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# Intentions of First Year University Business Students to use Smartphones as learning tools in Botswana: Issues and challenges

**Kanos Matyokurehwa**
**Zimbabwe Ezekiel Guti University, Zimbabwe**

**Norman Rudhumbu**
**Bindura University of Science Education, Zimbabwe**

**Chiedza P. Mlambo**
**Zimbabwe Ezekiel Guti University, Zimbabwe**

## ABSTRACT

The study sought to examine the intention to use smartphones technology as learning tools (mobile-learning) in universities in Botswana, with particular reference to a selected university. Preliminary investigations have shown that despite the high density of mobile phones in Botswana, very few of these devices seem to be used for learning purposes in higher learning institutions. A quantitative research approach that utilized a questionnaire for data collection was used in the study. A sample size of 132 business students was selected from a population of 200 students using a sample size calculator at 95% confidence level or 5% margin of error. The Amos 8 software was used for data analysis. The results from the study showed that most students had a positive attitude towards smartphones because they are easy to use and relatively useful in learning.

**Keywords:** *Information Technology, Smartphone, Mobile-learning, Ubiquity, Portability, Cell Phone, Functionalities, Learning tools*

## INTRODUCTION

The advent of the 21st century has been characterized by the prevalence of information technology gadgets that include mobile phones as devices for communication especially for voice calling, exchange of messages, files, images and videos. This century has witnessed an increase in millions and millions of mobile phone subscribers especially by people who are enrolled in higher learning institutions (Aamri & Suleiman, 2011). The above is also supported by Norris et al (2011) who argue that computing power lies in the hands of everyone and anyone, and mobile devices such as smartphones are fast becoming pocket computers of choice in today's world. At a global level, Ferreira et al (2015) point out that it is estimated that there will be upward of 20 billion smartphones for a population of around 8 billion people. Meanwhile, in Sub-Saharan Africa, Nyamaka, Botha and Biljon (2015) posit that it is estimated that by 2020 smartphones will make up half of the connection base, thus presenting an uncontested justification for the use of smartphones as learning tools in schools. While initially these devices could mostly support the exchange of messages and voice calling, we have seen great revolutionary innovations on these devices in terms of storage space and the processing power (Mehdipour & Zerehkafi, 2013).

The development of other social applications like WhatsApp and Facebook has motivated many people to possess these devices, and this includes students in universities (Fuxin, 2013). There has been a great evolution of these devices from just ordinary devices to smart devices which can do amazing work on behalf of the owners. Portability is one of the features which makes these devices very popular globally because people can carry them wherever they go without any hassles

(Gabor & Peter, 2015). According to Nashwa (2015), more than 85% of the students in higher learning institutions in the world are in possession of smart cell phones. Studies have shown that the use of mobile phones in different environmental settings ranging from education and instruction, the transportation industry, movie houses, restaurants, to the street and classroom has become the order of the day (Aamri & Suleiman, 2011).

The smartphone is one of the most common devices accessed and used by people worldwide (Mansour, 2014). Alfawareh & Jusoh (2014) argue that the smartphone has become one of the most ubiquitous, dynamic and sophisticated trends in communication. Chen & Denovelles (2013) also posit that in education, the popularity of smartphones such as tablets, and e-books are increasing among students in colleges. Rellinger (2011) also contends that a notable number of universities are utilizing mobile technologies that are enabling the students and instructors to connect with each other any time of the day. However, according to a study done by Chan et al (2015), there is limited research in tertiary institutions on the use of smartphones. The current study thus seeks to establish the intention of university students to use smartphones as learning tools at a selected university.

