

Adoption of Mobile-Devices in the Teaching-Learning Process: A Case of Zcas University Faculty Staff and Students

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ABSTRACT:

The use of mobile devices in the teaching – learning process has grown exponentially over the last few years and continues to grow. We conducted research that was carried out to ascertain the adoption of mobile devices at ZCAS University. The importance of our research was to understand where mobile devices fit into the modern higher education. Previous research utilised The Technological Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB) however the Unified Theory of Acceptance and Use of Technology (UTAUT) model was utilised as it was the most accurate and relevant. With our meticulous and detailed research which included literature reviews, data collection and critical analysis we reached a conclusion that ZCAS University 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: Information and Communications Technology; Universal Theory of Acceptance and Use of Technology; Mobile Devices; Learning Process

I. INTRODUCTION

It has been recognized that the way learning is now significantly changing. This realisation has come because of working with students; as not long-ago dictionaries were required

by the students to look for meanings of words and other corresponding words, but now students are just spending few minutes to access the materials required with the use of their smartphones or other mobile devices such laptops and tablets for quick information needed instantaneously.

Background of Study

One could argue that it is not an ambitious statement when 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 on our fingertips, and one only has to pick up a mobile device to find it and engage. The rapid rise in internet access has meant the traditional classroom has been revolutionized.

Mobile devices have now made it possible to access information remotely and well as at an on-demand notice in class or on campus. Thus, the availability of such devices and connectivity to online platform requires understanding and research in order to access the adoption rate of such devices. 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. Existing literature shows that adoption of mobile devices has slow been moving in an upwards trajectory, however the understanding of this has

been a complex issue especially from a higher education institution in Africa. The Covid-19 pandemic heavily contributed to higher levels of adoption of mobile devices within the teaching-learning process. The immediate move from the traditional classroom to the digital space led to questions about efficacy.

This research is conducted to make a vital contribution towards the understand of adoption of mobile devices within the teaching-learning environment. This would be archived by monitoring the student portal interaction, learner characteristics, and ease of use among others. The research goal is to understand and see the relationship that exists between mobile devices and the teaching and learning process.

Problem statement

The use of mobile devices in higher education has grown year on year. ZCAS University provides blended learning using the Moodle Learning Management System (LMS). Further, lecturers are supported with the provision of prepaid internet service by the use of MiFi provided by Liquid Telecoms. Most universities are now 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. There remains a significant gap in understanding the level of adoption of these devices in high education institutions specifically given rise in mature students from an African perspective. The remains a poor understanding of this adoption from local African universities.

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. A quick glance at Statista shows that there are about 3.9 billion mobile device users in the world and of that group close to 80% adoption use was amongst students who said they used devices in their learning. ZCAS University has about 3400 students of which about 300 are in the law school. All of them have access to computers as well as Wi-Fi on campus. 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.

Research objectives

- i. To determine mobile-devices adoption in the teaching and learning process of law students at ZCAS University
- ii. To assess the extent to which the use of mobile devices has been achieved in the teaching and learning process of law students at ZCAS University
- iii. To determine the impact of adoption of mobile devices usage in the teaching-learning process of the law students at ZCAS University
- iv. To determine how the usage of mobile devices in the teaching and learning process was impacted among law students during the Covid-19 at ZCAS University.

II. LITERATURE REVIEW

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 kinds 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.

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 it could respond to the demands by having a system that allowed for mobile device utilisation in the teaching-learning process. The survey that was taken showed that students responded positively to mobile learning via various learning platform that they accessed with their mobile device throughout the period of the pandemic (Yuan et al., 2021). It has also been observed that perceived ease of use and usefulness is what drove students to utilise mobile-learning tools even during the pandemic,

especially when people were confined and made work from their (Zaidi et al., 2021).

Penetration of the Information and Communication Technology

ICTs 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 as smartphones are even more prevalent than other technologies, such as personal computers and landline telephones (Tossellet 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 an ideal world of possibilities in learning (Woodcock et al. 2012).

Features of ICT devices

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.

