

UNIVERSITY OF EDUCATION, WINNEBA

CHALLENGES ASSOCIATED WITH USING TECHNOLOGY IN STAFF
DEVELOPMENT IN THE SEKYERE KUMAWU DISTRICT EDUCATION

DIRECTORATE



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and Communication Sciences submitted to the School of Graduate Studies,
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award of the Master of Arts (Educational Leadership) degree**

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DECLARATION

STUDENT'S DECLARATION

I, OFFEH, EBENEZER, declare that this dissertation, with the exception of quotation and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part of whole, for other degree elsewhere.

SIGNATURE:

DATE:

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of dissertation as laid down by Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development.

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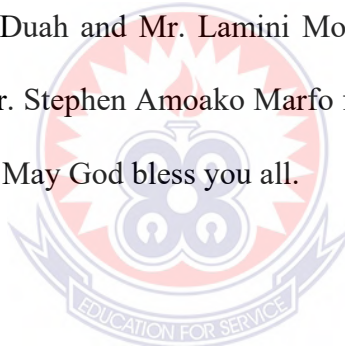
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DEDICATION

To my Late Father, Opanin Kwasi Offeh and my Late Mother, Obaapanin Akosua Amponsah.



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ABSTRACT

The study examined teachers' professional development in Information and Communication Technology (ICT). It specifically focused on teachers' knowledge level on ICT, professional development programme for teachers, and the challenges associated with teachers' inability to go for professional development in technology. The study utilised the case study design as well as the quantitative approach to research. The population of the study involved Personnel in District Education Office and teachers in Sekyere Kumawu District. The study used stratified, simple random and purposive sampling techniques to select 175 respondents. Data were solicited from respondents using questionnaires. The researcher personally gathered data from respondents. The Descriptive statistics was employed to analyze the collected data. The level of teachers in Sekyere Kumawu District was generally found to be low. However, most teachers in the district have experienced a number of professional development programmes and showed positive attitude towards professional development programme. The study identified challenges associated with teachers' inability to go for professional development in technology. Some of the challenges include; lack of funding for additional personnel to cover classes, family responsibilities, expenses for travel, teaching-related duties, professional development activities are not offered at the time when I am available, and headteachers' attitude. The study suggested that the government through the Ministry of Education must ensure that District Education Offices are provided with funds to enable them train teachers in the district in ICT, and travel expense must be subsidized or fully bore by the Ghana Education Service.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The existence of the human resource function in organization is to ensure that the organization is able to achieve success through people. Organizations that fail to pursue actively policies of continuous development for its employees often stagnate, decline and eventually die (David & Bwisa, 2013). Human resource management focuses on continued development of the employees, a concept known as continuous professional development (CPD).

The concept of continuous professional development is fundamental to the philosophy of total quality management (TQM) which improves organizational performance. Lifelong education for employees has been highly emphasized in the global world as a way of accelerating national development. For instance, David and Bwisa (2013) indicated CPD ensures that the teacher is equipped with adequate competencies that prepare the teacher for challenges of modern life.

Technology of late has become a power tool for professional development. This results from the fact that the world is experiencing rapid technological changes. Organizations have relied on technological tool for improving the employee's performance, facilitate job-tasks, and improve communication, increase efficiencies, as well as ensured higher-levels of effectiveness in work management (Imran, Maqbool, & Shafique, 2014). The introduction of technology has changed the way of performing job. Technological advancement improved the employee performance as well as less the employee working effort and task completion time.

Employee work load reduces through technological advancement. The number of employees to perform one task is also reduced. Organization requires not much more employees to perform one job. Human effort is also reduced through technological advancement. Single employee can perform its job without any hurdle.

The Human Resource Management function also uses technologies to check and evaluate the employees output or performance of employees (Jagero & Komba, 2012). Human Resource Management decides to leverage emerging technologies to drive productivity and the management of human capital will make the difference between a mediocre HR department and one that is truly a business partner (Imran et al., 2014).

The above suggest that training employees in technology is very pivotal. Training is systematic approach of behaviours that enables employees to change their behaviours according to the norms and values of the organization (Jagero & Komba, 2012). Training is used to fill gap between current performance and desired performance after training. Training has bigger impact on the performance of employees. Trained employees are more efficient in group work because they are well known about their expectation by other workers. Employees who take regular training programmes easily accept changes in organization. Whenever organization launches innovative programmes they face resistance from employees who do not attend regular training programs. Trained employees help organization to reduce training cost of other employees. This is because when one employee is full trained, he/she will be capable to train other untrained employees in the organization. Training develops employee's self-efficacy which is crucial for superior performance (Elnaga & Imran, 2013).

The demand of work professionalism is detected by teachers. Teachers, as an important part of education, are expected to accomplish the duties in professional ways. As a consequence, teachers have to show professionalism in every aspect of life. The growth of technology and information must be neutralized by teachers' skills and abilities. According to Craft (2000), to surface current changes such as high living standard and quality of life, teachers need to do an update by enhancing life skills through professional development.

The call for schools to move to a more technologically integrated approach to teaching and learning has been resonating among departments of education in various countries. Advancement of technology initiated by digital revolution through technology innovations has caused a paradigm shift in the way we do things of which the entire landscape of education is included. Akbulut (2010) says the current workplace practices urge individuals to have the ability to use Information Communication Technology (ICT) with efficiency and confidence. More so, ICTs are crucial for lifelong learning and awaits educators to equip trainees with the relevant experiences before gaining employment.

It should be noted that irrespective of the quantity and quality of technology placed in classrooms, the crucial point to how those tools are used is the teacher. Thus, teachers must have the competence and the right attitude towards technology. However, Hoque, Razak, and Zamora (2012) held that education system tries to inculcate ICTs to enable teachers and students gain access to knowledge. Hoque et al (2012) stated that teaching and learning cannot happen like the analogy of a spoon feeding knowledge at a given time. Thus, ICTs have a huge role in helping teachers and students to attain the desired knowledge.

The above suggest that teachers' professional development in technology plays significant role in education. This is because; it is not only the teachers who benefit, but also students. The entire schools also will benefits, some activities in schools such as registration, and other documentation requires the use of technology.

1.2 Statement of the Problem

Modern technologies process requires linking and recognizing new knowledge, which in turn requires the internal advancement of human capabilities and knowledge. Any technological advancement is said to impact the performance of organizations in a positive way, which therefore affects the employees' productivity and performance (Mudford, 2000). However, the improved performance and productivity levels can only happen if the proper resources are utilized in an effective and efficient manner (Dauda, 2009).

The proper use of technologies in the workplace can help employees be more effective in their job performance, which improves the organizational performance. Nonetheless, it is important to recognize that the present successes are based on past-improved performances; and in order to maintain a long lasting organizational success, organizations have to continue nurturing their workforce with the needed skills and knowledge to best address the future needs and demands of the organization's performance. The workforce performance is intimately linked to technological changes and technological innovation.

The above suggests the need for teachers' professional development. This is because it is they who train students to functional well in the society as well as the organization. It is for this reason that the Ministry of Education has introduced

Information and Technology in the primary, secondary and tertiary level. Student teachers in tertiary institutions receive some level of information technology education to apply in classroom after completion. The question therefore is, does it mean the level of information technology teachers received when they were in school adequate, considering the dynamic nature of the technological world? In other words, teachers need to upgrade their knowledge in information and communication technology to meet the changes in education and the society in order to provide their students with the current information to fit well in the society.