In the context of Botswana, as of 2013, the mobile penetration rate was 184% and considered one of the highest in Africa (Botswana Innovation Hub, 2013). Also, as of 2013, Botswana had 14,440,207 subscribers (and the number has since greatly increased) accessing the Internet using mobile phones such as smartphones which was an increase of 82.6% from 2012 (Statistics Botswana, 2013). The above statistics are evidence enough that Botswana has adequate mobile phones for computing and connectivity, and this offers huge possibilities and opportunities for the integration of smartphones into the school system. Students, in most universities have been highly exposed to the use of desktop computers for learning purposes, and these computers are mostly found in students' common areas like laboratories, practice rooms and classrooms (Al Hassan, 2015). The computers in these areas are not allowed to be moved to any other place and can only be used in fixed positions (Mehdipour & Zerehkafi, 2013). A small number of students from well-to-do families are in possession of laptops which have better mobility than desktops. However, studies have shown that effective mobile-learning can be achieved by the use of a multiplicity of devices which range from cell phones, smartphones, palmtops (a handheld computer), tablet PCs, laptops, and personal media players (Totten et al, 2005).

Several researchers have studied the use of mobile phones as educational learning tools by students in higher learning institutions (Thoronton and Houser, 2005). Other studies have also shown that the same devices can be a source of hindrances to the normal learning process of the students if their use is not well monitored and managed in class. Studies further show that university students are the largest consumers of mobile phone services in the world (Prensky, 2001; Totten et al, 2005).

**Statement of the problem**

Preliminary investigations have shown that in spite of the high density and availability of mobile phones in Botswana, there is no known study in Botswana that has been conducted to show the extent of use of smartphones as learning tools in universities despite the fact that most of the students are interested in using these devices for accessing social networks and communication with relatives and friends. A number of studies have found many benefits for students who use their mobile phones especially for academic purposes (Mehdipour & Zerehkafi, 2013). This research therefore, is an attempt at establishing the extent to which business students at a selected university in Botswana intend to use smartphones as learning tools. The research also sought to establish the challenges students face in using smartphones as learning tools. The research will also establish factors that influence university students to use smartphones as learning tools.

The research will be guided by the following research questions.

- What challenges do university students face when using smartphones which affect their intentions to utilize the smartphones as learning tools?
- How does ease of use of smartphones influence university students' intentions to use smartphones as learning tools?
- How does the attitude of university students towards use of smartphones influence their intentions to use smartphones as learning tools?
- How does the perceived usefulness of use of smartphones influence university students' intentions to use smartphones as learning tools?

The research will use the following hypotheses to validate the findings:

*$H_1$: There is no significant, statistical and positive relationship between university students' perceived usefulness of smartphones and intention to use smartphones for m-learning.*

*$H_2$: There is no significant, statistical and positive relationship between university students' attitudes towards use of smartphones and intention to use smartphones for m-learning.*

*$H_3$: There is no significant, statistical and positive relationship between university students' perceived ease of use of smartphones and intention to use smartphones for m-learning.*

## LITERATURE REVIEW

### The concept of smartphones and m-learning

The use of smartphones has become a part of many peoples' lives including students. Kumar (2011) argues that while a couple of years ago smartphones were regarded as a status symbol, today they are must-have productivity tools owing to their blend of functionalities especially with regard to accessing, storing and retrieving critical data at the click of a button. The use of mobile technology also influenced the way instructors behave within their classes, allowing for additional types of interactions between students and themselves (Percival & Claydon, 2015). Smartphones are now taken as computers in one's pocket that do more than just sending and receiving calls (Kumar, 2011; Harriman, 2017). UNESCO (2013) shows that mobile technology, as exemplified by smartphones, has potential to improve the quality of education by changing the efficacy of school systems, transforming traditional pedagogical models, extending learning opportunities beyond the limits of classrooms as well as expanding education access. The above is possible because the functionalities of smartphones offer more personalized teaching and learning possibilities to teachers and students than do textbooks (Hutchinson et al, 2012). While in many schools the world over the thought of using smartphones as a pedagogical tool is still viewed as an unacceptable disruption, and a notion akin to utopia (Gabor & Peter, 2015), many studies view the use of smartphones for m-learning as a ground-breaking innovation that should be taken seriously (Norris et al (2011).

