

September 2015

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Olasina, Gbolahan (2015) "FACTORS INFLUENCING THE USE OF M-BANKING BY ACADEMICS: CASE STUDY SMS-BASED M-BANKING," *The African Journal of Information Systems*: Vol. 7 : Iss. 4 , Article 4. Available at: <https://digitalcommons.kennesaw.edu/ajis/vol7/iss4/4>

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Factors Influencing the Use of M-Banking by Academics: A Case Study of SMS-Based M-Banking

Research Paper

Volume 7, Issue 4, October 2015, ISSN 1936-0282

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(Received February 2015, accepted July 2015)

ABSTRACT

There are several advantages with m-banking. Several related studies have shown that m-banking and indeed SMS-based mobile banking applications have become popular in many countries in Europe and America. The phenomenon remains not widely used in many others such as Nigeria. This study identified and investigated the factors that influence academics in Nigeria to use m-banking with focus on the evaluation of SMS-based mobile banking. The research model was adopted from the Unified Theory of Acceptance and Use of Technology model (UTAUT). A survey questionnaire was administered to collect data from 150 academic staff and 350 university students of the University of Ilorin, Nigeria. The results show a positive correlation between customer service, type of bank and perceived ease of use and the use of m-banking. The implications of the results are crucial for technology adoption research and managers of banks in Nigeria.

Keywords

Mobile banking, SMS banking, UTAUT, academics, Nigeria

INTRODUCTION

Short message service (SMS) for text messaging and associated applications such as m-banking are becoming increasingly popular, particularly in markets in developing countries such as Nigeria. The m-banking application referred in this study includes the banking services provided via the SMS capability that is also accessible using mobile devices, which are typically transaction based. As a matter of fact, several SMS messages are required to complete a bank transaction. Online banking via a mobile phone's browser generally offers the same options as on a desktop/laptop. Both downloadable apps and mobile

sites typically require logging in with the same user name and password used on the laptop/desktop. There is also encryption of communications for the purpose of security to and from the bank. The SMS-banking facility is almost available in all commercial banks in Nigeria. SMS-banking evolved over time as the phenomenon (SMS) was initially used as a social medium by friends, family, colleagues to share and exchange information (ESOMAR, 2011). The emergence of SMS-banking in Nigeria can be traced to the upsurge in the adoption of mobile telephony in Nigeria in 2001. A series of changes have taken place in that sub industry culminating in a series GSM licenses issued in the 1990s and early 2000s to four private telephone service providers (Mtel – NITEL, Econet now Zain, MTN and Communication Investment Limited – CIL, the latter's license was revoked and replaced by Globacom, Glo Nigeria). The statistics from the mobile sector are mindboggling quoting Olaniyi (2006), with just 10,000 lines in 1991, the number of lines was upgraded to about 20,000 in 1994. To put it succinctly, teledensity in Nigeria for mobile and fixed telephone as at January 2011 stands at 88,348,026 and 92% of which is GSM based (NCC Report, 2011). There have been several studies on m-banking in Asia, America and Europe (Laforet and Li, 2005; Ramayah et al., 2003). The areas of concern seem to come from reluctant users who are not using the facility for their banking even though they use mobile phones for non-banking purposes. Mobile services have an impact on consumers because they allow ubiquitous and universal access to information and services, as well as a possibility for a unique and personalized exchange of information (Watson, Leyland and George, 2002). As a result, using mobile devices in Nigeria is now part of daily life, and a way to keep in touch with the rest of the world as well as to communicate and network. New technology is said to be inseparable from everyday life (Weiser, 1991; Ericsson, 2007). Bångens and Söderberg (2008) report that in a survey over 57% of respondents who use m-banking like it. However, the use of m-banking in particular SMS-banking is yet to be embraced by most bank customers when compared with developed countries of the world.

Mas and Kumar (2008) report that SMS is used to support mobile banking service as the main medium. Reasons for mobile and SMS usage are largely saving time, varying location and convenience (Porteous and Wishart, 2006). Corradi, Montanari and Stefanelli (2001) reported that SMS banking is limited to low risk transactions because it is the most insecure as it cannot be encrypted. Perhaps it is quick and easy for users to become familiar with the mobile banking service. There are three options for mobile banking: downloading a program for the mobile phone, using the phone's browser to access a mobile version of a bank's website, or simply sending SMS (Donner and Tellez, 2008). Chakrabarty (2009) and Howarth (2008) have reported the many advantages of SMS-banking to include faster data transmission rate, ease of use, transfer of money from one account to another and remote checking of balances. It allows for 24 hours personal banking transactions for customers. Salisbury, Pearson and Miller (2001) found that perceived ease of use was a significant factor in the development of users' intention to use wireless banking. Prior research results from Europe, America and elsewhere may not be entirely relevant to that of Nigeria. Moreover, despite the fact that in recent time, the use of mobile phones has increased even within rural households in Nigeria it is important to improve the understanding of the factors that influence the use of M-banking (Olasina, 2011). Whereas, the use of mobile phones continues to grow worldwide, several survey reports indicate a low rate of user adoption of m-banking (Zhou, Lu and Wang, 2010). The current study explored these issues to reveal the reasons for adoption of SMS-banking, intention to use the facility and overall perception of bank customers using the lens of a modified Unified Theory of Acceptance and Use of Technology (UTAUT) model.

