Teachers' ICT usage in second-cycle institutions in Ghana: A qualitative study

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ABSTRACT

The purpose of this study was to investigate teachers' use of ICT and the factors that affect their ICT use in secondary schools in Ghana. A focus group interview was used to gather data from participants. Ten groups of six students each from urban, semi-urban and rural schools were chosen for the focus group interviews. The results of this study have shown that teachers' way of teaching is still teacher-centred. They mainly use ICT for organizational and informative purposes. Teachers' limited use of ICT in teaching is attributed to lack of technological resources (i.e. hardware, software and the internet) and school leadership support for the teachers in schools.

Keywords: ICT usage; factor; teachers; Pedagogical; focus group interview

INTRODUCTION

In the twenty-first century, education cannot be separated from technology. Rapid growth in information and communication technology (ICT) has made the world knowledge-driven. As ICT continues to reshape economies, it is necessary for citizens to be highly competent in the use of the technology. To deal with this issue, the effort of integrating ICT has received great attention in educational systems in many nations. The reason for this development is that ICT has the capability to revolutionize the education sector (Kaur, 2011) by improving the quality and transforming the teaching and learning methods (Reynolds, Treharne, & Tripp, 2003).

Research has indicated that an essential factor that impact teachers' acceptance of ICT is the quality and quantity of teachers' ICT experiences incorporated in their teacher training programs (Agyei & Voogt, 2011, Drent & Meelissen, 2008). Regrettably, studies have shown that both teacher trainees and young teachers are under-utilizing ICT (Tondeur, 2011, Dawson, 2008). It is clear from literature that a gap exists between what student-teachers are taught in schools and how teachers integrate ICT into teaching in schools (Ottenbreit-Leftwich, Glazewski, Newby & Ertmer, 2010). Study continues to show that fresh teachers are unprepared to integrate technology into their teaching (Sang, Valcke, van Braak and Tondeur, 2010).

Many research studies have highlighted a number of factors to explain why teachers are unprepared to use technology in their schools, comprising lack of ICT skills (Teo, 2009), inadequate computer access (Dawson, 2008) and inadequate time (Chen, 2010). Increasing access to technology, adequate time and technology skills are essential for successful integration of ICT by teachers. However, research has shown that these factors are not sufficient to prepare teachers to successfully implement ICT in their teaching (Kirschner & Selinger, 2003). According to Koehler and Mishra (2009), to prepare teachers to effectively use ICT in teaching, they need to be trained in good pedagogical practices, technical skills and content knowledge during their teacher education programs.

Several teacher training programs have realized the problems linked with building the teachers' abilities to integrate ICT into teaching in schools. Therefore, it is necessary that teacher education program prepare teachers to effectively use ICT in the classroom. The available research studies are mostly quantitative in nature, but qualitative studies which explore and investigate the teachers' technology integration and factors affecting its use are negligible. Given a lack of comprehensive qualitative study in this area of study especially in developing countries, the purpose of this study was to investigate teachers' technology use and the factors that affect its use in schools.

LITERATURE REVIEW

The integration of ICT into teaching and learning is seen as a priority by many governments and educational institutions worldwide. Many governments have developed a number of master plans on ICT in education (Pelgrum & Anderson, 1999) as well as spent millions of dollars on infrastructure and professional development. Despite all these investments, evidence suggests that ICT has not been greatly integrated into teaching and learning activities (Grabe & Grabe, 2008).

A study conducted by Sipila (2011) found that teachers frequently use ICT for informative, organizational, recreational, lesson planning purposes. In a similar study conducted by Usluel, Mumcu, and Demiraslan (2007) in basic schools, they revealed that teachers mostly used ICT for administrative tasks such as preparation of lecture notes, students' reports and scores, rather than for instructional purposes. These findings were supported by Wikan and Molster (2011) who found that most teachers used ICT for lesson preparation and information searching, while only few teachers integrate ICT into their teaching to enhance students' learning and engagement. They also found that 60% of teachers reported applying ICT in their classrooms less than once a month, while 22% reported using ICT daily. Wikan and Molster (2011) concluded that ICT integration is seldom used to stimulate students' higher-order thinking and for allowing constructivist learning. This conclusion is supported by the statement that there is little understanding of teachers' integration of ICT into teaching (Ainley, Enger, and Searle, 2008), and the factors that affect their pedagogical use of ICT (Chen, 2010; Wong, Teo & Russo, 2012). Therefore, Ainley et al. (2008), indicated that research study is needed to identify the way ICT is used in schools and to identify the factors that contribute to students' use of ICT (Wong et al., 2012; Chen, 2010).

