

## **Unlocking the Potential of the Mobile Phones by University Undergraduate Students: a case of Sokoine University of Agriculture**

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### **Abstract**

Literature show that use of mobile phones is omnipresent and pervasive in developing countries, especially among the youth. This study was carried out to assess the academic benefits of owning and using mobile phone among the undergraduate students at Sokoine University of Agriculture in Tanzania. Specifically, the study assessed the type of people students communicate to, preferred people and preferred period of the day and also the type of information that is communicated, and when mobile phones are inactivated. Students were randomly sampled from all departments. The study involved semi-structured questionnaires, and 302 undergraduate students who were randomly sampled from various degree programmes participated. The study found that most students prefer to communicate to their mothers and most of the communications are done from late evenings. Family issues were mostly communicated on mobiles phones. Further, the study found little use of mobile phones in academic issues. The study recommends that the University should educate newly enrolled students on proper use of mobile phones, with the view of using mobile phones in academic-related issues.

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## Introduction

The use of mobile phones communication device has rapidly increased since the commercialization of mobile phones technology by Motorola in early 1980s (Harman & Sato, 2011). Mobile phones are one of the most common information access devices with almost 31% of the global population having access (Sayan, 2006; Sanou, 2013). Mobile phone technologies are now in the hands of almost 31% or 2 billion people of the 6.47 billion people on this planet ("Population Reference Bureau Statistics", 2006; Motorola, 2006; Sanou, 2013). The penetration of these technologies is increasing very rapidly with around 779 million (Gartner Press Release, 2005). Mobile phones are sold every year and were expected to reach over 1 billion units per year in 2009 (Gartner Press Release, 2005). The Pew Research Center (2013) reported that USA with a population of 307 million people, 70.1% of its people owned mobile phones in 2012, and lowered to 52.7% in 2013 (Smith *et al.*, 2011). And an earlier study in 2010 found that of 246 tracked undergraduate students, 96% owned cell phones. These staggering numbers are indicator of the growth and reach of mobile phones. As 75 percent of the world's mobile subscriptions are in developing countries, studies of patterns of use of mobile phones are essential in broadening our understanding (Pearce, 2013).

Mobile phones have an intrinsic social impact by the way the technologies emphasize portability and constant communication. The portable nature of this communication medium means that it is often used in public spaces. Mobile phones today go beyond just voice communication and provide a multitude of other features and services including text messaging (SMS), multimedia messaging (MMS), photo display and recording, video playback and recording, calendaring, etc. Townsend (2002) argues that the diffusion of the mobile phone was among the fastest of any technology in history. Such a rapidly evolving and wide spread communication technology and medium has important social contexts and implications. The significance of the mobile phone lies in empowering people to engage in communication, which is at the same time free from the constraints of physical proximity and spatial immobility (Hans, 2004).

Nowadays, modern technology develops so rapidly that people can hardly catch up with its pace (Sife, Lwoga, & Sanga, 2007). There is no doubt that mobile phones, as a new industry of modern technology, have got into people's life. As sensitive reflectors of information, more and more mobile phone users have appeared in the campus everywhere (SM, 2012). While some students are enjoying whatever mobile phones have brought to us, there are others who stand against it. According to SM (2012), the main benefits of mobile phones in university are as follows: firstly, there is no denying the fact that mobile phones have made campus life more convenient. A survey found that mobile phones are becoming part of university life and 99.7% of students use their own mobile phones to communicate with others (Ransford, 2009). As it can be seen, mobile phones provide students with a fast and convenient way of communication, such as getting in touch with schoolmates and hunting for jobs, which was previously unimaginable. Secondly, instead of going to the PC lab and finding computers to look for news on current events, students can use mobile-network to search the Internet. It is by this means that university

students can broaden their horizon and enrich their minds. Furthermore, with the help of mobile phones, students can do work more efficiently. For example, Hans (2004) quoting Palen, Salzman and Youngs (2001) says that more and more, mobile phones invade daily routine behavior of all kinds, and there is an increase in “grooming calls” which have primarily a non-instrumental, socio-emotional function: for example, showing concern, solidarity and commitment, and articulating nearness, compassion, sympathy and love. Lastly, with the help of mobile phones, students can do work more efficiently.

Many students in university treat mobile phones as electronic dictionary and a chatting device with teachers for academic purpose. They share useful information related to their lessons and solve academic problems (SM, 2012). In this way, mobile phones not only can save students’ time and energy, but also help with them in their studies. However, the negative effects are also obvious. Above all, more and more university students are indulged in online chat and online games, which make them weak in studies. Moreover, some even use mobile phones to cheat in examinations. Hans (2004) quoting Ram and Jung (1990) says that in a quantitative perspective, the simple concept “amount of cell phone usage” results in a multidimensional construct unfolding on at least three independent axes: 1) Usage intensity: which refers to "how often the product is used (usage time) regardless of the different applications for which the product is used." 2) Usage breadth: referring to the number of partners to whom calls are directed and from whom calls are received; and 3) Usage variety, measuring the "different applications for which a product is used or the different situations in which a product is used, regardless of how frequently it is used" .

