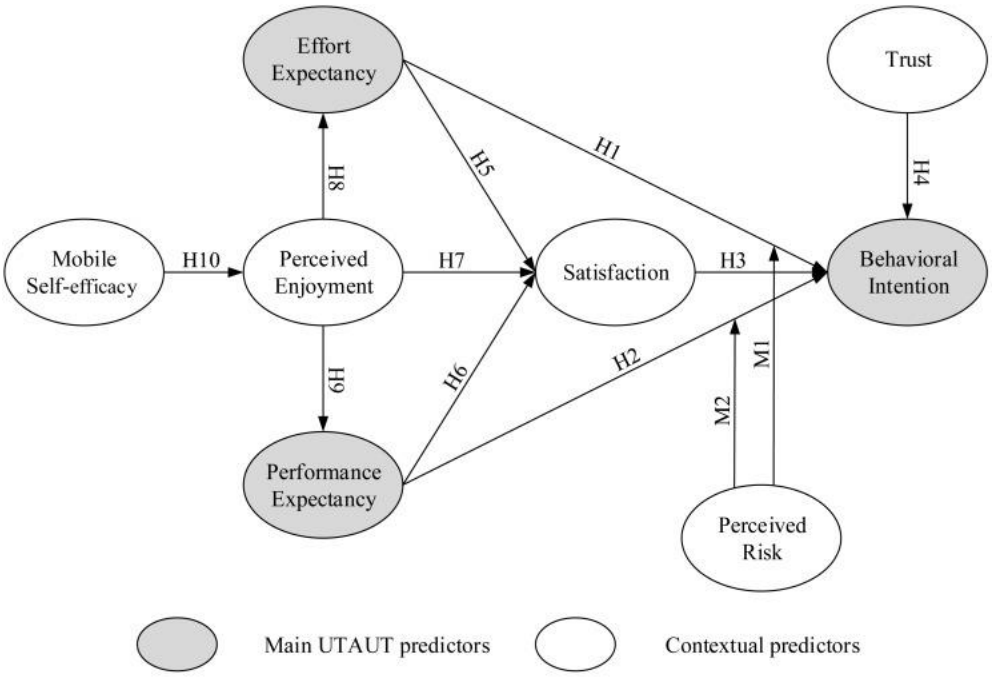


Figure 3 Chao's Extended Model

Wang and Wang

In their research on gender disparities in the acceptance of internet on mobiles they surveyed over 300 individuals and included three additional factors to the original UTAUT model expanding it again. These included perceived value and perceived playfulness to name two the result indicated that most adopter were between the ages of 20-35 and that proficiency with hand sized devises played a crucial role anticipation mobile internet access(Wang and Wang, 2010).

What is clearly evident is that whilst the original UTAUT model remains a very powerful and useful model in accessing adoption of technology and systems acceptance the above-mentioned development show that there is room for there to be extensions and additions to the model which in a way demonstrates its versatility. Apart from those already mentioned it should be noted that Lin and Anol (2008) as well as Sykes, Venkatesh and Gasion (2009) extend the model to.

Criticism of UTAUT

Whilst the model has been a great success in its use and adoption it has not been devoid of detractors and critics. The UTAUT model has been deemed to be a bit too narrow minded in its approach as it only considered the individuals beliefs their perceptions and furthermore it appeared

its contribution to knowledge seem to be plateauing(Shachak et al., 2019). There has been additional criticism from the likes of Li (2020) and Van Raaij and Schepers (2008) who have all identified short comings demonstrated by the study of the model.

There has also been argument presented that though the theory has been cited plenty of time and appears very popular there is evidence suggesting that some cited sources did not truly utilise the model to its full capacity. In a study carried of 450 cited papers it was discovered that only had fully utilised the model in full alluding to some limitations of the model without extension added to it(Williams et al., 2011).

Whilst the criticisms are valid it is worth noting that the model when extended upon and applied properly has proven itself to be very useful and a powerful tool to utilise in the examination of adoption of technology and it is for this reason that it has been selected by this author for this particular research.

2.4 Empirical studies

There is plenty of evidence of studies and researches that has successfully utilised UTAUT to determine various perceptions of adoption of technology in different fields and each. A few will be considered in this section to provide some additional empirical context of what examined. In their research Jacob and Darmawan (2019) used the model to study acceptance of an e-government by citizen in a developing country using a quantitative study and it showed that user satisfaction and privacy was key to adoption and indicative of what government could to offer a better platform.

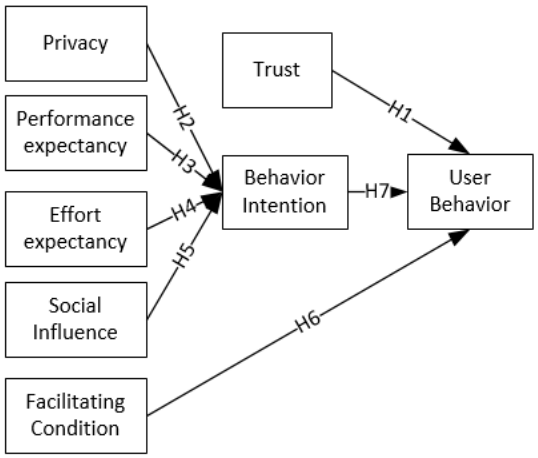


Figure 4 Jacob and Darmawan modified framework

Another study that could be considered that made use of the model was conducted in Saudi Arabia where over 75 students were survey in a quantitative study carried at an institution of higher learning. This study focused on mobile learning adoption with the model applied the results indicated that acceptance and adoption levels of mobile learning were very high amongst students(Nassuora, 2013). Figure 4 below shows the modified UTAUT model as applied at Al-Failsal University.

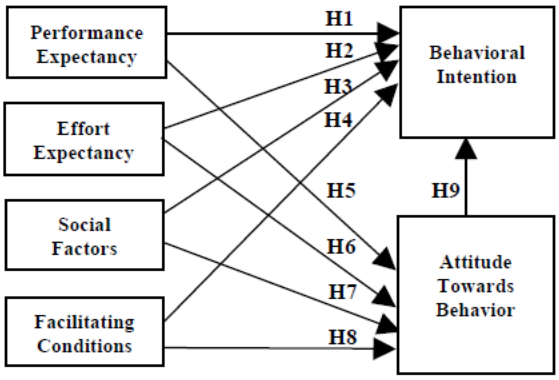


Figure 5 Nassuora modified research framework

The final study to consider under this section is that carried in the United Kingdom in relation to customer intention to use remote mobile payments as an option, once again the UTAUT model was utilised by virtue of a quantitative study with date being collected from more than 260 persons

and results showed that perception of risk and innovativeness had a serious impact on the users intention to adopt remote mobile payments as an option(Slade et al., 2015).

2.4.1 Covid-19 pandemic

Covid-19 has proven to be a challenge to universities however the blended learning that ZCAS-U offers placed it in a position where to could respond to the demands by having a system that allows for mobile device utilisation in the teaching learning process. Research has shown that students responded positively to mobile learning via various learning platform that they accessed with their mobile device through the pandemic(Yuan et al., 2021). It has also been observed that perceived ease of use and usefulness is what drove students to utilise m-learning tool even during the pandemic at its worst when people were restricted to their homes(Zaidi et al., 2021).

2.4 Gaps in the literature

Private universities in Zambia and Africa are currently on the rise and whilst research has looked into adoption of mobile devices very little has been done in the areas of mobile devices adoption in the teaching learning process in Africa and how that can have a positive impact on institutions and the service they offer to students both fulltime and in distance education. This can't be truer for newer Universities such as ZCAS-U where the students are that customer. The methods in which education is being provided is swiftly changing and online content is a huge part of this change (Cheon *et al* 2011). Henceforth the need to assess the adoption of ICTs such as laptops, smartphone, tablets and more, devices commonly known as mobile devices. Their impact on customer satisfaction is more important than ever. Majority of the literature has focused on adoption of the ICT with minor consideration whether or not students are satisfied with the quality and method of delivery therefore this gives an avenue to look into that (Woodcock *et al*. 2012). Which means there is a gap to be exploited which is what this research will endeavour to do.

2.5 Dependant and Explanatory Variables

2.5.1 Dependant variables

The UTAUT model has two dependant variables and these behavioural intention and the other being use behaviour these two focus on the user intention and usage of the system or adoption of new technology(Venkatesh et al., 2003).

2.5.2 Explanatory variables

there are four explanatory/independent variable and these are performance expectancy, social factors, facilitating conditions and effort expectancy and they focus on the users expectation and influences that will affect them when they are examined in relation to new technology(Momani, 2020).

2.5.3 Moderating variable

The UTAUT model has four moderation variables a moderating variable "can strengthen, diminish negate or otherwise alter the association between and independent variable and dependant variables" in other words these give additional insights in the relationship that can exist between a set of variables(Allen, 2017). The four-moderation variables in UTAUT are gender, age, experience and voluntary use. Age is expected to have an impact on performance expectancy, social factors and facilitating conditions. As for experience it is expected to have an impact on social factors facilitating conditions and effort expectancy whilst gender is expected to have an impact on performance expectancy, effort expectancy and social factors. Lastly voluntary use should have an effect on social factors only(Venkatesh et al., 2003).

2.6 Chapter Summary

This chapter emphasized the current and past literature in relation to the adoption of technologies and mobile devices in the teaching learning process. Different theories and theoretical concepts as well as theoretical frameworks that currently exist within the parameter's adoption of mobile devices within the teaching learning process have been highlighted particularly UTAUT. A gap has also been identified in that not much has been done to look into African Universities and the adoption of technologies related to the teaching and learning process. The next chapter will be focusing on the methodology that is going to be used in this research.

Chapter 3: Research Methodology

3.1 Introduction

This chapter will now focus on the research methodology for this research. This is the chapter that looks at the entire overview explaining how data will be collected, reviewed and how it will be scrutinized. This chapter considers the precise techniques and procedures that shall be used to analyse data which would the allow for checks in relation to reliability and validity of the study and shall also include the ethical considerations of the research as well.

3.2 Research Paradigm

The term paradigm means a typical pattern or a model in defining research paradigm one could say it is the method or research model that is to be utilised when carrying out research that has been vetted by various researchers within a particular topic area and has been used by many over a long period of time. According to Kuhn (1970) he defined it as a " set of common beliefs and agreements shared between scientist about how problems should be understood and addressed" whilst Guba and Lincoln, n.d.(1990) added that is it characterised by how research replied to questions surrounding epistemology , ontology and methodology questions. Generally speaking paradigm will rise out of two approached mainly the positivist or interpretivism approaches.

Positivism or the positivist paradigm is more suitable for quantitative research due to it nature of empirical considerations of data, a positivist approach allows for the testing of an empirical hypotheses it's also one to mould their research on a probability research that is influenced by past researches(Saunders et al., 2016).