Many research studies have revealed that successful integration of ICT into teaching depends, to a large extent on teachers' self-confidence, competence, access to computers, leadership support, values and beliefs (Irfan & Noor, 2012; Tondeur, Coopert & Newhouse, 2010; Papanastasiou & Angeli, 2008; Plomp, Anderson, Law, & Quale, 2009; Johnson, 2005). However, these studies employed quantitative study rather than qualitative study. Also, ICT and its application have been studied by many researchers in developed countries; however, teachers' ways of integrating ICT and the factors contributing to their use of ICT have received very little attention in developing and emerging economies, especially, Ghana since it is a new technology. Therefore, there is the need to investigate teachers' ICT integration into teaching and the factors affecting their use in developing economies is necessary.

RESEARCH QUESTIONS

In this study, the two research questions addressed were

(1) What are teachers' uses of ICTs in teaching?

(2) What factors affect teachers' use of ICTs in teaching?

METHODOLOGY

Participants

The current study used focus group interviews to collect data from participants. Kitzinger (1995) stated that the main advantage of focus group interviews is the purposeful use of interaction to get data. However, one disadvantage of focus interviews is that they can silence individual voices of dissent (Kitzinger, 1995). The use of focus group method in this study was to get the participants' understanding of the issues being studied. Sample size for focus group interview has become a controversial issue, as there is little agreement as to what is most appropriate. Fern (1982) studied the influence of size on focus group discussion and found that a group of eight gave more ideas than a group of four. However, Kitzinger (1995) recommended four to eight participants in a focus group interview. Nyamathi and Shuler (1990) supported the notion of four participants in a focus group. However, they stated that data generated after the third group should be considered largely redundant. In this current study, a purposive sampling procedure was used to select teachers for the focus group interviews from 24 public and private secondary schools. Six (6) teachers comprising both males and females were selected for teachers' focus group interviews.

Data Collection

Ten focus group interviews were conducted with four groups of urban teachers, three groups of semi-urban teachers and three groups of rural teachers. Stewart and Shamdasani (1990) suggest that there are no general rules as to the optimal number of focus groups. They argued that the number of groups should base on the similarity of the potential population, and the ease of research application. However, they suggest that one focus group may well be enough. Kitzinger (1995) suggests that focus group studies should consist of four to eight people. In this study, ten groups of six students each from urban, semi-urban and rural schools were chosen for the focus group interviews.

In the present study, the researcher acted as a moderator of the interviews. The role of the moderator was explained to the participants: that he would ask the questions and seek clarifications but remain neutral during the period of the interview. Participants were given the chance to express their thought freely without fear. They were told to speak individually and a time limit of one hour was allotted to the discussion. They were given the opportunity to ask questions before and after the interviews. Ground rules were set for all the groups before the commencement of the interview. Use of a tape recorder was explained to the participants. Assurances of confidentiality were given. They were guaranteed that there would be privacy in collecting, keeping and handling data. Also, they were assured that the data would be destroyed at the end of the research. Anonymity was ensured because participants did not provide their names during interviews. The tape-recording served the following purposes: it acted as validity checks in that raw data were collected for analysis, the recorded data would serve a range of

logical interests and finally events could be reviewed as frequently as possible and necessary (McLafferty, 2004).

DATA ANALYSIS

Tape-recorded interviews were transcribed into text and then analyzed. The processes followed during the content analysis included assigning codes to represent, classify, and organize data into identifying themes. In assigning codes, the transcripts were read repeatedly and grouped according to the participants' responses to the research questions. After grouping of data, repeated words and expressions in each group were identified and then labeled into coding categories. Finally, relationships among codes were identified and then grouped into themes before reporting.