A smartphone is defined as a mobile device which possesses more functionality than an ordinary cell phone (Nasser (2014). Smartphones are also described as pocket computers that have an advantage of portability and ubiquity over tablets and laptops since they can be carried and used anywhere, anytime and for anything where data are needed (Gabor & Peter, 2015). Kumar (2011) avers that like computers, smartphones, at a global level, provide access to a multiplicity of sources of information and data. USwitch (2017: 01) define a smartphone as

> *"a multi-functional mobile phone handset that packs in everything from a camera and web browser to a high-density display and have an operating system and powerful micro-*

> *processors to enable users to access more than one function or application simultaneously and ensure that there's minimal lag at all times".*

Some of these powerful operating systems include, "Symbian OS from Nokia, iPhone OS from Apple, Android from Google, BlackBerry OS from Research In Motion (RIM) and Windows Phone from Microsoft (USwitch, 2017: 01). According to Technopedia (2017: 01), a smartphone is a mobile phone with highly advanced features that include "a high-resolution touch screen display, WiFi connectivity, Web browsing capabilities, and the ability to accept sophisticated applications". Technopedia (2017) further intimates that smartphones are expected in the near future to have a more powerful central processing unit (CPU), more storage space, more RAM, greater connectivity, much larger screens and lower power consumption than regular mobile phones. From the above, it can therefore be observed, as shown by Vazquez-Cano (2014), that smartphones are veritable mini-computers that provide a multiplicity of capabilities for educational and social purposes.

Mobile-learning (m-learning) is a subset of e-learning, in which learning is delivered to recipients using hand held devices such as mobile devices, and the m-learning notion facilitates personalized learning, ubiquitous learning, anytime and anywhere learning (Mehdipour & Zerehkafi, 2013). MOBIlearn (2003) also defines m-learning as learning which occurs when the learner is not at a fixed location. Pinkwart et al (2003) defined m-learning as learning which can provide educational content on hand held devices such as smartphones. To sum it up all, Crescente and Lee (2011), viewed m-learning as any learning that takes place at anytime, anywhere and that can be supported by mobile devices.

In Botswana, according to research done by Lesitaokana (2016), most students in tertiary institutions cannot afford to purchase smartphones that enable them to engage with their instructors using mobile-learning. Smartphones are very expensive compared to the monthly stipends they receive from the government, and this development has significantly impacted the m-learning paradigm. In another study done by Kaliisa and Picard (2017) that covered tertiary institutions in the following countries - South Africa, Kenya, Botswana and Nigeria - it was found that the Internet bundles are expensive and that students could not afford to keep up with the m-learning dictates of anytime and anywhere connectivity for the purposes of learning.

**Benefits and challenges of using smartphones as educational tools**

The literature presents a number of benefits to both teachers and students alike on the use of smartphones for teaching and learning. Sevillano-Garcia and Vazquez-Cano (2015), Norris et al (2011), Akers et al (2010), Katz (2013), Vazquez-Cano (2014), Thorpe and Gordon (2012) as well as Ahmed and Parsons (2013) highlight a number of benefits of mobile devices such as smartphones over laptops, tablets and desktop computers. According to Thorpe and Gordon (2012), the use of smartphones relaxes the pace of learning, enables students to become digital content creators as well as to develop their own unique conceptions of knowledge within particular areas of training thus enhancing their innovativeness. Norris et al (2011) also argue that their light weight and orientation make smartphones far more superior than comparable devices for reading and accessing learning and teaching content. Sevillano-Garcia and Vazquez-Cano (2015) and Katz (2013) also aver that one of the most critical advantages of smartphones as learning tools is that they offer students unlimited possibilities to get study information via open educational resources (OER) distributed on wikis, blogs, mash-ups, podcasts, webinars, virtual worlds, personal learning environments (PLEs), massive open online courses (MOOCS) and other emerging online resources. Rodriguez (2015) also argues that smartphones can improve the quality of teaching and learning as students can use this technology to personalize their own learning, and teachers can begin to act as facilitators rather than transmitters of knowledge. The above benefit of smartphones is also highlighted by Vasquez-Cano (2014), Franklin (2011) and also Johnson et al (2014) who opine that smartphones can be a useful didactic resource in classrooms which, through the use of

personalized educational applications, can facilitate effective interaction between content and the student.