The study was conducted on academics at the University of Ilorin, Nigeria. The reason for the focus on academics stemmed from the on-going debate on disruptive technology and the revolutionary trends of

emerging technology to multiple categories of users. Moreover, empirical research has been well reported on the adoption and use of e-learning, m-learning, Internet and other Web 2.0 tools in the context of academics, teens and adults to name a few. There was the need to investigate the factors that influence the use of m-banking with regard to academics since many information science (IS) studies (Dwivedi, Ramdani, Williams, Mitra, Williams and Niranjana, 2013; Alwahaishi and Snásel, 2013) have reported a correlation between academic qualification and technology adoption in general but with less focus on m-banking services and applications in particular. Besides, embarking on a country-wide study was impossible and un-manageable by the researcher, hence an institutional based study that may shed light on key factors, constructs and assumptions to guide further studies. The University of Ilorin is a leader in the use of ICT for teaching, learning, student assessment (computer-based tests, online open courseware and online distance learning ODL), payment, registration, communication and administration. In addition, the institution in collaboration with banking institutions recently deployed a smart ID technology with features for m-banking solutions. Moreover, the institution has created a conducive environment for commercial banks to establish campus branches within the grounds of the university as directed by the federal ministry of education and the National Universities Commission (NUC) responsible for the running and supervision of academic institutions in Nigeria. Accordingly, the study is significant as it has potential to improve and enhance the practice of m-banking for industry/academic institutions and increase understanding of theory of technology adoption and use by exploring the relationships among the constructs and assumptions of UTAUT model in the context of academics' use of m-banking in an institution in Nigeria. The study is appropriate given the low adoption rates and use of m-banking in Nigeria. Lastly, the study has potential to inform the deployment of m-banking platforms by academic and banking institutions in the future.

The motivation for this study stems from issues such as the need to attract potential users, resistance, retaining existing users, perception, relevance, IT education, and affordability, behavioral, social and economic elements that may influence academics and others to adopt and use m-banking services. Economic, social and behavioral constraints need to be explored as they can create adoption barriers for academics and the society to use mobile banking. The investigation addressed these issues at the level of the individual rather than institutional as mobile devices are commonly considered as personal tools and the decision to use them are reached by the individual.

Statement of the Problem

Despite the numerous advantages with the use of SMS and mobile banking across the world as reported in several studies, the use of SMS-banking is still limited when compared to a well-researched area such as Internet banking. For instance, a study in Ireland found that there is a minority of people using m-banking in the market with approximately 1% of consumers using m-banking while nearly 90% of the population has mobile phones (Foley, 2005). Aboelmaged and Gebba (2013) have highlighted more general issues (such as exploration of the adoption of technology in banking) of m-banking outside the context of Nigeria. Similarly, in Nigeria there is the need to explore the reasons for the limited use of SMS banking as the results from outside Nigeria may not be relevant to the country. M-banking is underused by bank customers and this study was conducted to identify the key factors that influence the use of m-banking in the context of academics in an institution in Nigeria. There are several studies on m-banking in Europe, USA and elsewhere, but little in the context of Nigeria. Also, m-banking applications have emerged as products in almost all commercial banks in the country. There is the need for the evaluation of these services from the perspectives of the users. The study was necessary not only to extend geographic boundaries and add to the body of knowledge in the context of Nigeria, but also to

extend theoretical boundaries by using the lens of a recent theory of technology acceptance to underpin the research.

Research Questions

The main purpose of this study was to investigate the influence of factors such as customer service, bank type/brand, perceived usefulness (PU) and perceived ease of use (PEOU) on the use of m-banking by academics in the context of Nigeria. The study had the following research questions:

1. What m-banking applications and features are used by academics?
2. What factors influence the use of m-banking?
3. What are the relationships among factors such as customer services, type of bank, ICT skills, social influence and perceptions and the use of m-banking?

LITERATURE REVIEW

Overview of Mobile Technologies

Mobile Internet was introduced in the late 1990s by the Japanese conglomerate, NTT DoCoMo's i-mode in the forefront recording remarkable successes, whereas the initial European WAP approach was reported as not reaching wide markets (Kaasinen, 2005). Furthermore, mobile Internet access is implemented by having a browser software application on the phone. The browser is able to access different Internet contents, depending on the protocol in use. WLAN networks are available in offices and households, shops, hotels and airports as well as in schools, hospitals and factories. Different WLAN solutions are available, offering speeds up to 54 Mbit/s (ITU, 2002). WLAN connections are mainly used in laptops and PDAs although WLAN connections are also available for many types of mobile phones. In addition, mobile Internet usage is reported to be in short bursts of activity. Chen and Wellman (2004) found in the International Telecommunications Union report that browsing behavior is object-driven rather than exploratory, and that on average 80% of Internet usage sessions are shorter than 10 minutes.

Bluetooth is a communication protocol for short-range local communication that was originally conceived as a wireless cable replacement solution with which the user could connect peripherals with a mobile device, or exchange information between devices close to each other. The Bluetooth specifications currently enable a multitude of applications including hotspots for local connections (Sarker and Wells, 2003). Moreover, smart phones are with special computer-enabled features. The others are iphones, ipads, tablets and various forms of blackberries phones. In addition, mobile phone features may include email, Internet/Web browsing and personal information management. Typically the functionality of a smart phone can be further enhanced with add-on applications (Bieber and Giersich, 2001). The term media phone is often used to describe phones that include cameras and functionality for image messaging (Multimedia Messaging Service, MMS). In addition, Albers and Kim (2002) suggest that the revolutions in the designs of Personal Digital Assistants (PDAs) have transformed information dissemination using Web interfaces. The authors also state that the difference between mobile phones and PDAs is getting more blurred as the screen sizes on phones are getting larger more like laptops/PDAs. Smart phones are equipped with different applications, and PDAs

increasingly have network connections as a standard function. However, the main difference is still the numeric keypad and one-hand usage of most phones as opposed to the touch screens and two-hand usage of most PDAs, although there are blackberries and other smart phones without keypads but with touch screens only.