Chakraborty (2006) study of 100 university students in India (50) and the U.S.A (50) suggested that overall students in India used mobile phones differently from their American counterparts. The researcher concluded that in a developing market like India, mobile phones may be the primary and only phone to which students had access. Some of Chakraborty (2006) study findings included most of the respondents indicating that they owned and used mobile phones to stay in touch with family and friends, and the need to use in case of emergency or personal safety. Yet twenty five percent of students in India indicated that the most important reason for acquiring a mobile phone is for emergency. Further, Chakraborty (2006) study found that a large percentage of respondents (70% from India and 66% from the U.S.A) kept their phones in mute / vibrate mode while attending classes, similar 22 figures (70% from India and 60% from the U.S.A) were disclosed for a movie or concert scenario. Some respondents noted that they kept their phones in mute / vibrate mode while in a meeting. The respondents from both India and the U.S.A indicated that they used phones more in the evening than any other time of the day (76% and 86% respectively). The least used time of the day was morning with only 44% and 48% responses from India and the U.S.A respectively.

Studies on the impact of using a cell phone while driving or simultaneously engaging in other motor activities of a similar nature are common (Strayer, Drews, & Johnston, 2003; Drews, Pasupathi, & Strayer, 2008; Charlton, 2009; Hyman *et al.*, 2010), but research investigating the influence of cell phone use in other domains is surprisingly sparse. One area of particular interest which seems underrepresented in the literature regarding cell phones use is the impact of this communication device in academic settings.

Harman and Sato (2011) quoting Nielsen Wire (2010) indicated that the analysis of data gathered in the U.S.A by the Nielsen Company revealed that young adults aged 14-18 exchange an

average of 1,630 text messages per month, or approximately 54 messages per day. Additionally, in regards to cell phones use in educational settings, Herman and Sato (2011) quoting Pew Internet (2010) in the U.S.A. wrote that in spite of the fact that many schools prohibit the use of cell phones, 65% of students who attend schools that ban cell phones, still brought them every day and 43% of students reported that they used to text messages in class at least once per day.

### **Mobile phones in Africa**

Cell phones today are nearly ubiquitous in African society (Aker & Mbiti, 2010). Teenagers and young adults are obsessed by them, carrying them around everywhere. This is the first generation to have direct access to high technology. The World Bank and African Development Bank report that there are 650 million mobile users in Africa, surpassing the number in the United States or Europe (Aker & Mbiti, 2010; Sanou, 2013). In some African countries more people have access to a mobile phone than to clean water, a bank account or electricity (Sambira, 2009; Aker & Mbiti, 2010). In Sub-Saharan Africa especially, three out of four subscriptions were done by cell phones users. This is the highest ratio of mobile to total telephone subscribers of any region in the world (Sanou, 2013). People in Africa are using mobile phones for everything: communicating, listening to the radio, transferring money, shopping, mingling on social media and more (ITU, 2004; Sanou, 2013)

Researchers have outlined many reasons for using and for rapid spreading of mobile phones in Africa (Aker & Mbiti, 2010). The major reason as indicated by Alzouma (2006) is that mobile phone fit better in the African domestic environment; in the sense that it is in accordance with the mental dispositions of illiterate people. With cell phones, Africans can speak their own languages with the full emotional content and the rational, the logic of verbal communication between themselves and others. Other reasons are such as mobility and security. Also one can work using the radio spectrum, as such there is no need to rely on physical infrastructure; it requires only basic literacy, and therefore, mobile phones are accessible to a large segment of the population, allowing for the transfer of data, which can be used in the context of applications for the purposes of health, education, commerce or governance. Finally, due to factors like increased private sector competition and innovative payment methods (e.g. pre-paid method), mobile phones are increasingly affordable to a larger part of the population (Donner, 2006; Economist, 2008, Sambira, 2009; Rashid & Elder, 2009).

As mobile phone penetration rates increase rapidly in developing countries, there has also been an increase in the extent of research on mobile phone usage (Sife *et al.*, 2010; Sanga *et al.*, 2013; Sanga *et al.*, 2014). In general, studies have focused on different aspects of the adoption and use of mobile phones. Most of the findings from these studies put mobile phones as important tool for community development in the developing countries. However, there is still a lack of evidence of usage of mobile phones as a tool to solve development problems, mainly due to the difficulty in measuring their social and economic impacts (Rashid & Elder, 2009). To understand Africa's digital opportunity, one has to look at the numbers: six out of the 10 fastest-growing economies are in Sub-Saharan Africa (Aker & Mbiti, 2010). Africa is the second-biggest mobile market in the world — smartphones outsell computers four to one. Significant opportunities exist here to use social media in business (Aker & Mbiti, 2010).

## Mobile phones use in Tanzania

The use of mobile phones in various sectors in Tanzania for different purposes has been reported by many previous studies (Ringo & Busagala, 2012; Sanga *et al.*, 2013; Venkatakrishnan & Ngilangwa, 2013; Bhalalusesa, & Arshad, 2014, Sanga *et al.*, 2014, Shao & Seif, 2014; Mahenge & Sanga, 2016, Mtebe, 2016). Mtega *et al.*, (2012) explored the use of mobile phones by undergraduate students at Sokoine University of Agriculture; Morogoro, Tanzania for teaching and learning purposes and found that majority of the respondents used their mobile phones for teaching and learning process. It was found that most respondents reported to use conventional mobile learning applications including text messages and phone calls. Only few respondents from teaching staff and students had smart phones with a number of m-learning applications. These were able to create, upload, download and share academic resources through their smart phones while others recorded and stored files in their phones. It was also found that among teaching staff many were not aware of the capacity of their mobile phones such that they underutilized them. Costs associated with downloading multimedia content was another constraint which limited some respondents especially students from using phones for learning purposes. More than that, users were forced to use SMART/VISA cards for buying online mobile applications of which most respondents were not aware of (Mtega *et al.*, 2012).