On the other hand, you have interpretivism which is mostly applicable in qualitative researches. This paradigm notes that individuals are not all the same and this paradigm allows one to study such meanings, different situations and environmental aspects will play a big part. Factors such as

race, genes and cultural background make diverse for meanings therefore one is looking for meaningful insight when utilising this (Saunders et al., 2016).

3.3 Research approach and justification of the strategy

The positivist paradigm will be adopted for this research. Due to its experimental capability and openness to allow the study of casual linkages through quantitative methods via sample sizes. The paradigm is associated "hypothetico-deductive model" where there is theory in place followed by building a hypotheses and then use of variables to create an empirical research through experimenting(Park et al., 2020). This approach stresses that research is done an environment where set variable is able to be measured and used. Furthermore is can be utilised where there is palpable quantitative data that is obtainable as it allows for calculation of possible predictions relative to indicators like demography(Melnikovas, n.d.).

Therefore, in line with the overall objective of this research this appears to be the most suitable approach as it allowed the researcher the ability to study the adoption of mobile devices in the teaching learning process at ZCAS-U.

3.3.1 Inductive and deductive approaches

Where a research is utilizing an inductive approach, it involves the collection of data that will be deemed relevant to the topic at hand, with the data collected the researcher then has to review the data and it is at this point that they start to look for trends and patterns the conclude with coming up with an explanation for the trends or patterns observed by theorising it. However under a deductive approach almost the opposite will occur, one will start with the theory then move on to accessing its consequences with aid of data the deductive approach is one that favours scientific research(Saunders et al., 2016). For this research the deductive approach has been adopted as it allows for data collection that can then be compared to theories already in existence by virtue of the UTAUT model.

3.3.2 Time horizon

There are mainly two time horizons to consider cross-sectional or longitudinal research, where data is collected in one off period of time say days or weeks to respond to research objectives, this will often be referred to as a cross-sectional study where as one where studies are done more than once off for a research and there is multiple data collection and different points in time this would

be referred to as a longitudinal horizon(Saunders et al., 2016). In light of this it was the researchers view that a cross-sectional time horizon be utilised in that it is more in line with the research being carried at ZCAS-U and the collection of data is one off from the students.

3.3.3 Sampling frame and sample size

Sample frame

The sample frame is made up of all the fulltime students at ZCAS-U in the law school as of Semester 2 from September 2021 which accounted for 150 students at the time.

Sample size

The sample size was determined using simple random sampling from a population of 150 registered fulltime law students. From this population a sample size of 110 was determined at 5% margin of error (precision) of at 95% confidence level using the Yamane Taro table and formula (Yamane, 1973). However only 100 students responded to the questionnaire that was distributed via mail. Below is the determination of the sample size using the Yamane Taro formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where *n* = sample size

Where N= population

Where *e* =margin of error/precision

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{150}{1 + 150(0.05)^2}$$

n =110

The sample size determined was 110 students.

Sampling procedures

Generally speaking there are two major sampling methods in research, probability and non-probability sample. It is not possible to study the entire ZCAS-U population therefore a sample is required as a sample is seen as a subdivision of a much larger group. Probability sampling gives the research the chance to simplify their discoveries of a sample in a targeted population it allows for use of either simple random sampling, stratified random sampling or systemic random sampling to name a few. As for non-probability sampling it involves samples where probabilities of a particular component being chosen in unknown ans some common methods include convenience sampling or quota sampling(Acharya et al., 2013).

For this research simple random sampling has been selected as it aligns well with the type of research being conducted this allows the research to be able to produce a set of results that will be a common consensus of the whole ZCAS-U population (Saunders et al., 2016).

3.3 Data collection

Data that utilised in a research can either be primary or secondary in nature. Primary data is information that is gathered for a specified research problem utilising technique that best align together with the issue being researched, it is considered original data as it is collected for a very specific purpose. On the other hand, secondary data refers to data that already exist and has been collected by others and then made that was used for a different research and then used again but for a different research (Hox and Boeije, 2005).

For this submission primary data will be unitised. Primary data was collected by way of web-based questionnaire/survey that was emailed to the students of ZCAS-U. The structured questionnaire was selected as according to Hox and Boeije (2005) this is the option for this type of research that focus on behaviour.

3.4 Data processing and analysis

Having collected data the next logical and natural step is to analysis that data. Data analysis requires the linking together of information in order to interpret it to identify any trends and pattern that one can come across. This requires that use of critical, analytical and logical reasoning skills in order to see where the meaningful details emerge (Humble, 2020). In order for the researcher to analyse what was collected IBM’s SPSS tool was utilised in order to carry out adequate quantitative review of the data.

3.5 Reliability and validity and generalisability of research findings

The above are perceptions that are deemed necessary to evaluate the quality of research that has been done. Starting with reliability it could be defined as , "how far a particular test, procedure or tool such as a questionnaire will produce similar results in different circumstances assuming nothing else has changed" meaning that if it were to be applied elsewhere but at a different time the results should still be similar therefore the tool can be seen as reliable(Roberts and Priest, 2006). As for validity, this concept aims to measure the truthfulness of the outcomes of research done in order to access or determine the degree to which our results actually measured what was intended to be measured. This can be archived by examining how much the outcomes corresponded to or related to theories already in existence(Fitzner, 2007). As for generalisability, it's the level to which the research finding in this study could be made relevant to additional researcher scenarios. Meaning to what extent could this apply to other groups.

3.6 Ethical and access issues

3.6.1 Accessibility

Accessibility is in relation to access of the data that will be required for this research, there are different types of access and the relevant on for this research shall be internet-mediated access as this give the researcher the ability to use different technologies to make questionnaires available to the population to be sampled(Saunders et al., 2016). The research will be carried in the safest and most confidential possible manner in order to ensure honesty, transparency and accountability. Permission will be sought from all parties involved before any data is collected.

3.6.2 Research ethics

Ethical issues will be encountered however it is the intention of the researcher to ensure that all ethical obligations are meet. Ethics is about doing the right thing not because it is the right thing to do but because it is what is expected, it focuses on conduct and the standard of said conduct in relation to how the researcher is to act in dealing with the right of the sample personnel(Saunders et al., 2016). To ensure that all ethical obligations are met participants will be informed of the research and asked to take part anonymously, confidentiality will be in line with academic and legal provisions and all collected data will be maintained in the strict form possible and with the utmost privacy guaranteed.

3.7 Chapter Summary

Chapter three focused on the methodology that was utilised in this research, the positivism paradigm has been adopted in an attempt to come up with adequate responses to the objectives set in chapter one. It has also sought to explain the research design and the type of data that was collected and used. Further-more quantitative methods are adopted with probability sampling and the sample size coming from ZCAS-U students. Chapter four will be data analysis and diagrammatising of data collected.

Chapter: 4 Research finding and Analysis

4. Introduction

This chapter is divided into two parts. The first part focuses on the presentation of the finding and the second part will provide an analysis and discussion of the findings.

4.1 Part I Presentation of findings

This study was a descriptive study. Therefore, a presentation of descriptive statistics is provided here starting with the profile of respondents. This is followed by the key research variables or research questions/objectives as analysed using SPSS.

4.2 Respondents Profiles

4.2.1 Age

Statistics

Age1

N	Valid	100
	Missing	0

Age1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-25	23	23.0	23.0	23.0
	25-30	58	58.0	58.0	81.0
	30-35	16	16.0	16.0	97.0
	35-40	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Table 1 Age Break Down

Statistically speaking, 58 participants in the age group indicated above were in majority participation of the study, followed by 23, 16 and 3 respectively.

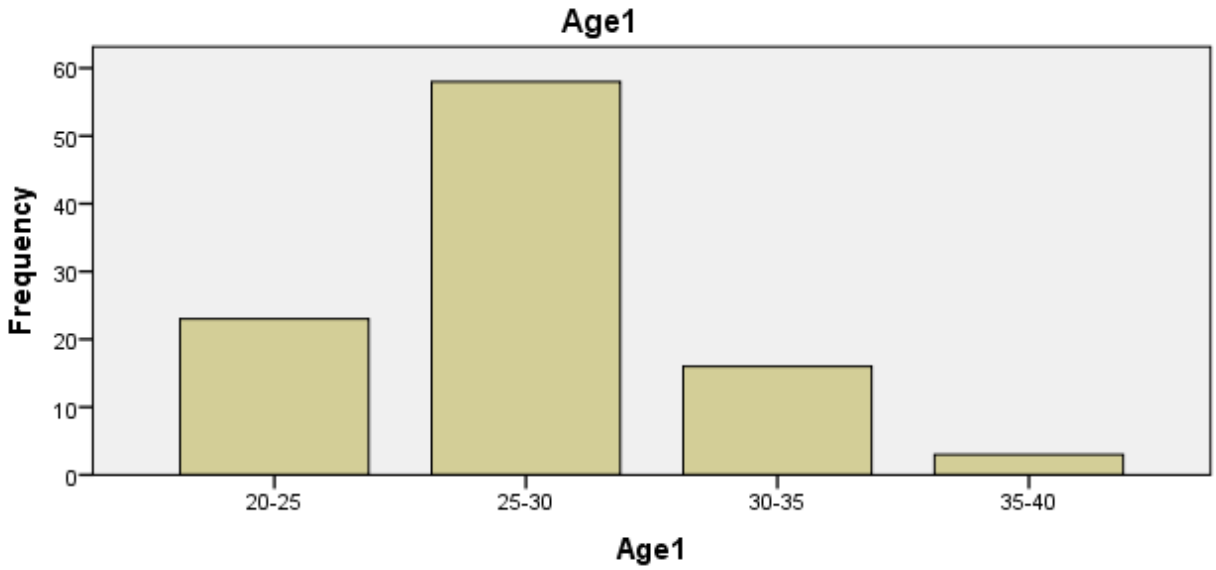


Figure 6 Age Bar Chart

Source: (Author 2022)

The Bar chart shows that the age group in the study comprised of those in the age group between 25-30yrs active participants. This was followed by those between 20-25 and the lowest been those between 35-40 respectively.