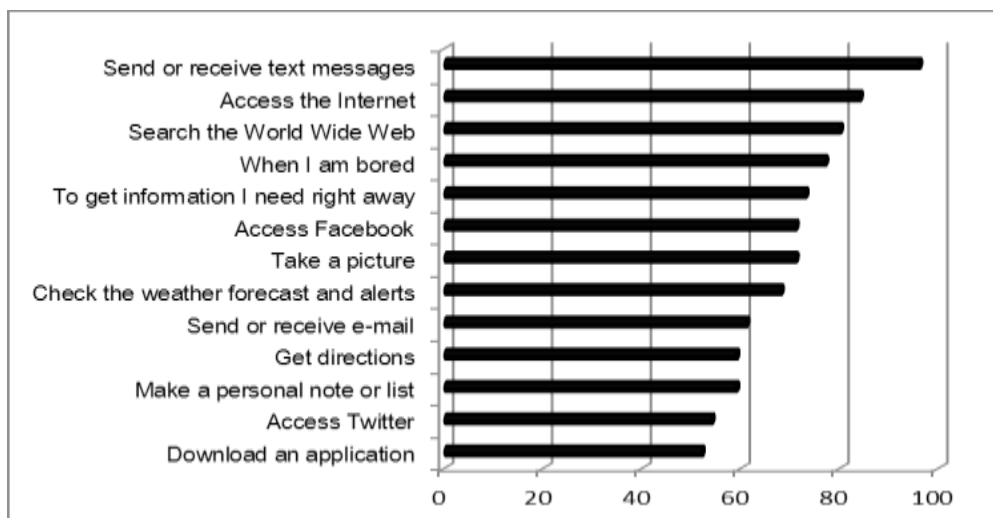


Figure 1: Student’s Smartphone Use (Emanuel 2013)

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).

Major mobile operating system

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.

Mobile learning core concepts

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-learning 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).

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 few theories that are essential and those will be highlighted below and made use of in this research.

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).

Venkatesh (2003) did discuss the development and conceptualising of the models with major factors taken into consideration: performance expectancy, social influences, effort expectancy, behavioural intention, and facilitation conditions. Since its inception the theory has grown to have significant impact on 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 study (Momani, 2020).

However, 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).

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).

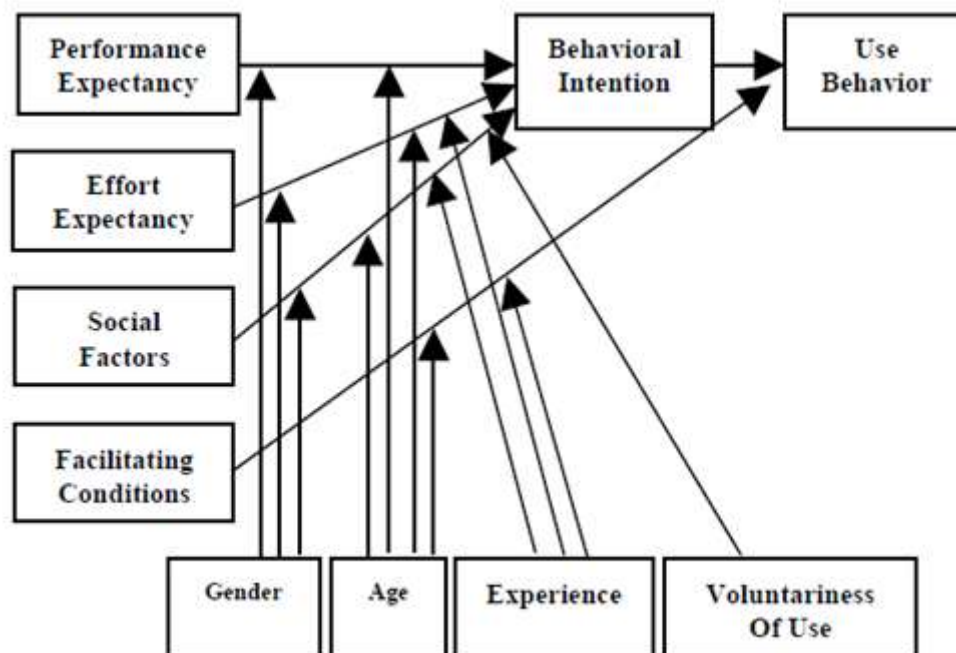


Figure 2: UTAUT Framework Model

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 regard 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.

