International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2019, Vol. 15, Issue 2, pp. 154-170

Awareness and use of a mobile phone as a potential pedagogical tool among secondary school teachers in Tanzania

Hamisi Mfaume
Dar es Salaam University College of Education, Tanzania

ABSTRACT

The government of Tanzania through its ICT Policy for Basic Education, has indicated a commitment to use of mobile phones among other ICTs, as a strategy to enhance the quality of education. It is from this fact that this study determined teachers' awareness of the educational benefits of the device, their use and barriers towards their educational use. The study was qualitative in nature, using a sample of twenty one (21) teachers who were purposefully selected from three secondary schools. Data were sought through semi-structured interviews and were thematically analysed. The findings revealed that teachers are well informed of the benefits, but they hardly utilize it for educational purposes. Lack of knowledge and skills, a negative attitude, lack of awareness of the ICT policy, age and low motivation emerged as key barriers. In light of the findings, the study concluded that the government's commitment to integrate the device in the promotion of quality education has not yet moved beyond policy statements. Thus, a concerted effort is needed to train teachers on pedagogical utilization of the device.

Key Words*: Teacher; awareness; mobile phone; pedagogical tool; Tanzania.*

INTRODUCTION

During the 21st century the proliferation of Information and Communication Technology (ICT) has been remarkable worldwide. Amongst the ICTs, the mobile phone is undoubtedly the most fascinating device the ICT industry has ever nurtured (Porter et al., 2016). Its rapid strides and price plummet have made it the most widely used among the personally owned ICT devices. A statistical report issued by the International Telecommunication Union [ITU] indicates that by the end of 2015, the world's subscriptions of the device accounted for more than seven billion (ITU, 2015). The multiple function applications inbuilt in the device, have transformed it from a tool for traditional communication to an instrument par excellence for development in different sectors including education (Mtega, Benard, Msungu & Saware, 2012). In education the device supports the educational activities in a diversity of contexts for a mixture of purposes (Avraamidou, 2008; Wendeson et al., 2010). Its applications such as mobile teleconferencing and text messages can support interaction and collaboration in the teaching and learning environment (Brown, 2005). The device can also enable teachers to share a variety of the teaching and learning materials, handle their schedules and access educational information ubiquitously (Kihwele & Bali, 2013).

Moreover, the device can support learning in science and arts subjects. For instance, reference applications can assist students to learn chemical formulae and observe the way chemical reactions take place (Twum, 2014; Williams & Pence, 2010). In language subjects the device can enhance the teaching and learning of vocabulary (Kheider, 2016). Due to teachers' tight schedules, the device can connect them to training opportunities and enable them to learn at convenient times and places and hence, enhance their career performance and professional growth, in ways previous ICT devices did not allow (Cisco, 2016).

Realizing the great benefits of the device, most countries have integrated it into their mainstream education systems (UNESCO, 2012; 2017). For instance, in the United States of America (USA) the device has been used as a pedagogical tool in more than 85% of education institutions

(Shaw, 2009). In the United Kingdom (UK) 90% of secondary school teachers use the device as an instructional tool. They share academic information and deliver various subjects through the device (Cuing & Wang, 2008). In Bangkok teachers hold academic discussions and administer tests, though the device (Whattananarong, 2005). Likewise, in Japan and the Philippines teachers deliver Mathematics, English and science subjects through the device (Thornton & Houser, 2005; Ramos, Trinona & Lambert, 2006).

Efforts to integrate the device into education are also prominent in African countries, such as South Africa, Nigeria, Kenya and Uganda to mention but a few (Alaba, 2011; Brown, 2005; Kajumbula, 2006; Porter et al, 2016; UNESCO, 2012). Accordingly, Tanzania, like other African countries has also committed to integrating the device into education (Ministry of Education and Vocational Training [MoEVT] 2007). The commitment is reflected in the ICT policy for Basic Education promulgated in 2007 to guide the integration of ICTs in pre-primary, primary, secondary and teacher education. The policy recognizes the device as an essential tool that can help in the provision of a higher quality education and build a knowledgeable nation by 2025 (Gibbons.et al., 2018; MoEVT, 2007).

Parallel to the policy, several pilot projects have been carried out that explore the educational worth of the device. They include the Bridge IT that was launched in 2007. It reached 536 schools and 116,000 pupils in six regions, namely; Lindi, Mtwara, Coastal, Dar es Salaam, Tanga and Kilimanjaro. It used the device to provide teachers with access to digital video content in Mathematics, Science, English and life skill subjects (UNESCO, 2012; Urassa, 2012). Similarly, the Ministry of Education in collaboration with the College of Information and Communication Technologies (CoICT) of the University of Dar es Salaam, conducted another pilot project on the use of short message services (SMS) to upgrade subject content knowledge of secondary school science and mathematics teachers (Mtebe, Kandoro, Kissaka & Kibga, 2015). The results of the pilot projects and other empirical studies conducted in the country on mobile phone use (Gibbons et al., 2018; Kafyulilo, 2014; Kibona & Rugina, 2015; Kiwhele & Bali, 2013; Mtebe et al., 2015; Mtega et al., 2012; Msuya, 2015; Urassa, 2012), have supported the enormous educational benefits of using the device.