Sife *et al.*, (2010) conducted a study to investigate the contribution of mobile phones to rural livelihoods and poverty alleviation in Tanzania and they found that mobile phones are useful in performing efficiently and effectiveness business, expand business and strengthening social networks as well as provide ability to handle emergency issues easily to citizens. Hassan and Semkwiji (2011) explored the role of mobile phones on sustainable livelihood in Arusha and Unguja (Zanzibar). They found that mobile phones are used as delivery tool for economic related information (e.g. business news), markets and market information (e.g. types and prices of different commodities), agricultural information (e.g. weather information, seeds varieties), social information (e.g. ceremonies, deaths, and sickness), education information, Government and international information as well as religious information. Kadigi *et al.*, (2013) investigated how information asymmetry between livestock keepers and other actors in local beef cattle can be address. They developed a system called 'e-ng'ombe' which till now is not yet fully implemented but if it could be implemented the problem of market information between different actors can be solved.

Similarly, Kihwele and Bali (2013) examined parents', teachers' and students' perceptions of the effects of students' access to mobile phones on students learning performance. They found that students' with mobile phone misbehave and hence have poor performance. Thus, they recommended the need to have a mobile control system for students who are using mobile phones. Also, they recommended the need to developing learning contents for students which will be censored to control the quality of mobile information. Furthermore, there is a need to having a mobile information literacy study for students. Chambo *et al.*, (2013) examined ten secondary schools in Kilimanjaro Region and they found that majority of students had mobile phones with Internet connectivity. Chambo *et al.* (2013) concluded that mobile learning platforms that were in place were not workable in all contexts.

From the literature reviewed in this study the major weakness of previous studies is that most of the studies were done without being guided by either theoretical framework or conceptual framework (Mtebe & Raisamo, 2014). Thus this study was guided by a combination theory and

conceptual framework (i.e. theoretical framework). Therefore, this study addressed the following questions: (i) what are the periods of conversations between undergraduate students and the people they talk to? (ii) how much money undergraduate students spent on mobile phones? and (iii) how is the mobile phone used by undergraduate students when they are in classrooms? The rationales for examining usage pattern of mobile phones among undergraduate students are many. The reasons for the importance of this study are as explained in this section. Authors believe that the study contributes in adding a work of literature. Also, the study will serve as a reference for telecommunications companies which need to investment their products in some universities in the country. In addition, this study fills the gap in knowledge in the areas of information science, communication and mobile informatics (Dahlbom & Ljungberg, 1998). Furthermore, the study can be used by systems analysts to design mobile learning (m-learning) appropriate for learning and teaching undergraduate students in the environments of low bandwidth. Finally, the findings from the study can be used by policy makers to develop appropriate policies for subsidizing Internet to undergraduate students who will be using m-learning.

### **Theories Explaining the Use of Mobile Phones**

The use of mobile phone for social and economic purpose is on the increase. Six theories contribute significantly in explaining the use and adoption of mobile phone among university undergraduate students. These include theory of technology acceptance; theory of reasoned action; theory of planned behavior; diffusion of innovations; domestication; and uses and gratifications (Venkatesh *et al.*, 2003; Martin & Ajzen, 2010; Terry *et al.*, 1993; Rogers, 2003; Pearce, 2013). Each of these theories is well explained below:

#### **Theory of technology acceptance:**

Theory of technology acceptance explains determinants of intentions to use or not to use a particular technology (Venkatesh *et al.*, 2003). The key elements of intention construct identified in the theory are: perceived usefulness; perceived easy to use; attitude toward use; and intention to use and actual use. Further, the model explains factors that form basic constructs influencing mobile phone adoption, which include social influence expressed as the pressure exerted on the individuals by opinions of others; facilitative conditions or necessary infrastructure and perceived usefulness or the extent to which a user believes on the benefit accrued from using the mobile phone and perceived ease to use. According to the theory determining factors toward intentions for using mobile phone include personal factors such as preference and beliefs about the mobile phone. Yet others are demographic factors such as age, gender, education and social economic factors like occupation and income. These hold back or foster the intention of one to use the technology, i.e. a mobile phone. This theory is relevant in understanding the possible factors that do motivate or demotivate university undergraduate students to use mobile phones to communicate information.

#### **Theory of reasoned action:**

Theory of reasoned action stipulates that intentions to use a technology proceed from attitude toward that technology and toward its use, and the subjective norms (Martin & Ajzen, 2010; Terry *et al.*, 1993). . This theory is important in understanding the influence of significant others

such as parents and close friends in communicating information using mobile phones. Significant others may be useful in various ways including buying mobile phones for university undergraduate students or friends, or even encouraging the use or ensuring the availability of money or airtime to them.

### **Theory of planned behavior:**

The theory of planned behavior is the extension of the theory of reasoned action (Ajzen, 2012). On top of attitude and subjective norms as determinants of intention in the use technologies, i.e. mobile phone, this theory adds perceived control to the construct of intention. This is what is called self-efficacy in some other literature. It is the extent to which an individual feels that they require certain skills and knowledge to work with the technology and produce the required outcome. The theory of planned behavior is important in understanding the influence of technological training in using mobile phones to communicate information. Hence, the undergraduate students need to have various skills and knowledge including how to search for relevant information and they should be trained well in the technology i.e. mobile phone use for communication of information, Internet use, downloading documents, etc.

### **Diffusion of innovation:**

Diffusion of innovation is the theory of how, why, and at what rate new ideas and technology spread through social systems (Rogers, 2003). Thus, diffusion of innovation can aid in the understanding or in exploration of complexities related to finding how undergraduate students use their mobile phones.