Karthikeyan (2014) revealed that emerging technologies provide users with access to the Internet using mobile platforms such as WAP supported phones and smartphones to access the Internet 24/7. In other words, the WAP enablement makes for convenience and appropriation for monitoring, managing, configuring and controlling embedded devices to support m-banking applications among others. Moreover, WAP ready phones now come with bigger screen sizes, faster GPRS, 3G and 4G connectivity, thereby improving user experiences and satisfaction.

Despite these technological trends and improvements of mobile phones, the technology is not without its challenges. For instance, Chon, Park, Hur and Kang (2013) suggest that data traffic has not fully grown to its potentials in the context of mobile phone services provision due to the expensive nature of services despite the explosion of wireless Internet traffic in South Korea. Likewise, Nikou and Mezei (2013) explore multiple networks, platforms and applications with regard to mobile services and report that many have failed in terms of profit from the massive infrastructural investments from the perspective of industries and organizations that have deployed the tools. They conclude that mobile network operators and service providers need to develop and implement specific mobile services for their users. These studies are directly related to the main theme of the current research as they underscore the need to evaluate mobile based services to determine if the needs and objectives of the users/providers are met. Humphreys, Von Pape and Karnowski (2013) reported that little is known about mobile Internet and how the phenomenon will evolve in the future. They suggested areas of concern to include over-reliance on the phone rather than mobile based services, and limited knowledge of theory with regard to the use of m-banking. Besides, several researchers (such as Przybylski and Weinstein, 2013) have found evidence of mobile phone based communication connecting billions of people over the world, over whereas, suggesting that little is known about the evolution of social behavior in the context of mobile phones. Tomlinson, Rotheram-Borus, Swartz and Tsai (2013) explore mobile phone applications in the context of healthcare delivery in sub-Saharan Africa and report that little is known about their efficacy, perceptions, use, and user behavior. The current research investigated the factors that influence the use of a mobile phone based service, m-banking in the context of academics in an institution in Nigeria to shed further light and understanding on the phenomenon.

User Studies of M-banking

Extant literature such as Nielsen (1993) defined usability and utility as subcomponents of usefulness which itself is a subcomponent of acceptability. Mobile devices are not necessarily used while on the move they can be used at home or at the office and within banks as well. However, the possibility for the user to carry the device introduces great variability to the context of use, which may even change in the middle of a usage experience (Yu and Fang, 2009). Väänänen-Vainio- Mattila and Ruuska (2000) emphasize the characteristics of mobile contexts to include the restrictions on use caused by the mobile contexts of use. In other words, the restrictions may be caused by unstable technology, lack of adequate technological infrastructure, or a social situation in which the user has to use the mobile device. The authors studied mental models of cellular phone menus with users of different ages. Their studies demonstrated that users' mental model of how a mobile phone menu is structured significantly influence

their navigation performance. Their results indicate that older users may need more transparent menu structures with hints that give feedback of the menu structure and where in the structure the user currently is. Ziefle and Bay (2006) found that children and teenagers might also need this kind of additional navigation support. Nah, Siau, and Sheng (2005) identified the cost of mobile devices and mobile services as investment concerns. Luarn and Lin (2005) argued that the financial cost was one of the greatest concerns in the adoption of m-banking services. In Nigeria, financial ability to procure web enabled mobile phones and subscribe for services may be a hindrance to the use of SMS-banking. Notwithstanding these challenges, Nigeria has by 2011 become one of the world's largest markets for mobile telephony. The reasons for this may be as a result of government's deregulation of the telecommunication industry, foreign direct investment and the importation of cheap mobile phones from Asia. This study conducted a survey to evaluate m-banking by academics in Nigeria.

Jarvenpaa, Lang, Takeda and Tuunanen (2003) carried out a cross-cultural study of mobile handheld devices and services involving 32 focus groups using 200 active urban mobile device users in Hong Kong, Japan and USA in 2001. The study found that USA users placed more significance on freedoms related to effectiveness at work and those in the individual sphere. Jarvenpaa et al. (2003) found that in Japan the mobile phone has not yet become part of many serious professional communications. The study concluded that in a collectivist culture, people are unlikely to use a mobile device to interact with others who do not belong to the same group.

Laukkanen (2007a) found that when customers had experience in using a mobile phone service they did not stress the importance of screen size in the service, but rather focused their attention on the other issues in the service consumption. Therefore device features may not be an issue for bank customers when considering using mobile banking. The somewhat limited input and display capability of current mobile devices is seen as limiting the use of m-banking applications (Pousttchi and Schurig, 2004; Laukkanen, and Lauronen, 2005). Laukkanen (2007a) found that a mobile phone's small screen cannot accommodate enough information about an account, and scrolling up and down would be needed. Results from Laukkanen (2007a) suggested that the mobile phone device itself may have little effect on the user adoption of m-banking.

Fain and Roberts (1997, p.53) defined risk "as a perception of consumers, not a characteristic of a product". Several empirical studies have focused on security of use of m-banking and found that using mobile phone in banking is entirely trustworthy (Brown, Cajee, Davies and Stroebel, 2003). Brown et al. (2003) and Luarn and Lin (2005) consider trust and security of the use of m-banking as one of the greatest concerns in adoption and the use of m-banking applications by bank customers. Their studies concluded that individuals may begin to worry about security issues during their use of mobile banking service transactions such as data input and output mechanisms, fearing loss of connection and personal bank customer performance errors. These have been corroborated in similar studies (Black, Lockett, Winklhofer, Ennew, 2001; Laukkanen and Lauronen, 2005; Kuisma, Laukkanen and Hiltunen, 2007). Laforet and Li (2005) report on the Chinese bank customers' use of Internet banking and finding that the security factor could influence consumers' perceptions and intention to use online banking in China.