Given the inspiring results, teachers were expected to take full advantage of the opportunity offered by the device towards improving their career performance and delivery of a higher quality education in schools. Surprisingly, despite the apparent benefits attached to use of the device and several initiatives undertaken to integrate its use in education, extant studies (Gibbons et al, 2018; Kafyulilo, 2014; Msuya, 2015; Swart & Wachira, 2010) indicate that many teachers in Tanzania hardly utilize the device for academic purposes. This situation creates doubts about their awareness of the device as a potential pedagogical tool. It also threatens to undermine the government's efforts to integrate modern technologies in education as a strategy to provide a higher quality education. This situation calls for an empirical investigation into teachers' awareness of the pedagogical benefits of the device and the reasons for the limited uptake. Hitherto, empirical inquiry in this area is strikingly lacking in Tanzania. Thus, this study was an attempt to gain a more informed understanding and eliminate any misconceptions on the subject. Specifically, it attempted to answer the following main questions:

1. What do teachers view as the educational benefits of a mobile phone?
2. How do teachers describe their utilization of a mobile phone for educational purposes?
3. What do teachers view as barriers towards their educational utilization of a mobile phone?

METHODOLOGY

This study employed a qualitative research approach. The approach which is a means of exploring the perspectives held by people about a particular theme (Mertens, 2010; Creswell,

2014), helped the researcher to generate insights of teachers and heads of schools on the subject under inquiry. The study adopted a case study design. According to Saunder, Lewis and Thornhill (2009, p. 145) the case study involves an empirical inquiry of a particular contemporary phenomenon within its real life context using multiple sources of evidence. This case study focused on teachers in three public secondary schools in the Kinondoni municipality in the Dar es Salaam region. The design enabled the researcher to obtain in depth perspectives about the topic from multiple sources of evidence in the real school contexts (Merriam, 2009; Muranda, 2004; Saunder, Lewis & Thornhill, 2009; Yin, 2014). Moreover, the combination of multiple perspectives from teachers and their heads in a single study added rigour, richness and depth of data (Devetak et al., 2010).

The researchers drew the participants from a population of the public secondary school teachers in the municipality. Purposive sampling was used to select three (3) schools within the municipality, but their names were kept anonymous for confidentiality purposes. The schools were selected on the ground that they are equipped with ICT facilities like computer labs and free Internet service. The fact that qualitative inquiries are less concerned with the number of participants, but the level and depth of data (Magwa & Magwa, 2015; Yin, 2014), a sum of twenty one (21) participants, including eighteen (18) teachers and three (3) heads of schools were purposely involved in the study. Specifically, from each sample school, five (5) class masters, the academic master and the head of the school, bringing in a total of seven (7) participants was selected by virtue of their positions. This sample size was obtained after data saturation was reached, and it was adequate to provide the researcher with sufficient insights into the subject (Mertens, 2010; Creswell, 2014).

Data were mainly collected through one to one interviews. The interviews which are ways that provide participants with an avenue to air their views about a certain topic (Cohen, Manion & Morrison, 2000), gave room for the researcher to probe and give more clarifications to the participants, hence generating detailed data about the subject. The data were recorded, transcribed and subjected to thematic analysis (Braun & Clarke, 2006). The process involved a thorough reading of the transcripts in order to become familiar with the data and seeking what emerged from the data, arranging of participants' responses in order to generate initial codes with regard to the research questions, searching for themes, reviewing of themes, defining and naming of themes, and finally reporting the findings (Braun &Clarke, 2006; Denscombe, 2007). In order to ensure confidentiality and anonymity, codes were used in the presentation of the findings. For example, schools were coded as school A, B and C, whereas, teachers were coded FT1SA to mean a female teacher of school A, MT7SB male teacher of school B, and FHoSA entails female head of school A.

FINDINGS AND DISCUSSION

This section first presents the data on the background characteristics of the participants, and then, the findings in the form of detailed descriptions and direct quotes from interviews.

Demographic Information, Profile of the Participants

The participants involved in this study mainly comprised of the teachers and heads of schools. The participants by their categories and sex is presented in Table 1 below.

Table 1: *Summary of respondents' characteristics*

Category of Participants	**Sex**		**Number**
	Male	**Female**	**Total**
Teachers	09	09	18
Heads of Schools	02	01	03
Total	**11**	**10**	**21**

Source: Field data

Teachers' Response on Educational Benefits of a Mobile Phone

The researcher first probed teachers' perspectives on whether they consider a mobile phone as a potential pedagogical tool. Then, they were asked to give their understanding of the educational benefits of the device in order to determine their level of awareness. The study had varied findings.

In response to whether teachers regard a mobile phone as a pedagogical tool, all participants agreed that a mobile phone has potential for enhancing the teaching and learning. The following reflect the views of the participants:

> *Personally, I believe that a mobile phone is a very useful tool in education. It can help in searching for teaching and learning resources…* [MT7SB]

> *I agree that a mobile phone is an important tool for education… it can enable teachers acquire and share knowledge through platforms like WhatsApp…* [FHoSA]

Moreover, all participants were found to be very well acquainted with the educational benefits of the device, as they all managed to depict a range of educational benefits of the device. Among others, the following were yielded from the interviews as key benefits of the device.