Another notable advantage of smartphones is that their use promotes constructivist teaching approaches that allow maximum participation in learning by students through the use of project-based and inquiry-based methodologies (Ahmed & Parsons, 2014; Vazquez-Cano, 2014). Norris et al (2011), Jesse (2015), Rodriguez (2015) and Freeman (2012) further highlight the following as some of the advantages of using smartphones as learning tools: their instant-on capability and fast switching mode among applications allow learning and teaching activities to progress with minimal, if any, disruptions; the touchscreen interface allows for a high degree of user interactivity; smartphones are much more portable and ubiquitous than comparable gadgets hence can be used anywhere, anytime and for any relevant information processing activity; the development of educational applications for mobile platforms is generally inexpensive as there are many free or low-cost applications for download. Smartphones also allow for collaborative learning through social networks such as Facebook, Twitter, and Instagram thus allowing students to have access to social groups (Vazquez-Cano, 2014). A study by Kumar et al (2010) found that one of the major benefits of smartphones is that they increase student motivation as they are interactive and students can access needed information at a click of a button. Akers et al (2010) in their study also found that smartphones increase literacy and numeracy among students due to their unique applications.

With regard to challenges posed by using smartphones for m-learning, the following are identified: the issue of Internet connectivity where limited bandwidths fail to support the learning processes (Elias, 2011; Crescente and Lee, 2011); the potential for distraction or unethical conduct where students focus on social networks and video watching in class instead of learning (Traxler, 2005; Turunen, et al., 2003); cultural norms and attitudes where teachers and parents refuse to accept the technology because they are so fixated with traditional models of teaching and learning (Elias, 2011); a lack of teaching models that inform how m-learning should be done, thus posing challenges to effective teaching, assessment and material review (Traxler, 2005; Crescente and Lee, 2011); and poorly designed mobile technologies which may negatively affect usability and can distract children from learning goals. These include physical features of mobile technologies such as restricted text entry, small screen size, limited battery life, and limited capacity to store learning materials that may prevent an optimal learning experience for students (Elias, 2011).

## THEORETICAL FRAMEWORK

The technology acceptancy model (TAM) which was originally developed by Davis (1986) informs this study whose main aim was to predict and explain factors that influence people's decisions to use or not to use technology. TAM is a theory that attempts to explain why people either accept or reject technology, and is premised on two cognitive beliefs, namely perceived usefulness and perceived ease of use (Park, 2009).

TAM, as shown in Figure 1 below argues that a person's intention and actual use of technology such as a smartphone is influenced directly or indirectly by his or her behavioural intentions, attitude, perceived usefulness of the technology, and perceived ease of use of the technology (Rodney-Wellington, 2014; Wann-Yin & Ching-Ching, 2015).