### **Domestication:**

Another theoretical perspective that aligns well with mobile adoption and use is domestication (Haddon, 2003). This theory concentrates on how individuals go through the process of discovering, purchasing, and integrating devices into their lives, and helps to account for how individuals judge others', how they use the devices, as well as the social consequences of the device. Domestication can be a fruitful theory to use to undergraduate university students because it accounts for social uses and consequences.

### **Uses and gratifications:**

The study of media choice of the mobile phone and other information communication technologies is sometimes examined from uses and gratifications perspective (Pearce, 2013). This approach is concerned with establishing the linkages between the kinds of motivations undergraduate university students might have for media.

### **Conceptual Framework**

The variable that this study set out to investigate was the university undergraduate students' use of the mobile phone, which was the dependent variable of the study (Figure 1). The independent variables of the study were four: owning mobile phone and cost; money that university undergraduate students spent on mobile phones; university undergraduate students rating of mobile phone use; periods of the day that these students had conversations on their mobile

phones; and students' mobile phone use in classrooms. As in many empirical studies, the independent variables for this study were the specific objectives (Figure 1).

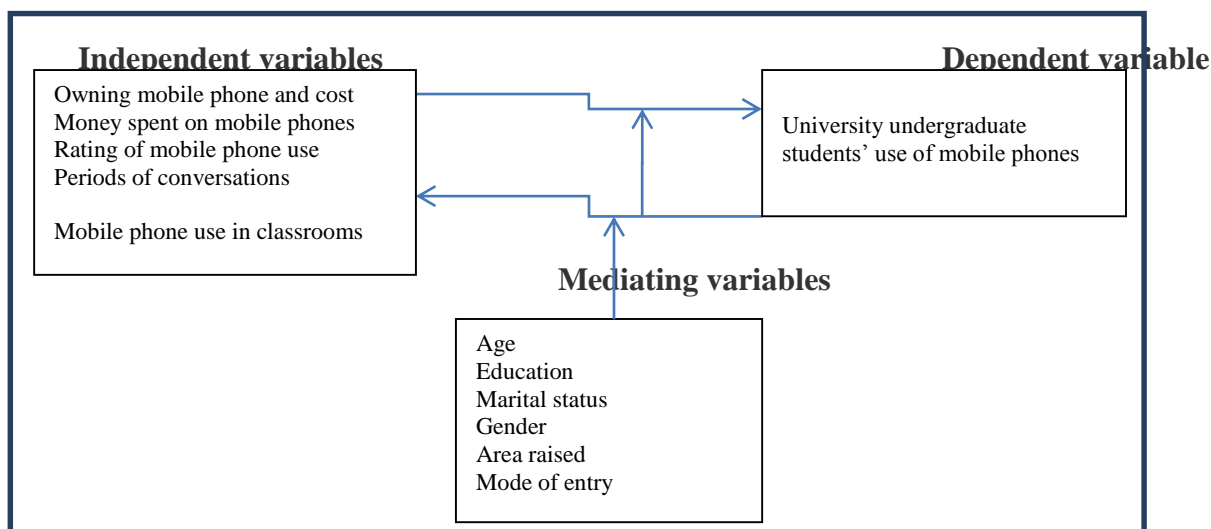


Figure1. Conceptual framework showing study variables for explaining university undergraduate students' use of mobile phones

### Study Methodology

This study interviewed 302 university undergraduate students at Sokoine University of Agriculture (SUA) in Morogoro, Tanzania, East Africa. The broad objective of the study was to investigate university undergraduate students' use of mobile phones at Sokoine University of Agriculture. Specifically, the study examined the students' owning of mobile phones; assessed the money spent on the mobile phones; the students' rating of the mobile phones. Also, the study described the periods of the day, when conversations were held on mobile phones and people they talked to; and lastly the study described mobile phones use in classrooms.

SUA is located in Morogoro Municipality and has 3,350 hectares of land for training, research and production in Morogoro municipality. SUA has four faculties namely; the Faculty of Agriculture, Faculty of Forestry and Nature Conservation, Faculty of Veterinary Medicine and the Faculty of Science. The randomly sampled university undergraduate students came from two campuses namely, the main campus within Morogoro municipality; and Solomon Mahlangu Campus which is also in Morogoro municipality. In the 2012/2013 academic year 2,444 undergraduate students were enrolled, and in the 2013/14 it grew to 6,456 students. This study sampled randomly 302 undergraduate first year students in 2012/2013 academic year from 12 departments in the three faculties, of which 66.2% were males, and 33.8% were females.

The primary data were gathered using semi-structured questionnaires, which were validated using 20 randomly selected students and ten academic staffs at the University. Two pairs each consisting of ten undergraduate students were randomly selected and each asked to respond to



semi-structured questionnaires for reliability test. The results of the two groups were subjected to Cronbach alpha test, which yielded a 0.78, which was within the accepted reliability test of the study instruments. Other data were collected through key informants discussions, observation, transact walks, and the secondary data were gathered through review of documents and through the Internet and websites. The data collected using semi-structured questionnaires included respondents' socio-economic characteristics, owning of mobile phone and cost/ money that students spent on mobile phones, rating of mobile phone use and on periods when conversations were held on mobile phones. The collected data were checked, reduced, and entered in the Statistical Package for Social Sciences and later were analyzed to yield parameters such as percentages, means, etc.