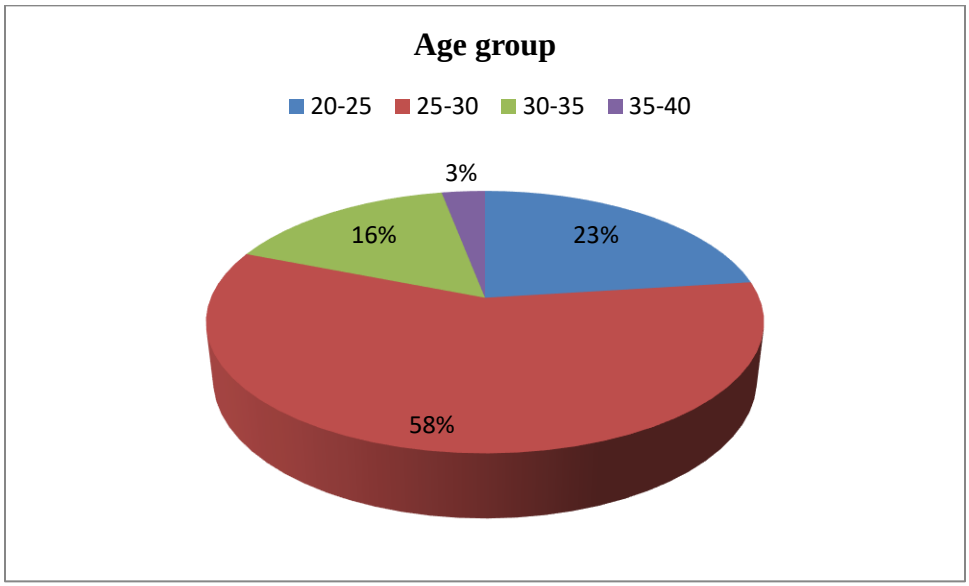


Figure 7 Age Pie Chart

Source: (Author 2022)

In view of the above data, it was evident that majority respondents age group was in the range between 25-30 translated into 58% of the total participants. These were followed by 23%, 16% and 3% being the lowest of all.

4.1.2 Sex

Statistics

sex2

N	Valid	100
	Missing	0

sex2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	37	37.0	37.0	37.0
	Female	63	63.0	63.0	100.0
	Total	100	100.0	100.0	

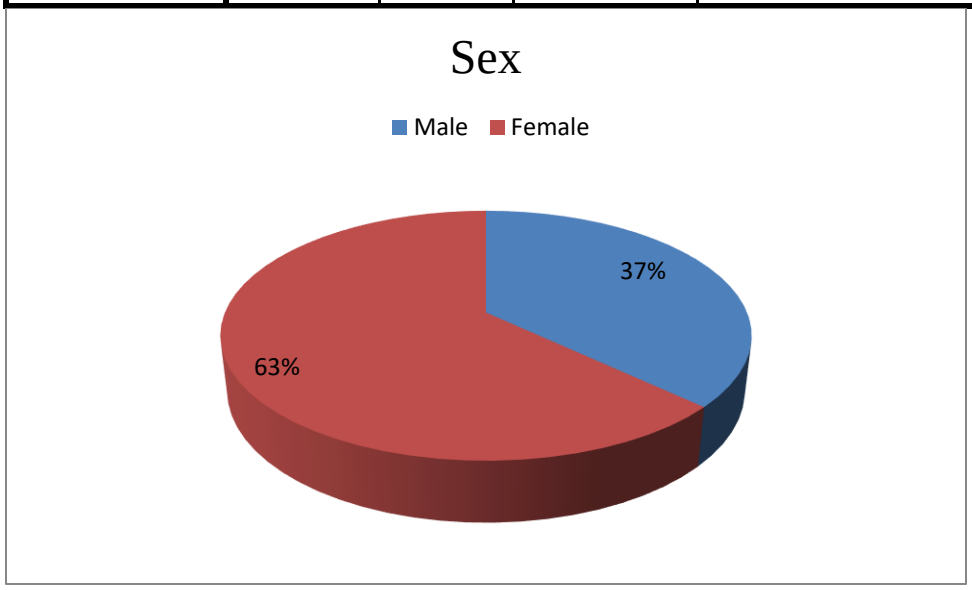


Figure 8

Source: Author (2022)

As can be seen above, 63% of the total participants were female students and 37% male students of the total sample size took part in the study.

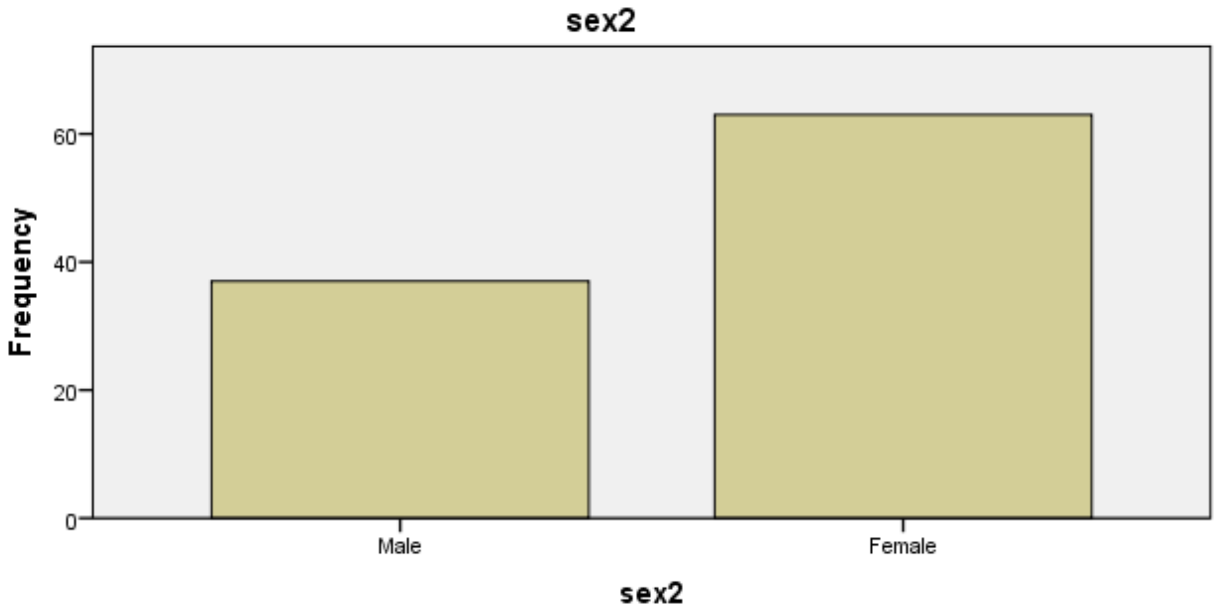


Figure 9

Source: Author (2022)

The data above indicates that there were more female participants than males in this study. An indication which could be interpreted that the female students took the study more seriously than the male students.

4.1.3 Education level

Statistics

Education3

N	Valid	100
	Missing	0

AcademicYear3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1st Year Student	7	7.0	7.0	7.0
	2nd Year Student	55	55.0	55.0	62.0
	3rd Year Student	34	34.0	34.0	96.0
	4th Year Student	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

Table 2

Source: Author (2022)

As can be observed from above, the highest number of students who participated in this study belonged 2nd year cohort followed by those in third years at ZCAS University. The lowest being fourth year students.

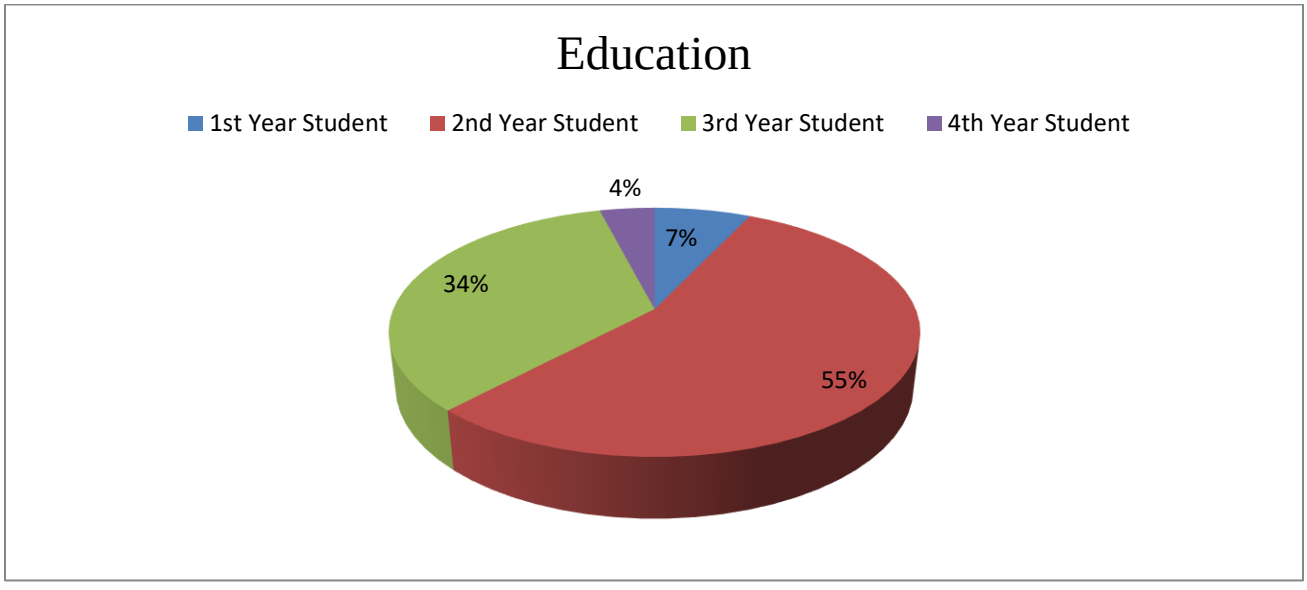


Figure 10

Source: Author (2022)

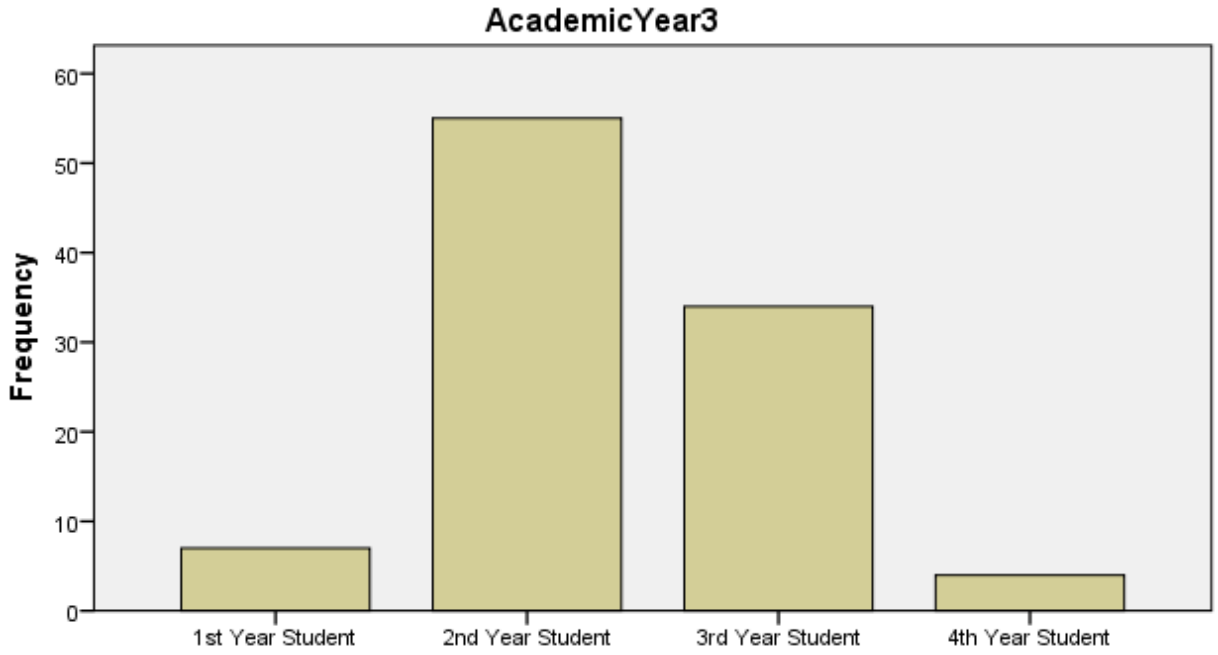


Figure 11

Source: Author (2022)