A cursory observation and research has shown that there has not been any effort by the District Education Office in Sekyere Kumawu to upgrade teachers' knowledge on information and communication technology. In other words, there havenot been any professional developments by teachers on ICT. This has lowered the use of technology in teaching and learning in the district (Field, 2020). This calls for the need to empirically find out the cause of this situation. Moses (2012) indicated that there exist limited research investigating Ghanaian SHS teachers' use of technology in teaching and learning of their subject areas.

1.3 Objective of the Study

It is based on the above that the researcher examines teachers' professional development in Information and Communication Teaching.

1. To assess teachers' knowledge level on information and communication technology
2. To examine professional development programmes for teachers in Sekyere Kumawu District

3. To examine the challenges associated with teachers' inability to go for professional development in technology.

1.4 Research Question

1. What is teachers' knowledge level in Information and Communication Technology?
2. What are professional development programmes for teachers in Sekyere Kumawu District?
3. What are the challenges associated with teachers' inability to go for professional development in technology?

1.5 Significance of the Study

Considering the fact that technology has been integrated in the teaching and learning process in most educational institution, identifying challenges associated with the teachers' inability to go for professional development in technology especially the basic and secondary schools will enable the District Education Office to take cognizance of them, and would put measures in place to help control them. This will enable the District Education Office channel resources to teachers in the district professional development in technology.

The study presenting the knowledge level of teachers in Information and Communication Technology will enable management or officers in charge of teachers' professional development to know areas where much attention should be directed to when designing a programme for teachers' professional development.

Even though few studies have been done on the research topic, the findings from the studies will help to confirm or disconfirm existing finding. In other words, what really

pertains, regarding teachers' professional development in technology can be made known. It will enable stakeholders to know the state of teachers' professional development in technology in Sekyere Kumawu District.

The study to some extent will encourage both teachers to use technology in the teaching and learning process. This is because the study will create awareness on the effective use of technology or instructional media. It will enable both teachers to be innovative using educational technology, which will result in a positive outcome.

1.6 Delimitations of the Study

The study was delimited teachers in Sekyere Kumawu District School. This was done because interview with some officials in the District Education Office revealed that most teachers in the district have received little or no professional development. Teachers and Education Officers were the target of the study. The researcher has colleague teachers and knows some educational officers in the District Education Office. The researcher's colleagues helped the researcher in getting data as quickly as possible. Contextually, the study focused on teachers' knowledge level on information and communication technology, professional development programmes for teachers in Sekyere Kumawu District, and the challenges associated with teachers' inability to go for professional development in technology.

1.7 Limitation of the Study

The researcher did his best to ensure that authentic data were attained to achieve the purpose of the study. However, the study was not free from limitations. The study was confronted with two main limitations or challenges. The challenges were from both the

respondents and the researcher's side. The researcher ensured that the limitations did not have great impact on the outcome of the study.

In the first place, some respondents at the onset of the study fell reluctant to respond to questionnaire. They had the intention that the data they provide may be used against them in future, and also, the data can be used to tarnish the image of the District Education Office. The researcher in order to prevent this from being a hindrance took time and brief respondents about the purpose of the study even the objective and instructions about how they should respond to questionnaire were presented on the questionnaire. The researcher during the briefing exercise asked respondents to ask any question bothering their mind. This enabled respondents to erase any negative perception they have about the study, and fully participated in the study.

On the side of the researcher, time was a major constraint. There were more grounds that could have been covered to make the finding more solid, but time became a challenge. The researcher could have used more respondents. This could have strengthened generalization. The researcher in order to obtain accurate data added Kumawu District Education Office, which represent the Ministry of Education in the district.

1.8 Organization of the Study

This study in all comprises of five chapters. Chapter one is concerned with background of the study, statement of the problem, objectives of the study, research questions, and significance of the study. Also presented in Chapter one are delimitation and organization of the study. Chapter Two of the study also focused on theoretical review, and review of empirical studies relating to the achievement of the objectives of

the study. Chapter Three of the study also focused on the methodology adopted to achieve the objectives of the studies. Issues that were discussed under Chapter Three are: the research design, population of the study, sample and sampling technique, research instrument, validity and reliability of the research instrument, research procedure and analysis of data. The fourth chapter, Chapter Four presented results, and discussion of findings. Finally, Chapter Five will deal with Summary, conclusion and recommendation of the study.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter of the study presents review of studies relating to the research topic. Basically, the review was done considering the objective of the study. The studies revealed have either direct or indirect link with the objective of the study. Thematic review was that done. The review of studies enabled the researcher to choose appropriate methodology for the study. Areas looked at in this chapter include; Theoretical Framework, the concept of technology, technology in education, the use of technology (e-learning) in training, the concept of professional development, the impact of technology on employee performance, teachers' perception toward the use of technology, and factors affecting teachers' professional development

2.2 Theoretical Framework

Considering the purpose of the study, the Experiential Learning Theory proposed by Rogers (1983), and the Technology Acceptance Model (TAM) were utilized for the study.

The Experiential Learning Theory

This theory distinguished between two types of learning: experiential and cognitive. Learning according to this theory is facilitated when; a learner participates completely in the learning process and has control over its nature and direction; self-evaluation is principal method of assessing progress or success; and it is basically based upon direct confrontation with practice, personal, social or research problem.

Experiential Learning Theory (ELT) has its roots in the experiential works of Dewey, Lewin, and Piaget. Unlike cognitive learning theories, which tend to emphasize cognition over affect, and behavioral learning theories, which do not allow any role for consciousness and subjective experience in the learning process, experience plays a central role in ELT's process. ELT is intended to be a holistic adaptive process on learning that merges experience, perception, cognition, and behavior. Previous research has shown that learning styles are influenced by personality type, educational specialization, career choice, current job role and tasks, and cultural influences (Kolb & Kolb, 2005).

As a widely-accepted theory, educators can use incorporate the model to support teaching practice and learner experience. The model is known for its holistic approach to student learning, which incorporates action/reflection and experience/abstraction. (Kolb & Kolb, 2011).

There are four key phases to the experiential learning cycle: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE) (Kolb & Kolb, 2011). There is no starting or end-point to the cycle, ensuring students can jump-in at any phase.

Concrete experience (CE): This is the action phase. Students are encouraged to try-out the action and have a new experience.

Reflective observation (RO): This is the observation phase. Students are encouraged to intentionally reflect on their experience from multiple perspectives and the factors involved (e.g. environment, stakeholder, context, outcomes)

Abstract conceptualization (AC): This is the integration phase. Students are encouraged to integrate the experience (action and result) into existing knowledge schemas and with existing theory. As a result, a new concept is formed and can be applied to future experience(s).

Active experimentation (AE): This is the hypothesizing and trial phase. Students are encouraged to hypothesize what will happen and try the action out by making decisions and solving problems.

Kolb and Kolb's (2011) extensive work in the field of experiential learning have resulted in some considerations that educators should review. They recommend that educators recognize that learning is cyclical and while students learn about specific content and subject matter, reflection and learning about the self and individual learning processes is just as important.