Garcia-Alba, Wilke-Meins and Navajas (n.d.) found that service providers anticipate and respond effectively to customer needs and requests by providing customers with the knowledge necessary to make a purchase of mobile phones and m-banking services. Hale and Thakur (2006) report that customer service is influenced by two variables - speed and mobility access. The higher speed of service

is considered important for customers using any new technology application while time saving was identified in the four preference clusters for self-service technology in a prior study. Mobile access is another necessary element for the use of m-banking. Garcia-Alba et al. (n.d.) report that one of the most promising mobile banking services is that of checking the account balance immediately anywhere at any time, to avoid, for example, queuing in front of the banking hall or ATM to check an account balance, a typical sight at banks in Nigeria.

United Theory of Acceptance and Use of Technology (UTAUT)

The theoretical framework adopted was a modified UTAUT model. The UTAUT is described by Oshlyansky et al. (2006) as a recent instrument, which is a synthesis of eight existing models of technology acceptance, - including TAM. The UTAUT also integrated elements from: Theory of Reasoned Action, Motivational Model, Theory of Planned Behavior (TPB), a combined Technology Acceptance Model (TAM) and TPB model, Model of PC Utilization, Innovation Diffusion Theory, and Social Cognition Theory. The unification of these models provides UTAUT with eight constructs: performance expectancy, effort expectancy, attitude towards using technology, social influence, facilitating conditions, self-efficacy, anxiety and behavioral intention to use the system (Baker-Eveleth and Stone, 2008; Venkatesh, Morris, Davis and Davis, 2003). According to Oshlyansky et al. (2006) the results presented in their study clearly showed that the UTAUT tool is robust enough to withstand translation and to be used cross culturally, outside its original country and language of origin. The assumptions of the UTAUT are that behavior is determined by intention to perform the behavior. Actual behavior and intention have been found to be highly correlated (Davis, 1989; Fishbein and Ajzen, 1975). In addition, intention, itself, is determined by attitude towards the behavior. Constructs of the modified UTAUT model such as facilitating conditions, effort expectancy (perceived ease of use), performance expectancy (expectations) and social influence (social factors) constitute the variables for the present research undertaken. The UTAUT has been tested in several studies of IT use (Marchewka, Liu and Kostiwa, 2007; Li and Kishore, 2006.). Davis and Venkatesh (1996) have proved that the UTAUT model (and its modification/extension) has been applied successfully to determine the factors responsible for the use of technology in multiple contexts.

METHODOLOGY

Design

The study was positivist with regard to paradigmatic orientation using a pure quantitative method. In addition, a survey design approach was adopted for the study. This approach was chosen because survey approach is the prominent approach used in previous related studies e.g. (Amoroso and Hunsinger, 2009). Frequency counts and percentages are used and descriptive statistics are calculated and relationships among the factors are analyzed using, Pearson Product Moment Correlation (PPMC) and multiple regression analysis.

Population, Sample and Instrument

A total of 500 academics were selected through simple random sampling and were invited to complete the survey questionnaire. The University of Ilorin has 1000 academic staff and 20,000 students. To draw a simple random sampling without bias, a computerized sampling program to produce customized sets of random numbers (called Research Randomizer which is JavaScript based) was used to impartially select 500 respondents. The respondents were spread across the 12 faculties of the University of Ilorin, Nigeria. All the respondents had both a mobile phone and a bank account as indicated in the exploratory data. A total of 500 copies of the survey questionnaire were administered and only 480 respondents completed and returned the questionnaire successfully. In addition, face to face administration of the survey questionnaire by the researcher and assistants was adopted to maximize the response rate. Between 3 June 3 and 25 June 25, 2011 a total of 480 staff and students responded to the questionnaire. The students and academic staff members who participated were 149 and 331, respectively. The demographics showed that staff: had 14 respondents each (Faculties of Agriculture, Arts, Basic & Medical Sciences, Business & Social Sciences, Communication & Information Sciences, Clinical Sciences, Education, Engineering & Technology, Law, Science, Veterinary Medicine, Pharmaceutical Science) and 3 respondents each from Veterinary Medicine and Pharmaceutical Sciences. With regard to the students, there were 35 respondents each from (Faculties of Agriculture, Arts, Basic & Medical Sciences, Business & Social Sciences, Communication & Information Sciences, Education, Engineering & Technology, Law, and Science) and 16 respondents from Clinical Sciences. The gender distribution showed that 360 (75%) of respondents are males with 120 (25%) females participating in the survey. The eventual analysis of results did not indicate any gender based differences. The design of the 30-item questionnaire was guided by the literature review, previous survey questionnaire from similar studies, the theoretical framework, the statement of the problem and the research questions of the study (see Appendix 1). Some of the previous related studies include: Yu (2012), Al-Jabri and Sohail, (2012), Zhou (2012), Ravindran (2012), Chen (2012), Salehi and Alipour (2014), Chong, Chan and Ooi (2012).