In view of the Bart Charts, it can be clearly seen that the highest bar corresponds with the 55% (2nd year) highest number of students in the Pie Chart and the 4% (4th year) of the total students being the lowest of all. The highest number in comparison to the lowest tells a narrative that the lowest number have been in school over a long time and could have gotten used to the system whilst the highest are still slightly new to the usage of the Portal System. Hence a full participation on the study.

4.2 Analysis of Variables

4.2.1 Student Portal Benefits

Statistics

Do you think student portal is beneficial to your academic learning process?

N	Valid	100
	Missing	0

Do you think student portal is beneficial to your academic learning process?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	37	37.0	37.0	37.0
	Agree	31	31.0	31.0	68.0
	Undecided	15	15.0	15.0	83.0
	Disagreed	6	6.0	6.0	89.0
	Strongly Disagree	11	11.0	11.0	100.0
	Total	100	100.0	100.0	

Table 3

Source: Author (2022)

In view of the above data, students were asked if the portal was beneficial in their learning process and the highest (37) responses indicate that majority students strongly agreed that the portal was more beneficial in their learning process. In terms of graphic and percentile representation, the results attest to the same facts as shown below;

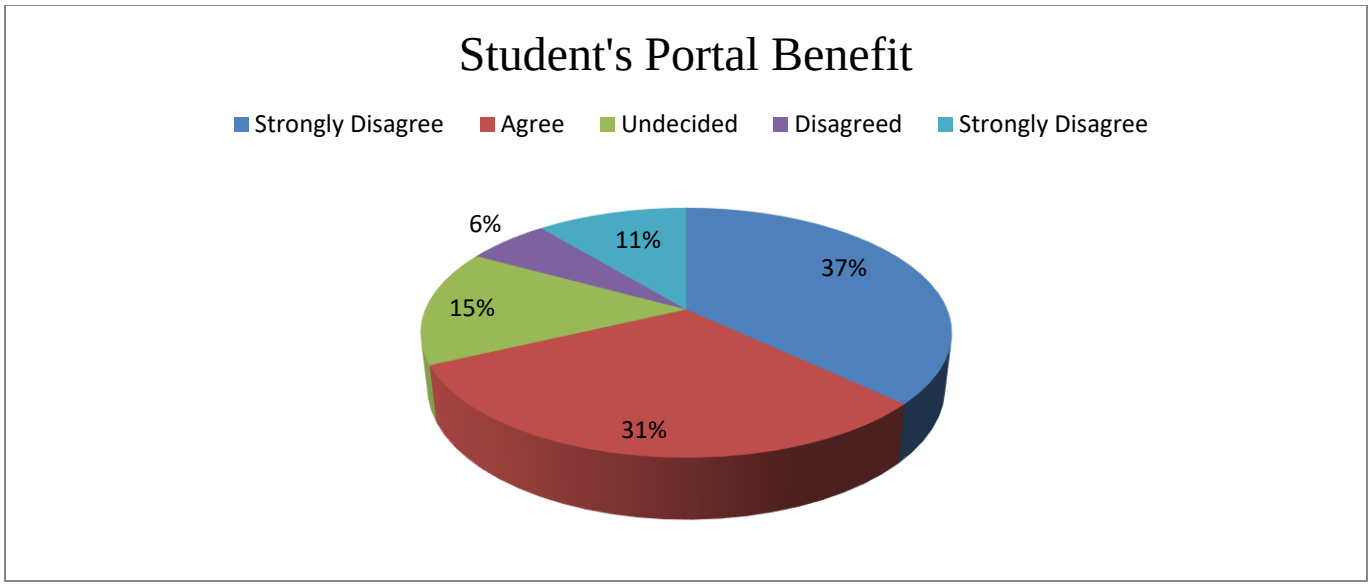


Figure 12

Source: Author (2022)

There, the above pie chart confirms that the majority (37%) students strongly believed so.

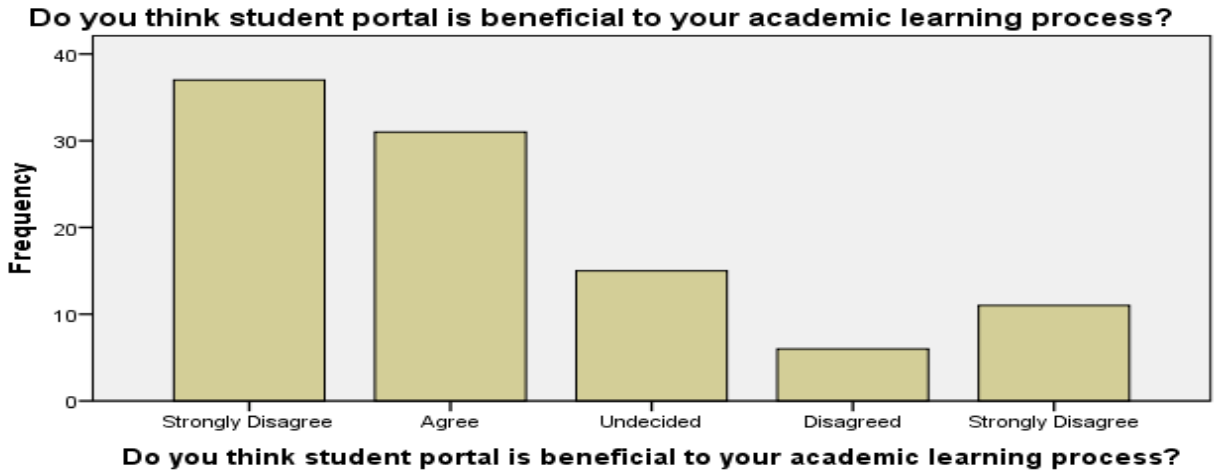


Figure 13

Source: Author (2022)

The Bar Chart also shows that majority student strongly that the portal was beneficial to their learning process.

4.2.2 Portal Navigation

Statistics

Do you think student portal is easy to navigate?

N	Valid	100
	Missing	0

Do you think student portal is easy to navigate?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	19	19.0	19.0	19.0
	Agree	39	39.0	39.0	58.0
	Undecided	33	33.0	33.0	91.0
	Disagree	5	5.0	5.0	96.0
	Strongly Disagree	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

Table 4

Source: Author (2022)

In view of the above data, it is clear that 39 students agreed that the portal was easy to navigate. This group was followed by 33 students who were not sure on their position regarding the ease with which to navigate with the portal.

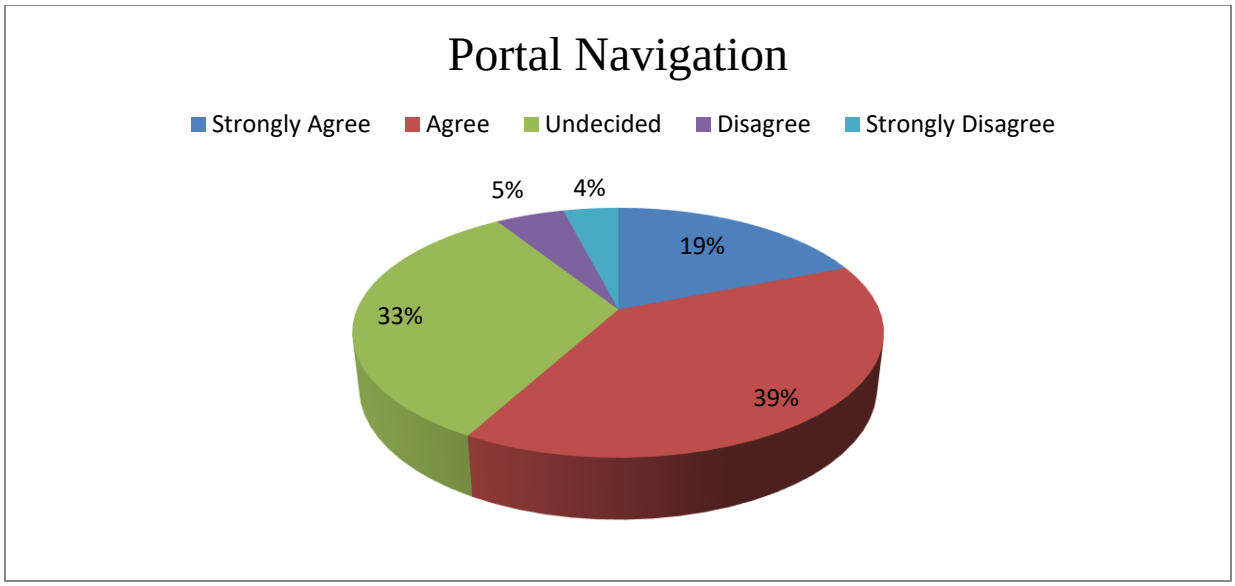


Figure 14

Source: Author (2022)