## **Study Results**

### **Respondents' socio-economic characteristics**

This study interviewed 302 undergraduate students at Sokoine University of Agriculture and of these 200 (66.2%) were males and 102 (33.8%) were females. Most, 229 (75.8%) were in the age range of 20-26 years old, while 40 (13.2%) were 27-32 years old. Of the 302 respondents, most, 251 (83.1%) indicated that they were single, and only 47 (15.6%) were married. Half of the respondents, 151 (50.0%) reported that they were raised in rural areas, while 141 (46.7%) said in urban areas. Over two thirds, 185 (61.3%) of the respondents indicated that they had completed Form IV in 2008, and 183 (60.6%) mentioned that they had completed Form VI in 2011. Of all the respondents, most, 227 (75.2%) reported that they were pre-service students, and few 58 (19.2%) were in-service students.

### **Owning Mobile Phone and Costs**

Of the 302 respondents, less than half, 126 (41.7%) agreed that they bought mobile phones themselves. Further, of all the respondents, 147 (47.0%) mentioned that they started owning mobile phones from 2003 to 2007, while 123 (40.7%) indicated to have started owning mobile phones from 2007 to 2011. The range of cost that respondents paid for their mobile phones varied greatly. Of all the respondents, few, 57 (18.9%) and 52 (17.2%) indicated that their mobile phones were priced at the range of Tanzanian shillings (Tshs) 10,000 to 40,000 (US\$ 6.20 to 24.80) and Tshs. 40,001 to 70,000 (US\$ 24.80 to 43.48), respectively. (Exchange rate used was 1 US\$ equivalent to Tshs. 1610 on 11th March 2014). Further, few, nine (3.0%) and five (1.7%) reported that the cost was in the range of Tshs. 70,001 to 100,000 (US\$ 43.48 to 62.10) and 100,001 to 130,000 (US\$ 62.10 to 80.75), respectively. Few, three (1.0%) mentioned that their phones were priced above Tshs. 130,001 (US\$62.10).

Similarly, of all the respondents, 65 (21.5%), 29 (9.6%) and 16 (5.3%) reported that fathers, mothers and brothers gave them the mobile phones they owned. Yet, 14 (4.6%) and ten (3.3%) indicated that parents and sisters gave them the mobile phones they owned, respectively. Others mentioned sources of mobile phones were from uncles--(2.3%), aunts and husbands-- (each 1.7%). Most of the respondents, 225 (74.5%) reported to have owned mobile phones for the past five years, while few, 33 (10.9%), 23 (7.6%) and 12 (4.0%) had owned phones for four, three, and two years, respectively.

Of all the respondents, a third, 104 (34.4%) reported that others influenced them to buy mobile phones. Yet few, 45 (14.9%), 44 (14.6%) and 30 (9.9%) mentioned that their fathers, mothers and brothers, influenced them to buy mobile phones, respectively. Other people mentioned to have influenced respondents to buy mobile phones were: boyfriends—23 (7.6%), girlfriend—19 (6.3%), and sisters—14 (4.6%). Of all the respondents, 71 (27.2%) mentioned that communicating family-related information was the most perceived reason to buy mobile phones. Other perceived reasons mentioned for buying mobile phones were reported as: to keep in touch with friends—71 (23.5%), to communicate business-related information—57 (18.9%), to communicate emergency--related information—19 (6.3%), and other information—23 (7.6%).

Again, of the 302 respondents, over two thirds, 209 (69.2%) agreed that their phones had Internet services, and 193 (63.9%) agreed that they used the Internets to search for information in their field of specialization. However, few, 119 (39.4%) of the respondents agreed that they used their mobile phones to search for information in their area of specialization generated in the country. Yet, few, 114 (37.7%) of the respondents agreed that they used their mobile phones to search for information in their area of specialization generated at Sokoine University of Agriculture, but about over two thirds, 185 (61.3%) agreed that they used their mobile phones to search for knowledge in their area of specialization generated from elsewhere. Also, few, 97 (32.8%) of the respondents agreed that they used their mobile phones to search for information in their area of specialization generated from outside the country.

### **Money spent on mobile phones**

Within the 302 involved respondents, about half, 148 (49.0%) indicated that they spent less than Tshs. 1,000 (US \$) per day to recharge their mobile phones. Yet a quarter, 78 (25.8%) of them said that they used in the range of Tshs. 1,000 (US\$0.62) to 2,000 (US\$ 1.24) per day to recharge their mobile phones. This is to say, most, 226 (74.8%) of the respondents mentioned that they spent less than Tshs. 1,000 (US\$ 0.62) to Tshs. 2,000 (US\$ 1.24) amount of money per day to recharge their mobile phones. Also, the study findings show that, 37 (12.3%) and 22 (7.3%) of the respondents mentioned that they spent Tshs. 500 (US\$ 0.31) and Tshs. 1,000 (US\$ 0.62) per day to recharge their mobile phones. Again, most, 226 (74.8%) of the respondents mentioned that they spent less than Tshs. 1,000 (US\$ 0.62) to Tshs. 2,000 (US\$ 1.24) per day to recharge their mobile phones. Further, over two thirds of the respondents, 186 (71.6%) mentioned that they spent in the range of Tshs. 1,000 (US\$ 0.62) to Tshs. 3,000 (US\$ 1.86) in three days to recharge their mobile phones, while few, 29 (9.9%), 22 (7.3%) and 19 (6.3%) said in the range of Tshs. 1,500 (US\$0.93), less than Tshs. 1,000 (US\$ 0.62), and Tshs. 3,000 (US\$ 1.86), respectively. Additionally, over half, 157 (51.1%) of the respondents reported that they spent in the range of Tshs. 3,000 (US\$ 1.86) to Tshs. 5,000 (US\$ 3.10) in seven days (per week) to recharge their mobile phones.

