

## Teachers' and Students' Perceptions of Self-Driven Acceptance of Mobile Phone Use as an ICT Teaching Tool

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### Abstract

This study investigated the perception of teachers and students on self-driven acceptance of technology and how it could influence their readiness to use mobile phones in teaching and learning if it is to be implemented in secondary schools. The study used mixed methods approach through cross-sectional survey whereby embedded design was employed while focusing more on quantitative approach. Data were collected from 184 participants who were selected using stratified purposive sampling techniques; and questionnaire and semi-structured interviews were used. The finding of this study revealed that teachers and students are accessing mobile phones with internet, despite the fact that students are forbidden to own any mobile phone. Teachers and students supported that mobile phone is easy to use and is a useful tool in education, although, they felt that there must be policy guidelines for teachers and students to use mobile phone as a teaching and learning tool. Adopting it as teaching tool will face challenges such as lack of electricity in community schools; emerging of attractive social media; rise of budget to students; absence of consistent guidelines on mobile phones use; and lack of compatible teaching and learning materials that are aligned with the current syllabus. The study concluded that for the time being adoption of this tool should not be ignored and can be designed to be used after class hours such that those students who possess the tool can at least have an opportunity to access e-materials to supplement their learning. It is recommended the pilot study should be conducted to prototype mobile phones use in schools as tool of teaching and learning.

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**Keywords:** mobile phones, perception, barriers, pedagogical tool, ICT

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### INTRODUCTION

The use of Information and Communication Technologies (ICT's) in education and training is "driven by the changing nature of work, the realities of the information age, new global partnerships and an awareness of the need for equal distribution of educational opportunities" (Department of Education, 2003, p. 1). Recently, in developing countries there has been an adoption of ICT by both governments and non-governmental organization in various sectors such as education, business or social services in general although its access, equity, quality and quantity vary ranging from urban to rural and youth to elder due. The technology in society is growing at fast rate and education is not isolated—as educational practices continue to use considerably ICT as tool of teaching and learning. Klaus (2011) reported that although not every teenager has a computer at home but still 93 percent are online with 63 percent getting online daily, this is due to the fact that internet access is not more confined to computers. Mobile phone network is one of ICT facility which can serve as a media to access e-materials in absence or supplement of computers.

Worldwide Mobile phone emerged and raised number of discourse in different fields such as in education, commerce and security and is currently the

most widely used technology for receiving and delivering networked information (Urassa, 2012). In education for instance, mobile phones also raised an anxiety in teaching and learning process due to fact that young people have been eager and are timely adopters of mobile technologies. Kihwele and Bali (2013) argued that mobile phones have to be used in teaching and learning due to its usefulness. Frias-Martinez, Virseda, and Gomero (2012) have noted that "the motivations for using cell phones as learning tools are varied including the improvement of student access to learning materials, offering flexibility to students, reducing the costs of using more expensive technologies (e.g. personal computers), or to explore collaborative and individual learning" (p.442). Mobile phone technology is useful ICT tool in education which is less expensive and can allow large coverage of people to access e-materials regardless of the geographical location. Due to this rapid increase in mobile phone usage and ownership it is possible for any country that possesses the supportive infrastructure for electronic communication (Urassa, 2012; Juma, 2013) to initiate using it as a pedagogical tool. For example in Peru, schools with insufficient budgets opted mobile phone as an affordable solution to supplement formal schooling while keeping students engaged and motivated in the classroom (Frias-Martinez et al., 2012).

Globally, there is an emerging trend in mobile phone use in education, particularly teachers and students have been using this tool in sharing information, consulting dictionaries, thesaurus, and as one of the application for teaching and learning in which it is portrayed as new opportunity for the ICT use in education (Aker, Ksoll, & Lybbert, 2012; Cowan & Butler, 2013; Lepp, Barkley, & Karpinski, 2015). For example in Tanzanian primary schools, there is mobile application of mathematics for some selected primary school teachers in grade 5 and 6 (Swartz & Wachira, 2010). Also according to Urassa (2012), Ministry of Education and Vocational Training of Tanzania introduced Bridge-IT (Mobile phone educational technology program in Tanzania for primary education) launched 2007 projects in collaboration with different international organization they intended to improve teaching and learning process. Urassa (2012) reported that Bridge-IT project “gave the opportunity to pupils to learn the concepts through images, pictures and diagrams,[and that]gave value to the subject content. This resulted in long-term retention of the pupils’ memories, and increased classroom interaction and motivation to learn” (p. 87).The ICT policy for basic education of 2003 of the Ministry of Education and Vocational Training of Tanzania, consider mobile phone, radio, computers to internet as an opportunity to improve access, equity, quality and relevance of education on the application of ICT in education (MoEVT, 2007). Most students possess mobile phones despite the fact that they are not allowed to use them while in school (Urassa, 2012; Kafyulilo 2012; Juma, 2013); and students access mobile phone through owning, borrowing from a colleague (Kihwele, & Bali, 2013) or using relative’s mobile phone at home (Kafyulilo, 2012). Despite pupils and teachers access to mobile phones, most secondary schools have inadequate e-learning materials. Thus, mobile phones can be an alternative tool for teachers and students to access e-materials (Mtega, Bernard, Msungu, & Sanare, 2012). A sensible choice is not to ignore the mobile phone that students possess, while struggling for modern ICT facilities which they will not replace mobile phone rather supplement for quality education. Support of mobile phone in education is potentially to overcome several barriers experienced in education and enhances the learning environment (Chambo, Laizer, Nkansah-Gyekye, & Ndume, 2013) through ICT. Recently, some projects such as Bridge-IT adopted mobile phone use in Tanzania primary schools; however, only teachers are allowed to use mobile phones in those projects (Kafyulilo, 2012). In this kind of adoption, the opportunity for students to practice self-learning beyond classroom walls through mobile phone is significantly limited as they just watch either video or listening to audio downloaded by their teachers. Kafyulilo (2012) affirmed that students’ behavior of owning mobile phone seemed to be distorted because students are

using mobile phones for non-learning activities such as texting, flirting and watching pornographic contents. Majority of school teachers seem to be alarmed with the negative consequences of using mobile phone than the positive consequences (Kafyulilo, 2012) such as providing learners with learning contents at the tips of their fingers (Ismail, Azizan&Azman, 2013).