Member checking was another technique used to ensure credibility of the study. The participants of the focus group were brought together to evaluate their responses to the interviews. Throughout the process, the participants were asked to ascertain that the themes made sense, whether they were developed with sufficient evidence and whether the interviews recorded were accurate and reflected the meanings of their views. In turn, the participants' comments were incorporated into the final narrative. In doing so the participants added credibility to the qualitative study by having an opportunity to react to the final technique.

FINDINGS

Research question 1: What are teachers' uses of ICTs in teaching?

The qualitative data (focus group interview) provided an understanding of the way teachers use ICT in schools. The teachers stated that "their students are allowed to use the internet in their learning". One teacher said that "Science is broad, so students are given assignments on the relevant topics to use the internet to search for information in the internet cafes since there is no internet connectivity in the school. At times, they are allowed to use the Encarta and Britannica software installed on the computers in the science resource center to search for information". A teacher who expressed similar opinion said that "I allow my students to use the internet a lot both in school and outside the school to search for information and bring the feedback for discussion". Additionally, another teacher stated that "I teach history. I give assignments to students to search for information from the internet at home or internet cafes since the textbooks do not cover much stuff. At times too in my teaching, I ask students to use their mobile phones to search for meanings of some terminologies". Besides the use of the internet to prepare assignments, one teacher said that "I browse the relevant websites to search for materials to prepare lesson notes".

In addition, most of the teachers who were interviewed said that they used word-processor to prepare lesson notes and type letters. Some of the teachers also said they used PowerPoint, Excel, CD-ROMs and projectors. The teachers revealed that PowerPoint for presentation and excel to record students' results. However, all teachers who were interviewed stated that they do not use Microsoft Access program. This view was summarized by one teacher when s/he said that: "I use all the Microsoft software with exception of database programs". Further, most science teachers who were interviewed reported that they use CD-ROM to demonstrate science concepts in their classrooms. Others also said that most science lesson notes are prepared on CD-ROMs and given to students to study. However, some teachers reported not using ICT tools in their schools at all. One teacher stated that: We the teachers in this school have no access to

ICTs at all; we use our textbooks to teach. Further probe, revealed that only the students have access to computers in the school's computer laboratory.

Research question 2: What factors affect teachers' use of ICTs in teaching?

Responses from the teachers' focus group interviews revealed that the school administration was not supportive enough in their use of ICT in teaching. One teacher stated that "the school administration is doing less than expected. The number of computers in the school is limited; there are no internet facilities, lack of software and other ICT equipment in the school. I think the Ministry of Education should provide some training for the school leaders to boost their interests in ICT". A teacher who expressed similar opinion stated that there is no administrative support in the school. If teachers are not using ICT in their teaching, the school authorities are to be blamed. Teachers are of the view that the administrators think that if teachers are trained in how to use computers they would acquire the necessary [ICT] skills and competence to seek for well-paid jobs and leave. In contrast, some teachers reported that they received some sort of administrative support. A teacher stated that the school administration provides some support. S/he said that the school administration in collaboration with the Parents-Teachers Association, Past Students Association and Non-governmental organization have provided three (3) ICT laboratories, one (1) smart board and one (1) visualizer. I think these facilities are not enough since the school's student population is large.

Furthermore, teachers identified other barriers such as large number of students in classroom, limited access to computers, non existence of internet facility, slow speed and instability of internet connection, low confidence, lack of knowledge, instability of electricity, lack of personal computers and malfunction of ICT equipment in schools. One teacher stated: "ICT classroom management is a problem due to large number of students. In my school the student to computer ratio is 27:1 and this makes teaching difficult". A teacher who expressed similar opinion said: "there are not enough computers for the students because of the large school population. I have to devise means to teach the students. I teach them only the theoretical aspect of the ICT syllabus and leave the practical aspect". Moreover, teachers' intention to use ICT in their teaching is hindered by the time to set up ICT equipment. One teacher said that: "It is a waste of time to set up ICT equipment in classroom for teaching. Imagine I have 40 minutes to teach a class and I spend 15 minutes to set up equipment, it means I have 25 minutes left to deliver my lesson which affect my teaching and students' learning".