Table 1: Money that undergraduate students at SUA received and spent on mobile phones in 2012/1 and 2013/14

Year	2012/2013			2013/2014		
# of students	2,444*			6,456*		
Students' allowances	11,738,396,080**			12,714,394,000**		
Voucher price	500	1,000	1,500	500	1,000	1,500
Tshs/day spent	1,222,000	2,444,000	3,666,000	3,228,000	6,456,000	9,684,000
Tshs/week spent	8,554,000	17,108,000	25,662,000	22,596,000	45,192,000	67,788,000
Tshs/month spent	36,660,000	73,320,000	109,980,000	96,840,000	19,680,000	290,520,000
Tshs/year spent	446,030,000	892,060,000	1,338,090,000	1,178,220,000	2,356,440,000	3,534,660,000
Tshs/stud./yr spent	185,500	365,000	547,500	185,500	365,000	547,500
% average spent	5.2	7.6	19.1	9.3	18.5	27.8

\*Figures were obtained from SUA Student Records Office in 4<sup>th</sup> March 2014; \*\*Figures sourced from SUA Accounts Department, 5<sup>th</sup> March 2014.

The data in Table 1 show that of the 2,444 students enrolled in 2012/13 academic year received allowances from the Tanzania Higher Education Students' Loans Board (THESLB) totaling Tshs. 7,267,899,550 (US\$ 4,514,223.30). Of this money, they spent an average of 8.1% of their allowance money to buy vouchers to charge their mobile phones. Also, in 2013/2014 academic year the University enrolled 6,456 students who received allowances from the THESLB totaling Tshs. 12,714,394,000 (US\$ 7,897,139.31) spent an average of 18.5% of their allowance money to buy air time vouchers to recharge their mobile phones. The data show that as students' enrollment at the University increased the money spent in mobile phones also increased. Implications of these findings are that there is sizeable amount of money that students at the University spend in mobile phones (Table1). Generally, due to this, mobile companies appear to make huge amounts of money countrywide from university students.

Of all the respondents, 109 (36.1%) reported that during the working days (Monday to Friday) they mostly talked to their mothers, and next others were: girlfriends—38 (12.6%), boyfriends—25(8.3%), fathers—18(6.0), sisters—10 (3.3%), and others 85 (28.1%). Of the 302 respondents, Over a third, 124 (41.1%) and 115 (37.5%) mentioned that family-and social-related messages were mostly communicated in the working days, respectively. Yet few, 24 (7.9%) and ten (3.3%) mentioned that they communicated school- and business-related messages, respectively. Of all 302 respondents, majority, 147 (48.7%) reported that they had multiple frequencies of texting SMS on their mobile phones per day while few, 33 (10.9%), 26 (8.6%), and 13 (4.3%) mentioned that the frequencies of texting SMS on their mobile phones were once a day, one to five times per day, and once in a week, respectively.

### **Rating of mobile phone use**

Further, of all respondents, about two thirds, 190 (62.9%) rated the use of mobile phones for family calls as the most important aspect, while 38 (12.6%), and 21 (7.0%) rated it as important and about average, respectively. Yet, about a third, 108 (35.8%) of the respondents mentioned that the use of mobile phones for receiving calls was rated as the most important, while 36 (11.9%), 18 (6.0%) and 13 (7.0%) rated it as about average, least important, and somehow important, respectively. Also, 89 (29.5%) and 61 (20.2%) of the respondents indicated that the use of mobile phones for composing and sending SMS was rated as the most important and important, respectively. On the same vein, few 45 (14.9%), 34 (11.3%), and 29 (9.6%) rated mobile phones as somehow important, about average, and least important, respectively. Additionally, few, 89 (29.5%) and 61 (20.2%) of the respondents mentioned that the use of mobile phones for composing and sending out SMS was rated as the most important and important, while 45 (14.9%), 34 (11.3%), and 29 (9.6%) rated phones as somehow important, about average, and least important, respectively. On other hand, majority of the respondents rated the use of mobile phones for playing games as least important, reported by 183 (60.6%), while internet use on phones was rated as the most important, by only 80 (26.5%). Yet, other ratings for internet use on phones were: 63 (20.9%) least important; 53 (17.5%) important; 37 (12.3%) about average; and 17 (5.6%) least important.

Moreover, less than half of the respondents, 131 (43.4%) reported that the use of mobile phones for calling university mates to discuss university take-home assignments was rated as the most important, while 72 (23.8%), 34 (11.3%), 16 (5.3%) and 11 (3.6%) of respondents rated it as important, about average, somehow important, and least important, respectively. Of all the respondents, few 80 (26.5%) and 56 (18.5%) mentioned that the use of mobile phones for keeping themselves updated with university almanac. This was rated as the most important and least important, respectively. On the same vein, 49 (16.2%), 43 (14.2%), and 25 (8.3%) rated phones as somehow important, important, and about average, respectively. Similarly, of all the respondents, few 83 (27.5%), 67, and 49 (16.2%) reported that the use of mobile phones for making and keeping university instructors' appointments were rated as most important, least important, and important, respectively. In addition, few 28 (9.3%) and 25 (8.3%) said that the use of mobile phones for making and keeping university instructors' appointments were rated as about average and somehow important, respectively.