Easy access to educational resources

There was consensus from all participants that easy access to educational resources is one of the benefits of the device. They argued that the device can be used to download a variety of teaching and learning materials like e-books for various subjects. They added that through applications and platforms such as Bluetooth, Wi-Fi, WhatsApp and YouTube, teachers can share a variety of teaching and learning materials ubiquitously. The following illustrate the viewpoints of the participants:

> *… A mobile phone can help in accessing the materials. I use Wi-Fi to download teaching and learning materials through my device… Luck enough our school is connected to a free internet service by Tigo…*

Another teacher noted:

> *... we used to go to internet cafes and pay for internet. But, with smart phones, we can simply search the materials just from the palms of our hands [laughter]…* [MT17SC]

To concur with this finding, Savill-Smith and Kent (2003) contend that through the device teachers can access electronic books, articles and reports. Accordingly, Cuing and Wang (2008) found that universities in the UK used the device to save and retrieve information by means of electronic books, therefore, making access to information for teaching and learning more readily available. The findings also support the work of Mtega et al (2012) who found that lecturers used their devices to download scholarly materials. From the findings, it is clear that the device has potential in the provision of a range of educational resources. This denotes that if it is fully utilized, it can help teachers and students' access up to date teaching and learning resources, hence addressing the persistent shortage of teaching and learning materials facing most schools.

Enhances Teachers' interaction and collaboration

The teachers and heads of schools pointed out that the device can promote interaction and collaborative learning. They argued that platforms like WhatsApp, Shule direct and tHL, can help teachers interact with each other, with students, and competent professionals, share knowledge and experiences and address a diversity of academic challenges altogether. The views expressed below illustrate:

> *Through a mobile phone teachers can interact and share knowledge and experiences and find solution to academic problems. Last year there was a confusing question in the mathematics national examination, but through our WhatsApp group we discussed and got a solution…* [MT4SA]

> *We have WhatsApp groups where teachers can interact, discuss and exchange knowledge and skills on different subjects…* [MHoSC]

The findings concur with Brown (2005) that mobile phone teleconferencing and SMS can support interaction and collaborative learning among teachers and students. The finding also shore up the work of Aubusson, et al. (2009) that Internet connectivity through the device provides teachers with the fastest medium to share educational knowledge, practices, experiences and concerns. From the findings, it is evident that teachers are aware that the device can enable them to interact and share knowledge. This entails that the device provides a viable channel for teachers, especially those working in remote areas to join with colleagues and other competent experts online. Thus, if it is fully utilized, it can potentially promote the professional competencies of thousands of teachers across the country, far more than they could be reached by the normal in-service training.

Easy communication and access to Information

Seventeen teachers and all the heads of the schools cited easy access to communication and information as another benefit. They noted that the device can allow them to quickly communicate with parents, other educators and educational authorities anytime and anywhere. They added that its Internet connectivity can allow them access to current information about new policies, circulars, meetings and opportunities for professional development. The following reflects the views of the participants:

> *You can use a mobile phone for communication with parents and colleagues. At the same time it can be used to share important information about meeting, circulars, syllabus change and other announcements...* [FT3SA]

> *The device helps in communication and circulation of information about circulars, policies and announcements from authorities can quickly be communicated through WhatsApp staff groups...*[FHoSB]

Reinforcing the findings, Jhurree (2005) asserts that a mobile phone enables school administrators to quickly update their subordinates about meeting schedules and new policy initiatives. Also, Bruce (2010) reported that in the USA it is used for updating teachers about changes in course arrangements and deadlines of upcoming events. Accordingly, Twum (2014) found that 69% of teachers in Ghana are updated through the device. In the light of the findings, it is obvious that the device is a quick and cost effective means to connect and update teachers spread across the country.

Storage and management of educational information

Twelve teachers and two heads of the schools argued that through a memory card and other storage spaces available in the device, teachers can keep and manage their personal data and students' records. They can also use it to keep hundreds of teaching and learning materials for reference in the future. The following views illustrate:

> *Yeah, a mobile phone can serve as a storage device... I work with the shule direct platform. They provide me with a variety of materials and I keep them all in my device and students' records...* [MT6SA]

> *We can use the device for keeping records... Do you see this timetable? I can use my phone's camera to capture it and keep it in the device for future review...* [FT16SC]

In keeping with these views, Yuen (2008) argued that the device provides a classroom teacher with a greater opportunity to keep students' academic progress, attendance and financial records. Also, Cuing and Wang (2008) reported that universities in the UK use the device in saving information by means of electronic books. These findings suggest that the device can act as an omnipresent private library where, in fact, most educational information can be stored and managed for future reference. This will provide teachers with an opportunity to learn at a convenient time and place.

Translation and acquisition of vocabulary

Approximately half of the participants considered the device as a potential tool in the learning of vocabulary and translation. They said that the device contains dictionaries of different languages and formats including text, audio and videos, which are helpful in the learning of spelling, pronunciation, acquisition of new vocabularies and explanations of difficult concepts for different subjects. They added that the dictionaries are useful in the translation of different concepts and phrases. The participant noted:

> *This device comprises of a dictionary that can help teachers understand the meaning of vocabularies and difficult concepts. It can also help teachers in translating various words...*[MT12B]

> *As you know, English teachers are dealing with different concepts and vocabularies. So it helps us acquire meaning of concepts through dictionaries installed in...* [MT13SC]

In support of the above viewpoints, Thornton and Houser (2003) contended that SMS can be used to send out vocabulary items at spaced intervals, hence escalating students' retention. Cohen and Cowen (2008, p. 253) posit that "it is an excellent tool that can be used to help students continue their lifelong pursuit of improving vocabulary independently". Accordingly, Chen et al. (2008) reported that the transmission of English vocabulary materials through the device made students in Taiwan enjoy learning. Similarly, Twum (2014) found that 36.6% of university students in Ghana got the meaning of science concepts through the device. The fact that the language of instruction has been a serious problem in the country, the device offers an omnipresent platform to improve language proficiency. It is therefore imperative to ensure that teachers and students are informed of this opportunity, so that they enhance their language proficiency by improving their ability to spell, translate and pronounce various words precisely.