The Technology Acceptance Model

The Unified Theory of Acceptance and Use of Technology Model (Venkatesh, Morris, Davis & Davis, 2003). This model implies belief in an active user who rationally takes decision on whether or not to use a given medium depending on the benefits derivable from the medium. Specifically, the model looks at the predictions of an information system. Thus, the model is purposed to predict the acceptability of a tool and to identify the modifications which must be brought to the system in order to make it acceptable to user.

This model however suggests that the acceptability of an information system determined by two factors: perceived ease of use and perceived usefulness. The relevant

of this model is that technology use is dependent on ease of use and usefulness of the system.

The theory is applicable to this study, since this study seeks to ascertain the impact digital materials have on users, and their perception on the use of digital materials. The model is relevant to the study since the study will be brought to light whether users have accepted or utilising the digitized means of accessing information. Also, since the study sought to identify challenges users encounter in accessing digitized material, this will suggest areas where modification is needed so as to improve upon the digitization and also the process of accessing digitized material.

2.3 The Concept of Technology

The term technology defies an all-embracing definition. The concept of technology does not only relate to the technology that embodies in the product but it is also associated with the knowledge or information of its use, application and the process in developing the product (Bozeman, 2000).

They argued that the search for a precise definition is destined to fail because technology has no single meaning. This notwithstanding, few researchers have made the attempt to define the concept from their own viewpoints. For instance, Ayas (2006) defines technology basically as the process and tool by which humans modify nature to meet their needs and wants and to make life easier and better.

In addition to software resources and standard tools such as graphing calculators, educators are exploiting a variety of technological tools in mathematics instruction, including cell phones (Davis, 2010; Valk, Rashid & Elder, 2010). The iPod touch has

been adopted in some classrooms as a means of getting technology into the hands of all students (Auchincloss & McIntyre, 2008; Banister, 2010).

Karve (2009) also conceptualizes technology as the knowledge of the manipulation of nature for human purposes. Technology influences and governs human behaviour, and impinges on societal behaviour, traditions and culture. As an entity that intervenes directly or indirectly in the life of human beings (Karve, 2009), technology could be seen as the use of human capabilities to satisfy peculiar needs or wants.

The advent of technology has led to remarkable developments in the field of education. The contribution of technology to the field of education has been variously described as educational technology (Balogun & Abimbade, 2002). According to the Association for Educational Communications and Technology (AECT) (2004), educational technology is “the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources” (p.1). Educational technology denotes the application of ideas from a variety of sources to create the best learning environment for students. This suggests that technology can be tailored to classroom instruction in order to create a supportive atmosphere that will enhance teaching and scaffold the learning of various subjects in the school curriculum.

The various ICT facilities used in the teaching learning process in schools according to Babajide & Bolaji (2003), Bryers (2004), Bandele (2006) & Ofodu (2007) include; radio, television, computers, overhead projectors, optical fibres, fax machines, CD-Rom, internet, electronic notice board, slides, digital multimedia, video/VCD

machine and others. According to Ajayi (2008), the use of these facilities, involves various methods which include systematized feedback system computer-based operation/network, video conferencing and audio conferencing, internet/ worldwide websites and computer assisted instruction. It must however be stressed that the effective use of the various method of the ICT in teaching and learning depends on the availability of these facilities and teachers' competence in using them.

2.4 Technology in Education

There is limited or no information about access to and use of ICT tools (Internet, Computer and Mobile Phones) among students and teachers in schools. In this regard, in Ghana, it is difficult to make concrete decisions about effective pedagogical models to fit students (digital natives) and teachers (digital immigrants) towards effective integration of ICT into education in this technological era. Within this context the present study is aimed at exploring the challenges in the area of access to and the use of emerging ICT tools among Senior High School students in Ghana.

Information and Communication Technologies (ICT) have become key tools and had a revolution impact on how we see the world and how we live. Today, the place of ICT in education and the world in general cannot be undermined. Modern day businesses are conducted and facilitated through the use of telephones, fax machines and computer communication networks through the internet. This phenomenon has given birth to the contemporary e-commerce, e-government, e-medicine, e-banking and education among others.

According to Bandele (2006), ICT is a revolution that involves the use of computers, internet and other telecommunication technology in every aspect of human endeavor. The author posited that ICT is simply about sharing and having access to data with ease. It is regarded as the super highway through which information is transmitted and shared by people all over the world.

The field of education has certainly been affected by the penetrating influence of ICT worldwide and in particular developed countries; ICT has made a very profound and remarkable impact on the quality and quantity of teaching, learning research in the educational institutions. Information and communication technology has the potentials to accelerate, enrich, and deepen skill; to motivate and engage students in learning to help relate school experiences to work practices; to help create economic viability for tomorrow's workers, contribute to radical changes in school; to strengthen teaching and to provide opportunities for connection between the school and the world.

Aribisala (2006) posited that ICT is increasingly playing an important role in organizations and in society's ability to produce access, adopt and apply information. They are however being heralded as the tools for the post-industrial age and the foundations for a knowledge economy due to their ability to facilitate the transfer and acquisition of knowledge. Stressing the importance of the use of ICT in schools, Olurunsola (2007) posited that through ICT, educational needs have been met; it changes the needs of education as well as the potential processes. Message can be communicated through e-mail, telex or telephones particularly the mobile ones.

The pervasiveness of ICT has brought about rapid teleological, social, political and economic transformation, which has eventuated in a network society organized around ICT (Yusuf, 2005). The author posited that ICT is an indispensable part of educational administration as its application makes institutions more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' pedagogical activities. For instance, e-learning is becoming one of the most common means of using ICT to provide education to students both on and off campus by means of teaching online offered via web based systems.

Considering the role of education in nation building and the population explosion in the secondary schools these days, the use of ICT in the teaching and learning process becomes imperative. This is true because its adoption by the teachers will enhance effective teaching. Such issues like good course organization, effective class management, content creation, self-assessment, self-study collaborative learning, task oriented activities, and effective communication between the actors of teaching learning process and research activities was enhanced by the use of ICT based technology.

Teaching and learning has gone beyond the teacher standing in front of a group of pupils and disseminating information to them without the students' adequate participation (Ajayi, 2008). The author posited that with the aid of ICT, teachers can take students beyond traditional limits, ensure their adequate participation in teaching and learning process and create vital environments to experiment and explore. This new development is a strong indication that the era of teachers without ICT skills are gone. Any classroom teacher with adequate and professional skills in ICT utilization definitely has his students perform better in classroom learning.

2.5 The Use of Technology (E-learning) in Training

The introduction of e-learning represents a significant change in practice that needs to be managed carefully particularly as there are a number of important components at different levels that require alignment through the process of change management. E-learning is already being used widely in education and training, and this can be exploited in the home and in community centres, as well as in universities and the workplace.

Individuals are discovering that they can now access courses that were hitherto unavailable to them, making it easier for them to get involved in personal and professional learning. In addition, through the use of technology, learners can be provided with opportunities to have access to other learners in diverse contexts thus removing some of geographical constraints attached to the learning process. One of the other major potential benefits of e-learning is that it has the capability for training to proceed at a pace that it is appropriate to the learner.