Despite literature support on the potential of mobile phone in improving teaching and learning, mobile phone is yet not officially adopted in Tanzanian schools as a pedagogical tool. Therefore, this study investigated views of teachers and students on self-driven acceptance of mobile phone as a tool in teaching and learning in a formal education system. This is due to the fact that most researchers in Tanzania have looked at views of educational stakeholders on the effect or impact of students possessing mobile phones in schools (Kihwele & Bali, 2013). Less has been studied on teachers’ perceptions to use mobile phone as a tool of teaching in Tanzania. As pointed out Ismail et al., (2013) noted that teachers’ perceptions are crucial since teachers’ willingness and preparedness to adopt mobile-learning is one of the critical success factor. Students have little access of e-materials and computers. Thus, emergences of affordable mobile phones with internet connectivity including smartphones are adding to broader opportunity for access of e-materials. This study investigated teachers’ and students’ perception on the mobile use as teaching and learning tool in Tanzania’s secondary schools. The study was guided by the following research questions:

- i. To what extent do teachers and students access mobile phone?
- ii. To what extent are teachers aware on the use of mobile phone as a teaching tool?
- iii. How do teachers and students perceive mobile phone as a teaching and learning tool?
- iv. What are the possible challenges that might face teachers/students on using mobile phones for teaching and learning in secondary schools?

## LITERATURE REVIEW

### Mobile Phones Accessibility

Currently, Africa experiences high level of mobile phone ownership, acceptance and usage, lively and energetic mobile phone networks, and moderate regulatory and licensing systems. There is a growing access and reduction of the equity gap (digital divide) ranging from higher in urban and low in rural remote areas (Kafyulilo, 2012). In Tanzania, since 1997 the growth rate of mobile phone is rapid and has influenced high access to internet connectivity (Nartker, Shumays, Stevens, Potter, Kalowela, & Kisimbo, 2009; TCRA, 2014; Chambo et al., 2013).

Attwell and Hughes (2010) also reported that industrial predictions of sales of smart phones and ability to access internet services would surpass that of 'ordinary' mobile phones by March, 2011 in Tanzania and there would be diverse application of them in social services. In Tanzania for example, public health providers are reported to have positive attitude in the use of mobile phone disseminating clinic based information via SMS (Genuchten, Haring, Kassel & Yakubi, 2012). Mobile Phone Applications for Public Health revealed that at least eight organizations are using mobile phones and this technology appears to offer great potential for the training of health care workers, especially in the absence of computers and internet access for students (Nartker et al., 2009). Apart from health sector, mobile phone has been used for income generating activities such as agriculture, fishing, tourism, livestock keeping (Hassan & Semkwiji, 2011).

Apart from health and education business sector has recently using mobile service in financial transactions. The recent study, the Audience Scapes data - gathered roughly two years after M-PESA launched the first mobile money service in Tanzania - shows that 11.5 percent of Tanzanian adults had used m-money service at some point (Montez & Goldstein 2010). Mobile devices are significantly changing human computer interaction, communication, and learning activities, however ubiquitous access to remote resources is one of the most interesting characteristics achievable by using mobile or handheld devices such as cellular phones (Liaw, Hatala, & Huang, 2010). Generally mobile phone is among the few ICTs' gadget which has defeated common physical and social barrier for technology adoption in developing countries and penetrated in rural and urban setting compared to other technologies (Olson, Kodde, deMaagd, Tarkleson, Sinclair, Yook, & Egidio, 2011). Availability and use of mobile phones among students and teachers show higher possibility of implementing m-learning in Tanzania (Chambo et al., 2013) provided that the teachers' perceptions are studied and strategic plans of adopting mobile phones are well structured (Ismail et al., 2013).

### **Mobile Phone as ICT Tool of Teaching and Learning**

Most school have no electricity, computers, have inadequate materials and qualified teachers (MoEVT, 2007) and the problem of getting learning materials can be solved by employing ICT (Kalinga, 2008), and the available vulnerable ICT gadget is mobile phone (Swartz & Wachira, 2010). Mobile phone as a tool of teaching and learning can bring the positive impact in teaching and learning because it can allow students to interact with texts, pictures, videos and audios files (Urassa, 2012). For example Dyke and Knight (2012) pointed out that the BlackBerry Academic Program

in UK provides educational resources that enable students to develop applications, manage BlackBerry devices and software, and learn more about BlackBerry technology. The key component of this programme is teaching students to develop mobile applications to address real-world problems. Pedagogically students who can interact with those features is able to improve his or her learning process by visually processing the information and understanding it.

According to Daher (2010) mobile phone can bring about open situations and actual surroundings and enable student learning activities characterized by communication, collaborative knowledge building, observation, and innovation. However, using mobile devices students are able to construct useful knowledge in real situations (Daher, 2010). This turns the mobile devices into powerful asset in the hands of students. Olson et al., (2011) pointed out that, mobile phone (smartphones) can be used by students in the classroom as a virtual clicker, games or quizzes by using text messaging interfaced to an instructor's computer or phone. The mobile phones have proven to be useful in teaching in most projects, such as that of Bridge-IT where Urassa (2013) reported that mobile phones gave the opportunity to pupils to learn the concepts through images, pictures and diagrams which resulted from the fact that pupils gave value to the subject content. While, resulted in long term retention of the pupils' memories, this increase classroom interaction and motivation to learn. The Brigde-IT project carries out for selected primary schools: "*Bridge-IT's ... significantly increase the quality of teacher instruction and achievement among primary school students in standards 5 and 6 in math, science and life skills through the innovative use of cell phone and digital technology*" (Swartz & Wachira, 2010. p. 27). Schofield, West, and Taylor (2011) reported that mobile phone is truly students centered if the project or adoption of mobile phone gives access (opportunity to use) to both teachers and students, and pointed out that:

Portability (it is a hand-held devices and can influence learning to occur at anywhere and anytime), Connectivity (Linking to other learning such as through other people, devices or networks), Interactivity (enhances a cooperative learning environment), Context sensitivity (enables usage of a person's immediate context and surroundings), Lifelong (it is continuous) and Individuality (learning can be customized and based on previous learning experiences). (Schofield et al., 2011, p. 2)

The mobile phone in education can influence teaching and learning to be personal or self-paced,

informal and formal, distance or blended learning, content contextually dynamic, social and constructive, ubiquity and mobility (Sharples, Taylor & Vavoula, 2007; Mtega, 2012). Liaw et al., (2010) pointed out some benefits of mobile phone which includes; mobile devices offer personal individualized connectivity, mobile connectivity improves collaboration via real-time that may lead to better decision making and mobile connectivity enhances users' orientation. These benefits are proved to be equally useful in improving the learning environment (Liaw et al., 2010).