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).

Advantages that UTAUT

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).

Second advantage identified is that UTAUT is full-bodied and translate a great deal of information especial in the adoption of technology research. 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.

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 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.

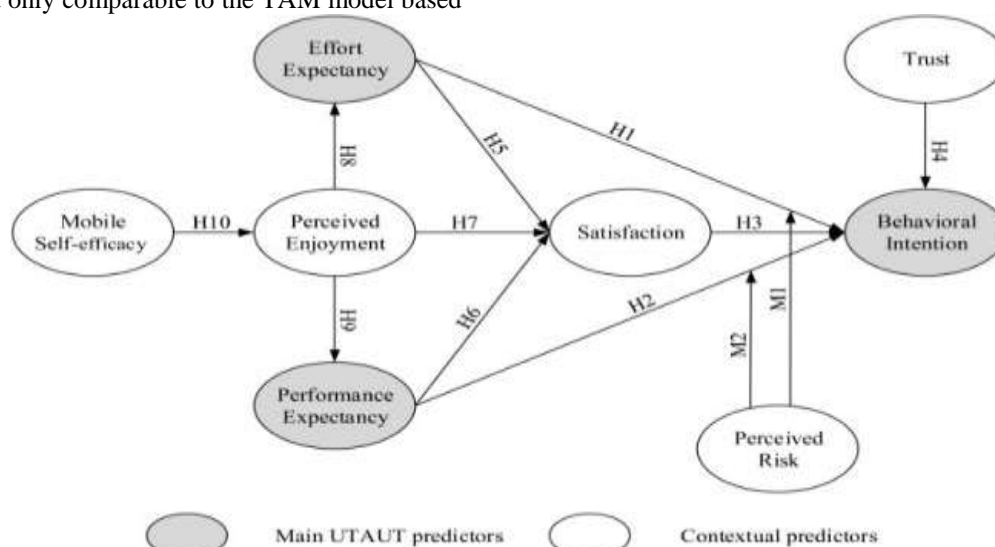


Figure 2 Chao's Extended Model

In the study that was taken by Wang and Wang (2010), 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.

What is clear 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 research.

Acceptance of an e-government by citizen in a developing country

There is plenty of evidence of studies and research 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.

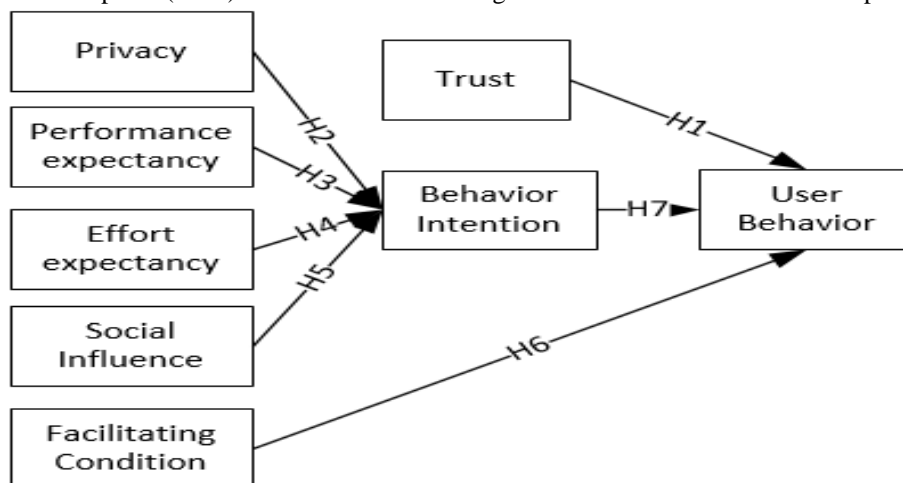


Figure 3 Jacob and Darmawan modified framework.

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.