In a helpful contribution, Noe (2005) has identified six levels of technology-based training. These include: communications, online referencing, testing assessment, the delivery of computer-based training and multimedia, blended learning, and electronic performance support systems. The difference between the higher and lower levels of technology-based training is that at the higher levels learning is more job-related and helps meet a business need. The simplest level facilitates communications between trainers and trainees.

More complex uses of technology involve the actual delivery of training. For example, sound, automation, and video are used in Web-based training. In addition,

trainees are linked to other resources on the Web. They are also required to share information with other trainees and to deposit knowledge and their insights from the training (such as potential applications of the training content) in a database that is accessible to other company employees. At the highest level – electronic performance support systems – employees receive training while they perform their jobs (Noe 2005).

These features of e-learning give it various advantages over other training methods. E-learning initiatives can be designed to contribute to the strategic objectives. E-learning supports company initiatives such as expanding the number of customers, initiating new ways to carry out business such as e-business, and speeding the development of new products or services. E-learning may involve a larger audience than traditional training programs do that focus on employees. E-learning can reduce training time and allow training more students or employees in a shorter period of time than with traditional training methods, thus reducing training costs. Learning is enhanced through e-learning because it is possible for learners to become more engaged through the use of video, graphics, sound, and text, which appeal to multiple senses of the learners. Also e-learning requires learners to actively practice, ask questions, and interact with other learners and experts.

The adoption of an e-learning solution is becoming increasingly attractive as a solution to provide flexibility and/or to widen participation (McPherson 2003). Thus, benefits of e-learning for learners, tutors and organizations alike, have also been discussed by a number of other researchers (Kumpikaitė and Čiarnienė 2008). These potential benefits of e-learning can be summarized as follows:

- Electronic distribution of course material;

- Flexibility for learners – when to study, at what place;
- Supporting different learning styles;
- Accommodation of different ability levels;
- Establishment of communication between learners and tutors;
- Engendering contact between learners;
- Greater access to information;
- Greater flexibility in maintaining and up-dating course documentation.

2.6 The Concept of Professional Development

Professional development was the disciplinary framework used to focus this study's design and methodology. Fullan (1991) cited in Takacs (2017) defined professional development as formal and informal learning experiences from pre-service teacher education through one's entire career to retirement. Professional development in the realm of technology integration and digital literacy is significant for teachers who may not be savvy in information and communication technology. Fullan (2011) explained that through professional development, a person can explore multiple approaches, experiment, and learn from experiences with practice, which is a powerful tool for change.

Students today are digital learners interacting with technology at home, at school, and on the go with technologies in hand (Gurung & Rutledge, 2014). Often called digital natives, these students have the ability to use technology in an advanced way (Thomson, 2013). Prensky (2001) explained that today's students have changed radically and are no longer the people the current educational system was designed to teach. Prensky (2001) gave the name *digital natives* to the first generation to grow up with digital technology, explaining that their brains work and process information differently from previous

generations. Prensky (2001) claimed that it is very likely that their brains have changed due to the different experiences that they have had, which is an explanation very similar to the theory offered by Fullan (2011) suggesting that practice engages and reshapes the brain.

Professional development is a priority in most developed and developing countries. For instance, in Finland, where the school system ranks among the best in the world (Sahlberg, 2015), it was reported that, teachers devoted about seven working days per year on average to professional development in 2007; approximately half was drawn from teachers' personal time and about two-thirds of primary and secondary schoolteachers participated in professional development that year (Sahlberg, 2015). Finland uses teacher preparedness to raise student achievement rather than making schools and teachers more accountable for student performance.

In Hong Kong, schools are encouraged through their own professional development programmes, focusing on collaboration and collegiality, to meet the individual needs of their teachers (Wong & Wong, 2000, p. 3). In Turkey, teachers use technology on a limited basis, primarily for classroom management and as an extension of traditional teaching methods (Kurt, 2013). Younger teachers in Turkey use technology more regularly than do older teachers, according to Kurt (2013).

A study in England concluded that effective professional development for teachers was necessary in order for interactive whiteboards to be considered beneficial to the classroom experience (Hennessy & London, 2013). The interactive whiteboard itself had no intrinsic value to the educational process without the investment of teacher time and professional development to incorporate its use into the classroom (Hennessy &

London, 2013). Professional development activities are most successful when they are offered within the teachers' home school organization as continuous, reflective, and supportive practices (Hennessy & London, 2013).

Teachers improve their practice through reflection, training, and professional development. Cooper (2014) suggested that teachers will not teach well if they do not have appropriate professional development. Cooper noted that professional development includes “activities such as [having] teacher mentors and coaches, educational workshops, conferences related to teaching fields, teacher collaboration, and follow-up professional development training” (p. 47). Job-embedded professional development helps the teachers to improve the infusion of technology into the curriculum (Cooper, 2014). If they are to improve teaching and to benefit the students, professional development activities should be meaningful to the teachers and should fulfill their needs (Cooper, 2014).

Just as students have different learning styles and diverse needs, when teachers are learning they also need professional development that accommodates their learning styles, not a one-size-fits-all commodity. Cooper (2014) proposed that “as teachers have unique teaching and learning styles, curriculum directors, along with campus administrators should consider that a generic type of professional development may not meet the dire needs of all teachers, nor improve classroom instruction” (p. 65). Administrators hoping to improve the teaching skills of educators should include teachers in the planning process for professional development sessions. In New Jersey, several teachers must serve on the professional development committee for a school district to help to make the topics, activities, and methods more meaningful for the educators.

Job Embedded Professional Training; Job-embedded professional development (JEPD) is professional development that is cultivated in-house with and among teachers who are learning from and working with one another to advance the learning of their students in a school-specific manner (United States Department of Education, 2017). Professional development needs to progress from one-day training sessions to job-embedded professional development activities run by members of the teaching staff (Darling-Hammond, 2010). Professional development that is planned, effective, and ongoing increases teaching skills and improves student successes (Darling-Hammond, 2010). Darling-Hammond and McLaughlin (2017) explained that “job-embedded professional development (JEPD) refers to teacher learning that is grounded in day-to-day teaching practice and is designed to enhance teachers’ content-specific instructional practices with the intent of improving student learning.

Job-embedded professional development creates a situation in which teachers can share their feelings about what they need to improve and can seek advice and assistance from others in a nonthreatening learning environment (Cooper, 2014). This format of professional development may encourage teachers to use new types of technology because immediate assistance is available as needed. Cooper (2014) claimed that the results of his study could benefit all members of the school community as job-embedded professional development improves instruction.

2.7 The Impact of Technology on Employee Performance

A study by Imran, Magbool and Shafique (2014) assessed the impact of technological advancement on employee performance in banking sector. The study was completed with the help of extensive literature on technological advancement and

employee performance available on the databases and websites. Questionnaire was used as the only instrument for gathering primary data. Total of 140 questionnaires was distributed among different banks and out of which 100 were get completed and returned. It was found that that technological advancement had significant impact on motivation and training of employees. Motivation had significant impact on employee performance but training had no significant impact on employee performance. Moreover as the concerned for technological advancement and employee performance, there was significant relationship among them.