### **Mobile Phone Applications**

There are several learning application in the mobile phones which can be useful in the teaching and learning process, such as generic software such as Word, Excel and PowerPoint (Mtega et al., 2012) and mobile app (Alzaza&Yaakub, 2011). Those mobile Apps are of two types; first, the operation system applications like iPhone OS, Androids, mobile windows and RIM's BlackBerry (Dias, Keegan, Kismihok, Mileva, &Rekkedal, 2008); andsecond, the application software which performs different tasks like graphic processor, courseware (e.g. simulation, problem solving, and instructional games), scientific calculator, search engines (e.g. Google, Opera mini), educational forums, blogs, and social networks (Dias, et al., 2008; Alzaza&Yaakub, 2011). Teachers should design some exercises containing collaborative elements such as game play, employing a variety of tools like social networking, calendars, customized calculators, simulations, or augmented reality (attach valuable information to real objects in real time) (Alzaza&Yaakub, 2011).

### **Perception of Teachers on Using Mobile Phone as Teaching Tool**

Perceptions are interpretation of things into meaningful thought based on prior experiences in which their attitudes normally reflected into their behaviour. Different researchers studied perception of teachers on effect mobile phone use to students who have access to mobile phone in schools (Swarts&Wachira, 2010; Urassa 2012; Kihwele& Bali 2013), and findings showed that teachers have negative attitude towards allowing students to use mobile phone (Kafyulilo, 2012). For example Kihwele and Bali (2013) argued that, teachers said that students with mobile phones perform poorly and misbehave more often than students without mobile phone. Prohibiting students from using mobile phones was found to be challenging and most students who accessed mobile phones were given by their parents by being trusted as mature enough to have self-control; however, some respondents believe that female students are not supposed to get mobile phones as they are more likely to be influenced into having sexual relationships (Kihwele& Bali 2013). Kihwele and Bali (2013) also point out that, there is a

contradictory interest among students, teachers, and parents, where teachers restrict students to access mobile phone but most parents give their children the mobile phones.

Kafyulilo (2012) studied the perception of teachers to use mobile phone as a tool and found that teachers indicate hesitance on mobile phone use because of their negative effects on students' behavior, there is undisputable truth that laptop, iPods, and other technology can as well have several negative outcomes to students if not used properly. Therefore, the strategies that teachers use to overcome negative impacts of other technology should also be applied to mobile phones that are used for educational purposes. Trusting students is one step toward independent learning which is key concept in using mobile learning and it's time to open up on the value based training to our students, in so doing it gives an opportunity to strengthen moral behavior and building appropriate attitude in the cause of directing the appropriate learning experiences (Kafyulilo, 2012; Urassa, 2012; Kihwele, 2013). Kafyulilo (2012) also observed that "Students, pre-service teachers and college instructors were in favour of the use of mobile phones for learning, but the majority of in-service teachers were against it" (p. 115).

### **Challenges of Integrating Mobile Phones in Education**

Despite the massive advantages that mobile phones do have in the teaching and learning process, there are some challenges of m-learning (Mtega et al., 2012) facing mobile phone use in teaching and learning. Studies reported inequality among pupils in accessing mobile phones. For example, parents are used to buy mobile phones for boys than girls; pupils from remote rural hardly have little access to mobile phones than urban and this create the mobile phones digital divide among the same society even though the network coverage is expanding every day (Olson et al., 2011).

According to Kihwele (2013) some parents and teachers reported that students with mobile phones perform poorly in subject and misbehave more often than students without mobile phones and girls are vulnerable to sex relationships as mobile phone provided easy communication with sex partners (Kihwele, 2013, Kafyulilo, 2012). This suggests that students with mobile phones are likely to engage in non-learning activities (Kafyulilo, 2012).

Studies (Swarts, &Wachira, 2010; Urassa, 2012; Juma, 2013) shows that in Tanzania there is no formal policy of using Mobile phone as teaching tool despite the support from ICT policy demanding the need integrate ICT in Education. Due to lack of mobile phone policy students at secondary schools are unlawful restricted by teachers to use mobile

phones in schools while universities are free to use. However, despite restriction students are still using it because they have been given by their parents and guardians or friends. Apart from lack of policy intent on the use of mobile phones in schools mobile phones use illiteracy level is also barrier for integrating in education system (Mtega et al., 2012), because they mostly use it for text messaging and calling (Nartker et al., 2009). Study by Klaus (2011) raised a fear that children or students might be addicted with social networking, and become prone to cyber bullying, and online sexual exploitation. Thus, social networking (e.g. Facebook, Myspace, twitter, WhatsApp) consume students' time and change their attitude toward schooling.

Incompatibilities of mobile phone programmes with the academic programs such as pdf, words, excel and PowerPoint (Mtega et al., 2012) is also a challenge in adopting mobile phones as a tool of teaching (Swarts&Wachira 2010). Thus, adapting a mobile phone in education needs a careful modification for successful and meaningful adoption. Multiple and varied strategies are needed to address the complex issues affecting quality learning for secondary education which is messed to varied issues including cultural and social interruptions. According to Winthrop and Smith (2012) the potential to help handle some of these existing barriers are such as technology from distance learning; to digitized teaching and learning materials; to information management and teacher support. Most mobile phone with internet connections are powerful tools and can bear almost the same functions as personal computers (Cui & Wang, 2008).

#### **Theoretical model of technology acceptance**

This study adopted technology acceptance model (TAM) by Davis (1989) which describes why users accept or rejects adoption of new technology. According to Davis (1989) the intentions for people to use or reject new technology is influence by two behavioural beliefs: first perceived usefulness—extent to which the new technology helps in simplify their work better in comparison to old technology; and second, perceived ease of use—extent to which a person believes that adoption of new technology is easy to use or require lesser effort (Venkatesh & Davis, 2000). Building from TAM perspective teachers to use or reject the integration mobile phones as pedagogical tool is likely to be influenced by their beliefs that it easy to use and it requires less effort for them and students to adopt as teaching and learning tool.

#### **METHODS**

This study employed pragmatism paradigm as the philosophy for informing teacher and student self-driven use of mobile phones as teaching tool. Pragmatism was adopted because of its flexibility in

data collection and support in the study complex concepts such as mobile phone innovations in teaching, and allows both quantitative and qualitative data to be collected simultaneously for purpose of cross-examining the credibility of the findings. This study employed embedded design majoring quantitative where qualitative data were used to supplement the quantitative data within a single study (Ary, Jacobs, Razavieh, & Sorensen, 2010). This design was chosen for this study to collect quantitative and qualitative data simultaneously, but to have qualitative data which play a supportive role to the quantitative data; triangulate data and study different groups (students, teachers and administrators) (Creswell, 2012). Mixed approach aiming to utilize strength of both within a single study by ensuring the weakness of one approach do not overlap significantly with the weakness of another (Ary et al., 2010).