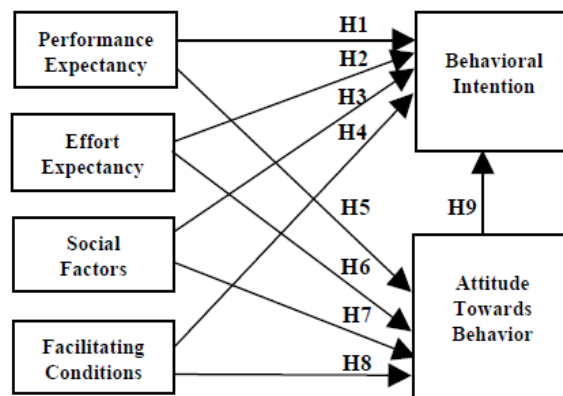


Figure 4 Nassuora modified research framework.

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 data 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).

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. 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 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.

III. RESEARCH METHODOLOGY

The positivist paradigm was adopted for the study. Due to its experimental capability and openness to allow the study of casual linkages through quantitative methods via sample sizes. The

paradigm which 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). Therefore, in line with the overall objective of this study, the approach appeared most suitable to help with study of the adoption of mobile devices in the teaching learning process at ZCAS-U.

Deductive approaches

However, a deductive approach with the start of theory then move on to accessing its consequences with aid of data was favoured for the study (Saunders et al., 2016), as it allowed for data collection that was then be compared to theories already in existence by virtue of the UTAUT model.

Sample frame

The sample frame was made up of all the fulltime students at ZCAS-U in the law department of the school of Social Science which accounted for 150 students at the time of the study.

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

The simple random sampling for the quantitative data from the probability sampling was selected to align the type of study in order to allow the study to production of a set of results that was to be a common consensus of the whole ZCAS-U population (Saunders et al., 2016).

Data collection

Primary data was collected by way of web-based questionnaire that was emailed to the students

of ZCAS-U. The structured online questionnaire was selected as according to Hox and Boeije (2005) this is the option for this type of research that focus on behaviour.

Data processing and analysis

Data analysis required the linking together of information in order to interpret it for the identification of any trends and patterns that one can come across. This required the 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 using the Five-point Likert scale analysis and correlation in order to carry out adequate quantitative review of the data. 100 questionnaires were completed and returned for the analysis.

IV. RESEARCH FINDING AND ANALYSIS.

Respondents Profiles

Age1

	Frequency	Percent	Valid Percent	Cumulative Percent
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.

Sex

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

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. 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

AcademicYear3

	Frequency	Percent	Valid Percent	Cumulative Percent

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

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. In view of the table, it could be clearly seen that the highest number corresponds with the 55% (2nd year) highest number of students in the table 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.

Analysis of Variables Student Portal Benefits

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

	Frequency	Percent	Valid Percent	Cumulative Percent
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
Disagree	6	6.0	6.0	89.0
Strongly Disagree	11	11.0	11.0	100.0
Total	100	100.0	100.0	

Table 3

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;

4.2.2 Portal Navigation

Do you think student portal is easy to navigate?

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	19	19.0	19.0	19.0
Valid 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

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.

Interactive Learning

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

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	23	23.0	23.0	23.0
Agree	35	35.0	35.0	58.0
Valid 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	

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.

Lecturer Engagement

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

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

Table 5

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.

Portal for Learning Purposes

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

	Frequency	Percent	Valid Percent	Cumulative Percent
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 6

The above result in the statistical representation indicate 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.

Feedback on Student Portal

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

	Frequency	Percent	Valid Percent	Cumulative Percent
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 7

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.

Academic Information

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
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 8

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.

Validity of Findings

Thus, 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.

Correlations

	Age1	sex2
A Pearson Correlation	1	.105
Age Sig. (2-tailed)		.297
N	100	100
se Pearson Correlation	.050	1
x2 Sig. (2-tailed)	.792	
N	100	100

Table 9

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.

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

Reliability of Findings

This is referred to as a process through which testing for consistency a method measures

Reliability Statistics

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

Table 10

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 11

V. FINDINGS FROM THE STUDY

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).

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 they interacted with the portal regularly therefore indicating general adoption.

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.

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 using 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.

Recommendations

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

- i. **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.
- ii. **Adult Support-** from the data can be seen that mature student support is required therefore this is greatly needed to cater to all demographics of the student population.

- iii. **Constant Lecturer training-** because 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.
- iv. **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.
- v. **Enhanced Free student Wi-Fi-** 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.

VI. CONCLUSION

This research was carried out to ascertain the adoption of mobile devices in law department 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.

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