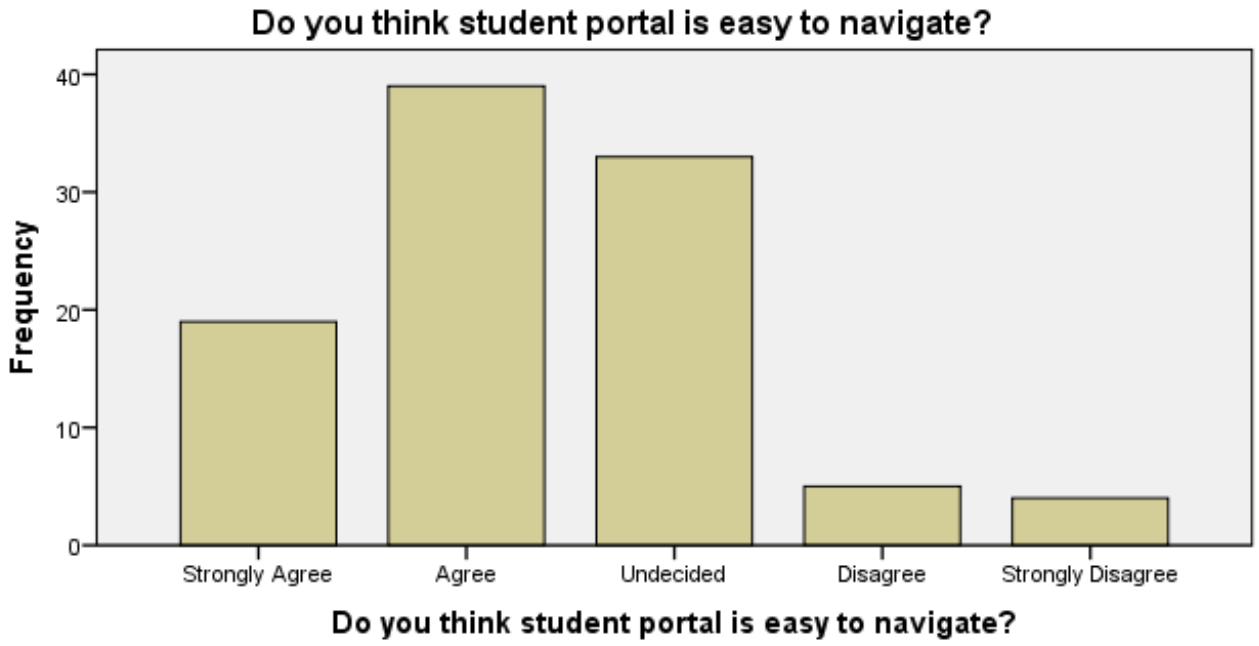


Figure 15

Source: Author (2022)

The above Bar and Pie Charts conforms the responses for all the participants indicates that majority of students (39%) agreed that the Portal is easier to navigate.

4.2.3 Interactive Learning

Statistics

Do you think the content on the student portal encourages interactive learning?

N	Valid	100
	Missing	0

Do you think the content on the student portal encourages interactive learning?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	23	23.0	23.0	23.0
	Agree	35	35.0	35.0	58.0
	Undecided	28	28.0	28.0	86.0
	Disagree	5	5.0	5.0	91.0
	Strongly Disagree	9	9.0	9.0	100.0
	Total	100	100.0	100.0	

Table 5

Source: Author (2022)

In view of the question and variable above, 35 students in majority of the total participants agreed that the portal encouraged interactive learning. However, 28 students were not sure with 9 students strongly disagreed to the question. The same results are presented in graphic form below.

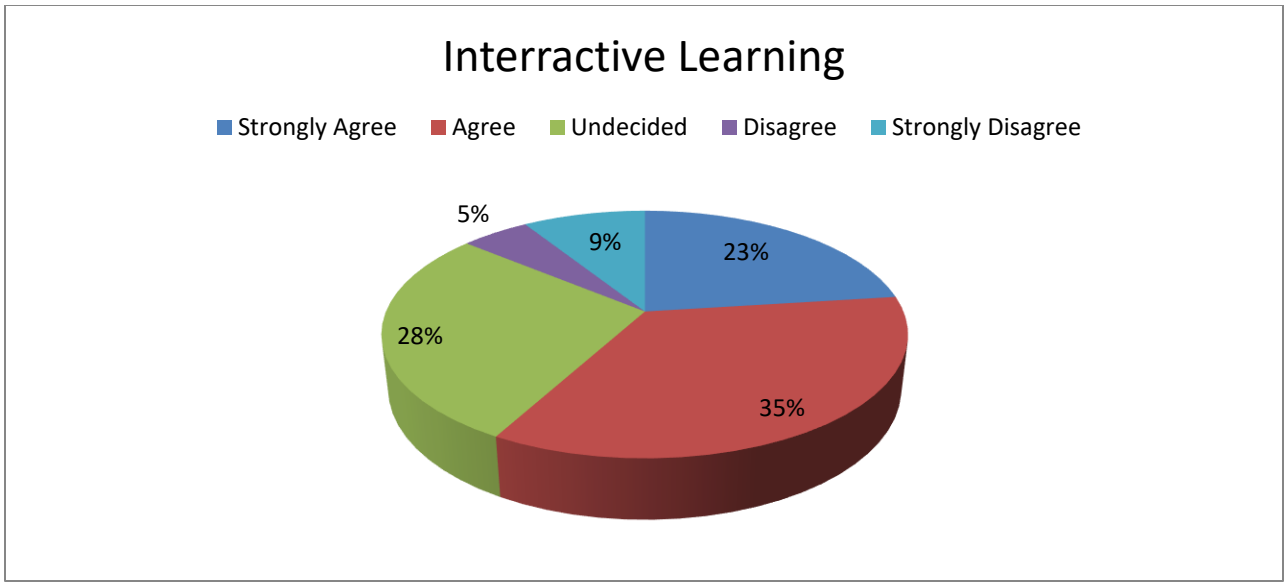


Figure 16

Source: Author (2022)

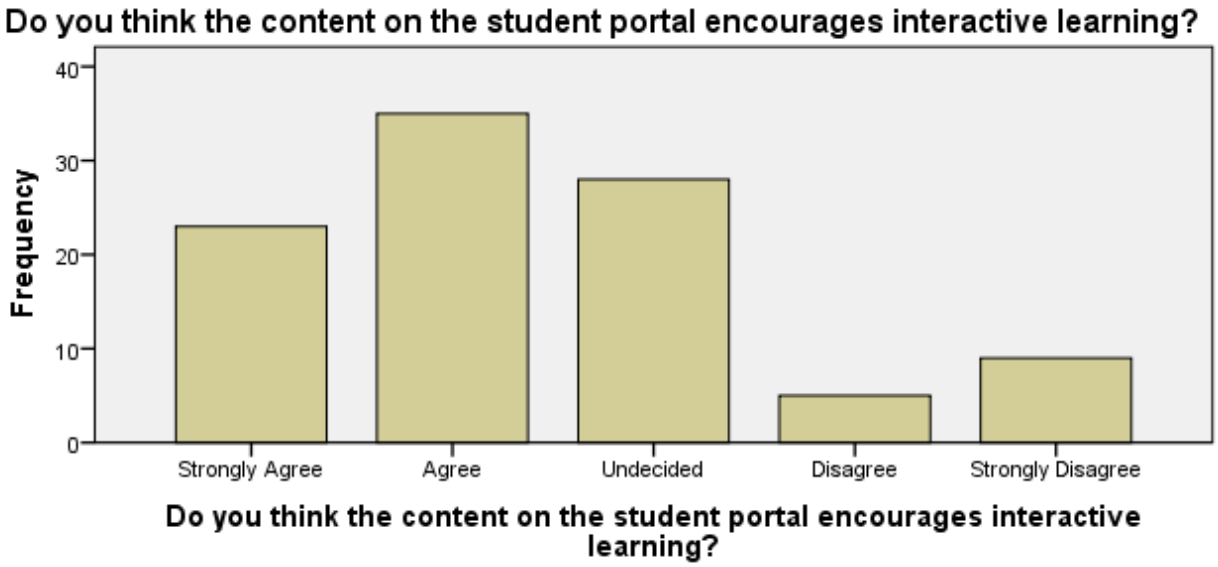


Figure 17

Source: Author (2022)

4.2.4 Lecturer Engagement

Statistics

Is it possible to easily engage with your lecturer or tutor through the student portal?

N	Valid	100

	Missing	0

Is it possible to easily engage with your lecturer or tutor through the student portal?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	39	39.0	39.0	39.0
	Agree	33	33.0	33.0	72.0
	Undecided	11	11.0	11.0	83.0
	Agree	7	7.0	7.0	90.0
	Strongly Disagree	10	10.0	10.0	100.0
	Total	100	100.0	100.0	

Table 6

Source: Author (2022)

In view of the question and data presented statistically, 39 students strongly agreed to the fact that it was possible for students to engage their Lectures in the portal. This was supported by 33 students, 11 were unsure/undecided, 7 disagreed and 10 strongly disagreed thereby taking a position that it was not possible. The same results are presented below in form of a Bar and Pie Charts.

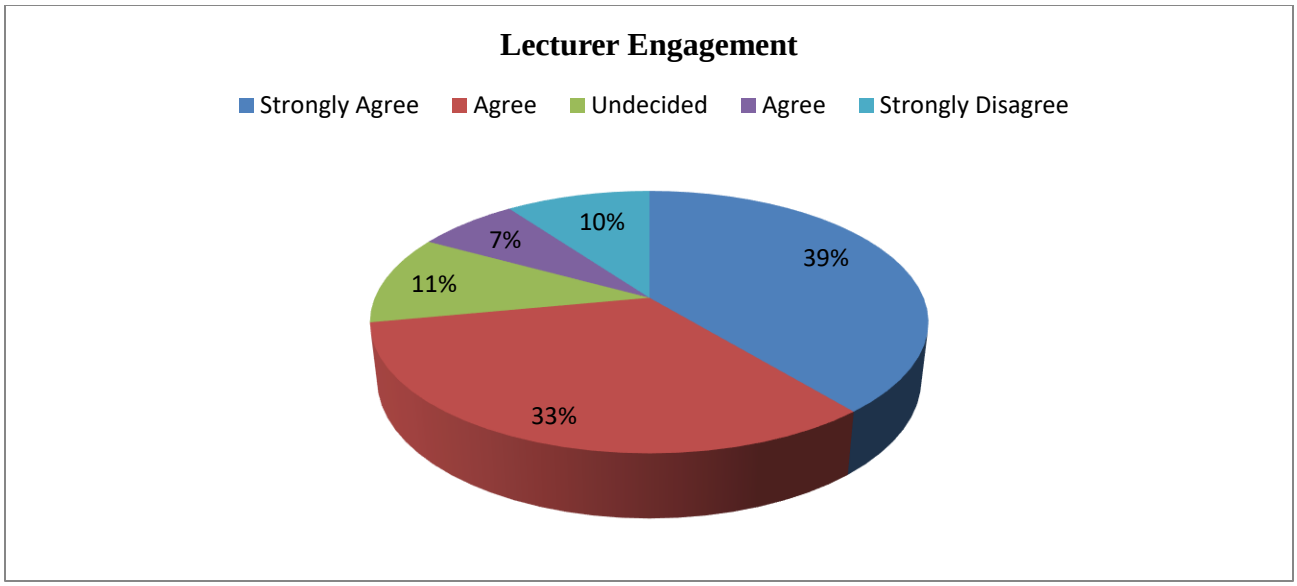


Figure 18

Source: Author (2022)