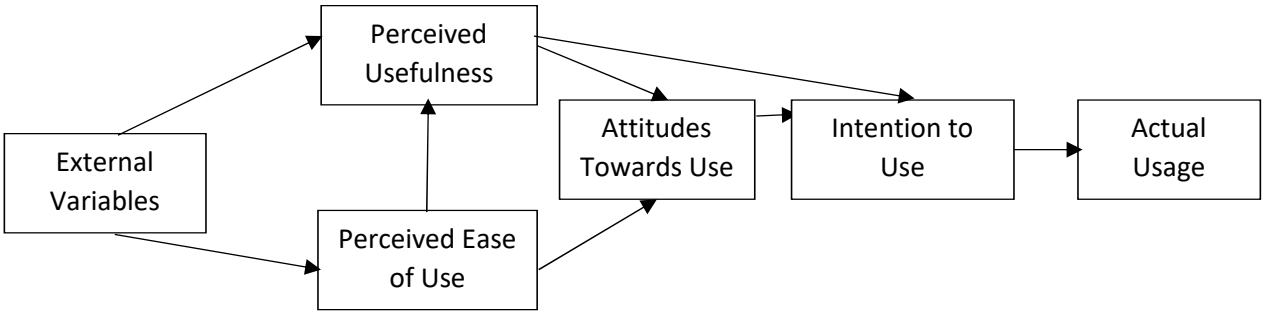


***Figure 1***. Technology Acceptance Model (TAM) (Davis, Bogozzi and Warshaw, 1989).

Perceived usefulness, perceived ease of use, attitude and subjective norms are all factors that define user motivation to use a technology (Huda et al, 2012; Shroff et al, 2011; Lai, 2016). Perceived usefulness is defined as the extent to which a person believes that using a technology such as a smartphone will boost his/her performance (Performance expectancy) (Suki & Suki, 2011; Lai, 2017; Durodolu, 2016). Perceived ease of use is the extent to which a person believes that it would be effortless and hassle-free to use a technology (performance expectancy) (Wen & Kwong, 2010; Rivard & Lapointe, 2012; Mordini, 2007). Attitude relates to having either positive or negative feelings towards a technology (Teo, 2013; Holden & Karsh, 2010). Subjective norm relates to the degree to which a person perceives that important others believe that he or she should use a technology (Walker & Pearson, 2012). External variables relate to system and learner characteristics that have an effect on his or her decision to either accept or reject a technology (Lee, 2006; Pituch & Lee, 2006).

## METHODOLOGY

### Instrumentation

This study assumed a quantitative approach that employed a structured questionnaire to collect data from first year business students. A structured questionnaire is defined as a data collection instrument that has pre-determined closed-ended questions (Neuman, 2011; Phellas, Block & Seale, 2011). The questionnaire was tested for both internal consistency and content validity. A simple random sampling procedure was used to select 132 participants for the study. Mathers et al (2007) define simple random sampling as a sampling procedure in which selections are made purely by chance. A sample size of 132 students was calculated from a population of 200 business students using a sample size calculator at 95% confidence level or 5% margin of error. *Amos 8* software was used for data analysis. 132 questionnaires were administered and 125 were returned giving a return rate of 94.7%. Psychometric properties of the scale items or research variables were used for data analysis.

### Psychometric Properties of the scale items

Psychometric properties of the scale items were examined as evidence that the reliability values of the sub constructs of perceived usefulness, perceived ease of use, and attitude towards use of smartphones were all above a minimum threshold. The factor structure of the scale items with respect to Bartlett's Test, Average Variance Extraction (AVE), Factor metrics and Keiser Meyer Olkin (KMO) indicate the robustness of the Factor structure for the sub constructs in the hypothesized relationship of the study model. The mean values of the perceived ease of use, perceived usefulness, attitude and behavioural intentions indicate a significant contribution of the

scale items to behavioural intentions as regards intention to use smartphones as learning tools at the selected university.

With regard to the internal consistency and validity of the scale items for this empirical study in terms of the extent of use of smartphone for learning, perceived usefulness, perceived ease of use, attitude and behavioural intention metrics, the psychometric data as explained below emerged from the study. The Cronbach alpha for extent of use of smartphone was 0.810, mean values ranged from 2.31-3.50 for scale items, KMO was 0.604, Bartlett's' test was 222.397, AVE was 95.94 and factor metrics ranged from 0.74-0.95. With regard to perceived usefulness, Cronbach alpha was 0.827, mean values of scale items ranged from 2.54-3.47, KMO was 0.672, Bartlett's' test was 201.672, AVE was 95.94 and factor metrics ranged from 0.74-0.886. With regard to perceived ease of use, the Cronbach alpha was 0.737, mean values of scale items ranged from 2.34-3.76, KMO was 205.613, Bartlett's' test was 78.81 and Factor metrics ranged from 0.65-0.874. With regard to the attitude and behavioural intention, Cronbach alpha met the minimum threshold for internal consistency (0.856), mean values of the scale items ranged from 2.37-3.53, KMO was 0.517, Bartlett's' test was 10.890, AVE was 71.08 and factor metrics ranged from 0.675-0.753. The above data therefore showed that the questionnaire met the minimum threshold for internal consistency and content validity and hence the instrument was good enough for the study.