Instrument Reliability and Validity

Weiner (2007, p. 20) described reliability as “the degree to which any measurement approach or instrument succeeds in describing or quantifying what it is designed to measure” whereas, validity “reflects those errors in measurement that are systematic or constant.” To ascertain measurement validity, construct validity is conducted. The latter is the measure consistent with the theoretical concept being measured. In other words, validity tests are designed to support or reject the instrument’s construct validity (Allen, Meyer, 1996; Weiner, 2007). Consequently, a principal component analysis was performed using the extraction and iterative sequence techniques to examine the structure of the two sections and thirty-item survey questionnaire (Wold, Esbensen and Geladi, 1987). As expected, the results therefrom were similar to those obtained by the items of each similar construct of the original instruments that were adapted from previous research (see section 3.2). Previously to identifying the factor structure of the constructs of the items in the survey questionnaire, a chi-square value of 6301.62 and significant level of 0.05 were obtained. Ultimately, eight (8) factors that influence the use of m-banking by the academics were retained without any further removals. In fact, the eight factors are: gender, customer service, type of bank, perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), behavioral intention (BI) and ICT Skills. These eight factors explained 75% of the variance in the data set and the significant loadings of all the items on the single factor indicate unidimensionality. To put it succinctly, no cross-loadings were found and these results provide evidence of the discriminant validity of the survey questionnaire (Lucas, Diener and Suh (1996). Accordingly, a re-test reliability method of two weeks interval was conducted using Cronbach Alpha (Santos, 1999;

Brazier, Harper, Jones, O'cathain, Thomas, Usherwood and Westlake, 1992). The survey questionnaire was pre-tested on twenty secondary school teachers and students (final year high school students) that informed slight revisions to the instrument. The reliability co-efficient stood at 0.71 that suggested the reliability of the questionnaire based on Gliem and Gliem (2003) and this was deemed appropriate for the eventual data collection. The reliability of each factor ranged from 0.54 to 0.91.

ANALYSIS AND RESULTS

Demographics

Fifty-two point one percent of respondents are male and 47.9% are female. All the respondents use mobile phones with 39.1% of total respondents indicating they have never used m-banking applications. The non-users of m-banking belonged to the academic staff aged 40 and above. Thirty one point four percent of the total respondents are students in the age group less than 30 years of age. The staff members are 68.9% but 99.3% of students who were invited to participate in the survey responded and students' ratio is much higher than that of staff that participated in the survey. Over 70.2% of total respondents had used mobile phones in the last 5 years. Only 9% of total respondents had never used SMS before. This category belonged to staff members. Seventy- nine point four percent (79.4%) use their mobile phones primarily for social reasons. Well over half of total respondents indicated using web-enabled handsets that was m-banking ready but only 1.4% do not know what types of mobile phones they used whether web-ready or not.

M-banking applications used by bank customers

Sixty-five percent of respondents use Internet banking with student customers in the overall majority in comparison to staff members of the university who participated in the survey. Ninety-eight point two percent of student respondents use Internet banking. SMS banking is preferred by academic staff who use m-banking as 91.2% of academic staff respondents use SMS banking as their application of choice. Two percent of total respondents use phone banking whereby they make phone calls to check for their balance, transfer funds, or do other transactions. None of the students who responded to the survey use phone call banking. Wang, Wang, Lin and Tang (2003) reported similar results from a survey of 123 users that collected data using telephone interviews that provided empirical support to show the influence of perceived usefulness and perceived ease of use on intention to use m-banking. Seventy six percent of total respondents use ATM banking with 92.8% of student respondents indicating its use. A less number of staff uses ATM banking in ratio to the student users. Only 13% of total respondents use MasterCard or VISA banking applications. No respondents use credit cards. Fifty- four point one percent uses some forms of m-banking on a daily basis. The m-banking applications mostly used are Internet banking, SMS banking, automated teller machines (ATM) and phone call banking.

The Factors that Influence the Use of M-banking by Academics

The relationships between the factors (gender, customer service, type of bank, perceived usefulness, perceived ease of use, social influence, behavioral intention and ICT skills) and the use of m-banking was investigated and the results are presented in table 1.

Table 1: Results of the Relationships among the Factors that influence the Use of M-banking (Using PPMC)

S/ N	Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1	Use of m-banking	1.15	0.510	1								
2	Gender	3.69	1.054	-0.107	1							
3	Customer service	1.75	0.801	0.021	0.173	1						
4	Type of Bank	1.68	0.991	-0.051	-0.012	-0.043	1					
5	Perceived usefulness	13.33	2.813	0.041	-0.419	0.065	0.033	1				
6	Perceived ease of use	1.91	0.819	0.097	0.273	0.457	0.286	-0.145	1			
7	Social influence	1.78	0.820	0.049	0.288	0.336	0.054	-0.091	0.345	1		
8	Behavioral Intention	1.60	0.841	0.172	0.350	-0.125	0.171	-0.058	0.075	0.043	1	
9	ICT skills	1.98	0.974	0.104	0.249	0.211	-0.123	-0.308	0.091	0.379	0.034	1

Level of significance = 0.05

The results of the relationships between factors such as customer services, type of bank, perceived usefulness (PU) and perceived ease of use (PEOU) and the use of m-banking by academics in Nigeria revealed that customer services ($r = 0.021$), type of bank ($r = -0.051$), perceived usefulness ($r = 0.041$), perceived ease of use ($r = 0.097$) and social influence ($r = 0.049$), ICT skills ($r = 0.014$) were positively correlated with the use of m-banking by academics. However, the type of bank ($r = -0.051$) and gender ($r = -0.107$) were found to be negatively correlated with the use of m-banking by the academics. Behavioral intention ($r = 0.172$) and ICT skills ($r = 0.104$) were positively correlated with the use of m-banking by the academics. The results showed that gender was positively correlated with customer service ($r = 0.173$), type of bank ($r = -0.012$), perceived usefulness ($r = 0.419$) and perceived ease of use ($r = 0.273$) positively correlated with customer service ($r = 0.173$). Customer service and perceived usefulness ($r = 0.065$) were positively correlated, perceived ease of use ($r = 0.237$), social influence ($r = 0.288$), behavioral intention ($r = 0.230$) and ICT skills ($r = 0.249$) were negatively correlated with perceived usefulness (-0.0419) and the type of bank ($r = -0.012$). The type of bank and perceived usefulness ($r = 0.033$), perceived ease of use and social influence ($r = 0.345$) and behavioral intention and ICT skills ($r = 0.034$) were positively correlated. The behavioral intention and gender were positively correlated ($r = 0.350$), but behavioral intention was negatively correlated with perceived usefulness ($r = 0.058$).