### **Periods of conversations and the people they talked to**

Further, of all the respondents, 86 (28.5%) reported that during the non-working days (i.e. Saturday and Sunday) they mostly talked to their mothers, and next others were: girlfriends—35 (11.6%), fathers—27 (8.9%), boyfriends—25(8.3%), brother 24 (7.9%), sisters—8 (2.6%), and others 78 (25.81%). Specific time that respondents had conversations on their mobile phones on non-working days differed greatly. For instance, 69 (22.8%), 65 (21.5%), and 63 (20.9%) reported that they made conversations on their mobile phones in the evenings (6 pm to 8 pm), at nights (8 pm to 12 pm), and in the afternoons (2 pm to 5 pm), respectively. Yet few, 53 (17.5%) and 17 (5.6%) indicated that they made conversations on their mobile phones in the mornings (6 am to 12 am) and in the afternoons (12 pm to 2 pm), respectively. Of the 302 respondents, over a third, 119 (39.4%) and 110 (36.4%) mentioned that social-and family-related messages were

mostly communicated in the non-working days, respectively.

Also, on working days, that is, Monday to Friday, time when they made conversations on their mobile phones to various people differed widely. Of all the respondents, one third, 102 (33.8%) of respondents who were the most, reported that they had conversations on their mobile phones at night (from 8 p.m. to 12 pm), while few, 83 (27.5%) and 58 (19.2%) reported to have conversations on their mobile phones in the evenings (6 pm to 8 pm) and in the mornings (6 am to 8 am), respectively. The other period mentioned was in the afternoons –39 (13.0%) (2 pm to 4pm). Over two thirds of the respondents, 220 (72.8%) mentioned that they preferred to have conversations on their mobile phones in the evenings and at night because it was the free time available to them.

### **Mobile phones use in classrooms**

Most respondents, 238 (78.8%) disagreed that they received phone calls on their mobile phone when they were in the classrooms, while few, 55 (182) agreed to the statement. Further, over half, 173 (57.3%) of the respondents agreed that students' learning was affected by receiving mobile calls when attending classes. Also, many respondents, 226 (74.8%) indicated that they kept their mobile phones in the mute mode when attending classes, while few, 20 (6.6%) said so when taking tests and examinations. Further, few 108 (35.8%) mentioned of putting their mobile phones in vibration mode when attending classes, while others said when: sleeping – 27 (8.9%), doing class assignment – 26 (8.6%), in library, office, and discussion groups – each 19 (6.3%). However, few respondents reported switching off their mobile phones when: in examination rooms – 82 (27.2%), in classes – 61 (20.2%), taking tests – 45 (14.9%), sleeping – 14 (4.6%), and with supervisors – 10 (3.3%). Over two thirds of the respondents, 198 (65.6%) agreed that they got annoyed with instructors who received calls on their mobile phones when teaching. Similarly, majority of the respondents, 221 (73.2%) agreed that they got annoyed with instructors who made calls out on their mobile phones when teaching. Of all the respondents, most, 247 (81.8%) agreed that SUA should have bylaws that control and regulate students' and instructors' mobile phone usage in classes and examination rooms.

### **Discussions**

#### **Periods of conversations and the people students talked to**

Further, of all the respondents, 86 (28.5%) reported that during the non-working days (i.e. Saturday and Sunday) they mostly talked to their mothers. Of the 302 respondents, over a third, 119 (39.4%) and 110 (36.4%) mentioned that social-and family-related messages were mostly communicated in the non-working days, respectively. On working days, that is, Monday to Friday, of all the respondents, one third, 102 (33.8%) who were the most reported that they had conversation on their mobile phones at night (from 8 p.m. to 12 pm), because it was the free time available to them said by 78.2 percent.

A study at Virginia Tech, Blacksburg, Va., USA studied 568 undergraduate students had mobile phones and found that 80% of the cell phone users talk between 6pm and midnight, and the three main categories of cell phone calls were family members, boyfriends or girlfriends, and

friends/relatives. Further, the study found that female students differed from male students by using their cell phones for communication with immediate family members, including parents, speaking more often, and talking for longer times (Belew, 2007)

A total of 500 undergraduate students from East Tennessee State University, USA were examined on their text messaging behavior. The findings revealed that age is the strongest predictor of text messaging; with younger respondents being more likely to text. The study also shows that women prefer texting, while men prefer voice calls. Age affects preference as well, with younger respondents preferring texting and older respondents preferring voice calls. The study also found that women are much more likely to use cell phones to avoid others during co-present interaction. Around 60 percent (289) said they texted their friends very frequently compared to other categories. Twenty-six percent of respondents (118) very frequently texted "others," while 15.1 percent (69) texted siblings very frequently. Approximately eight percent (37) and five percent (15) texted their parents or child very frequently, and around 34 percent of respondents (164) stated they called their friends frequently or very frequently. By contrast, nearly 70 percent of respondents (339) frequently or very frequently called their parents. Parents were thus the most likely category to receive voice calls from participants (LaBowe, 2011). In the Tanzanian context, these findings led us to question whether or not a student's overall frequency of cellular phone use at night impacted on their overall academic performance. This could be a question in other future studies.

### **Money spent on mobile phones**

This study has established that most students spend Tshs. 1,000 (US\$ 0.62) per day to buy airtime to recharge their mobile phones, and of the 2012/2013 academic year the 2,444 enrolled students spent Tshs. 2,444,000 (US\$ 1,518.00) per day, which implied a 7.6% expenditure of their allowances per year. Extending further, we used university students' enrollment data for 2010/2011 academic year as provided by the Tanzania Commission for Universities (TCU) for Tanzania to calculate the national students' expenditure of their allowances in mobile phones. In all universities (11 public and private), students' data of enrollment for 2010/2011 academic year was 135,367, of which 88,178 (65.1%) were males and 47,189 (34.95) were females (TCU, 2012). Therefore, countrywide, all undergraduate students in these universities spent Tshs. 135,367,000 (US\$ 84,078.90) per day or Tshs. 49,408,955,000 (US\$ 30,688,791.90) per year. This is a huge sum of money to be spent on non-material activity of recharging mobile phones, especially in a poor country like Tanzania. To extend the discourse is the frugal expenditure of the tax payers' money that students get from the THESLB as loans and partly use it on mobile phones. Worse still is that these loans are partially repaid back to the government by the students after graduating. Most of them after graduation become unemployed or are employed in sectors that are difficult to trace, and/or change jobs many times that they cannot be easily traced on their whereabouts.