Management of time

Moreover, eleven teachers and one head of school articulated that the watch and alarm can be used to be more prepared for their daily academic routines. They also stated that alarm reminders and the calendar installed on a phone are vital in reminding teachers about their class sessions, time during examinations, meetings and deadlines. The participants noted as follows:

> *An alarm inbuilt in the device can remind us about teaching sessions and events, we are required to attend such as a meeting. In the meeting and examinations the device can be used to manage time...* [FT9SB]

> *A mobile phone is useful for management of time. An alarm, a stopwatch and a calendar can alert us about our duties...* [MHoSC]

The literature also confirms these views. Twum (2014) found that 6.7% of students in Ghana used their device in the management of time. The fact that time management is critical in educational contexts (albeit among students), situates the device as a viable means to serve the purpose.

Overall, these findings indicate that most teachers are aware of the educational worth of the device. These findings concur with Simon (2008) that teachers in Hong Kong considered the device vital for education. Also, Mtega et al (2012) noted that most lecturers were aware of the educational benefits. Further, the findings buttress the work of Msuya (2015) who revealed that 72% of teachers viewed the device as a potential pedagogical tool.

Nevertheless, the findings contradict those of Suki and Suki (2009) who found that most lecturers were not aware of the educational benefits of the device. Further, Ismail et al (2009) noted that most teachers in Malaysia did not view the device as a useful tool for education, and Nordin, Yunus, and Embi (2010) have noted that most pre-service teachers were not interested in the educational use of the device. Accordingly, the findings do not concur with that of Twum (2014) that most lecturers in Ghana were not aware of the educational benefits of the device. The findings also do not concur with Gibbons et al. (2018) that few teachers in the schools studied in Tanzania could see the positive benefits of the device in education.

From the responses and literature, it is apparent that teachers' awareness about the benefits of the device is mixed. The mixed viewpoints cannot be denied, however, a major fact is that the device is crucial for academic success. Lack of consensus among teachers, is a serious concern undermining the uptake of new technologies in education systems in many countries. This entails that more knowledge and training are necessary in order to ensure that all teachers have a common understanding. This will cultivate a positive attitude and encourage them to grasp the opportunities brought about by the very device to increase productivity in their career.

Teachers' Responses on Educational Use of a Mobile Phone

This section intended to establish whether teachers fully utilize their mobile device for educational purposes. In response to this, all participants strongly admitted that the device is not being used for education as much as one would anticipate. They all expressed the view that teachers use their devices to communicate with their friends, families, business customers, and rarely with the parents of students. They also use them for chatting on social networks about politics, business and following the lives of celebrities, in particular the musicians, artists and politicians. Accordingly, they noted that the devices are used for socialization and entertainment like listening to music, watching movies and playing games and for taking photos for sharing on social networks. One teacher in school B noted: *"Teachers have forgotten their roles and become the journalists. Most of the time they are busy taking photos to post on social networks."*

Other participants noted the following:

> *... The majority of teachers rarely use their phones for academic. Often they communicate with their families, friends and customers, discuss about politics and for entertainments...*
>
> *... Some indicators make me believe that teachers do not use the device for academic matters. Three communication companies offer us free internets. You cannot believe that gigabytes expire unused...* [FHoSA]

Similar to these findings, Peter (2007) revealed that many educators in Australia were aware of the benefits of the device, but their educational use was limited. Suki and Suki (2009) revealed that most lecturers disliked using their devices for academic purposes but used them for communication. Also, Thomas and O' Bannon (2013) found that educational use of mobile phones among teachers was low. Accordingly, Ismail, Azizan and Azman (2009) revealed that most teachers in Malaysia were not using their devices for educational purposes. The findings sustain the work of Msuya (2015). He revealed that 88% of teachers in the Dodoma and Kilimanjaro regions, used their devices for chatting on social networks, 80% for taking videos for sharing via social media, 66% for listening to music, 30% for watching videos and 13% for education.

On the contrary, Simon (2008) found that teachers in Hong Kong often used their devices for education. Likewise, Mtega et al (2012) found that lecturers used their phones to download and read scholarly materials.

With regard to the findings above, it is evident that despite the fact that many teachers in this study were aware of the benefits attached to use of the device, they barely exploit it. This implies that the government's commitment to enable schools in the provision of quality education through the device is far from being realised. Twum (2014, p. 162) concluded that "the single biggest problem facing education today is the unwillingness of lecturers to use new technologies in education." To this end, an argument that is easier to express is that the device is a readily available and a financially feasible channel to promote education in the country. However, its meaningful integration requires time, investment and teachers' enthusiasm to deliver using new tools and approaches. Therefore, investment in the training of teachers on educational use of the device is an imperative.

Barriers to Teachers' Educational Utilization of a Mobile Phone

This section sought to establish barriers towards the teachers' educational use of a mobile phone.

It is imperative for the planners and administrators in education to look for ways to ensure its effective utilization. The following emerged as key barriers.