## RESULTS

### Analysis of demographic data

***Table 1:*** *Demographic profile of sampled respondents*

| Gender | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Male | 40 | 30.3 | 30.3 | 30.3 |
| | Female | 92 | 69.7 | 69.7 | 100.0 |
| | Total | 132 | 100.0 | 100.0 | |

As shown in Table 1, the male respondents constituted 30% of the sample, while females constituted 69.7% of the respondents. These results therefore show that among the sample more female students used smartphones for educational purposes when compared to male students.

### Challenges faced when using smartphones

The results in Table 2 below show that the major challenges which students faced when using smartphones as learning tools included low Internet connectivity (M = 3.9, SD = 1.09), high Internet costs (M = 4.7; SD = .911), high smartphone costs (M = 4.1; SD = 1.12), smartphones having limited storage capacity (M = 3.1; SD = .904). Students also indicated a problem they consider minor, that is, smartphones sometimes cause distractions as students may go into social networks (M = 2.9; SD = 1.12) during class. However the results in Table 2 also showed that students believed that use of desktop computers and laptops is not a hindrance to them using smartphones as learning tools (M = 1.8; SD = .841). Results also showed that most students did not believe that smartphones were not user friendly (M = 1.9; SD = .850), not useful as learning tools (M = 1.4; SD = .791), had limited capability (M = 2.1; SD = .720), lowered student motivation during class (M = 1.8; SD = 1.14) or that smartphones were difficulty to use because they were too small (M = 2.17; SD = .911).

***Table 2:*** *Challenges affecting intention of students to use smartphone as learning tools*

| **Challenges faced** | **M** | **SD** |
|---|---|---|
| Fixation with desktop computers and laptops | 1.8 | .841 |
| Low internet connectivity | 3.9 | 1.09 |
| High internet costs | 4.7 | .911 |
| High smartphone costs | 4.1 | 1.12 |
| Smartphones are not user friendly | 1.9 | .850 |
| Smartphones do not protect privacy | 3.8 | 1.07 |
| Smartphones are not useful as learning tools | 1.4 | .791 |
| Smartphones distract learning through social networks | 2.9 | 1.12 |
| Smartphones have limited information storage capacity | 3.1 | .904 |
| Some smartphones are of limited capability | 2.1 | .720 |
| Smartphones lower student motivation levels during class | 1.8 | 1.14 |
| Smartphones are too small making using them difficult | 2.17 | .911 |

**N = 125, CM = Criterion Mean, M = Mean, SD = Standard Deviation

**Hypothesized relationships**

Table 3 below presents a global view of the step-wise regression model for intention to use smartphones as learning tools by university students.

***Table 3*****:** *Hypothesized relationship between antecedents and behavioural intentions to use smartphones*

| **Coefficients[a]** | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
| | | B | Std. Error | Beta | T | Sig. | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance | VIF |
| 1 | (Constant) | 5.027 | .000 | | 1.228 | .000 | 5.027 | 5.027 | | | | | |
| | Perceived Usefulness | 1.029 | .015 | 1.585 | 2.009 | .000 | 1.029 | 1.029 | .665 | 1.000 | .763 | .232 | 4.318 |
| | Attitude towards use | .286 | .118 | 1.063 | 1.814 | .000 | .286 | .286 | .176 | 1.000 | .689 | .420 | 2.379 |
| | Perceived ease of use | .064 | .037 | .152 | 2.763 | .000 | .064 | .064 | .139 | 1.000 | .105 | .475 | 2.104 |
| a. Dependent Variable: Intention to use | | | | | | | | | | | | | |

For ease of review of hypothesis testing, Tables 4 to 6 are all extractions from which Table 3 was developed.