The impact of the emerging technologies on teacher education experiences of teacher-trainees was explored by Wilson (2014). This study used a blend of quantitative and qualitative methods to collect empirical data. The quantitative data was analysed using simple means and standard deviation. Responses from the qualitative data were analysed under themes. Findings from the study showed that teacher-trainees' received technical support to use the online learning management system (LMS). The main findings of the study showed that a number of teacher-trainees' access technology for academic and non-academic activities. The use of the social media was popular among teacher-trainees. However, using it to support learning is still a challenge. The study also made it evident that a number of teacher-trainees' lack confidence in using technology tools, because of their low technology skills. The lessons drawn from the opportunities and challenges faced by students in the utilization of technology tools could be used to formulate ideas in the deployment of ICT tools and facilities.

A study by Dauda and Akingbade (2011) examined how employee relation could be employed for technological change management. It also seeks to determine effective

method of using technological innovation for improved performance in the Nigerian manufacturing industry. The researchers distributed 1256 questionnaires to selected 30 manufacturing industry in beverages, textile, steel, cement and chemical industry in Nigeria. Findings revealed that employee relations do not have significant relationship with technological change. The study recommended that employee relation should be considered in the management technological change for profitability, competitiveness and survival of the Nigerian Manufacturing industry.

2.8 Teachers' Perception toward the Use of Technology

Computers have changed the way that many teachers approach to teaching. Teachers are now able to use computers to demonstrate dynamic processes in real time such as providing students with simulations of how gases behave at different temperatures in science classes (Hurwitz, 1999 cited in Mundy, Kupczynski, & Kee (2012) or showing videos and movie clips of significant historical events, all of which allow the teacher to provoke deeper thought processes.

Teachers' attitudes and beliefs are crucial factors in determining the role and effectiveness of technology in classrooms. Attitudes and beliefs about both educational technology and pedagogy in general will ultimately influence how teachers implement technology. Now that technology is being widely used in schools, perhaps the most important question is *how* to best implement technology, rather than *whether* technology will be used (Ertmer et al., 2012; Keengwe, Onchwari, & Wachira, 2008; Lowther, Inan, Strahl, & Ross, 2008).

Despite the enormous headway that computer technology has made, there is still a common misconception that computers and the internet are the only useful technologies

for the field of education (Lyle, 2009). However, education technology is actually spread throughout a broad spectrum of different technologies including, but not limited to, those used in “design-making, problem-solving, technological systems, resources and materials, criteria and constraints, processes, controls, optimization and trade-offs, invention, and many other aspects dealing with human innovation” (Lyle, 2009,p.45).

There is a lot of research on the views of teacher’s about technology use in the classroom. According to Cope and Ward (2002), experienced teachers who had little or no professional development in the use of technology in the classroom were less likely to use it in the classroom and were less likely to see the benefit of technology usage in the classroom. Royer (2002) found that the more teachers were involved in actually setting up classroom technology the more likely they were to use that technology for instruction. This is why it is important for teachers to receive technology skill training. This is not to say that the advancement of technology use in the classroom changes the role of the teacher. Wang (2002) found that teachers saw their roles as being more teachers centered and fewer students centered in classrooms that did not have computers. However, teachers did not think that they would teach differently or that their roles would be different in a classroom with computers.

Savery (2002) noticed that faculty felt comfortable using technology such as email, overhead projectors, and videos. However, faculty felt that they used email more often for instruction rather than for the students demonstrating a difference in the perceptions of the use of email (Savery, 2002). Wilson, Notar, and Yunker (2003) found that on the average, teachers used the computers 1.9 hours per week mainly to enter

grades in elementary schools. Students spent even less time on the computers only 1.5 hour per week.

A study in Taiwan showed a strong relationship between teacher training and the integration of technology into the curriculum. Hsu (2010) discovered that the better trained the teacher was in the use of technology, the more likely he or she was to successfully integrate it into classroom instruction. In a study of teacher perception of the values that are needed to be an “exemplary” user of technology in the classroom, it was found that teachers believe that a person has to be confident in his or her ability to use technology and committed to its use (Ertmer, Ottenbreit-Leftwich & York, 2007).

When middle school and secondary school teachers used web-based learning tools as part of their lessons, they perceived that their students were more successful as it appeared to significantly engage the students (Kay, Knaack, & Petrarca, 2009). Furthermore, the students also scored higher on tests. This study also found that teachers felt the web-based learning tools were easy for the students to use. The use of technology in the classroom allows students to engage in a more active way of thinking, literally a hands-on learning experience in which they are able to practice executing skills that would be impossible with a traditional book lesson.

Mundy et al (2012) analyzed teachers’ perceptions of technology use in the classroom by surveying those who participated in the TeachUp! Technology empowerment program created and developed by Digital Opportunity Trust USA, Inc. (DOT USA). The results show that teachers who were part of DOT USA’s TeachUp! Program perceived a significant increase in the areas of student engagement, student excitement, student acceleration of learning, and student proficiency with computer

technology. The result indicated that faculty members need not only to learn how to use technology at a basic level but also to learn how to integrate that technology into their curricula. In addition, newer teachers from digital native generations must be taught how their acquired skills can be used to integrate technology into the classroom curriculum to provide complex cognitive engagement for their students. It is essential that the role of the teacher as a professional in the classroom not be discounted when evaluating classroom curriculum development and strategy, including those that would integrate various technologies.

2.9 Factors Affecting Teachers' Professional Development

The factors influencing professional development of teachers have been categorized into two: Internal and external factors. The internal (personal) factors include teachers' attitude towards professional development, and teachers' self-efficacy. The external (environmental) factors include; time, funding, principal influence, colleagues influence, and the culture of the school (Bayar, 2013).

2.9.1 Internal Factors

According to Bayar (2013), a common belief among professional development (PD) researchers is that internal factors affect teachers' participation in activities. These include: teachers' attitudes toward professional development activities and teachers' self-efficacy.

Teachers Attitudes toward Professional Development: Each teacher has his or her own attitudes about PD activities. Therefore, PD activities have both positive and negative implications for different teachers (McLaughlin & Talbert, 2006; Yamagata-

Lynch & Haudenschild, 2009). While a PD programmes might work well for some teachers, the same activity might fail others. In this regard, the importance of teacher attitudes toward PD activities has been supported by researchers (Torff & Session, 2008; Torff & Session, 2009). In order to show the importance of 24 teachers' attitudes toward PD activities, Amos and Benton (1988) conducted a study and found that negative teacher attitudes towards PD affect their participation in PD activities.

Additionally, Silane Ruberto (2003) tested the attitudes of teachers toward PD activities and ascertained: 1) there were no differences between veteran teachers and novice teachers regarding their attitudes toward PD activities, 2) when offered PD activities that were useful and related to their content area, teachers maintained their positive attitudes about those PD activities, and 3) the majority of participant teachers believed that PD activities were necessary for improving their instructional skills. As these studies have clearly shown, teachers' attitudes toward professional development are one of the key factors influencing their participation in PD programs.

In order to increase the participation rate of teachers in professional development activities, it is necessary to build positive attitudes toward professional development among teachers (Garip, 2011, personal communication).