In addition, most of the teachers reported lack of training in basic and advance ICT skills. One teacher reiterated: not just training on the use of productivity software such as word-processor, PowerPoint, etc but also on how to integrate ICT into the curriculum and technical skills to support students' learning. The above views were summarized by one teacher when he/she said that "teachers need sufficient resources and training to apply ICT in teaching. As one teacher puts it: "How can teachers apply ICT in teaching effectively, if they lack knowledge, training, access to the internet, leadership support"? This statement implies that if teachers are provided with sufficient ICT resources as well as administrative support they would be motivated to use ICT in their teaching.

DISCUSSION

In this study, it was found that teachers permitted their students to use ICT to explore new learning materials and also conduct research on their own initiatives using the internet. Also, most teachers use ICT for organizational (i.e. lesson plan) and informative (i.e. internet) purposes. This is the same as other study has found. ICT seems to be used very little for constructivist teaching

in schools. This finding confirms Abbott and Fouts (2003) research that more than half of the ICT lessons observed had very little or no elements of constructivist teaching present.

Effective and successful use of ICT in teaching depends on several factors, including competence, access, leadership support and self-efficacy (Woreta et al, 2013; Chen, 2010; Plomp, Anderson, Law, & Quale, 2009; Tondeur, Coopert & Newhouse, 2010). The result of this study indicates that school leaders are not supportive of teachers' ICT integration in schools. Teachers should be motivationally and technologically supported to fully utilize in their teaching. The adoption of cultural integration model is one possible way to give support to teachers (Yuen, 2000). According to Pelgrum and Law (2003), successful implementation of ICT depends on school leaders' perception and vision and the culture of the school. As concluded by Tondeur, van Keer, van Braak and Valcke (2008) that successful ICT implementation takes place when a school has a shared vision, develops ICT policies, and its teachers share the values expressed within the school policy and understand their implications" (p. 220).

This study found that teachers lack confidence in the integration of ICT. This situation arises from the fact that they lack knowledge in the use of ICT in teaching and learning process. To increase teachers' confidence level, training concentrating on pedagogical use of ICT should be developed in a manner that would help teachers to integrate ICT into teaching successfully. ICT infrastructure is key component of ICT development and integration. The current study shows that access to computers, internet connectivity, electricity and personal computers are the most important determinants of ICT integration in schools. This suggests that provision of technological resources motivate teachers to use ICT in schools. This is the same as other research studies (Chigona & Chigona, 2010; Lau & Sim, 2008; Tezci, 2011) have revealed that there are a wide range of factors which influence teachers' integration of ICT into teaching. These include access to technological resources, quality of software and hardware, school support and training. Also, the finding of this study is similar to studies in Nigeria, South Africa and Kenya where internet connectivity, technology support, obsolete technology, and know-how, access to computers, training, technical support are significant determinants of teachers' ICT adoption (Eze, Awa, Okoye Emecheta & Anazodo, 2013; Chigona & Chigona, 2010; Sulungai, Tolli & Amadalo, 2011).

CONCLUSION

The purpose of this study is to investigate teachers' uses of ICTs in second-cycle institutions (secondary schools) in Ghana. This study has demonstrated how qualitative method provides rich insights into factors influencing ICT integration in schools. Evidence from the study has led to two conclusions. First, schools are yet to exploit the potentials of ICT in teaching. The use of ICT by teachers is mainly for organizational and informative purposes. However, the actual integration of ICT into teaching still remains an issue in schools. Therefore, professional development opportunities concentrating on the actual integration of ICT into teaching should be provided to teachers to promote pedagogical practices of ICTs in schools. Second, the availability of training, the availability of school support, availability of computers, the availability of electricity and the availability of internet connectivity are inadequate, indicating that these factors are concerns of teachers. Since these factors limit teachers' ICT integration in schools, it is important for the school authorities and other stakeholders to address these issues in order for the teachers to effectively use ICT to support teaching and learning process in education.

The limitation of the current study was that the use of self-developed interview questions could have affected the reliability of the analysis. In addition, the use of interview method only to collect data could have limited the results. Future research could adopt an observation method to add to the data. Finally, the sample size was small. Future research involving more schools to increase the sample size can be investigated to give comprehensive perspectives of ICT usage in schools.

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