KNOWLEDGE AND SELF-EFFICACY OF TEACHERS INTEGRATION OF ICT INTO BASIC INSTRUCTION

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Abstract

The use of technology in education has become an unstoppable force in recent years. However, its usefulness largely depends on the success of its integration into teaching and learning. Unfortunately, the majority of teachers do not incorporate it into their classes. The study aimed to test teachers' knowledge and self-efficacy belief towards integrating Information Communication Technology into teaching and learning at the elementary level. In particular, this research focuses on Junior High Schools in the Kumbungu District of Northern Ghana. The study adopted a qualitative research approach. The results showed that the teachers had high knowledge about ICT and strong positive self-efficacy beliefs on ICT integration into the delivery of their lessons.
Keywords: ICT, knowledge, self-efficacy, teaching and learning, Integration

Introduction

ICT is a conventional acronym for the terms Information and Communications Technology. It represents a set of technological tools and resources used to communicate and create, disseminate, store, and manipulate information (Blurton, 1999). Thus, ICT facilitates the storage and control of information. This growing phenomenon was welcomed in the 1980s when education systems needed to bring students together to transform and survive in this new technology-driven society. Thus, students were prepared for lifelong learning in an information society (Pelgrum and Law 2003, p.20). Furthermore, the early proponents of integrated ICT education saw it as a catalyst for change that fosters problem-solving, and critical thinking skills, and improves student-centered learning (McGrail, 2005). Information and Communications Technology (ICT) encompasses a range of applications, communications, and technologies that aid information retrieval, research communication, and administration, it includes, Internet access, electronic mail, CD-ROM, telephone, online databases, library services, and fax machines. These technologies and techniques help manage information and knowledge (Scott, 2002). In the educational context, it connotes the teacher's act of using ICT, particularly in the process of lesson instructions such as writing lesson plans, preparing materials for teaching, recording and calculating student grades, lesson delivery, and communicating with students and other teachers among others. This form of technology provides vast quantities of information in an easily accessible, non-sequential format to both teachers and students (Ministry of Communication ICT Report, 2013).

The use of technology within the teaching and learning environment has become an unbeatable force in recent years (Cohen and Rosenzweig 2006; Laubsch 2006). ICT wedged mostly on education systems, from record keeping and provision of large accessible data on school websites to the creation of online learning communities (Bishop, 2007). Institutions used specialized websites to create learning resources offered online at any time. With improved web accessibility, students are not needed to be

physically present in schools and classrooms. These virtual classrooms and learning models have flourished, particularly in the era of the Covid-19 pandemic. The numerous barriers of time, physical encounter, and distance have rendered nearly unstylish in such virtual classrooms and learning models (Stennes, 2008). However, the advantages of ICT usefulness within teaching and learning depend upon the success of its integration in schools (Condie and Munro, 2007). In Europe, countries like Poland, Ireland, Belgium, and Germany still have the usage and integration of ICT into teaching and learning in schools below average (Organization for Economic Collaboration and Development (OECD), 2015). Teachers in many other developing countries, including Ghana, use ICT on a less regular than expected basis (Fraillon et al., 2014). This depicts the traditional verbal method of lesson delivery characterization in many schools (Natia & Al-Hassan, 2015).

Statement of the Problem

In the Ghanaian context, efforts to integrate ICT into teaching and learning in schools seem to remain at the national level, with no real reflection of their implementation on the ground (Dankwa, 1997). Most schools that benefit from ICT are tertiary and secondary schools located in urban areas or are classified as premier schools (Hawkins, 2002; Parthemore, 2003). Teachers are considered key species for the effective implementation of ICT in teaching and learning (Davis, Eickelmann & Zaka, 2013). Their attitudes, beliefs, and knowledge of ICT are considered crucial for the effective use of it in educational circles (Zhao, Hueyshan & Mishra, 2001). The authors observed that little has been done to discover this knowledge and the self-efficacy of teachers in the integration of ICT in basic education. In light of this context, the paper examined the knowledge and self-efficacy of public JHS teachers in the integration of ICT in teaching and learning in basic education. Such a study is important in the context of the COVID-19 pandemic era, and beyond, which demands less physical integration.

Purpose of the Study

The purpose of the study was to discover the knowledge and self-efficacy of teachers towards the integration of ICT into teaching and learning.

Objectives of the Study

1. identify the relevant knowledge of teachers towards ICT integration into teaching and learning at the basic level.
2. ascertain the self-efficacy of teachers towards the integration of ICT into teaching and learning at the basic level.

Research Questions

Based on the objectives, the study raised the following question:

1. How relevant is the knowledge of teachers towards ICT integration into teaching and learning?
2. What self-efficacy beliefs do teachers have towards the integration of ICT into teaching and learning at the basic level?