Self-Efficacy: The second set of internal factors related to PD participation is the teacher's perception of his/her self-efficacy for teaching. Teachers are a heterogeneous group with different beliefs about themselves. These beliefs are greatly influenced by the teachers' philosophy regarding how students learn. If the teacher regards student learning as primarily dependent on explicit teacher teaching, classroom activities will be driven by the traditional chalk-and-talk approach. More traditional educational beliefs have been

related to less integration of computer-based technology in classrooms (Hermans, Tondeur, van Braak, & Valcke, 2008).

Some researchers have found the importance of teachers' "self-efficacy" on education (Ware & Kitsantas, 2007). Wexler (2000) has stated, "people with the capacity for self-efficacy not only manifest emotional self-control, but also use this to accomplish specific pre-set goals"

There are various definitions of teacher efficacy. For instance, Ross and Bruce (2007) have defined "... efficacy is a teacher's expectation that he or she will be able to bring about student learning" (p.50). Similarly, Aydin (2011) has defined teacher efficacy as "Teachers' own beliefs about their capacity to teach (Aydin, 2011).

Each teacher has his or her own self-efficacy related to his or her own teaching ability. Lohman (2006) has found that self-efficacy is one of the most important factors affecting teachers' participation in learning activities. How one feels about their ability to teach may influence what they view to be important, and thus effect which new ideas and approaches teachers value and consequently adopt as a part of their pedagogical routine.

2.9.2 External Factors

There exists a general consensus among PD researchers that external factors affect teachers' participation in PD activities. In this section, the researcher will discuss the following external factors: time, funding (supplementary salary), principal influence, colleague influence, and school culture.

Time: Time can be broken down further into three components: (1) work-time, (2) personal, leisure-time, and (3) family-time. The responsibilities of teachers have changed over the years, and therefore the workload of teachers has noticeably increased beyond just time spent teaching in the classroom (Lohman, 2006); which in turn means that

teachers are spending much more time on teaching-related tasks, and consequently have very limited time to participate in PD activities (Hodkinson & Hodkinson 2005).

A number of studies have emphasized that time is one of the most influential factors impacting teacher participation in PD activities and have shown that the lack of time affects teachers' participation in PD programs (Demirtas, 2010; Yamagata-Lynch & Haudenschild, 2009; Easton, 2008). A study by Collinson and Cook (2000) supported the notion that lack of time impacts teachers' participation in PD activities. According to Collinson and Cook's (2000) findings, time shortage is one of the most serious problems linked to low participation of teachers in PD activities.

Many teachers have personal lives filled with responsibilities related to their families. These responsibilities include childcare, care for aging parents, spousal duties, and leisure time activities spent with family. These responsibilities all consume teachers' time, causing time allocation issues, and adversely affecting their decisions to participate in PD activities (Aydin, 2011). Duquette, Painchaud, & Blais (1987) cited in Bayar (2013) have reported that having a family, including young children in the home, and working full or part-time impacts individuals' ability to participate in any educational activities.

Ozer (2004) has found the importance of setting aside appropriate time for any PD activity and recommended that "In-service training activities may well become a part of the teacher's working schedule at school. In other words, the teachers may spend certain working hours in a week on in-service training instead of teaching students. According to Watts and Castle (1993) cited in Bayar (2013), several studies have suggested strategies for making time for the increased participation of teachers in PD activities. These

strategies include: (a) using substitutes or releasing students early; (b) buying teachers' time; (c) creating common scheduling time for similar assignments among teachers; (d) restructuring time; and (e) better using available time for professional development programs.

Funding: This Funding is one of the most important factors, not only for the design and implementation of PD activities, (Postholm, 2011) but also for the participation of teachers in these PD activities (Lohman, 2006). A number of studies have clearly emphasized the importance of funding (salary supplement) for teachers in PD activities (Abadiano & Turney, 2004), and shown that it affects the participation decisions of individuals in PD activities. There is an agreement among researchers that funding (financial support-salary supplement) is one of the key factors encouraging participation of teachers in PD activities (Easton, 2008; Shafer, 2009).

Bayar (2013) emphasised that the link between time and cost is an essential one to consider. If leaders give teachers more time out of the classroom to participate in PD, or require them to attend training outside of their work hours, they must either pay substitute teachers or pay teachers extra for their additional time (Leonard & Leonard, 2003). If teachers receive salary increases through participation in PD activities, they are more likely to attend (Yamagata-Lynch & Haudenschild, 2009). However, in times of budget retrenchment, finding available funding to support the highest quality PD programmes may be difficult. PD programs may even have to be eliminated in order to protect the financial stability of schools and allow them to continue to support the core functions of schools.

Headteacher/Headmaster/Principal Influence: The headmaster's influence has great importance on the decisions of teachers to participate in PD activities. The head of the school is the main factor influencing the participation of teachers in PD activities in or beyond the school. They set the tone by creating a positive or negative school culture (McLaughlin & Talbert, 2006). Collinson and Cook (2000) supported this idea and found that principals play a major role in the PD of teachers; the degree of support from principals can positively or negatively affect teacher participation in PD activities.

In a similar vein, Payne and Wolfson (2000) found the importance of principals for teachers' participation in professional development activities and affirmed, "As the leader of a learning organization, the principal must motivate teachers to continue to grow professionally throughout their careers. Meister (2010) has stated that the supportive behaviors of principals positively impact the PD of teachers.

Postholm (2011) found in a study that the principal plays a key role in teachers' professional development and said that, "A continuous development of practice appears to rely on a common vision or objective among teachers and school leaders" (p. 567). Arly, Sandholtz and Scribner (2006) found that school leaders should be facilitators of PD activities. Consequently, the principal is one of the most important influences over teachers' decisions to participate in PD activities.

Colleague Influence: The importance of the influence of colleagues on teachers' decisions to participate in PD activities among PD researchers cannot be underestimated. A broad look at the literature states that having a learning culture among teachers

(colleagues) in schools encourages teachers' decisions to participate in PD activities. For instance, Meister (2010) discovered in her study that participants report their colleagues are the most important people in their work. Senge (2006) mentioned that having common understandings and visions are important for teachers' development. Postholm (2011) found in a study the importance of colleagues and stated, "A continuous development of practice appears to rely on a common vision or objective among teachers and school leaders" (p. 567).

School Culture: Having a supportive school culture is another important external factor affecting teachers' participation in professional development activities. Studies have found that school culture holds great importance for teachers' participation in PD activities (Opfer & Pedder, 2011; Postholm, 2011). Pedder et al. (2005) argue for the importance of supportive school culture for teachers and reveal the importance of a supportive school culture for teachers' professional learning. Having a learning culture, common understandings, visions, and shared values among teachers in schools is important both for building a supportive school culture and for ongoing teacher professional development (McLaughlin & Talbert, 2006)

2.9.3 Teachers' Personal Characteristics

In addition to all the internal and external factors, teachers' personal characteristics might influence their participation in PD activities. For instance, Bayindir (2009) has explored the relationship between the number of years of teaching experience and teachers' participation in PD activities. Bayindir (2009) found that new teachers (those with fewer than 5 years of teaching experience) and experienced teachers (those

with over 21 years of teaching experience) report that participation in PD activities is unnecessary and therefore often view it as a waste of time.