Teachers' lack of knowledge and skills

All the participants cited teachers' lack of knowledge and skills on pedagogical use of the device as a great barrier. They reported that teachers had not received any formal training that could empower them to fully exploit the benefits inherent in the device. Thus, many are incompetent, anxious and uncomfortable with the use of the device for education. The following views reflect the overall opinions:

> *Lack of knowledge and skills about using applications available in the device is the greatest barrier. A mobile phone is like a computer; to use it teachers need knowledge and skills. Lack of it limits them from using it...* [FT3SA]

> *Teachers' lack knowledge and skills on how to use the device... You know, if you do not have knowledge about something, it is obvious that you will lack confidence and develop a negative attitude towards it...* [F15SC]

The excerpts above, support the Technology Acceptance Model that perceived ease of use is a key determinant towards the adoption of a particular technology (Davis, 1989). They also concur with various findings in the literature (Becta, 2004; Balanskat et al., 2005; Pelgrum, 2001; Twum, 2014; Chirwa, 2018). In the light of the findings, it can be argued that teachers' lack of ICT knowledge is a recurring impediment affecting the integration of modern technologies in education across countries. This suggests a dire need for proper capacity-building opportunities among teachers, if the government's commitment to provide quality education through the device is to be realized.

Teachers' negative attitudes and reluctance to change

All the interviewees perceived teachers' nonchalant attitude and inherent reluctance to change as great barriers. They argued that teachers believe more in the negative dimensions of the device than they believe in the benefits. They also believe that they can accomplish their duties without employing new tools. The participants attributed this to factors such as teachers' lack of expertise caused by lack of effective training. Other factors included lack of support from the educational authorities and unfavourable teaching conditions. The following reflect the views of participants:

> *Here there are some teachers who never accept the changes. They believe in hard copy materials... They do not believe that these devices can help them simplify their work...* [FT16SC]

> *Many teachers never use their phones for education because they are conservative. They openly say "we have been teaching for years without technologies and students have been passing. Nowadays you use these devices yet there is a mass failure."...* [FT2SA]

The preceding findings align with that of Albaugh (1997) that teachers are often doubtful about implementation of new initiatives without proof of their usefulness. Similarly, Snoeyink and Ertmer (2001) noted the views of a teacher who aspired to remain comfortable with her traditional teaching, regardless of whether the technology would improve her practices. From these findings, it can be deduced that the delay in the uptake of new innovations in the teaching profession is partly a result of teachers' inherent attitude and beliefs. This is an indication that essential education about long-term opportunities for use of the device might be lacking among

teachers (Cox et al., 1999). Thus, teachers need necessary education to assist with accepting changes and must be given adequate long-standing opportunities to make sense of the device.

Teachers' lack of awareness of the ICT policy

Teachers' lack of awareness of the ICT policy is another barrier. According to the participants, the device is not being fully used due to the lack of policy informing its usage in schools. This was a shocking finding to the researcher given the fact that an ICT Policy which guides the integration of ICTs in pre-primary, primary, secondary, teacher colleges and non-formal education has been in existence since 2007. The policy recognizes the device as a vital tool to promote quality education delivery (MoEVT, 2007). This prompted the researcher to inquire about teachers' awareness of the policy. Surprisingly, all teachers and their heads confessed that they are not informed of its existence. They added that they neither had any orientation about the policy, nor a copy in their respective schools. The following views illustrate:

> *To be honest, you have just opened my ears today that there is an ICT policy that recognizes these devices as pedagogical tools... I have never come across the policy and I know nothing about it...* [FHoSB]

> *... Unless teachers see something in the policy, they do not take trouble to implement it. The fact that there is no policy informing the use of mobile phones in education, teachers do not see the need to use it for education purpose...* [MT7SB]

In concurrence with the findings, Kayombo and Mlyakado (2016) revealed that there is little awareness of the ICT policy among teachers in the Tanga and Mwanza regions in Tanzania. Accordingly, Evoh (2007) contended that comprehensive ICT implementation policies are lacking in most African countries. When they exist, they tend to be vague and make little reference to implementation (James, 2001). Also, poor ICT policy knowledge and implementation strategy are a great barrier in Nigeria (Adomi & Kpangdan, 2010). These findings imply that for most teachers the ICT Policy is still something mysterious. This is a serious concern that vies for the attention of policy makers if the policy is to yield the anticipated results. It is therefore plausible to argue that, concerted efforts should be taken to ensure that the policy moves beyond general statements.

Teachers' age and teaching experience

Eleven (11) of the teachers that participated in the study, felt that young teachers are more enthusiastic about using the device. Senior teachers were reported to be reluctant about using the devices because they did not have any ICT training when in college. Also, having taught for years without technology, senior teachers believed more in the traditional methods of teaching. Due to this belief, most of them did not see the need to have the latest devices with the capacity to support educational use. The views below illustrate:

> *Teachers' age and working experience are serious obstacles. Teachers of advanced age studied at a time when technology was nonexistent. Thus, to them technology is something new and a burden*... [MT4SA]

> *Teachers aged forty five and above hardly if any, use the device for education. You can hear one saying " I cannot use these devices for education at this age. We have been using textbooks for years and students are doing well… how possible to train an old dog new hunting technique?"…* [FT10SB]

These findings are similar to Yaghi (2001). He revealed that teachers of advanced age were less confident with the use of computers. Teo (2008) found that in Singapore most young teachers were more fervent about using computers for education than their counterparts. Lee (1997) as cited in Becta (2004) contended that teachers of higher age hardly use ICTs, because they did not receive any ICT training. However, other studies (Meskill, Mossop, Diangelo & Pasquale, 2002; Mahdi & Al-Dera, 2013) revealed that teachers' age had nothing to do with ICT utilization. In sum, the findings suggest that age and work experience, partly affect teachers' utilization of the device. This suggests that regardless of age and experience, teachers need regular training on pedagogical use of ICTs to allow for their use in enhancing their career performance.