This phenomenon is not unique to Tanzania as other findings from elsewhere are indicative. A survey polled 900 Kenyan youth aged between 16 and 24 and found that they are constantly on their cellular phones – texting and surfing the Internet – and sending an average of 250 messages as texts and chat posts daily. They spend the biggest portion of their income on mobile phone (about KShs.900 monthly) airtime (79%) and trendy clothing (78%) (Herbling, 2012). In UK for

instance, Save the Student estimates that the typical student spends £24 a month on their mobile phone, plus another £12 a month on the internet and home phone connections (Mohammed & Collinson, 2012). Zulkefly and Baharudin (2009) study of N=386 students at the University of Putra, Malaysia, found that students spend on average 6 hours daily and USD18.70 monthly on their mobiles. In their study, the text message was the most used feature and peers were the most frequently contacted people. Further, in Australia, Zulkefly and Baharudin (2009) quoting the Australian Psychological Society (2004) reported that a study revealed that a large proportion (66%) of Australian adolescents preferred to use the mobile phone pre-paid system. This system allowed adolescents and their parents to monitor and control the mobile phone cost of their children. In summary, the reviewed studies show that it is true that worldwide students in universities spend substantial amounts of money on their mobile phones, and therefore, policies must be put in place to curb such frugality, especially in the state-funded university education like SUA.

### **Mobile phones use in classrooms**

Most respondents, 238 (78.8%) disagreed that they received phone calls on their mobile phone when they were in the classrooms, while few, 55 (182) agreed to the statement. Further, over half, 173 (57.3%) of the respondents agreed that students' learning was affected by receiving mobile calls when attending classes. Also, many respondents, 226 (74.8%) indicated that they kept their mobile phones in the mute mode when attending classes.

Studies from other countries show that indeed this is a common problem. For example, a study at University of New Hampshire, Whittemore School of Business and Economics interviewed 1,265 students. Almost all (99 percent) of the college students owned cellular phones. And half of them (51 percent) said that cell phone use in class affects their ability to concentrate and the amount of information that they receive during class (52 percent). The most commonly used phone feature was the clock, followed by texting. The study found that, although students were aware that phone use was frowned upon in class, almost half (49 percent) of those who checked their phones during class attempted to conceal their use somewhat or extremely frequently. The study found also that female students were found to be 7 percent more likely to text, or more times per class period, and they were also 13 percent more likely to frequently hide their phone use in class. Female students were 5 percent more likely to text frequently during class (Alfano *et al.*, 2010).

The other study was conducted by McCoy (2013) which involved 777 students from six U.S universities in 2012. The results showed that on average, respondents used a digital device for non-class purposes 10.93 times during a typical school day for activities including texting, social networking, and emailing. Digital Distractions in the Classroom: Student Classroom Use of Digital Devices for Non-Class Related Purposes. The study found that most respondents did so to fight boredom, entertain themselves, and stay connected to the outside world. More than 80% of the respondents indicated such behavior caused them to pay less attention in the classroom and miss instruction. Majority of respondents favored policies governing digital device distractions in the classroom. Other reviewed studies which seem to have similar findings are those of Zulkefly and Baharudin (2009) in Malaysia, Economides and Groupoulou (2008) in Greek, in the Pearson Student Mobile Device Survey 2013 National Report in the U.S.A and

Europe as reported by Abeele and Roe (2011) and also by Leung (2001). These findings led us to question whether or not a student's overall frequency of cellular phone use has impacts on his/her overall academic performance, as measured by a student's grade point average (GPA). This can be an area for future research.

### **Conclusion, limitation of the study and Future research**

This study examined the pattern of the use of mobile phones among university undergraduate students at Sokoine University of Agriculture. The study reports on the following questions: (i) what are the periods of conversations and the people students talk to? (ii) how much money is spent on mobile phones? and (iii) how is the mobile phone used in classrooms? The study found that most students use their mobile phones for social aspects. This is mostly done during late hours after having attended classroom. Also, the study found that the money spent for mobile phones is very huge compared to the money they spent in buying books. Finally, the study found that the use of mobile phones for learning purposes (i.e. mobile learning or m-learning) is not yet fully implemented in most Higher Education Institutions in Tanzania (Bhalalusesa & Arshad, 2014; Mtebe, 2016).

The use of a convenience sample was a major limitation of this study. Consequently, it was not possible to generalize the findings to the general population. Moreover, respondents sometimes could provide untruthful answers to survey questions. The respondents may do this because they feel embarrassed or for other personal reasons. As a result, some information in this study may reflect this lack of truthfulness. The study would have been more complete, if focus groups had been used in conjunction with questionnaires. Focus groups provide researchers the opportunity to gain a more in-depth knowledge about subjects than questionnaires alone. Breaking up groups into various ages and dividing them by sex would have greatly enhanced the results of this study. Hence, the study would have benefited by using student focus groups. Each of these deficiencies can be easily corrected by future researchers. Nevertheless, even with these limitations, the current study adds to the body of literature on cellular phone behavior and provides valuable direction for future research in m-learning.

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