#### **Participants**

The participants of this study consisted of 184 comprising of secondary schools teachers teaching in lower secondary schools (Ordinary level) and higher secondary schools (A-level) and students in both lower secondary and higher school secondary education in Tanzanian secondary schools. There were three categories; namely, teachers, advanced level and ordinary level students. Teachers were 17 females and 46 males—students were 61 ordinary level students and 60 were advanced level students, whereby 60 were females and 61 were males. The sample consisted of heterogeneous groups such as boys, girls, day students, boarding, O'level and A'level schools. This choice was made because secondary teachers and their students are in conflict of interest such that teachers prohibiting students to access mobile phone in school, while students are still accessing. The participants were selected using simple random sampling and purposive sampling technique. Purposive sampling was used to select key informants with specific categories such as A'level, O'level, day and boarding schools and during selection of teachers (e.g. head of schools, second masters, discipline masters and teachers completely filled a questionnaire) for interview. Teachers and students were randomly selected to participate in the study because in this study students and teachers presumed having the same characteristics to offer to the study, and also it would help to get the reasonable larger number of participants.

#### **Data Collection**

In this study data were obtained through questionnaires, individual interviews and focus group interviews. During the research process 121 students and 63 teachers filed the questionnaires, 21 students appeared for individual interviews and 14 teachers were interviewed. Likewise, three focus group interviews were conducted with students and 3 group

interviews with teachers. The reason for adopting these approaches was trustworthiness of the findings.

**Data Analysis**

The quantitative data from questionnaire was analyzed through the descriptive statistics using the Statistical Package for Social Science version 20 (SPSS v20). From questionnaires, each questionnaire was coded and presented by alphabet and number. Alphabet A, B-F, O, S, and T represents A’level, school B-F (school 1-5), O’level, students and teachers respectively, where numbers shows individual participants. The data were entered into SPSS v20 for analysis and measure of data (Nominal or Ordinal) were identified for each variable for various appropriate statistics. In SPSS, tables and descriptive statistics were used to draw out tables and charts showing percentages, mean and standard deviation of participants’ responses. Qualitative data from interviews were analysed using thematic analysis method. The items were coded and themes were categorized into sub-categories of themes and their frequencies were used for interpretation and quotation as an evidenced grounded to participants’ views. This technique was chosen because it gives a room to determine themes in a number of ways, and it allows flexibility in which researcher may not code data trying to fit the pre-existing frame and allowed to code data to and forth before writing a report.

**Ethical Considerations**

The researchers adhered to principles of good conduct of research including assurance of confidentiality of information obtained and this was communicated to the participants in advance especially in questionnaire and before interview that names of participants will not be involved (individual identity). Further, confidentiality was ensured by coding the named of institutions and participants, for instance student participants from A’level school B, were called BSA<sub>n</sub> or teacher participants from school B, were called BT<sub>n</sub> instead of their names.

**RESULTS**

The study investigated mobile phone accessibility in schools and data were collected from teachers and students. Findings indicated that teachers and students have access to various types of mobile phones from android to non-android phones.

**Teachers’ Mobile Phone Access and Types**

From the survey, teachers were asked if they have mobile phones and which types do they own. The finding shows that 98.4 % have mobile phones and 1.6 % has no mobile phone. Out of 98.4 %, 64.1 % own smart phones, including BlackBerry, Androids and iPhones. While 31.3 % own other mobile phones with internet connectivity and 3.1 % own mobile phone without internet connectivity.

**Teachers Purpose of Mobile Phone Usage**

Teachers were asked to point out the mostly used service with their mobile phone, the results show that they frequently use them for communication (calling, chatting, listening to radio, searching online news), money transfer, internet surfing (searching online teaching materials and news), entertainments (audio-visual player, listening to radio, playing games), and others (camera, clocks, torch, storage devices). The Figure 1 shows the different purposes of using mobile phones.

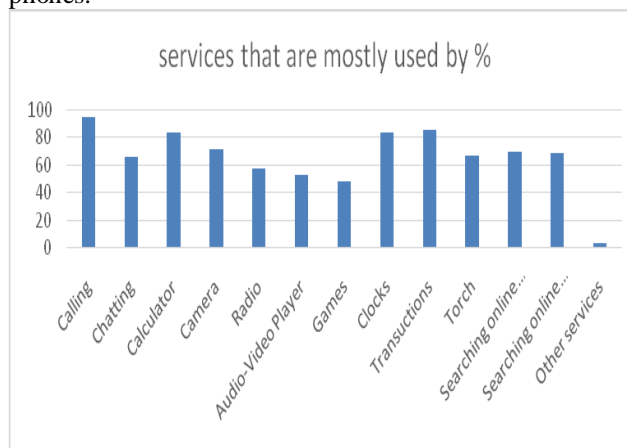


Figure 1: Services teachers get from mobile phone

**Teachers Mobile Phone Application**

Also teachers were asked to show the mobile application that they mostly used within their mobile phones (See Figure 2).

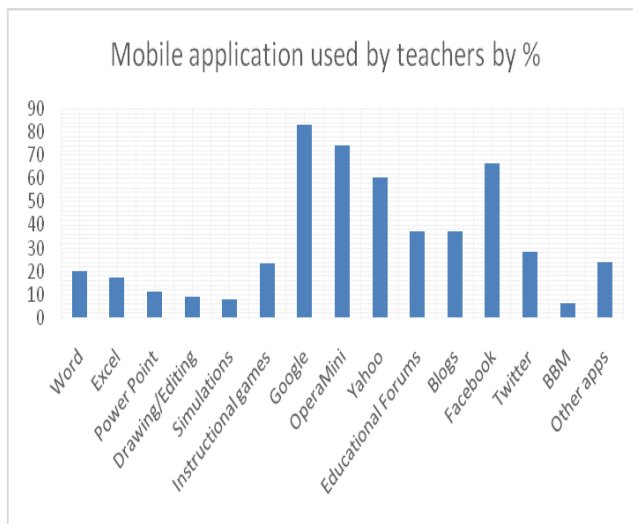


Figure 2: Mobile Phone application that teachers have access in their mobile phone

**Students Mobile Phone Accessibility and Use**

Students were asked to mention the types of mobile phone that they had a chance to use and services they used within a mobile phone. Results show that 51.09 % had no opportunity to use a mobile phone, 10.87 % had an opportunity to use smart phones (including BlackBerry, Androids and iPhones), 28.26 % had an opportunity to use other phones with internet

connectivity, 7.61 % had opportunity to use mobile phones without internet connectivity and 2.17 % did not respond (see Table 1).