Table 2 suggests that the R square value is 0.60 while the R value adjusted is 0.57. Furthermore, the overall correlation of all the factors influencing the use of m-banking shows that $R = 60$. The standard error of the estimate gives a value of 12.57. Subsequently, the second step of analysis of variance implemented on multiple regression yields the F-ratio value of 53.12 which is significant at 0.05 levels. Overall, these results suggest that all the measures of the factors influencing the use of m-banking together make 57% of m-banking use. In other words, all the factors jointly influence the use of m-banking.

Table 2: Summary of Multiple Regression Analysis on the Combined Causes/Factors Influencing the Use of M-banking (Dependent Variable) by the Eight Influencing Factors/Measures (Independent variables) (N = 480)

Model Summary						
Model	R	R Square	Adjusted Square	Standard Error of the Estimate		
1	.599	0.60	.570	12.568		
Anova						
Model		Sum of Squares	df	Mean Square	F.	Sig.
1	Regression	102031.415	6	10412.111	53.12	.000
	Residual	101312.120	474	132.121		
	Total	203343.535	480			

The results in Table 3 indicate the relative contribution of the following factors to the use of m-banking in the order of magnitude of significance. Perceived usefulness made the most significant contribution (Beta = 0.324, t = 5.581); followed by social influence (Beta = 0.31, t = 4.100); perceived ease of use (Beta = 0.25, t = 3.332); user expectation (Beta 0.18, t = 2.10); behavioral intention (Beta = 0.15; t = 2.190); type of bank (Beta = 0.14; t = 2.090); perceived value (Beta = 0.13; t = 2.008); ICT skills (Beta = 0.11; t = 2.001); Customer service (Beta = 0.10; t = 1.671) and lastly; gender (Beta = 0.01; t = 1.431). Overall, these results suggest that all the factors influence the use of m-banking.

Table 3: Relative Contribution of the Factors that Influence the Use of M-banking (N = 480)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std Error	Beta		
1 (Constant)	13.140	4.103		2.912	.005
Gender	.789	.543	0.047	1.431	.047
Customer service	.967	.498	0.104	1.671	.006
Type of Bank	.871	.541	0.143	2.090	.030
Perceived usefulness	2.348	.341	0.324	5.581	.000
Perceived value	.982	.456	0.128	2.008	.009
Perceived ease of use	2.198	.387	0.251	3.332	.007
Social influence	1.982	.488	0.310	4.100	.001
Behavioral Intention	1.589	.512	0.153	2.190	.018
ICT skills	1.348	.401	0.109	2.001	.010
User expectation	1.762	.450	0.183	2.504	.003

Level of sig<0.05

DISCUSSION

The overriding purpose of the study was to investigate the influence of factors like customer services, type of bank (brand), perceived ease of use, perceived usefulness and ICT skills on the use of m-banking by academics in Nigeria. The study surveyed only the members of the academic community and did not include the rest of the general public. More tables have not been included as a result of space limitations.

Overall, the results suggest a technology friendly university environment. The majority of respondents have been using mobile phones for more than five years making the evaluation more worthwhile to draw conclusions with regards to user perceptions of the use of m-banking. Ultimately, the first research question sought to find out the m-banking applications mostly used by academics in Nigeria and found that SMS banking and the use of ATMs were the commonly used features followed by the MasterCard and VISA applications. Luo, Li, Zhang and Shim (2010) report a growth in the number of bank customers who use various m-banking channels for financial services via mobile devices such as downloadable applications, mobile browsers, text messaging, and preloaded applications. Laukkanen (2007b) reported that current m-banking services enable consumers to request their account balance and the latest transactions of their accounts, to transfer funds between accounts, to buy and sell orders for the stock exchange, and to receive portfolio and price information. The implication for banks and service providers in Nigeria is that there is the need for continuous encouragement of bank customers to use m-banking and putting in place regular maintenance and support systems of m-banking services.

The second research question focused on the factors influencing the use of m-banking. Until now, Jeyaraj, Rottman and Lacity (2006) had reported over sixty factors that may influence the adoption and the use of technology in multiple contexts. Some of the factors include: government, competition, satisfaction, professionalism and uncertainty. Accordingly, the current research sought to determine the key factors that influence m-banking use in the context of Nigeria. The key findings identified eight factors which are: gender, customer service, type of bank, perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), behavioral intention (BI) and ICT Skills. These findings are similar to Yu (2012) that identified perceived credibility, performance expectancy, social influence and perceived financial cost as the factors that affect individuals in their decision to use m-banking in the context of Taiwan. The researcher reported that social influence is the most significant factor that affects the individual intention to adopt m-banking. In addition, Hanafizadeh, Behboudi, Abedini and Jalilvand (2014) report variables such as perceived usefulness, perceived ease of use, need for interaction, perceived risk, perceived cost, compatibility with life style, perceived credibility and trust with regard to m-banking. All earlier mentioned variables successfully explain the adoption of m-banking in the context of Iran, although, life style and trust were found to be the most significant factors. Whereas, there is a difference in the finding of Malik and Gulati (2013) that highlight factors such as accuracy, security, convenience, control/accessibility and cost as crucial to the adoption and use of m-banking by clients in India. The reason for the difference in the findings may be as a result of the fact that the research by Malik and Gulati (2013) was restricted to only two public sector banks' customers and the absence of any paradigmatic and theoretical frameworks and measurement scales used to guide the study.