Ozer and Beycioglu (2010) explored the effects of teacher characteristics, such as gender and teaching experience, on the attitudes of teachers in terms of PD activities and found that: 1) female teachers have more positive attitudes toward PD activities than do male teachers and 2) experienced teachers generally have negative attitudes about PD activities. Consequently, gender and years of teaching experience impact teachers' participation in PD activities.

Torff and Session (2008) examined how personal characteristics such as age, years of teaching experience, gender, grade level (elementary versus secondary), and level of educational attainment affect the attitudes of teachers as related to PD programmes and found that age, years of teaching experience, and the grade level in which they teach affects teachers' attitudes about PD activities. As a result, they influence teachers' participation in PD activities. Therefore, these factors must be included in any study of teacher participation in PD.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The research methodology is indeed considered as the heart of every research. This is because it shows how a study should be carried on to achieve the objectives of a study. Without methodology, a study has no life. This section provides basically describes how data will be gathered, processed and analyzed. Among some of the items discussed under this section were; research design, population of the study, sample and sampling technique, research instrument, research procedure and data analysis. The profile of the studied organization was also presented under this chapter.

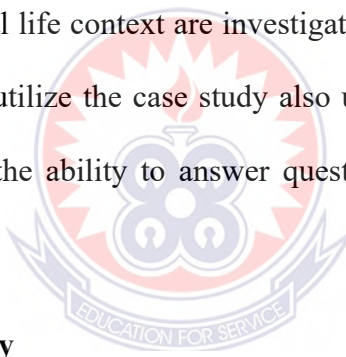
3.2 Research Design

Krishnaswami and Satyaprasad (2010) pointed out that the qualitative and quantitative are the two main approaches used when performing research. The quantitative approach according to the researcher deals with numbers and the research results are mostly shown in statistical format. Thietart (2011) added that the quantitative

approach primarily focuses on test rather than construct. Contrary, the qualitative approach does not deal with numbers. It provides description of an event through interviews and observation. The qualitative approach is construct-oriented. It does not use numerical elements. For the purpose of the study, the quantitative approach was used.

Saunders et al (2007) defined research strategy as a plan of how research questions are answered. These researchers pointed out that there are numerous research strategies to choose from; of which some are histories, experiments, archival analysis, surveys, and case studies.

A case study approach according to Polit and Beck (2006) is used when contemporary events in real life context are investigated, and relies on several sources of evidence. This study also utilize the case study also used the case study approach. This was used because, it has the ability to answer questions of “why”, “what” as well as “how” in a research study.



3.3 Population of the study

Population of a study is defined as the whole group of elements or characteristics in which a researcher is interested in studying (Polit & Beck, 2006). Thietart (2011) also referred to a population as a well-defined set of individuals, services, element, group of thing or event that are being investigated. The population of the study involved Personnel in District Education Office and teachers in Sekyere Kumawu District. The study chose this population because the time frame for the study was limited and also because of easy access to information pertaining to the objectives of the study. The chosen of population was done after several consultations with some staff with rural on accessibility of

information from their organization. The district has 187 schools comprising of about 1,593 teachers. 607 are females while the remaining 986 are males.

3.4 Sample and Sampling Techniques

Due to research constraint like time and funding, it was impracticable to capture the entire target population in the study. Therefore, a sample was drawn as a representative for the entire targeted population so that generalization could be made. This was because it was highly expensive, time consuming, and might also require the services of a lot of research assistants.

The study used stratified, simple random, convenient and purposive sampling techniques to select 175 respondents. A stratified sampling technique according to Maxwell (2005) estimates overall population parameters with greater precision and ensure a more representative sample is derived from a relatively homogenous population. Stratified sampling technique was used because it reduces standard error by providing some control over variance.

The study categorized the population into three strata (Category A, B, C). The study from each stratum conducted a simple random technique to select two branches. In all, 50 schools teachers were used for the study. A simple random sampling is a sampling technique where all elements or individuals have equal chance of being part of a population.

Purposive sampling technique is a technique where a researcher chooses respondents with key information relating directly to the objective of a study. Some key personnel in the district education office such as the District Director, Human Resource

Manager, District Staff Development Officer (District Training Officer) Supervision and Monitoring, and Statistical Officer were purposively selected.

3.5 Sources and types of data

A secondary data was the first source of data for the study. A collection of materials were sourced, and reviewed in order to establish some degree of consistency. Information was sourced from textbooks, journals, dissertation, and academic journals. These were sourced from various libraries in higher institutions of learning.

In addition, a field data was also gathered for the study. The field data was gathered through administering questionnaire to respondents. A questionnaire is defined as a research instrument made up a series of questions and options, which aims at gathering information from respondents. Questionnaire was used because of its wider application, high response rate, limited time in administration and less cost. It was also used because; it aimed to elicit first-hand information from the respondents on the topic understudy.

Also, since the study used a structured questionnaire, the researcher conducted an interview with some of the key staff (District Director of Education, Human Resource Manager, District Staff Development Officer (District Training Officer) and Statistical Officer) within the District Education Office, so as to have a deeper understanding of use of technology in personnel development in the district.

3.5.1 Validity and Reliability of Instrument

In order to attain authentic data, the researcher paid attention to these elements. This because the authenticity of research data to some extent is dependent on how reliable a research instrument is. Validity is the extent to which a research instrument

measures what it is supposed to measure, while the reliability refers to the consistency in measures. That is, when a research instrument gives a consistent result it is said to be reliable

The validity of the researcher instrument was ascertained using the face and the content validity. The instrument was given to the researcher's supervisor and some other experts in the field of maternal health to assess whether the instrument can be used to achieve the purpose of the study. The healthy critique from these individuals were taken into consideration the final questionnaire was drafted.

In checking the reliability of the instrument, the Cronbach's alpha was utilized. According to the Cronbach's alpha, reliability co-efficient of 0.70 and above signal that the instrument is reliable. A pilot study using forty respondents was carried out and the Cronbach alpha was applied on the scores.

The study used the split-half method to assess the reliability of the research instrument (questionnaire). In using this method, each instrument was split into two halves (that is even and odd items). The Pearson' correlation co-efficient was calculated between the responses of the two halves.

3.6 Data collection

Permission was sent by the researcher to the District Director of Education. This was done to ask for permission to carry out the research in the organization. The researcher personally distributed the questionnaires. The researcher administered the questionnaires to those who were willing to complete them. The researcher then waited for respondents to complete them. This enabled the researcher to interact with

respondents personally and also paved way for the researcher to explain the importance of the study to respondents, and also issues they did not understand.

3.7 Data Analysis

Data obtained from the respondents was first edited. This was done with the aim of making data analysis and interpretation easier for the researcher. The edited data was grouped and presented in tables. All the data were subjected to frequency count to check and correct coding errors. The researcher used Statistical Package for Service Solution (SPSS) to organise the data. The results were presented in the form of frequency counts, and percentages. The descriptive statistics was employed to analyze data. This entails the use of mean standard deviation, percentage, and frequency.