Table 1: Students’ access to mobile phone for each level

	Students accessing mobile phone (Percentage)					Total
	Has no access to Mobile Phones	Smartphone	Other phone with internet connectivity	Others phone without internet connectivity	Not responded	
<b>O’level</b>	46.74	2.17	13.04	4.35	.00	66.30
<b>A’level</b>	4.35	8.70	15.22	3.26	2.17	33.70
<b>Total</b>	51.09	10.87	28.26	7.61	2.17	100.00

Results show that out of 51.09 % with no access to mobile phone 46.74 % are O’level and 4.35 % are A’level secondary school students. Among students owning mobile phone, 19.56 % are O’level and 27.18 % are A’level (See Table 2).

Similarly, data suggest that among those students which had opportunity to use mobile phones, about 83.72 % used mobile phone with internet connectivity and most of them are A’level students. During the interview one O-level student elaborated that: *“I never used a mobile phone. When I need to [communicate with my] parents for my school needs, I ask others who go home on Sundays”* (S<sub>3</sub>, O’level student, school F). Another student claimed that:

If I need to communicate to my parents I usually borrow a mobile phone ... If you have mobile phone mostly you will use for playing music, chatting with friends all the time without studying hard and you will be thinking about mobile phone all the time (S<sub>22</sub>, O’level student school E).

This student’s views indicate fear of students might use mobile phones other the study purpose.

**Student Mobile Phone Usage**

Study findings indicated that students has several uses of mobile phones such calling, chatting, listening to radio, searching online news, money transfer, internet surfing (searching online teaching materials and news), entertainments (Audio-Visual player, listening to Radio, playing games) and others (camera, clocks, torch) (see Figure 3).

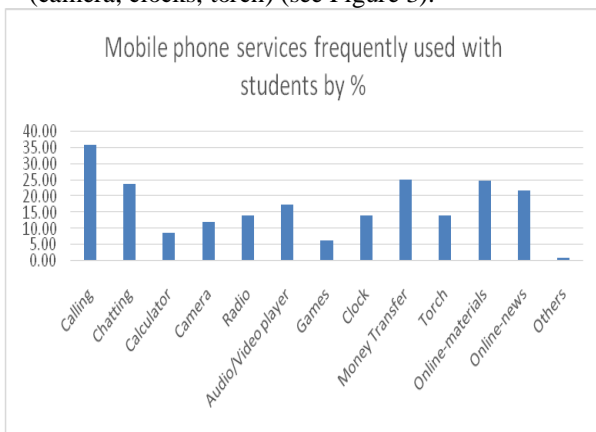


Figure 3: Represents in percentage the frequently used mobile phone services by students

Students are aware that mobile phones can be used for several purposes including internet services for education. For instance, one A’level students said: *“When I was coming to school from home I knew nothing about a mobile phone, but now I have learnt a lot in school about it ... Now I can use a smartphone to search materials through applications like ask.com”* (S<sub>2</sub>, A’level student, school D). This student’s views suggest that students have been using mobile phone for learning purposes.

Also the survey has found that there are trends of using mobile phones at school and at home. Findings indicated that students are using mobile phones from evening to night and rarely in morning, afternoon or any time (see Table 2).

Findings have revealed that 18.68 % of students use mobile phones at night. Interestingly, 60.87 % did not respond to these questions maybe they feared that they might be reported to the school management and steps could be taken against them because mobile phones were prohibited at school. An A’level student from school B reported that:

I always use mobile phone every day at night to search materials and searching them mainly through google. However, there are other services like communication, chatting with friends through social media and watching movies, and searching online information. I use it at night because I am free during that time and no teachers could see me... (S<sub>63</sub>, A’level students, school B).

Mobile phone has been observed to be used by students mostly during night despite the fact that they are prohibited.

Table 2: Frequency and time at which students use mobile phone at home and school

Mobile Phone usage at:		Time at which mobile phone are mostly used %						Total
		Morning	Afternoon	Evening	Night	Any time	Not responded	
<b>School</b>	Once	.00	.00	3.26	9.78	1.09	.00	14.13
	Twice	.00	1.09	4.35	2.17	.00	.00	7.61
	Thrice	.00	1.09	.00	.00	.00	.00	1.09
	All the time	1.09	.00	.00	1.09	1.09	.00	3.26
	After class	.00	.00	1.09	.00	.00	.00	1.09
	Weekend	.00	.00	1.09	2.17	.00	.00	3.26
	Once per week	.00	1.09	2.17	3.26	1.09	.00	7.61
	Not responded	.00	.00	1.09	.00	.00	60.87	61.96
	Total	1.09	3.26	13.04	18.48	3.26	60.87	100.00
<b>Home</b>	Once	.00	.00	2.20	.00	.00	3.30	5.49
	Twice	.00	1.10	1.10	.00	.00	.00	2.20
	Thrice	.00	.00	2.20	2.20	.00	1.10	5.49
	All the time	1.10	2.20	5.49	16.48	2.20	13.19	40.66
	Evening/night	.00	.00	.00	.00	.00	1.10	1.10
	Weekend	.00	.00	1.10	.00	.00	.00	1.10
	At emergency	.00	.00	.00	.00	1.10	.00	1.10
	Not responded	.00	.00	1.10	.00	.00	41.76	42.86
	Total	1.10	3.30	13.19	18.68	3.30	60.44	100.00

**Teachers’ Awareness to Use Mobile Phone in Teaching And Learning**

The investigation involved the studying the teachers’ perceptions of mobile phone as ICT teaching and learning tool by seeking their views on its usefulness in education. During the survey teachers were asked 10 questions to track their awareness on the use of mobile phones as a tool in teaching and learning. The results suggested that most teachers did not agree on the adoption of mobile phone as a teaching and learning tool.

**Teachers Perception on Usefulness of Mobile Phone as Teaching Tool**

Findings revealed discrepancies in responses on the usefulness of mobile phone as a teaching tool. The critical aspect was the use of mobile phone for communication with colleagues and students (mean 3.73).It shows that teachers queried on its usefulness (see Table 3). This shows teachers had doubts on the use of mobile phone for communicating with students due to the fact that mobile phones are not allowed at schools.

Table 3: Teachers’ mobile phone usefulness in education

	Mean	S.D
Communication with colleagues and students	3.73	1.472
Accessing online news/e-materials at any point	4.36	0.998
Quick reference when preparing lesson	3.94	1.332
Mobile phone need control like computer if is to be used with students	4.16	1.171
Mobile phone being useful tool to schools with limited resources	3.94	1.153

In interview, some participants denied the use of mobile phone to students because its usefulness will

depend on how well it is used. A teacher from school E said: *“It is very useful for adults especially in communication, but for students is useful at least for A’level students whoare grown up enough to be educated and directed about the proper uses of it”* (T<sub>50</sub>, teacher, schoolE). Other two aspects have the same mean (3.94), which shows teachers perceived mobile phone being a useful quick reference when preparing a lesson especially in schools with limited resources. The Head Teacher of school B pointed out that:

....Mobile phone is very useful tool for communication, browsing online news, sending and receiving money, and in academic for preparing notes as the substitute of books, getting immediate information especially for controversial issues, tutorialsfor students, using dictionaries, and sending and receiving materials through emails... (T<sub>39</sub>, teacher, school B)

Teachers felt that students need to be controlled in using mobile phone (mean 4.16). In looking for controversial issues were it takes long time for emerging issues to be printed on books and get into schools, but not for students. Head of school E said:

... For teachers it is useful but for students it is not because they need guidance (closer follow up) especially these O’level students who are still very young to have mobile phones. They need control in using ICT-related tools. For instance,with TV at home if parents are not there or have not set in-house norms, children (mostly students at home) will watch TV fulltime, so likewise with mobile phones, they

may be affected if not controlled (T<sub>48</sub>, teacher, school E).