*$H_1$: There is no significant, statistical and positive relationship between university students' perceived usefulness of smartphones and intention to use smartphones for m-learning.*

***Table 4:*** *Relationship between perceived usefulness and intention to use smartphones*

| Coefficients[a] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
| | | B | Std. Error | Beta | T | Sig. | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance (TL) | VIF |
| | Perceived Usefulness | 1.029 | .015 | 1.585 | 2.009 | .000 | 1.029 | 1.029 | .665 | 1.000 | .763 | .232 | 4.318 |

**Significant P < .05.

The step-wise regression results in Table 4 showed that (t = 2.009; β = 1.585; p = .000; p < .05) hence the results are significant, and it was concluded that there was a significant, statistical and positive relationship between students' perceived usefulness of smartphones and intention to use the smartphones for m-learning. $H_1$ was thus rejected. These results therefore demonstrated students' intention to use smartphones as learning tools since they believed that smartphones were useful tools for learning. Tolerance level = .232 (TL < 1) and Variance Inflation Factor (VIF) = 4.318 (VIF > 1) showed that the assumptions of multicollinearity were not violated.

*$H_2$: There is no significant, statistical and positive relationship between university students' attitude towards use of smartphones and intention to use smartphones for m-learning.*

***Table 5:*** *Relationship between students' attitudes towards smartphones and intention to use smartphones*

| Coefficients[a] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
| | | B | Std. Error | Beta | T | Sig. | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance | VIF |
| | Attitude towards use | .286 | .118 | 1.063 | 1.814 | .000 | .286 | .286 | .176 | 1.000 | .689 | .420 | 2.379 |

**Significant P < .05

The step-wise regression results in Table 5 showed that (t = 1.814; β = 1.063; p = .000; p < .05), hence the results are significant and it was concluded that there was a significant, statistical and positive relationship between students' attitudes towards use of smartphones and intention to use smartphones for m-learning. $H_2$ was hence rejected. These results therefore demonstrated students' intention to use smartphones as learning tools since they had positive attitudes towards smartphones. Tolerance level = .420 (TL < 1) and Variance Inflation Factor (VIF) = 2.379 (VIF > 1) showed that the assumptions of multicollinearity were not violated.

*$H_3$: There is no significant and statistical relationship between university students' perceived use of use of smartphones and intention to use smartphones for m-learning.*

***Table 6*****:** *Relationship between perceived ease of use of smartphones and students' intentions to use smartphones*

| Coefficients[a] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
| | | B | Std. Error | Beta | T | Sig. | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance | VIF |
| | Perceived ease of use | .064 | .037 | 1.152 | 2.763 | .000 | .064 | .064 | .139 | 1.000 | .105 | .475 | 2.104 |

**Significant P < .05

The step-wise regression results in Table 6 showed that (t = 2.763; β = 1.152; p = .000; p < .05), hence results are significant and it was concluded that there was a significant, statistical and positive relationship between students' perceived ease of use of smartphones and intention to use smartphones for m-learning. $H_3$ is hence rejected. These results therefore demonstrated students' intention to use smartphones as learning tools because they believed that smartphones were easy to use. Tolerance level = .475 (TL < 1) and Variance Inflation Factor (VIF) = 2.104 (VIF > 1) showed that the assumptions of multicollinearity were not violated.

## DISCUSSION OF RESULTS

The results of the study present a number of findings on intentions of university business students to use smartphones as learning tools. First, results showed that there were a number of challenges that affected intentions of students to use smartphones as learning tools. Among these were low Internet connectivity, high Internet costs, high smartphone costs as well as limited data storage of smartphones. The first three challenges were viewed as the major ones in that if Internet connectivity were low then it meant that students could not download the learning data they wanted when they wanted it. It was the same for high Internet costs, which meant that students were constrained in the downloading of learning materials. High smartphone costs also meant that students ended up buying cheaper phones of limited capability, thus affecting other things such as the speed with which they did the downloads as well as storage capacity, among others. All these challenges were viewed as affecting students' intentions to use smartphones as learning tools. Extant literature also attests to these challenges. In their separate studies, Elias (2011) as well as Crescente and Lee (2011) found that the use of smartphones for learning (m-learning) is affected by Internet connectivity where limited bandwidths fail to support the learning process. In the same study, Elias (2011) also found that physical features of mobile technologies had the potential to prevent optimal learning experiences of students, for example, limited capabilities such as restricted text entry, small screen size, limited battery life and limited capacity to store learning materials. Gabor and Peter (2015), in their study, also found that the use of smartphones as learning tools faced the challenge of being considered a distraction and disruption of learning as it was felt that students tended to go into social network sites such as Facebook and others instead of concentrating on actual learning.