The last research question sought after the relationships among factors (such as customer services, type of bank, ICT skills, perceived usefulness, perceived ease of use) and the use of m-banking by academics. The results indicate that customer services, type of bank, perceived usefulness (PU) and perceived ease of use (PEOU), ICT skills and social influence are factors that positively correlate with the use of m-banking by academics in the context of Nigeria. The inter-correlations among the factors showed that perceived ease of use, social influence, behavioral intention and ICT skills were negatively correlated with perceived usefulness and the type of bank/brand name. The type of bank, social influence, behavioral intention and ICT skills were positively correlated with perceived ease of use. These results suggest implications for theory and practice of m-banking. The theorists of technology adoption and use (particularly, m-banking use) may need to integrate constructs such as customer services and bank

services into the models of technology adoption to better explain the phenomenon in the context of Nigeria. The banks can also focus their m-banking products' drives, strategies and initiatives on customer services and in ways to impact on perceived usefulness and perceived ease of use of bank clients through awareness campaigns, since these factors have been shown to have positive influence on m-banking and may well shore up the rates of use. Gikandi and Bloor (2010) advocate for increased publicity of values of m-banking to increase the rates of adoption and use of m-banking in Kenya. Further analysis of the key results of the current research shows the relative contributions of the factors that influence the use of m-banking. The factors are presented in the order of their significance: perceived usefulness, social influence, perceived ease of use, user expectation, behavioral intention, type of bank, perceived value, ICT skills, customer service and gender. In addition, the key findings indicate that all the factors influence the use of m-banking in Nigeria. Meanwhile, Aboelmaged and Gebba (2013) found a positive significance of attitude and subjective norms on the use of m-banking. The researchers report a positive correlation of perceived usefulness on attitudinal intention to the use m-banking in the context of the United Arab Emirate (UAE). Furthermore, Chitungo and Munongo (2013) apply the Technology Acceptance Model (TAM) as theoretical framework to explore m-banking with regard to rural Zimbabwe and report that perceived usefulness, perceived ease of use, relative advantages, personal innovativeness and social norms positively correlate with intention to use m-banking. There seems to be a convergence of findings which may be due to the fact that m-banking is still growing in a number of countries such as Nigeria, UAE and Zimbabwe that share similar developmental and socio-economic challenges.

CONCLUSION

The contributions of the study to prior research have been highlighted in the discussion section. This study is important for academics, bank customers, banks, m-banking service providers, and theorists of technology adoption and use. Despite limiting the current survey to academics, the results emphasize the importance of variables such as perceived usefulness and social factors in explaining the use of m-banking in Nigeria. The inter-correlations between factors like customer services, type of bank, perceived usefulness, perceived ease of use and ICT skills have also provided benchmark data for policy makers to focus improvements in design, products and lead to potential increase in the rates of use of m-banking. The improved understanding of the positive and negative correlations among the relevant variables has extended the boundaries of knowledge of the constructs of the modified UTAUT model in the context of academics in Nigeria. The study was not without its limitations. Firstly, a purely quantitative approach that the study adopted must have left out valuable data that could have been examined for patterns and trends, using a multiple methods approach with regard to qualitative data that may have added breath and scope to the study. In addition, a sample drawn from academics may not be a true reflection of the larger society in the context of a developing country such as Nigeria where poverty remains high despite a recent increase in the adoption and the use of mobile phones. Consequently, the generalization of the results of the study outside the context of the University of Ilorin, Nigeria may be misleading, as the university is a pioneer in the adoption and use of technology. In addition, there are the issues of illiteracy and access to mobile applications with regard to the general public. A larger sample including non-academics in Nigeria can also be taken in future research, since this study has shed some light on the use of m-banking in the country. Further analysis of the relationships among the constructs from UTAUT in the context of SMS/m-banking can be carried out by future studies using second generation methods of data analysis that include Structural Equation Modeling (SEM).

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APPENDIX A

Questionnaire on the Factors Influencing the Use of M-banking by Academics: Case study SMS-based M-banking

Thank you for agreeing to participate in this survey to investigate the factors that influence the use of M-banking by lecturers, researchers, librarians, scholars and students. All information provided will be used only for educational purposes and will not be divulged to third parties.

A: Demographic Data

Please provide your status in the university by ticking appropriately below:

i. 1. Lecturer 2. Researcher 3. Librarian Other academic Student Any other

ii. State your gender:

1. Male 2. Female

iii. State your age:

1. 14-24 2. 25-35 3. 36-46 4. 47-57 5. 58 -68 6. 69 and above

iv. State your position (staff) or level (student):

1. Undergraduate student 2. Postgraduate student 3. Graduate Assistant to Lecturer I 4. Senior Lecturer to Reader 5. Professor Other such as remedial student, please specify.....

v. What is your ICT skill level?

1. No skills 2. Beginner/Learner 3. Skilled user 4. Advanced user 5. Expert

vi. Do you own a bank account? 1. Yes 2. No 3. I do not know

vii. Do you subscribe to mobile banking services offered by your bank(s)? 1. Yes 2. No 3. I do not know

viii. Kindly respond to the items below by indicating your level of agreement with the statements.

ICT Skills	Agree 3	Undecided 2	Disagree 1
a).I find it easy to use mobile devices & applications			
b).It is not easy for me to understand how to use mobile devices & applications like m-banking			
c).Having the Internet and computer skills improve my use of mobile devices for online interactions.			
d).Having the ICT/Internet and computer skills enable me to access the m-banking applications using mobile devices			

ix. ICT resources such as Internet data plan and Wi-Fi are available at my home, hostel, classrooms

And office. Tick as appropriate. 1. Yes [] 2. No [] 3. I do not know []

B: The Use of M-banking (Performance Expectancy)

1. The following table contains a list of mobile tools, m-banking features and services.

Indicate in the boxes on each row your frequency of use.