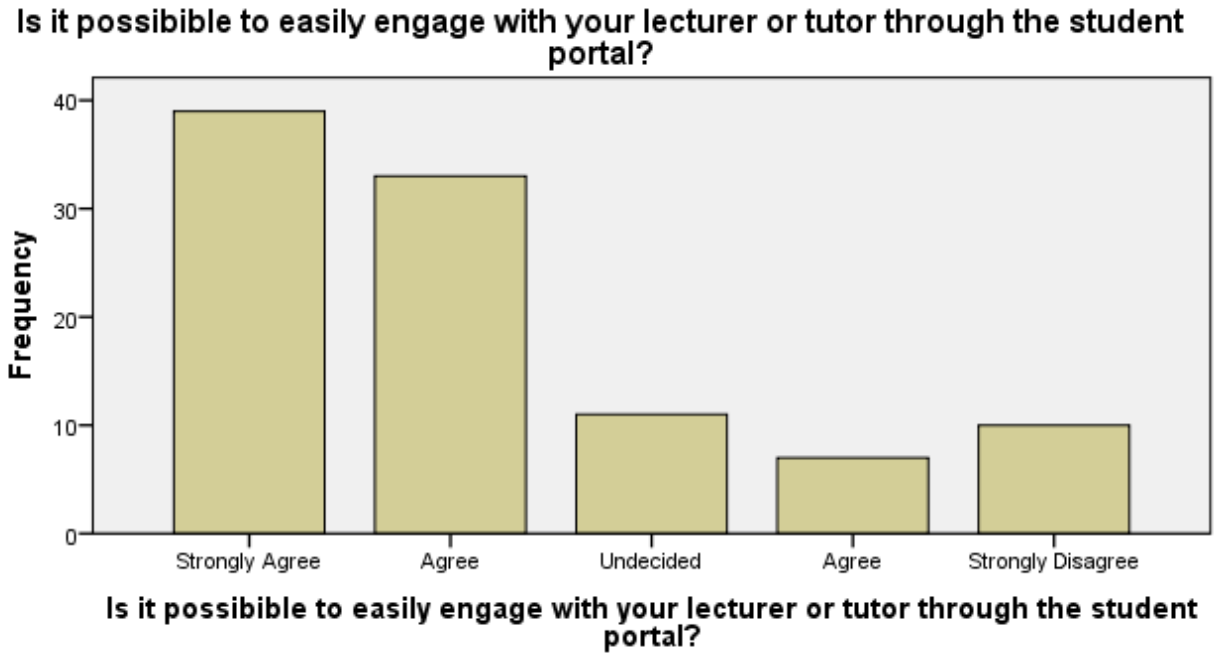


Figure 19

Source: Author (2022)

The above graphics representation confirms the above results in the statistical presentation.

4.2.5 Portal for Learning Purposes

Statistics

Would you strongly recommend others to use the student portal for learning purposes?

N	Valid	100
	Missing	0

Would you strongly recommend others to use the student portal for learning purposes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	46	46.0	46.0	46.0
	Agree	23	23.0	23.0	69.0
	Undecided	12	12.0	12.0	81.0
	Disagree	6	6.0	6.0	87.0
	Strongly Disagree	13	13.0	13.0	100.0
	Total	100	100.0	100.0	

Table 7

Source: Author (2022)

The above results in the statistical representation indicates that 46 students strongly agreed, supported by 23 students, 12 undecided, in disagreement supported by 13 who strongly disagreed that they recommend some on to use the portal for learning purposes. The same results are presented in both the pie chart and Bar Charts as can be seen below;

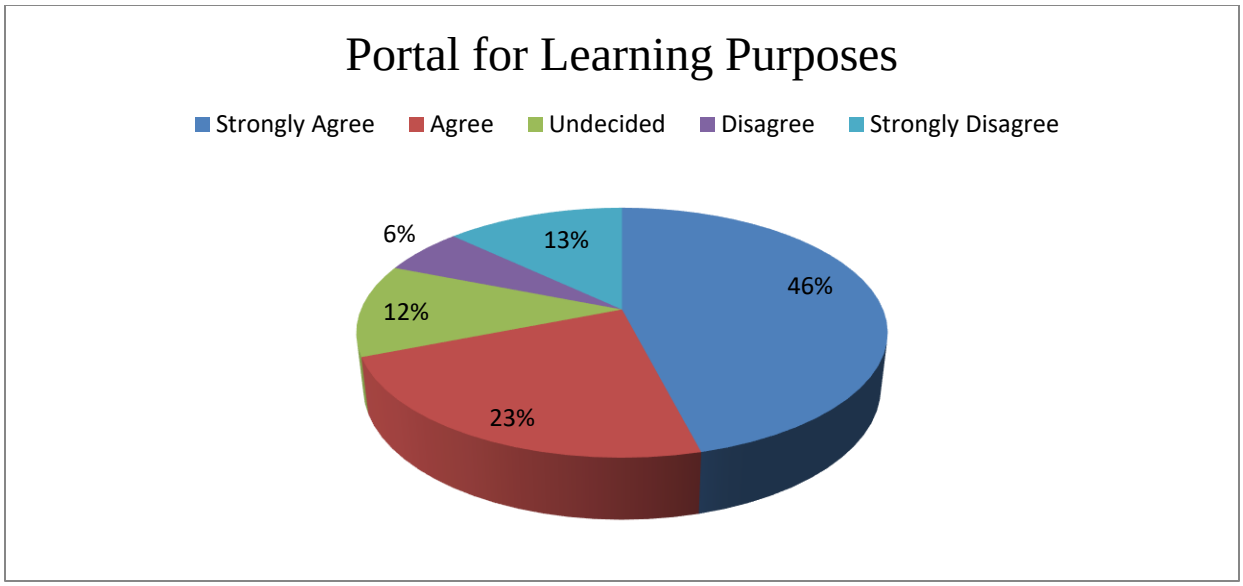


Figure 20

Source: Author (2022)

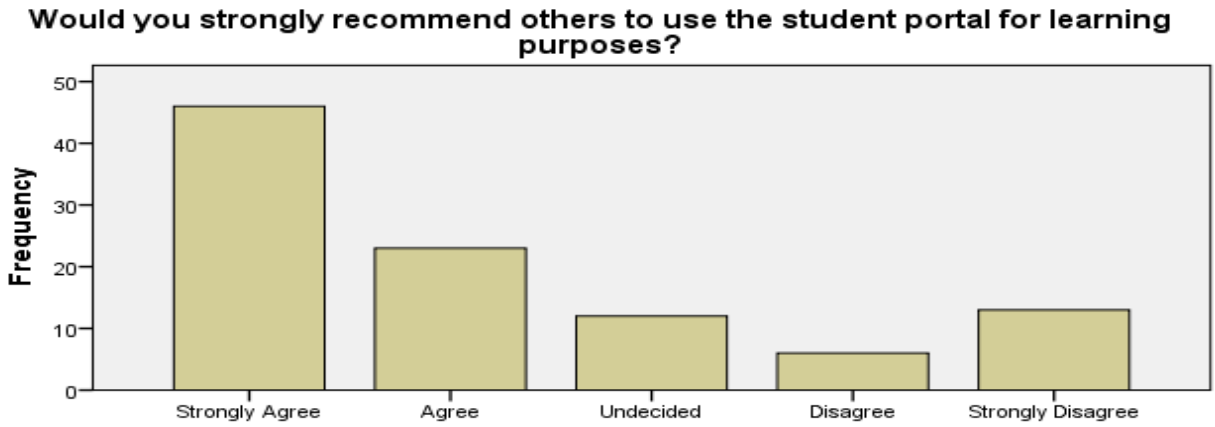


Figure 21

As can be seen both in the Bar and Pie Charts, data correlates with one presented statistically.

4.2.6 Feedback on Student Portal

Statistics

Do you think feedback on the student portal is timely and easy to understand?

N	Valid	100

	Missing	0

Do you think feedback on the student portal is timely and easy to understood?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	42	42.0	42.0	42.0
	Agree	24	24.0	24.0	66.0
	Undecided	21	21.0	21.0	87.0
	Disagree	8	8.0	8.0	95.0
	Strongly Disagree	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

Table 8

Source: Author (2022)

In view of the above question and data presented, 42 students strongly agreed that the portal was timely and easy to understand. Then, 24 students agreed as well, 21 undecided, 8 disagreed and 5 strongly disagreed that the portal feedback was timely and easy to understand. The same results are presented in Bar and Pie Charts respectively as shown below;

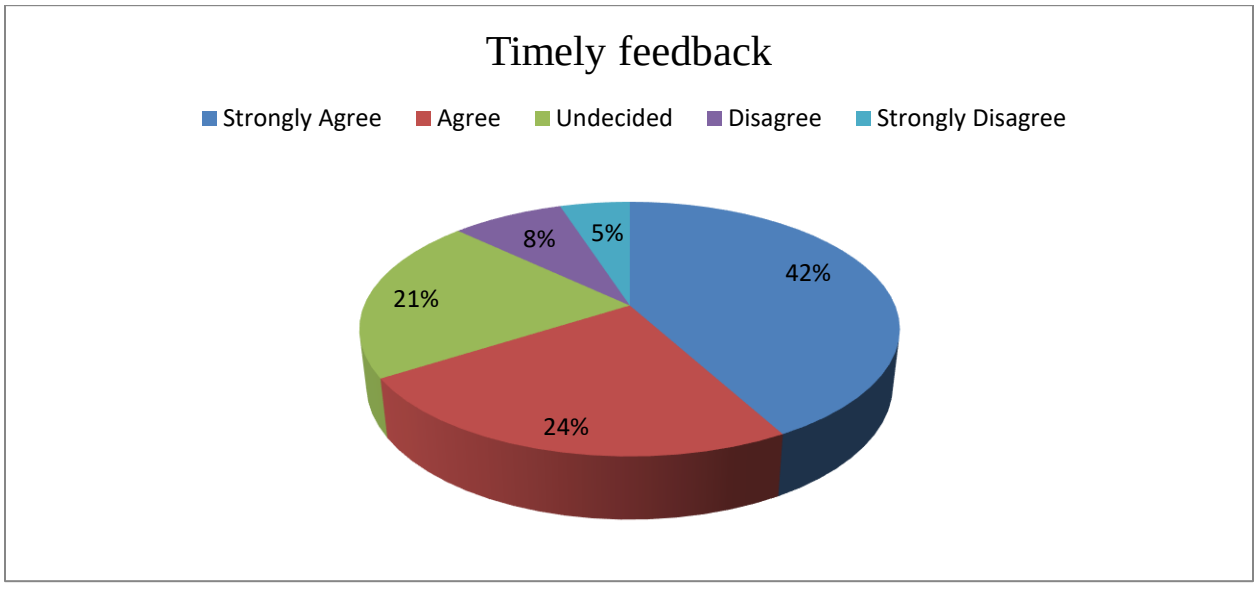


Figure 22

Source: Author (2022)