Cost of mobile phones and Internet service

It emerged from the views of ten of the participating teachers and two heads of schools that the price of the latest devices is often high, making it difficult for many teachers to afford. They estimated that a minimum cost ranges from three hundred thousand shillings upward. As a result, many teachers own devices with very limited functionalities. Accordingly, an exorbitant price of the Internet bundle was reported to prevent teachers from using the device. However, all heads of schools and some teachers denied that Internet cost was a barrier because their schools had free wireless Internet services. The following illustrate the views:

> *The high price of Smartphone is an obstacle to many teachers. Only teachers with a sound financial status can afford a latest device useful for educational use. The majority own low quality devices with limited capacity...* [MT5SA]

> *Limited educational use of mobile phones is attributed to the high cost of the latest devices… internet cost is a problem in rural schools, but at my school we have a free wireless internet service...* [FHoSC]

The findings above suggest that the exorbitant cost of most ICT devices is a stumbling block for their educational use. This is in keeping with the findings of Brakel and Chisenga (2003) who disclosed that due to the high cost of computers and Internet provision, many schools and teachers cannot afford. Similarly, the cost of ICT facilities limited their use in schools in Nigeria (Adomi, 2006). It can therefore be argued that as far as the government of Tanzania is committed to develop the use of mobile phones to provide quality education, there is a need to provide schools with the latest devices and reliable Internet free or at an affordable price.

Teachers' lack of motivation and commitment

Ten teachers and all heads of schools reported that most teachers lack motivation and self commitment to the teaching profession. This was attributed to an inadvertent path into the profession that makes them disregard teaching as their core career, but as a stepping stone to careers of their interest. In addition, low commitment was attributed to the failure of the employer to address their plight in a timely manner. As a result, teachers tend not to be accepting of any new initiative. The following comments illustrate:

> *Many teachers are in this profession because they had no alternative job. Teaching was not their choice. As a result, they consider any initiatives as a burden...* [MT5SA]

> *As you know, motivation is a key determinant for teachers to work effectively. The fact that teachers have half-hearted motivation, their readiness to use new tools to improve their work is low...* [FHoSB]

In support of these findings, Bennel and Akyeampong (2007) discovered that teachers' motivation in Sub-Saharan Africa is very low due to poor living and working conditions and dysfunctional management. Also, Mkumbo (2012) reported that for most teachers in Tanzania, teaching was not their choice, they were compelled by the ease with which they could get the job. In view of these findings, it is clear that low motivation is a serious concern across most developing countries including Tanzania. Thus, rigorous effort must be made to improve teachers' motivation. In return, teachers should not regard teaching merely as a gainful occupation, but as their core role.

CONCLUSION AND RECOMMENDATIONS

The study determined teachers' awareness of a mobile phone as a pedagogical tool. It has revealed that teachers are well informed of the educational worth of the device. Despite high awareness, teachers do not fully utilize the device for academic activities. Lack of ICT knowledge, the costs of the device and low motivation are some of the limiting factors. The findings imply that the government's commitment to the use of the device in promoting quality education has not moved past policy declarations. Therefore, concentred effort to translate the policy pronouncements into actuality is imperative. A policy implementation unit should be formed to provide schools with modern devices through grants and facilitate the training teachers on pedagogical use of the devices and ICT in general. In return, teachers must be ready to experiment and deliver with new tools to enable students to reach their full potential. Based on the study's conclusion, the following practical recommendation is advanced. This is a qualitative study with a limited sample size whose findings cannot be generalized. Therefore, a quantitative study comprising a large sample size should be undertaken for the purposes of generalization.

REFERENCES

Adomi, E. E. (2006). Mobile phone usage patterns of Library and Information Science students at Delta State University, Abraka, Nigeria. *Electronic Journal of Academic and Special Librarianship*, vol. *7,* no.1, pp. 10-17.

Adomi, E. E., & Kpangdan, E. (2010). Application of ICTs in Nigeria on Secondary schools. *Library Philosophy and Practice,* (345), pp. 1-8.

Alaba, S. O. (2011). Mobile phone adoption, Its influence on social behaviour, schooling and academic work of adolescent students in Osun state, Nigeria. *Malaysian Journal of Educational Technology*, vol. 11, no. 1, pp. 35-43.

Albaugh, P. (1997). The role of scepticism in preparing teachers for the use of technology. *'Education for community': a town and gown discussion panel.* Westerville.

Aubusson, P., Schuck, S. & Burden, K. (2009). Mobile learning for teacher professional learning: Beliefs, obstacles and issues. *ALT-J, Research in Learning Technology*, vol. 17, no. 3, pp. 233-247.

Avraamidou, L. (2008). Prospects for the use of mobile technologies in science education. *Association for the Advancement of Computing in Education Journal*, vol. 16, no. 3, pp. 347-365.

Balanskat, A., & Gerhard, P. (2005). *Head teachers' professional profile across Europe.* Retrieved November 17, 2014, from http://www.insight.eun.org/ww/en/...survey_profile_htm

Becta. (2004). *A review of the research literature on barriers to uptake of ICT by teachers*. Retrieved December 3, 2016, from http://www.becta.org.uk

Bennell, P., & Akyeampong, K. (2007). *Teacher motivation in Sub-Saharan Africa and South Asia.* London: Department for Internationl Development.