Actual Use: Tick appropriately, those that apply to you

Item 1: System Use	a) State frequency of use					
Mobile Tools and Services	Many times a day	Daily	Weekly	Monthly	Rarely	Avg No of yrs of use of mobile devices
Phone						
• (a) Have access to Mobile phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (b) Have access to Smart phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (c) Have access to Web phone (VoIP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (d) Have access to iPhone/Android	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (e) Have access to iPad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (f) Have access to Blakberry (BBM)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (g) Have access to Texting/SMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Computer/Organizer						
• (h) Have access to smart technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (i) Have access to Laptop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (j) Have access to Notebook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (k) Have access to Tablet computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (l) Have access to Handheld organizer (PDA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
M-banking Services						
• (m) Real time transactions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (n) Transfers to my/other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

accounts						
• (o) Requests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (p) Self-service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (q) Exchange rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (r) Change my profile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (s) Account information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (t) Access mobile money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (u) SMS banking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
• (v) Alert notification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
((x) Have access to Other (please specify)						

2. The items below test for the motivational and technical support you receive for your m-banking

Item 2: Facilitating Conditions	Agree 3	Undecided 2	Disagree 1
1) Customer services of my bank helps with my m-banking			
2) My type of bank (new generation/old generation, commercial/community bank, m-banking is by default, technology focused or not, staffing, IT facilities) has influence on my use of m-banking			
3) I have access to the Internet via my phone or mobile devices			
4) The university encourages mobile banking e.g. smart ID cards with banking features, e-payment, etcetera			
5) I feel that my bank does enough to make me use m-banking			
6) My mobile devices are compatible with m-banking applications and software used by my bank			
7) My attitude towards the use of m-banking is positive			
8) I perceive that m-banking is good for me			
9) I perceive that banks encourage me to use m-banking			
10) My banks provide technical support like software downloading and manual set up on my mobile devices for m-banking			

3. Social Influence: (Using a three-point scale below, indicate how these statements have influenced your use of m-banking):

Item 3: Perceived Relevance of Use of M-banking	Agree 3	Undecided 2	Disagree 1
1) M-banking is very important			
2) My use of M-banking has increased the			

	quality of my transactions			
	3) My use of m-banking has enhanced my status as a bank customer			
	4) The use of m-banking provides me with relevant and timely information about my bank accounts & transactions			
	5).SMS alert notification & transfers are good			
	6).I depend on SMS & M-banking for 24/7 banking			

4.(Using a three-point scale, indicate your perceived usefulness of m-banking):

Performance expectancy – perceived usefulness

Item 4: Perceived Usefulness	Agree 3	Undecided 2	Disagree 1
1) Using m-banking will enable me to pay more quickly			
2) M-banking makes it safer for me to pay or receive money (as opposed to cash or other forms of transactions)			
3). SMS banking helps me to conduct my banking transactions			
4).I will find m-banking a useful possibility for transactions			
5).M-banking improves my performance of banking transactions			
6).Using m-banking will make it easier for me to make transactions.			
7).I will find mobile services useful in conducting my banking transactions			

5. (Using a three-point scale, indicate your attitude towards the use of m-banking): Attitude

Item 5: Attitude	Agree 3	Undecided 2	Disagree 1
1 I use m-banking and it is a good idea			
2 I would prefer conventional banking transactions because of negative impressions I have about the use of m-banking			
3 My efficiency as a bank customer is enhanced by the use of m-banking			
4 I trust the use of m-banking			
5 I am scared and afraid of using m-banking			

6	I am worried about threat of fraud associated with the use of m-banking			
7	I am worried about my banking data getting into the wrong hands with m-banking			
8	I am worried with electronic transactions			
9	Overall, I am satisfied with the use of m-banking			

6.(Using a three-point scale, indicate your perceived ease of use of m-banking):

Effort Expectancy PEOU

Item 6: Perceived Ease of Use (PEOU)	Agree 3	Undecided 2	Disagree 1
1) Learning to use m-banking is easy for me			
2) My interactions with m-banking will be clear and well understood			
3) It will be easy to become skilled in the use of m-banking.			
4) I would find SMS banking easy to use			
5) I would find the m-banking applications flexible to interact with.			
6) I will find procedures of the use of m-banking adaptable to my needs			

7.(Using a three-point scale, indicate how you intend to use m-banking in the future):

Social influence - BI

Item 7: Behavioral Intention	Agree 3	Undecided 2	Disagree 1
1 I will use m-banking provided I have access to the Internet/SMS			
2 I will increase my use of SMS banking and mobile banking in general in the future.			
3 I will strongly recommend my colleagues to use m-banking.			

8. Inhibitors to the Use of M-banking

Item 8: Inhibitors to the use of M-banking	Agree 3	Undecided 2	Disagree 1
1) Lack of access to Web-enabled mobile devices			
2) Lack of Internet data plan/Wi-Fi			
3) Overall sentiment that m-banking is not good			
4) Technical issues – server down, web pages of banking platform do not display well on small screen of mobile device			

5) Lack of technical skill to use mobile devices & applications			
6) I do not feel like using m-banking			
7) I have no trust in SMS/m-banking			
8) The subscription/SMS rate for m-banking is high			
9) High cost of airtime (service provider) on my mobile devices			
10) Learning to use SMS-banking consumes time, too slow, complicated			
15) Lack of technical support for m-banking by my bank			
16) My mobile devices are not compatible to the university/provider Wi-Fi			
17) The use of m-banking is not trustworthy and safe in terms of privacy and security of personal financial data			

18) Other inhibitors please specify.....

19) Further additional (concluding) comments.....