Results of the study also showed that while the use of smartphones as learning tools faced some challenges, the benefits of using smartphones outweighed the challenges. Most of the respondents believed that smartphones as learning tools improved student motivation levels during learning. This then meant that smartphones improved students' desire to learn. This could be so because smartphones allow for interactive and collaborative learning and are also exciting because they provide a multiplicity of sources of information (USwitch, 2017). Also, the portability and ubiquity of smartphones make them more motivating to use than other devices like desktops as, according to Kumar (2011) and Nasser (2014), smartphones can be carried and used for learning anywhere and anytime. In further demonstrating why smartphones are more motivational than other devices as learning tools, Sevillano-Garcia & Vazquez-Cano (2015), Norris et al (2011), Akers et al (2010), Katz (2013), Vazquez-Cano (2014), Thorpe and Gordon (2012) as well as Ahmed and Parsons (2013) carried out separate studies.

Sevillano-Garcia & Vazquez-Cano (2015) in their study found that smartphones offer students unlimited possibilities to get study information on the go through open educational resources (OER) distributed on wikis, blogs, mash-ups, podcasts, webinars, virtual worlds, personal learning environments (PLEs), massive open online courses (MOOCS) and other emerging online resources. Thorpe and Gordon (2012) in their study also found that the use of smartphones is motivational because it relaxes the pace of learning, enables students to become digital content creators as well as to be able to develop their own unique conceptions of knowledge within particular areas of training thus enhancing their innovativeness. In further explicating the importance of smartphones as motivational learning tools, Rodriguez (2015) in his study argued that smartphones improved the quality of teaching and learning as students can use this technology to personalize their own learning and teachers can begin to act as facilitators rather than transmitters of knowledge. From the above studies, it could be concluded that smartphones had many characteristics that could lead to improvement of the intention of students to use smartphones as learning tools in universities.

The study further showed that smartphones were user-friendly despite their relatively smaller sizes when compared to devices such as desktops and laptops; possessed good capability in terms of functionality; and hence were viewed by students as useful learning tools. The above is supported in a number of research studies as well as in extant literature. Vazquez-Carno (2014) argued that the touch screen interface of smartphones allowed for a high degree of user interactivity while Ahmed and Parsons (2013) also argued that the multi-functionality of smartphones is highly motivational to students as it promoted constructivist teaching approaches that allowed maximum participation in learning by students through the use of project-based and inquiry-based methodologies. The study also showed that smartphones were useful pedagogical tools because, as a result of their functionality, they offered more personalized learning and teaching possibilities to both the learner and the teacher than do textbooks. This view is also supported by Hutchinson et al (2012).

## CONCLUSION

Based on the above results, a number of conclusions were made with regard to the intentions of students to use smartphones as learning tools. From the results it was concluded that there were more benefits to the use of smartphones as learning tools than there were disadvantages, a situation which had potential to lead to high intention by students to use these phones as learning tools than otherwise. Second, it was also concluded that students believed that smartphones enhanced learning and teaching as a result of the multi-functionality and ubiquity of smartphones, and hence this was a good indicator of students' intention to use smartphones as learning tools. Third, it was concluded that students believed that smartphones made learning highly motivational as learning could be personalized to individual needs of students and this was another indicator of students' intention to use smartphones as learning tools. It was also concluded that while the

smartphone technology made a positive impact on the learning and teaching process, students believed that there were also some challenges that potentially affected their impact as pedagogical tools. The major challenges which students believed had potential to negatively impact their intentions to use smartphones as learning tools included high costs of internet, low internet connectivity and high costs of smartphones as well as limited data storage capacity of some smartphones. Overall though, it was concluded, in line with results of the study, that students believed that the benefits of using smartphones as learning tools outweighed the disadvantages, and this was a strong indicator of business students' intentions to use smartphones as learning tools in universities.

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