Brakel, A. V. & Chisenga, J. (2003). Impact of ICT based distance learning: The African story. *The Electronic Library*, vol. 21, no. 5, pp. 476-486.

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, vol. 3, no. 2, pp. 77-101.

Brown, T. H. (2005). Towards a model for m-learning in Africa. *International Journal of E-learning*, vol. 4, no. 3, pp. 299-316.

Chen, N. S., Hsierh, S. W. & Kinshuk, K. (2008). Effects of short-term memory and content representation type of mobile language learning. *Language Learning and Technology*, vol. 12, no. 3, pp. 93-113.

Cisco (2016). Mobile forecast projects 70 percent of global population will be mobile users. SANJOSE, California: Cisco. Retrieved January, 18, 2018 from http://newsroom. cisco.com.

Chirwa, M. (2018). Access and use of the internet in teaching and learning at two selected teachers' colleges in Tanzania. *International Journal of Education Using Information and Communication Technology*, vol. 14, no. 2, pp. 4-16.

Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education (5th ed.).* New York: Routledge.

Cohen, V. & Cowen, J. E. (2008). *Literacy for children in an information age: Teaching reading, writing and thinking.* Belmont: Wadsworth Language Learning.

Cox, M., Preston, C. & Cox, K. (1999). What factors support or prevent teachers from using ICT in their classrooms? *British Educational Research Association Annual Conference.*

Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches (4th ed.).* London: Sage Publications Limited.

Cuing, G. & Wang, S. (2008). Adopting cell phones in EFL teaching and learning. *Journal of Educational Technology Development and Exchange*, vol. 1, no. 1, pp. 68-80.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *Mis Quarterly,* vol. 13, no. 3, pp. 319-340.

Denscombe, M. (2007). *The good research guide for small scale social research projects (3rd ed.).* New York: Open University Press.

Devetak, I.; Sasa, A.; Glazar and Vorrinc, J. (2010). The role of qualitative research in Science. *Eurasia Journal of Mathematics, Science & Technology Education,* vol. 6, no. 1, pp. 77-84.

Evoh, C. (2007). Policy networks and the transformation of secondary education through ICTs in Africa: The prospects and challenges of the NEPAD E-schools initiative. *International Journal of Education and Development Using Information and Communication Technology,* vol. 3, no. 1, pp. 64-84.

Gibbons, A.J., Galloway, D., Mollel, A., Mgoma, S., Pima, M. & Deogratias, E. (2018). Mobile phone use in two secondary schools in Tanzania. *Educational Information Technology,* vol. 23, pp. 73-92.

Ismail, I., Azizan, S. N., & Azman, N. (2009). Mobile phone as pedagogical tool: Are lecturers ready for use of mobile phone technology for teaching? *International Educational Studies,* vol. 6, no. 3, pp. 36-47.

ITU. (2015). *MDGs 2000-2015: ICT revolution and remaining gaps.* Geneva: Telecommunication Development Bureau-ITU.

James. (2001). *An information policy handbook for Southern Africa: A knowledge base for decision-makers.* Johannesburg: International Development Research Center.

Jhurree, V. (2005). Technology integration in developing countries: Guidelines to policy makers. *International Educational Journal,* vol. 6, no. 4, pp. 467-483.

Kafyulilo, A. (2014). Access, use and perceptions of teachers and students towards mobile phone as a tool for teaching and learning in Tanzania. *Journal of Education and Teaching,* vol. 19, no. 1, pp. 115-127.

Kajumbula, R. (2006). The effectiveness of mobile short messaging services (SMS) technologies in the support of selected distance education students of Makerere university, Uganda. *Pan-Commonwealth forum (PCF4) in open learning.* Ochio Rios, Jamaica: Commonwealth.

Kayombo, J. J. & Mlyakado, B. P. (2016). The paradox of ICT integration in secondary school education in Tanzania: Assessment of teachers' ICT knowledge and skills in Tanga and Mwanza regions. *International Journal of Research in Educational Technology,* vol. 5, no. 1, pp.17-27.

Kheider, M. (2016). *The importance of using mobile technology in improving students vocabulary.* Algeria: University of Biskra.

Kibona, L., & Rugina, J. M. (2015). A review on the impact of smartphones on academic performance of students in higher Learning institutions in Tanzania: A case of Ruaha Catholic university. *Journal of Multidisciplinary Engineering Science and Technology,* vol. 2, no. 4, pp. 673-677.

Kihwele, J. E. & Bali, T. A. L. (2013). The perceptions of Teachers, Parents and Students on the effects of mobile phone use on student learning in Tanzania. *Journal of Education and Practice,* vol. 4, no. 25, pp.101-106.

Magwa, S & Magwa, W. (2015). *A Guide to conducting research: A student handbook.* Texas: Strategic Book Publishing Rights Co., LLC.

Mahdi, H. S. & Al-Dera, A. S. (2013). The impact of Teachers' age, gender and experience on the Use of information and communication technology in EFL teaching. *English Language Teaching,* vol. 6, no. 6, pp. 57-67.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* Franscisco, CA: Jossey-Bass.

Mertens, D. (2010). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative and mixed methods (3rd ed.).* London: Sage.

Meskill, C., Mossop, J., DiAngelo, S., & Pasquale, R. (2002). Expert and novice teachers talking technology: precepts, concepts, and misconcepts. *Language Learning & Technology ,* vol. 6, no. 3, pp. 46-57.