Justification of the Study

The study contributes immensely to identifying the knowledge and self-efficacy of teachers toward ICT integration. Such study is important in the context of the COVID-19 pandemic era, and beyond, which demands less physical integration.

Theoretical Framework

This study was based on the self-efficacy construct proposed by Bandura (1977). This theory pinned that the ability of individuals to take the actions they believe can cause the desired results (Tschannen-Moran, Hoy, & Hoy, 1998). The self-efficacy of teachers is related to the knowledge, behavior, and attitudes of teachers as well as teaching and learning outcomes (Mulholland & Wallace, 1996; Bandura, 2003; Tosun, 2002). Thus, knowledge and self-efficacy predict future teaching practices (Anderson & Maninger, 2007; Lumpe, & Chambers, 2001). As a result, the concept of self-efficacy Bandura has been designated as a predictor of the use of ICT in the classroom (Banas & York, 2014).

Methodology

The study deployed the case study design within the qualitative approach. The study was conducted in the Kumbungu District. The district is one of the sixteen (16) districts in the Northern Region of Ghana. The district was carved out of the Tolon-Kumbungu District in 2012. It shares a boundary to the North with Mogduri District in the North East Region of Ghana, To the East with Savelugu Municipality, to the South with Sagnarigu Municipality, and the West with Tolon District. The district has 72 Kindergarten (KG) and Primary Schools, 18 Junior High Schools (JHS), and 1 Senior High School (SHS). The district was selected because it is one of the deprived districts in the northern part of Ghana. Such areas generally have educational challenges such as inadequate infrastructure and furniture, inadequate trained teachers, high teacher-student ratio among others (Ghana Statistical Service (GSS), 2010).

The study engaged all 18 JHSs within the district. Out of the 18 schools, only 17 had permanent structures and 1 JHS has temporal structures. The researchers used teachers of these schools as respondents for the study. These individuals were purposively sampled because they are the key individuals involved in the teaching and learning activities of the schools within the district. A semi-structured interview guide was used to conduct interviews with respondents in their various schools for the primary data. The interviews were complemented with observation. Both interviews and observation were conducted from January 2021 – March 2021. This was supplemented by secondary data derived from books, articles magazines among others, and analysis in the form of narratives.

Results and Discussion

The section is grouped into teachers' knowledge and teachers' self-efficacy beliefs for discussion and analysis of data.

Teachers' knowledge

This section sought to investigate the level of Teachers' knowledge of ICT integration into teaching in JHS within Kumbungu District. The ICT knowledge level of the teacher is relevant in the use of PowerPoint, internet access, and lesson preparations. The findings revealed that teachers have adequate knowledge in integrating ICT into their lesson delivery; thus, talks of delivering lessons with some of the tools used in ICT which make them chronologically deliver lessons. The interviews with some of the participants showed that they had good knowledge of the integration of ICT into their lesson delivery. Participants indicated that they can search for information on the internet and use ICT to create instructional materials and lesson plans. The comments made during the interview are as follows.

> *Yes, I can say many of the teachers have some knowledge about how to use ICT to deliver their lessons. They can search for information on the Internet. They also use computers to create and store documents including students' records, and lesson plans among others* (**Field Respondent, 2021**).

> *In this modern world, can one teach without using ICT at all? At least you will need to use some ICT tools. As for me, I can use the computer and projector to teach. But the old teachers are less limited in ICT integration than the recent teachers* (**Field Respondent, 2021**).

Other teachers stated that the use of ICT tools facilitated their teaching. This is exemplified by the following excerpts:

> *Teachers use ICT tools to play games during their free periods. Other teachers use their computers and Android phones to do research. They go on the internet and search for information. They get the latest update before they get into the class. I don't keep students' assessment records in the book. Rather, I kept them in Excel and generate their results with ease. It is even old fashion to carry textbooks again. Almost everything is on the internet, interacting with others. Employing such in the class setting help makes things very easy* (**Field Respondent, 2021**).

> *Using ICT is not a problem for me. I know ICT and can use it to learn. The world is now ruled by ICT. Almost everything requires the application of ICT. So, I try as much as possible to learn more about ICT. Now, the information you need is on the internet, so I make sure that I search for information on the topic to teach. I use the computer for the preparation of weekly forecasts and lesson plans. So, with ICT is easy to find teaching and learning materials. This is, however, tedious for those who don't know how to use ICT* (**Field Respondent, 2021**).

The comments indicated that teachers have good knowledge of ICT useful for integration into teaching and learning. It was observed that the majority of teachers were at least using Android phones and few

others using laptops on a personal basis. This endorsed the high level of knowledge registered by the sample. The findings suggested that ICT integration in lessons could make teaching and learning easy, considering the knowledge of teachers. However, there appears to be a difference in the level of knowledge on ICT integration between teachers who had their training in the olden days and those with recent training. The comments suggest that the current crop of teachers have more knowledge of the integration of ICT into their lesson delivery than the old teachers. As such, participants indicated that teachers need constant training on ICT use in teaching and learning.