This study finding suggests that mobile phone is perceived as useful tool for teachers, and it will be useful to students only if there is a structured supervisory system to ensure there is a good follow up.

**Teachers’ Knowledge on Mobile Phones**

Findings indicated that teachers perceived mobile phone as an easy ICT tool to be used in teaching and learning because the mean ranges were close (mean 3.88-4.06 approximately to 4 which is agree). However, there were discrepancies in individual perspectives due to the fact that the standard deviation among the five aspects, participants’ responses are about 1.1 – 1.2 (see Table 4). The highest agreed aspect was ability to search materials (mean 4.06).

Table 4: Teachers’ knowledgeable on mobile phone in education

	Mean	S.D
Ability to search materials	4.06	1.180
Ability to use apps	3.80	1.129
Mobile phone has simplified features found in computer	3.97	1.112
Mobile phone is easy to use compared to other ICT tool	3.88	1.1175
Most of apps are free to download and easy to use	3.97	1.154

During interviews, teachers portrayed ability to search online materials using mobile phone as it depends on personal enthusiasm. As one of participant said: *“Ability to search online materials differs among teachers because it depends on interest, teachers who are speculative do not even need training while others do need it so as to use their mobile phones effectively to search online materials”* (T<sub>42</sub>, teacher, school B). Teachers perceived mobile phones as a simple tool with simplified features which makes teachers easy to use. In interview, one teacher reported that, *“using mobile phone is easy because even uneducated person can operate it”* (T<sub>12</sub>, teacher, school D).

**Teachers’ And Students’ Perception on the Use of Mobile Phone**

The study investigated the teachers’ and students’ perception on the use of mobile phone in teaching and learning, and the variables of the study were the affordability of mobile phone, time at which mobile phone is used by students, and policy of mobile phone use in secondary schools relating to the current situation of mobile phone use in schools.

**Teachers Perceptions on Affordability of Mobile Phone for Teachers and Students**

Mobile phone being an affordable tool, results show that 62.30 % of participants agreed to mobile phone

being the most available and affordable ICT tool (See Table 5).

**Table 5: Mobile phone use to schools**

	Yes	No	Total
Mobile phone is most available and affordable ICT tool	62.3	37.70	100.0
Allowing Mobile phone to students	1.61	98.39	100.0
Students coming with mobile phone	58.0	41.94	100.0
	6		0

While 37.70 % of participants did not agree and reported that mobile phone is affordable for teachers only and not students because most students are not able to buy air time credits, and also another challenge is unavailability of electricity in most places in rural areas. One of the participants said: *“Mobile phone is mostly available and affordable for teachers only, most students come from poor family”* (T<sub>3</sub>, teacher, school F).

**Teachers’ Perceptions on Policy of Mobile Phone use to Students**

Findings revealed that 98.39 % of teachers said they are not allowing students to come with mobile phones to school. Teachers claimed that mobile phones are destructive to some students because some of them do not know their proper uses hence prohibiting helps to control students’ behavior. One participant reported that: *“The tool itself is very useful, but the problem is that students do not use it properly, that is why we prohibit them to use it”* (T<sub>3</sub>, Head of school C). Study findings reported that there is no consistence on the implementation of the policy of banning mobile phone in schools. School B’s discipline master reported that:

.... there are no formal regular guidelines, such as government circular, that prohibit use of mobile phones in schools.... We are relying on ministry’s announcement to prohibit mobile phones to students in school, which lead to inconsistency of implementation and interference of politicians in the decision that teachers make towards proscription of mobile phones. We make our decisions based on the side-effects of mobile phones to convince school board members to put it in school by-law so that students caught with mobile phone should be discontinued from studies, but still there is some interference. Effective prohibition of mobile phone will depend on the administrator at a particular school (T<sub>29</sub>, teacher at school C).

These participants’ views suggest that teachers have been prohibiting mobile phones in schools without any formal guidelines in schools.

**Current Situation of Mobile Phone Use to Students**

Results show that 58.06 % of teachers said that students are coming with mobile phone while 41.94 % obey not going with mobile phones to school. However, there are several punishments for those caught with mobile phones at school (see Table 6). Teachers agreed that banning of mobile phones is not simple because most students still access them. Teachers perceive that mobile phones are distractive tool in learning process and they suggested that the government needs to take it seriously.

Table 6: Students coming with mobile phone (in 100%) and the measure against them

	Students coming with mobile phone		
	No	Yes	
Measure for Students coming with mobile phone	Suspension, Taking Mobile phone and other Punishment	.00	25.71
	Taking Mobile phone and Punishing	.00	45.71
	No or weak control due to Inconsistence of guide lines	.00	2.86
	Suspension, Taking mobile phone, Punishment and Paying for replacement of electric suppliers	.00	14.29
	Taking mobile phone and returning after school	.00	11.43
	Total	.00	100.00

One teacher from school F reported that: Mobile phone is appropriate for teachers and not for students because we need to continue prohibiting its use to students by putting more efforts like calling the community in, especially parents, to control its use by students. Actually the problem is bigger than

Table 7: Teachers’ responses toward support of mobile phone use by students

	All the time	After class hours	During class hours	At home	Not any where	Not sure	Total
Supporting students accessing mobile phone	1.56	25.00	4.69	29.69	28.13	10.94	100.00

Another teacher claimed that: “Let us start using it after class hours then later they will get used to it. I do support it because at school where I studied it was allowed and we were using it after classes and it did not harm us” (T<sub>24</sub>, teacher, school C). However, many teachers seem not to trust students, despite the fact that it is agreed that mobile phone is the potential tool in education but they suggest that there must be a system to guide their use to make it more productive than destructive. One, teacher said: *I don’t support it but if is to be used there must be a well-structured*

it seems so other stakeholders should intervene and help to ban mobile phone in school because students do not perform well and girls do not finish schools. A’level students are grown up and can be given moral directives for its proper use (T<sub>6</sub>, teacher, school F).