Mkumbo, K. A. (2012). Teachers' commitment to, and experience of, the Teaching profession in Tanzania: Findings of focus group research. *International Educational Studies,* vol. 5, no. 3, pp. 222-227.

MoEVT. (2007). *Information and Communication Technology policy for basic education.* Dar es Salaam: Ministry of Education and Vocational Training.

Msuya, O. (2015). Mobile phone in teaching and learning in secondary schools in Tanzania. *International Journal of Education and Research,* vol. 3, no. 5, pp. 207-218.

Mtebe, J.S., Kandoro, A., Kissaka, M.M & Kibga, E. (2015). Using SMS, mobile technology to access the mastery of subject content knowledge of science and mathematics teachers of secondary schools in Tanzania. *Journal of Social, Behavioural, Education, Economic, Business and Industrial Engineering,* vol.9, no. 11.

Mtega, W.P., Benard, R., Msungu, A. C & Saware, R. L. (2012). Using mobile phones for teaching and learning purposes in higher learning institutions. The case of Sokoine University of Agriculture in Tanzania. *Ubuntu Net alliance annual conference* (pp. 118-129). Morogoro: Ubuntu Net Alliance.

Muranda, Z. (2004). *Dissertation writing: concepts and practice.* Harare: University of Zimbabwe Publications.

Nordin, M. N., Yunus, M, M. & Embi, A. M. (2010). The mobile learning environment for the in-service school administrator. *Social and Behavioural Science,* vol. 9, no. 7, pp. 671-679.

Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computer and Education,* vol.37, pp. 163-178.

Porter, G., Hampshire, K., Milner, J., Munthali, A., Robson, E.,Ariane, D.,Bango, A., Gunguza, N.,Mashiri, M., Tanle, A., and Abane, A. (2016). Mobile phones and education in Sub-Saharan Africa: From youth practices to public policy. *Journal of International Development* vol. 28, pp. 22-39.

Ramos, S., Trinona, J & Lambert, S. (2006). Viability of SMS technologies for non-formal distance education. In J Baggaley (Ed.) Information working paper series on mobile learning. *UN Educational, Scientific and Cultural organization and communication technology for social development* (pp. 69-80). Jakarta: Asean foundations.

Savill-Smith & Kent. (2003). *The use of palmtop computers for learning: A review of literature.* London: Learning and skills Development Agency.

Shaw, K. (2009). *Students and cell phones: Controversy in the classroom*. Retrieved October 15, 2015, from http://www.associatedcontent.com

Simon, S. (2008). A study on the acceptance of mobile phone for teaching and learning with a group of pre-service teachers in Hong Kong. *Journal of Educational Technology and Development and Exchange,* vol. 1, no. 1, pp. 81-91.

Snoeyink, R., & Ertmer, P. (2001). Thrust into technology: how veteran teachers respond. *Journal of Educational Technology Systems,* vol. 30, no. 1, pp. 85-111.

Saunder, M. N. K., Lewis, P. & Thornhill, A. (2009). *Research methods for business students (5th ed.).* London: Pearson Education.

Suki, N. M., & Suki, N. M. (2009). The use of mobile device for learning: A case study. *International Journal of University Teaching and Faculty Development,* vol. 1, no. 1, pp. 2-11.

Swart, P. & Wachira, E. M. (2010). *Tanzania: ICT in Education situational analysis.* Dar es Salaam: Global e-schools and Communities Initiative.

Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australian Journal of Educational Technology,* vol. 24, no. 4, pp. 413-424.

Thomas, K. & O' Bannon, B. (2013). Cell phones in the classroom: Preservice teachers' perceptions. *Journal of Digital Learning in Teacher Education,* vol. 30, no. 1, pp. 11-20.

Thornton, P & Houser, C. (2005). Using mobile phones in English education in Japan. *Journal of Computer Assisted Learning,* vol. 21, no. 3, pp. 217-228.

Twum, R. (2014). *Influence of mobile phone technologies on science students' academic performance in selected Ghanaian public universities.* Nairobi: Nairobi University.

UNESCO. (2012). *Mobile phone learning for teachers in Africa and the Middle East: Exploring the potential of mobile technologies to support teachers and improve practices.* Paris: UNESCO.

UNESCO. (2017). *Supporting teachers with mobile technology.* Paris: UNESCO.

Urassa, M. R. (2012). *Stakeholders' views towards students' use of mobile phones in secondary schools in Tanzania.* Unpublished Masters of Arts in Education Dissertation, University of Dar es Salaam, Dar es Salaam.

Wendeson, S., Fatimah, W. B., Ahmad, W., & Nazleeni S. B. H. (2010). University student awareness of m-learning. *World Academy of Science, Engineering and Technology,* vol. 62, pp. 787-791.

Whattananarong, K. (2005). *An experiment in the use of mobile phone for testing at King Mongkut's institute of technology.* North Bangkok: King Mongkut's Institute of Technology.

Williams, S. A. J., & Pence, H. E. (2010). Smartphone a powerful tool in the chemistry classroom. *Journal of Chemical Education,* vol. 88, no. 6, pp. 683-686.

Yaghi, H. M. (2001). Subject matter as a factor in educational computing by teachers in international settings. *Journal of Educational Computing Research,* vol. 24, no. 2, pp. 139-154.

Yin, R. (2014). *Case study, research design and methods (5th ed.).* Thousand Oaks, CA: Sage.

Yuen, S. (2008). *The use of emerging technologies in teaching and learning.* CPLSS.