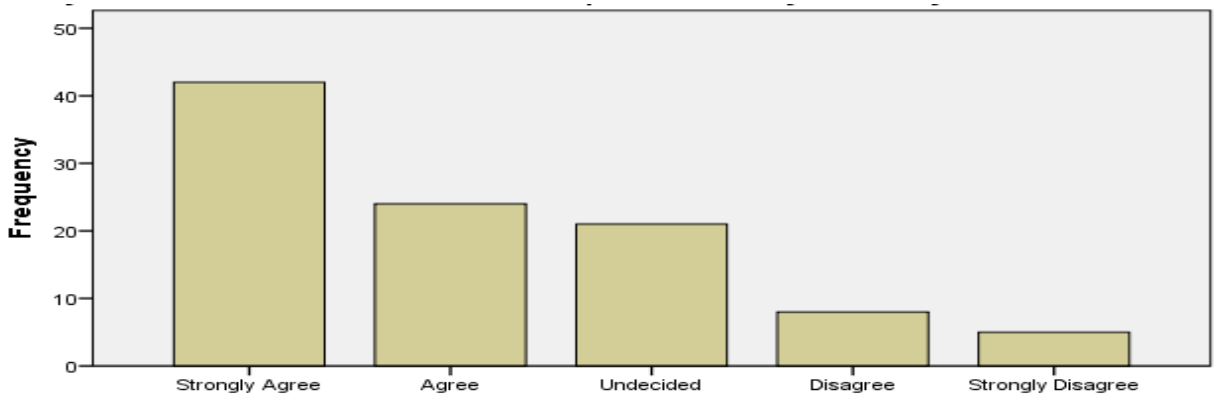


Figure 23

Source: Author (2022)

As can be seen above, the majority students strongly agreed that feedback on the portal was efficient and easily understood by ZCAS University Students.

4.2.7 Academic Information

Statistics

Do you think having access to academic information on the student portal 24/7 is beneficial to your learning process

N	Valid	100
	Missing	0

Do you think having access to academic information on the student portal 24/7 is beneficial to your learning process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	53	53.0	53.0	53.0
	Agree	16	16.0	16.0	69.0
	Undecided	7	7.0	7.0	76.0

	Disagree	12	12.0	12.0	88.0
	Strongly Disagree	12	12.0	12.0	100.0
	Total	100	100.0	100.0	

Table 9

Source: Author (2022)

In view of the above question and data provided, 53 students strongly that having access to academic information on the student portal 24/7 is beneficial to your learning process. This was how effective the use of the portal was hailed by students' users. This view was supported by 16 students and an equal number of students (12) strongly disagreed. In other words, these students observed that receiving academic information 24/7 was not possible and beneficial to the students. The same information is present both in Bar and Pie Charts as shown below;

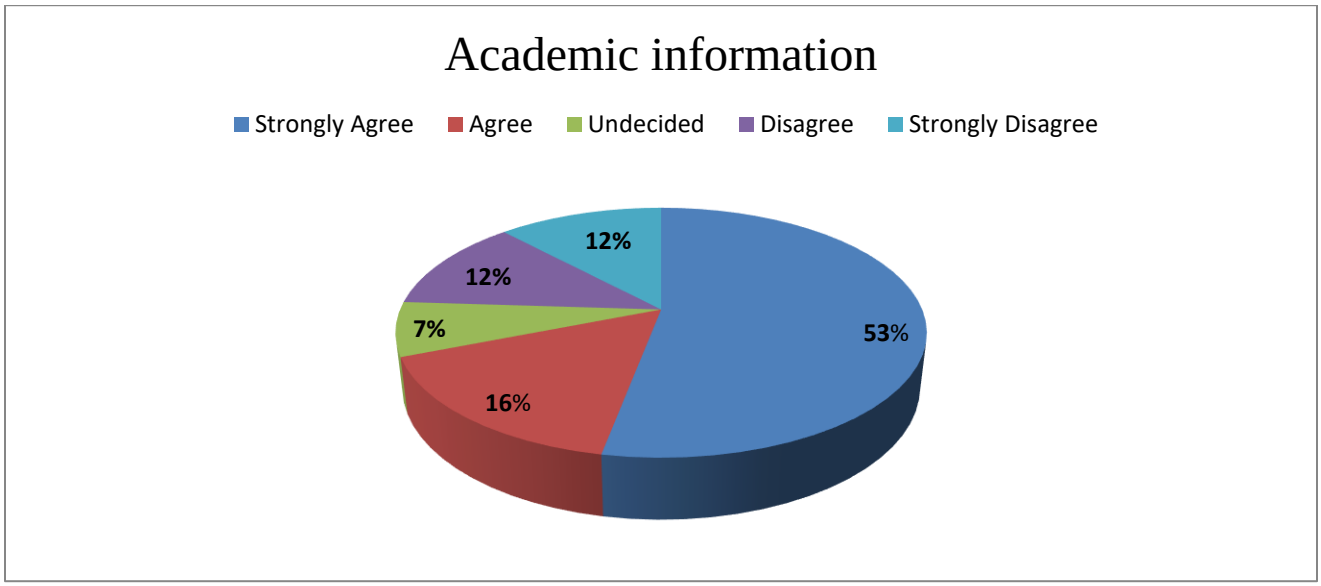


Figure 24

Source: Author (2022)

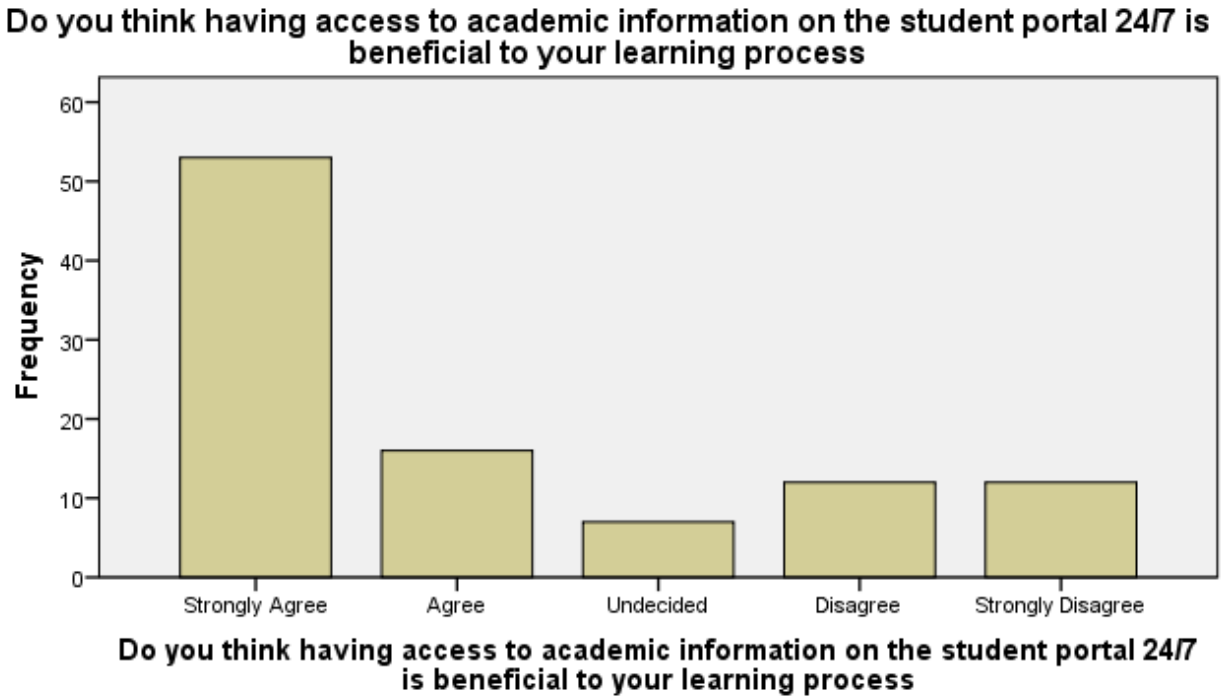


Figure 25

Source: Author (2022)

As can be seen from above, Students found it beneficial to have access to academic information on the student portal 24/7 is beneficial to your learning process.

4.3 Validity of Findings

This is a process of validating how sound the instrument measurement weighs or measure an item or items that it is intended to measure (Sabir, 2011). It is also the extent to which the scores factually represent the variables that are intended to be measured on the basis of various types of evidence available according to (Hales, 2012). Thus, in order to assess the criterion used, the researcher tested the correlation between the results of the measurement of the items tested using a Pearson correlation as shown below.

Descriptive Statistics

	Mean	Std. Deviation	N
Age1	1.99	.502	100

sex2	1.63	1.505	100

Correlations

		Age1	sex2
Age1	Pearson Correlation	1	.105
	Sig. (2-tailed)		.297
	N	100	100
sex2	Pearson Correlation	.050	1
	Sig. (2-tailed)	.792	
	N	100	100

Table 10

Source: Author (2022)

In view of the foregoing, Age and Sex were the two variables the researcher tested for correlation in the SPSS and the results indicate a Sig (2 tailed) of 0.79 or 79% with a margin of error of 0.05 (5%) acceptable in all scientific and social research correlation acceptable standards. Thus, there was a perfect correlation between Age and Sex variables.

4.4 Reliability of Findings

This is referred to as a process through which testing for consistency a method measures something according to Michael (2012). It then implies that is after measuring something through a chosen method, provides the same results under similar conditions and under similar circumstances, and that the results are consistent, then the measurement is reliable. In view of the foregoing, the researcher tested the questionnaire for consistent using different questions but under similar Likert of 1. Strongly agree, 2. Agree, 3. Undecided, 4. Disagree and 5. Strongly Agree. When data was coded, the outcome indicates proved to be consistent as can be shown below

Case Processing Summary

	N	%

Cases	Valid	100	100.0
	Excluded[a]	0	.0
	Total	100	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.859	.787	8

Table 11

Source: Author (2022)

Thus, in view of the above, the test for reliability consistency of the questionnaire (using Likert scale) and analysis using the Cronbach Alpha was executed. The results as can be seen above indicate that the questionnaire was internally consistency was 78% reliable as required and by acceptable standard of both social and scientific research circumstances (Sherry).