The results suggest that A’level students can be given opportunity to use mobile phones and guided for its proper use. It has been observed that most A’level students own and use mobile phones with internet connectivity.

**Teachers’ Perception on the Occasion of Mobile Phone to be used with Students**

The survey asked the views of teachers at which time do they support mobile phone to be used to students. Findings revealed that 29.69 % supporting students to access mobile phone at home and 28.13 % not anywhere, 25 % after class hours, 10.94 % are not sure, 4.69 % during class hours and 1.56 % all the time (see Table 8). Teachers who support mobile use in school commented that:

...Matured students are easier to control or direct like A’ level students, instead of prohibiting we can allow and direct them to use it properly. This is because I believe the tool is beneficial for many students hence prohibiting it is like misusing it. I know, currently in Tanzania in this shortage of teachers especially for science teachers, mobile phone is very important for students and it is the only ICT tool that students from poor class can afford... (T<sub>40</sub>, teacher, school B)

system to guide the proper use of mobile phone (T<sub>14</sub>, teacher, school D). This means, the systems which are external factors influence the use of mobile phone to students, the tool can be very useful and helpful in education but it will depend on the approach of adoption.

**Students Perceptions on Occasion of Mobile Phone Use**

From the survey students were asked to specify at which time they support mobile phones to be used.

The findings indicate that mobile phone should not be used during class hours (00 %) rather they should be after class hours (39.13 %) as shown (See Table 8)

Table 8: Students response toward support of mobile phone to school

	All the time	After class hours	During class hours	At home	Not any where	Not sure	Not responded	Total
Supporting students accessing mobile phone	2.17	39.13	.00	26.09	19.57	9.78	3.26	100.00

The results show that students know both side effect of mobile phone that if not used properly will cause many imbalances. Three students reported that:

Mobile phone is portable and easy to search materials but only in absence of computer, if computers are present its better to use computer than mobile phone, because a computer cannot be used frequently and all the time (S<sub>88</sub>, A'level student, school C).

Mobile phones should be allowed especially for advanced schools so as to help teachers how to utilize them effectively to avoid misusing them. Teachers are not helping/supporting how to use them properly because we are prohibited to use mobile phones (S<sub>72</sub>, A'level student, school B).

Although students might be positive because they need it for those non-academic matters, but from their response there was strong reason for their support. Thus, it will be a backup tool where computers are available or when computers have no internet connection.

**Challenges of Using Mobile Phone in Teaching and Learning**

The study also investigated the views of teachers and students about the challenges of using mobile phone in teaching and learning. The variables for this were policy of banning mobile phone, impact of mobile phone to students, barriers of using mobile phone and strategies to make mobile phone a useful pedagogical tool.

**Teachers Perception on Banning Mobile Phone in Schools**

From the survey questionnaire results show that 86.89 % of teachers said that banning mobile phones in schools was unsuccessful and only 13.11 % reported that they have successfully banned mobile phone to students in schools (See Table 9).

Table 9: Represents response on policy of banning and impact of mobile phone

	Yes	No	Total
Banning mobile phone policy is unsuccessful	86.89	13.11	100.00
Mobile phone influence students to fail and misbehave	91.80	8.20	100.00

For example, one teacher claimed that it is not possible to ban mobile phones: “It is not possible to ban mobile phone (prohibiting 100 %) due to the benefits of mobile phones and political interference on decisions made against those who are coming with mobile phones”(T<sub>1</sub>, teacher, school F). Banning mobile phones in school became challenging due to fact that students are curious with the services in mobile phone. Findings revealed that 91.80% reported that mobile phone influence students to fail and misbehave.

**Teachers Perception on Making Mobile Phone as Useful Teaching Tool to Students**

Teachers were asked to suggest strategies to make mobile phone as useful tool to students. Findings revealed that 60.78% of teachers suggested that the use of mobile phones for students should be outlawed at school as strategy to control the behavior of students (see Table 10). Likewise 3.11% of teachers suggested that teachers should ensure collaboration with parents when dealing with mobile phones, and 21.57 % suggested that students need advices on effects of mobile phone and proper use.

Table 10: Strategies to make mobile phone as useful tool to students

Responses		Mobile phone influence students to fail and misbehave (in %)	
		Yes	No
Strategies to control mobile phone not influencing students to fail and misbehave	Education about proper use of M.P	21.57	8.20
	Banning M.P use at school	60.78	.00
	Taking Mobile phone until holidays	1.92	.00
	Blocking some apps and allow access of L.M.	4.42	.00
	Working with parents when dealing with M.P.	3.11	.00
	Total	91.80	8.20

On other hand 4.42 % support the use of mobile phone but after blocking some mobile applications and allow access to learning materials (Table 10).

**Teachers’ Views on Challenges of Using Mobile Phones In Schools**

Teacher reported several barriers (see Table 11) that affects mobile use in schools. Findings indicate that 3.33%; reported that lack of electricity is a barrier

while 61.66% of teachers believe that students will misuse the tool and waste studying time by chatting in social media than accessing learning materials is a barrier. Likewise, 3.33% reported that allowing mobile phone to students will increase cost such as buying credit. No clear guidelines (6.67 %) in schools which make the policy of banning mobile phone difficult.

Table 11: Teachers response on challenges of using mobile phone with students at school

	Responses	(%)
Challenging of using Mobile phone with students at schools	Lack of electricity	3.33
	Low internet connection	5.00
	Difficult to accessing learning materials	3.33
	Waste studying time by chatting with social media	61.66
	Budget increase	3.33
	Make students vulnerable to sexual relationship	8.33
	No clear policy guidelines in schools	6.67
	No charging systems hence school is vulnerable to fire due to	8.33
	Illegal connections	
	Total	100.00

Some (8.33 %) said that no charging systems hence school is vulnerable to fire due to illegal connections. Also 8.33 % said that it makes students vulnerable to sexual relationships, especially girls.

pedagogical tool in teaching; these are: provide moral directive or counseling on proper use of mobile phone; setting rules and regulations guiding the use of mobile phone; and block some of mobile applications like social media and enable features which help them to access learning materials only (see Table 12).