The results feed into the argument that the teacher is responsible for establishing the classroom environment and preparing learning opportunities that facilitate students' use of technology to learn and communicate (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2008). The findings are supported by Tin's (2002) study, which revealed that most teacher training courses focused on basic computer operations rather than advanced computer skills and subject-specific pedagogical applications. It is suggested that the use of new technologies requires new teacher roles, new pedagogies, and new approaches to teaching and learning. Therefore, before teachers develop the ability to achieve all of the above, they must have a comfortable level of ICT skills. Unless teachers are at a comfortable level of ICT skills for integration, they will not be able to integrate ICT into teaching and learning across the curriculum.

Teachers' Self-efficacy

This section sought to investigate the level of self-efficacy beliefs towards ICT integration into teaching in basic schools within Kumbungu District. This study has found very high self-efficacy beliefs toward ICT integration into teaching among the teachers in the basic schools within Kumbungu District.

The interviewees' responses to the interview questions on their capability of ICT integration into teaching were categorized into low, moderate, and high levels. They demonstrated different levels of ICT integration when asked to explain how they integrated ICT into their lessons. The interviews within the high-level bracket reported that their ability to use ICT can enhance the quality of education and effective lesson delivery. They believed that ICT integration would make lesson delivery easier and more practical. For instance, one of the teachers in the interviews indicated this as follows:

> *I can use ICT to teach. I can use the computer to prepare my lessons. I can also conduct experiments in class using ICT tools and equipment, and this helps students to understand concepts better* (**Field Respondent, 2021**).

Another teacher shared that:
> *Well, I can use ICT and as you can see the kind of phone I have, if you are not good in ICT you cannot use such a phone, although you may be capable of buying it. I have my computer at home that I use to do my things. I am always on the computer. Further, I can use the computer to teach with the aid of a projector. My class scores and assessments are all recorded on my computer. I no longer record my students'*

> *assessments in a book or sheets, and this help to store and keep track of the*
> *performance of my students* (**Field Respondent, 2021**).

Meanwhile, teachers agreed that they still need constant training and support to enable them to effectively use ICT to deliver their lessons.

> *Although I can use ICT in teaching and learning, I believe that still we need continuous*
> *training and support to ensure our effective use of ICT in teaching. Mastery of the*
> *subject is not enough. We also need skills in ICT usage. You know things are changing,*
> *and we need to always be abreast with the time* (**Field Respondent, 2021**)

Evidence suggests that teachers with higher levels of technology self-efficacy are more confident about integrating technology in their future classrooms (Abbitt & Klett, 2007; Afful, Acquaye, and Ngman-wara 2016). The teachers believe their ability to integrate ICT into teaching and learning is significant in ensuring effective lessons and improving the quality of education. The general high self-efficacy beliefs toward ICT integration found in the study might be partly attributed to the many pedagogical courses they offered during their training in Colleges of Education and Universities (Cantrell, Young & Moore, 2003). It could also be due to their experiences with the curriculum over the years, and their interaction with colleagues and students (Norton, 2013). This is reinforced by research findings by Elbitar (2015) that there is a statistically significant relationship between teachers' computer experience and their perceived computer self-efficacy.

Conclusion

The study was situated within the qualitative paradigm and adopted a case study research design. The population was made up of all teachers within Junior High Schools in the Kumbungu District. A purposive sample of 18 respondents was used for the study. The main findings revealed that teachers had significant knowledge that can be very useful in integrating ICT into their lessons. They indicated that teachers could download relevant teaching and learning materials and store important information on computers for future use. Other teachers can use computers to solve educational problems in their subjects. Found through observations that teachers use basic computer accessories such as Android phones, calculators, and laptops for their problems. The findings of this study also showed a high level of self-confidence in the integration of ICT into the delivery of lessons.

Firmly, the discoveries of this study supported the Bandura concept about connecting the teacher's self-efficacy with the teacher's behavior, attitudes, outcomes, and achievements. However, the resulting results showed a different level of skills for ICT integration. High levels of knowledge and self-efficacy cannot reflect in actual arrangements because most lessons are still marked by verbal interactions. This does not place the knowledge and self-efficacy of the teachers against ICT solely in the center of improvement of the outcomes and achievement of ICT integration as espoused by Bandura's theory. This is also contrary to the statement of Pelgrum (2001) that the lack of knowledge and competencies

in technology, among teachers in developing countries, is the main obstacle to ICT absorption in education.

Recommendation for further studies

Based on the finding and conclusions drawn from the study, a further study is recommended to reveal challenges that hinder ICT integration into teaching and learning in basic schools in the Kumbungu District.

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