Item Statistics

	Mean	Std. Deviation	N
How long have you been using mobile devices (This includes laptops, tablets and smart devices)	1.89	.994	100
Do you think student portal is beneficial to your academic learning process?	2.23	1.309	100
Do you think student portal is easy to navigate?	2.36	.980	100
Do you think the content on the student portal encourages interactive learning?	2.42	1.165	100
Is it possible to easily engage with your lecturer or tutor through the student portal?	2.16	1.293	100

Would you strongly recommend others to use the student portal for learning purposes?	2.17	1.407	100
Do you think feedback on the student portal is timely and easy to understand?	2.10	1.185	100
Do you think having access to academic information on the student portal 24/7 is beneficial to your learning process	2.14	1.470	100

Table 12

Source: Author (2022)

4.5 Part II Data Analysis and Discussion

4.5.1 Do you think student portal is beneficial to your academic learning process?

From the data that was received it showed that there a high number of students that found the student portal to be beneficial to them in their academic journey with a combined total of 68% of student agreeing or strongly agreeing with the question presented. This is in line with the findings of Nassuora (2013) study at Prince Sultan Collage in Saudi Arabia.

4.5.2 Do you think student portal is easy to navigate?/ Do you think the content on the student portal encourages interactive learning?

58% of student agreed or strongly agreed that the portal was relatively easy to use and interactive when they logged onto it. Ease of use and interactivity appear to be critical to adoption from a student perspective and what has been discovered was in sync with the findings of Hamidi and Chavoshi (2018) research at University of Technology.

4.5.4 Is it possible to easily engage with your lecturer or tutor through the student portal?/ Would you strongly recommend others to use the student portal for learning purposes?

From the date collected it was evident again that majoring of student agreed that it was easy to engage the lecturer with 72 being positive respondents and 69% stating they would recommend the portal to other users. Such results were aligned with Nassuora (2013) study.

4.5.6 Do you think having access to academic information on the student portal 24/7 is beneficial to your learning process

63% of students agreed or strongly agree that access to information 24/7 was beneficial to their learning process. This indicate that for students access to crucial information wither in class or during assignment or revision, access was beneficial. This syncs up with the conclusions from Briz-Ponce et al., (2017) study on student behaviours.

4.6 Chapter Summary

This Chapter analyzed data that was collected from 100 students at ZCAS-U in the school of law. It gave a statistical overview of adoption of mobile devices in the teaching learning process. The responses and outcomes showed that there is a high likelihood that students are willing users of various mobile devices in the teaching-learning process in line with the UTAUT model. They also showed that the the ZCAS-U's e-learning portal is fairly easy to use and that the younger students show more aptitude with regards to usage as well as recommending others to use the portal. Chapter five will give a full account of conclusions and recommendations.

Chapter 5: Conclusions and Recommendations

5. 1Introduction

As for chapter 5 this will be a presentation of findings and conclusions of this research in line with the objectives that have been stated at chapter 1 in trying to assess the adoption of mobile devices in the teaching learning process at ZCAS-U. The recommendations for ZCAS-U are also stated below as well as the implications of the findings and how they could affect ZCAS-U. Furthermore, the limitations that this research has faced have been laid bare for consideration and finally there is direction that has been provided for future areas of study in relation to what has been established in this study.

5.2 Conclusions

5.2.1 RO1: To identify determinants of mobile-devices adoption in the teaching and learning process at ZCAS University

From the data that was received the determinants to use mobile devices in the teaching learning process appeared to base on benefits the student portal had to offer, in which a combined 68% of students agreed that having a mobile accessible platform was beneficial to them. Secondly ease of use was also a key determinant as in line with the UTAUT model and once again a combined 68% stated that it was easy to navigate on their devices. Thirdly the data showed that learning content (combined 69%) and interactivity (combined 58%) was another key determinant to the adoption of mobile devices in the teaching-learning process. This was in line with research findings of Hamidi and Chavoshi (2017).

5.2.2 RO2: To assess the extent to which actual use of mobile-devices have been achieved in the teaching and learning process at ZCAS University

From the data collected it can be seen that there has been a significant adoption of mobile-device usage in the teaching learning process at ZCAS-U. This can be seen and has been determined from the data collected during the research period which showed an overwhelming usage of the student learning portal at ZCAS-U. The highly positive responses to availability of resources, interaction with lecturers, feedback and the ease of usage of the student portal indicated that the level of usage

was in line with the UTAUT model as expected and is supported by Venkatesh et al (2003). 68% of the students agreed that the student platform was beneficial to them and 58% saying the interacted with the portal regularly therefore indicating general adoption.

5.2.3 RO3: To determine the impact that the demographic characteristics have on the adoption of mobile-devices in the teaching-learning process at ZCAS University

Once again in line with the UTAUT model age was also considered in regards what part it played in the adoption of mobile devices in the teaching learning process. Though the impact of age seemed minimal given the data collected. The usage seemed to be more in the younger demographic as evidenced by 81% usage amongst the combined groups 20-30-year-old versus the 19% amongst the older student combined group of over 30s. This is in line with Momani (2020) and Nassuora (2013) both of whom noted that usage is expected to be higher in the younger students as opposed to the older generation of students.

5.2.4 RO 4 To determine whether Covid-19 impacted the usage of mobile devices in the teaching and learning process

Due to the nature of the blended learning system ZCAS-U offers there appears to have been very little difference in the uptake and usage of mobile devices in the teaching learning process at ZCAS-U. A combined 72% of students agreed that they had more than sufficient lecturer engagement via the student portal and a further combined 69% of respondents agreed with regards to suing the portal for learning purposes. this is in line with research finding of Yuan et al., (2021).This indicates positive response to the usage of mobile device however not necessarily a higher uptake.

5.3 Implications and Recommendations

5.3.1 Implications

The resulting implications of this study show that ZCAS-U and probably other institutions of higher education will have to ensure that they have above average infrastructure to meet their students demands in relation to support and software tools that assist them and are available through mobile devices. From the data collected they will also have to find ways of supporting the older students or mature students to be more conversant with the software to further push student engagement on the student portal. ZCAS-U will be required to constantly update and continually

invest heavily in the tools given the potential and great financial benefits of distance education has to offer through the use of mobile devices. The Covid-19 pandemic stressed this need more blatantly that could have been imagined.

5.3.2 Reccommendations

As a result of what has been discovered the following recommendations are being submitted;

Investment-ZCAS-U will have to constantly and continuously invest in the latest and best most user-friendly platforms, software and tools that will benefit student the most in the teaching-learning process.

Adult Support- from the data is can been seen that mature student support is required therefore this is greatly needed in order to cater to all demographics of the student population

Constant Lecturer training- as a consequence of constant updates and investment in new tools and software that is in to be utilised by students through mobile devices there will be a need to ensure that all teaching staff is constantly up to date with training in the use of new tools

Full digitalized orientation- orientation is always key to keeping student aware and engaged therefore a recommendation is made that a digital/online orientation is carried out and available 24/7 for the students.

Enhanced Free student Wi-Fi- in order to serve the demands of the students to have access on their mobile devices the institution will have to ensure there is a reliable connection for then to utilise 24/7.

5.4 Limitations and future direction of studies

5.4.1 Limitations

The study had limitations in respects of methodology. The study was only quantitative. So, it did not carter for gaining knowledge from the qualitative aspect. Furthermore, the sampling technique used was simple random sampling – though it gives a chance to be included in the sample, it could have been better to include a census since the study population was small. Lastly there was some potential unintentional researcher bias due to the researcher being law lecturer in the school of law where the study was carried out plus due to the cross-sectional nature of the study data was

collected at only a specific time as opposed to a long period of time favoured under a longitudinal time horizon.

5.4.2 Direction of future researches

Whilst this research focused on the adoption of mobile devices in the teaching learning process especially form the student point of view future research studies could focus on two main areas. Firstly, one could focus on the Lecturers aspects of mobile adoption and its effective ness given the rise of distance and remote learning. Secondly one could also carry out research in line with the pass rate of students who are fully dependant on mobile devices for learning without any face to face contact with their lectures when compared to student who are studying traditionally full-time or part-time in the classroom set up.

5.5 Conclusion

This research was carried out in order to ascertain the adoption of mobile devices at ZCAS-U by students in the teaching-learning process. Through meticulous and detailed research which included literature reviews and data collection and analysis a conclusion was researched that ZCAS-U students have embraced mobile learning devices in their pursuit of higher education. Easy users' ability and navigation on mobile learning platforms has proven to be key in driving adoption as well as the inter-activeness that takes place between the student and lecturer. The results showed that the UTAUT model does a stellar job in highlighting that ZCAS-U students have accepted the use of mobile devices to a great degree.

5.6 Chapter summary

Chapter 5 has been a summary of all findings in the research that has been carried out in line with the objectives established in chapter 1. All objectives were responded to and a conclusive position was reached. This research has concluded that ZCAS-U students has greatly adopted mobile learning devices in the teaching-learning process. ZCAS University would be wise to continue investing in software and platforms that support this.

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APPENDIX 1

Adoption of Mobile Devices in The Teaching-Learning Process Questionnaire

I Chaponga Nguluwe, a post-graduate student From Greenwich University in affiliation with ZCAS University currently pursuing a Masters of Business Administration in International Business cordially invite you to take part in my research study on the adoption of mobile devices in the teaching-learning process. I would like to assure you that all data gathered from your responses will be subjected to the strictest of ethical standards and confidentiality laws will be maintained. This information will only be utilised for academic purposes. Your participation will be highly appreciated.

SECTION A

1. Age 20-25 ☐ 25-30 ☐ 30-35 ☐ 35-40 ☐

☐ ☐

2. Sex Male Female

3. Experience 0-5 5-10 10-15 15-20

4. Education Year1 Year 2 Year 3 Year 4

5. Mobile devices usage experience (This includes laptops, tablets and smart devices)

Less than 1 year 1-5 Years 6-10 years Over 10 years

SECTION B: Kindly tick in the box of your choice for the questions below;

6. The student portal is beneficial to your academic learning process.

Strongly Disagree Agree Undecided Disagree Strongly Disagree

7. The student portal is easy to navigate.

Strongly Disagree Agree Undecided Disagree Strongly Disagree

8. The content on the student portal encourages interactive learning.

Strongly Disagree Agree Undecided Disagree Strongly Disagree

9. I can easily engage with my lecturer or tutor through the student portal.

Strongly Disagree	Agree	Undecided	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

10. Having access to academic information on the student portal 24/7 is beneficial to your learning process.

Strongly Disagree	Agree	Undecided	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

11. I would strongly recommend others to use the student portal for learning purposes.

Strongly Disagree	Agree	Undecided	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

12. Feedback on the student portal is timely and easy to understand.

Strongly Disagree	Agree	Undecided	Disagree	Strongly Disagree
☐	☐	☐	☐	☐