**Teachers Views on Mobile Phone as Useful Pedagogical Tool**

From the survey teachers suggested strategies to be undertaken in order to make mobile a useful

Table 12: Teachers’ response on suggestion to make mobile phone as useful tool in schools

	Responses	(%)
Mechanism to make mobile phone useful pedagogical tool if is to be implemented	Block some Mobile apps e.g. social media	14.04
	Grand access only when needed	38.60
	Moral directive on proper use	14.04
	Rules and strategies guiding the use of M.P must be set before allowing	1.75
	Mobile phone cannot used as pedagogical tool	14.04
	Ensure standard internet connection	5.26
	Ensure availability of supportive infrastructure like charging socket	1.75
	Design and install teaching application for teachers	7.02
	To be used by teachers and higher learning students	3.51
	Total	100.00

Source: Field data (April, 2015)

Students may be positive toward mobile phones at school because they need them and most of them use for non-academic matters like chatting in social media, SMS, calling most of time and having little or no time for private study.(S<sub>109</sub>, A’level student, school D)

**Students Views on Challenges of Mobile Phone Impact of Mobile Phone to Students**

Findings revealed that 67.05 % of students admitted that mobile phone affect students and cause them to fail and misbehave (see Table 13).

In this view phones should be kept with teachers and students are given when needed and/or cancelling and guidance on proper use of mobile phone by given to students.

Table 14: Represents impact of mobile phone to students

	Yes	No	Total
Mobile phone influence students to fail and misbehave	67.05	32.95	100.00

In interview, results show that students having mobile phones are using them for chatting and calling girl/boyfriends during night and hence failing to have enough sleeping time. One of the students observed that:

**Students’ Barriers of Using Mobile Phones**

Findings indicate that Mobile phone in class will disturb lessons and after class will delay take-home assignment because students will be frequently thinking or using phones (chatting,

browsing/watching pornography) rather than concentrating with the lessons; vulnerability to sexual relations, especially for girls and hence getting pregnancy; and mobile phones may cause students to

misbehave at home and at school by being busy with phone and ignoring other important tasks (Table 14).

Table 14: Students’ Responses on the Challenges they Face on using Mobile Phone

	Responses	(%)
Challenging of using Mobile phone in schools	Busy chatting with friends and browsing for pornography	28.83
	Exams failure and sexual relation	15.21
	Mobile phone causes miss behaviour at home and school	24.32
	Increase of the budget	7.21
	Loss of peace of mind	10.81
	It bring classes	1.80
	No help to access learning materials because it is prohibited	1.90
	Lack of sleeping time due night being occupied using mobile phone	9.90
	Total	100.00

**Mobile Phone as Useful Pedagogical Tool**

Results show that students suggested several mechanisms to make mobile phone a useful pedagogical tool. Some of those are; moral directives and education on its proper use; block some mobile

applications like social media; grand access only when needed; should not be used by students, but should be used by teachers only; should be used during weekend (see Table 17).

Table 17: Students’ responses on means to use mobile phone for teaching and learning

	Responses	(%)
Mechanism to make mobile phone useful pedagogical tool if is to be implemented	Block some Mobile apps like social media	2.73
	Grand access only when needed	52.73
	Should be used with teachers only	11.82
	If is to be used the government should supply	2.73
	Moral directive and education on proper use	13.64
	Educational directives on specific academic sites to access materials	5.45
	Designing materials for our context and education on proper use of phone	1.82
	Electronic libraries, internets and qualified teachers to help students	1.82
	Phone should only be connected to internet to search materials or installed academic programs or use of computer/laptop	7.27
	Total	100.00

Students show that they do not trust themselves on use of mobile phones because 52.73 % said adaptation of mobile phone should be done only in a way that students are given opportunity to access mobile phones when needed under supervision. While others (13.64 %) believed that moral directive and education on proper use of mobile phone are the key issues. Students did not quite agree and support the use of mobile phone at school.

**DISCUSSIONS**

The findings of this study suggest that both teachers and students support the view that students should not be allowed to use mobile phones in the classrooms due to the fear that students are likely to use mobile phones for other purposes than school learning like involving in sexual issues, chatting in social media, sending SMS during class time etc. This implies that there are contextual and social factors that made teachers and students to fear the adoption of technology such as mobile phones into teaching. The resistance to technology adoption was also reported in the study by Callum, Jeffrey, and Kinshuk (2014)who observed that teachers’ attitude toward technology provides deciding role in adoption of new technology into teaching and if they have negative attitude towards new technology they will resist it.

This fear of teachers and students on the adoption of new technology into teaching is supported by theory of technology adoption as reported by Straub (2009) who observed that individuals adopt or reject new innovations because (a) “technology adoption is a complex, inherently social, developmental process; (b) individuals construct unique (but malleable) perceptions of technology that influence the adoption process; and (c) successfully facilitating a technology adoption needs to address cognitive, emotional, and contextual concerns” (p. 626). Thus, in this study the perception of Tanzanian teachers and students on mobile phone use was affected by contextual concerns such as teachers and student lack knowledge on how to use mobile phones and lack of policy on mobile phones use in schools. Despite the fears on mobile phones use in schools, mobile phone will remain the pedagogical tool for teachers in the future. As Cheon, Lee, Crooks, and Song (2012) argued that ownership of mobile phone in particular android with ability to send multimedia information is not a barrier even in developing countries there is no exceptional room for teachers to apply mobile phone as pedagogical tool.

This study finding established that outlawing students to possess mobile phones did not stop students

accessing the mobile phones in school environment as many students were found to own android mobile phones and they are using them for searching e-learning resources. This implies that instead of schools and teachers prohibiting mobile phones in schools they should use them as an educational opportunity to support students to access e-learning resources for purpose of improving students' learning outcomes. In an experimental study Aker et al. (2012) reported that simple ICT technologies such as mobile phones can be used to improve student learning outcomes in rural schools. In addition, instead of considering mobile phones in schools as barrier to student learning it should be used as a means of addressing existing digital divide between urban and rural schools as even low income families own mobile phones. In this study, teachers feel that lack of electricity is one of the barriers for mobile phones as pedagogical tool in schools; however, compared to computers which require electricity or standby generators mobile phones are user friendly in rural areas because they can be charged using small solar panels and sustain power for a long.

The potential of mobile phone as means of closing digital divide was noted by Osunkunle (2010) who said that "cell phones are quite cheap and in various forms, which has made it possible for most people, including primary school pupils to have one. This has therefore made it possible for people to communicate in both rural and urban areas ... Fortunately, one does not need to be educated to use a mobile phone as individuals, households and organizations are able to communicate" (p. 379). This implies that there is potential of using mobile phones as teaching tool as it supports easy access to e-learning materials.

#### CONCLUSION AND FUTURE RESEARCH

Mobile phones are the new ICT tool for teachers and can help to address the digital divide gap between urban and rural areas in accessing e-learning resources. Building in this study findings mobile phone access is not a barrier but adoption by teachers and students is a challenge in schools because of fearing technology adoption. This study was an opinion based study where participants were explaining their feelings. Therefore, this study recommend an experimental study that will allow pupils to use mobile phones and see if the reservations that teachers have on negative impact of mobiles phones in schools if students are allowed.

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