3.8 Ethical consideration

The researcher tried as much as possible to observe all possible ethics as far as research and a study of this kind is concern. Ethical clearance was obtained from my department giving me an ethical backing for the research. Issues of plagiarism were addressed by acknowledging all sources of information appropriately. Respondents' approval was also sought and their confidentiality and anonymity not compromised; first by not letting them to put their names or any form of identification on the questionnaires and by assuring them the results will be used only for academic purposes. None of the respondents were forced or coerced into responding to the questionnaire. Other institutional policies on accessing confidential documents were strictly observed.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

Presented in this chapter are the results of data gathered from the 175 respondents used for the study. The data were collected to achieve the purpose of the study. Specifically, data were gathered on background of respondents, teachers' knowledge level on Information and Communication Technology, Professional Development Programme, Perception of Professional Development programme, challenges associated with teachers' inability to go for professional development in technology. Results are presented under their respective headings.

4.2 Background of Respondents

Under this section, data were gathered on respondents' gender, age, education and year of work in the district. These variables did not directly form part of the specific objective of the study. Data on the variables were gathered in order to find the relationship between the variables and the outcome of the study.

Results in Table 4.1 showed that ninety five (95) of the respondents representing 54.3% were males, while the remaining eighty (80) of the respondents representing 45.7% were females. The statistics indicated that majority of respondents were males. The inclusion of both males and females ensured fairness in the data collected. That is, the data to some extent were not gender-bias.

Regarding the age group of respondents, it was found that seventeen (17) of the respondents representing 9.7% fell within the age group of 16 to 25 years, thirty two (32) of them representing 18.3% fell within 26 to 35 years, while sixty five (65) of them representing 37.1% fell within 36-45 years. It was reported that twenty eight (28) of the respondents representing 16.0% fell within 46 to 55 years. The remaining thirty three (33) of them representing 18.9% were above 55 years. The statistics shows that respondents are matured to provide relevant data for the study.

The statistics indicated that seventy eight (78) of the respondents representing 44.6% held diploma certificate, while sixty one (61) of them representing 34.9% were first degree holders. The remaining thirty six (36) of them representing 20.5% were postgraduate students. This is an indication that reading and understanding of question items on the questionnaire were not much problem to respondents.

Data on the number of years respondents have spent teaching in the studied district were sought. Results showed that thirty three (33) of the respondents representing 18.9% had worked up to 5 years, sixty two (62) of them representing 35.4% had worked between 6 to 10 years, while forty one (41) of them representing 23.4% had worked between 11 to 15 years. The remaining thirty nine (39) of the respondents representing

22.3% had worked above 15 years. It is evident that majority of respondents have been in the district for long time and so can provide relevant data for the study.

Table 4.1 Background of Respondents

Characteristics	Frequency	Percentage (%)
Gender		
Males	95	54.3
Females	80	45.7
Age		
18-25 years	17	9.7
26-35 years	32	18.3
36-45 years	65	37.1
46-55 years	28	16.0
Above 55 years	33	18.9
Education		
Diploma	78	44.6
First Degree	61	34.9
Postgraduate	36	20.5
Years of Work in the District		
Up to 5 years	33	18.9
6-10 years	62	35.4
11-15 years	41	23.4
Above 15 years	39	22.3

Source: Field Data, 2021

4.3 Teachers' Knowledge Level on Information and Communication Technology

The first objective calls for the need for the researcher to adopt descriptive statistics to analyse data gathered on teachers' knowledge level on Information and

Communication Technology. The mean and standard deviation scores were utilized to analyze data. The mean score was used to analyze commonalities in respondents' response, while the standard deviation scores were used to analyze variation in respondents' responses. Respondents were asked to respond to a set of question items relating to teachers' knowledge level on Information and Communication Technology. Respondents responded using a five point Likert Scale from strongly disagree to strongly agree.

It is found in Table 4.2 that the mean score of the question items used to measure teachers' knowledge level of Information and Communication Technology ranged from 2.13 to 4.80. The question item, "Technology is the process by which humans modify nature to meet their needs and wants and to make life easier and better" had the highest mean score of 4.80, while the question item, "I possess the technological skills needed to use innovative resources" had the lowest mean score. Only the mean score of the question item, "Technology is the process by which humans modify nature to meet their needs and wants and to make life easier and better" have the mean score above the midpoint (2.5), suggesting that majority of respondents agreed to the question item. The mean scores of the remaining question items were below the midpoint scale, and it suggested that majority of respondents disagreed to these question items.

In other words, majority of respondents disagreed that they have positive attitude towards the use of technology, they have knowledge on standard technologies such as books, dry erasers boards, chalkboards, etc, they have knowledge on modern/advanced technologies such as computer, internet, interactive white board, digital video and overhead projectors, they can use computer software and hardware within the educational

context, and they possess the technological skills needed to use innovative resources. Majority of the respondents also disagree that they create electronic templates or graphic organizers for students' work, they record students' grade and print reports with grade book programme, they use technology in the development of strategies of solving problem in the real world, they have had sufficient opportunities to work with different technologies, they know about a lot of different educational technologies, and they know how to solve their own technical problem.

Table 4.2 Teachers' Knowledge Level on Information and Communication Technology

Level of Knowledge	Mini	Max	Mean	Stan Dev.
Technology is the process by which humans modify nature to meet their needs and wants and to make life easier and better.	4	5	4.80	.401
I have positive attitude towards the use of technology	1	5	2.38	1.29
I have knowledge on standard technologies such as books, dry erasers boards, chalkboards, etc	1	5	2.41	1.17
I have knowledge on modern/advanced technologies such as computer, internet, interactive white board, digital video and overhead projectors	1	5	2.43	1.30
I can use computer software and hardware within the educational context	1	5	2.38	1.15
I possess the technological skills needed to use innovative resources	1	5	2.13	1.30
I can create electronic templates or graphic organizers for students' work.	1	5	2.32	1.32
I record students' grade and print reports with grade book program	1	5	2.20	.953
I can use technology in the development of strategies of solving problem in the real world	1	5	2.25	1.50

I have had sufficient opportunities to work with different technologies	1	5	2.37	1.10
I know about a lot of different educational technologies	1	5	2.27	1.06
I know how to solve my own technical problem	1	4	2.27	1.02

Source: Field Data, 2021

4.4 Professional Development Programmes

Respondents were also asked to respond to the professional development programmes they have attended. Respondents responded using, yes or no response. Results in Table 4.3 showed that majority of respondents have attended professional development programmes such as; training for elementary education institution, preparatory education programme, course in computer and internet use, education technologies, seminar on emergency medical service, and seminar on learning-leader teacher. Majority of respondents also responded that they have attended seminar on disaster and emergency preparedness, as well as seminar on COVID-19. The results indicates that majority of respondents have participated in professional development programmes.

Table 4.3 Professional Development Programmes

Professional Development Programmes	Yes (%)	No (%)
Training for Elementary Education Institutions	127 (72.6)	48 (27.4)
Preparatory Education Programme	113 (64.6)	62 (35.4)
Course in computer and internet use	136 (77.7)	34 (22.3)

Educational technologies programs	98 (56.0)	77 (44.0)
Seminar on Emergency Medical Service	123 (70.3)	52 (29.7)
Seminar on learning-leader teacher	99 (56.6)	76 (43.4)
Seminar on Disaster and emergency preparedness	108 (61.7)	67 (38.3)
Seminar on COVID-19	138 (78.9)	37 (21.1)

Source: Field Data, 2021

4.4.1 Perception about professional programme

Furthermore, respondents were also asked to indicate their perception about professional programme. Respondents responded to a set of question items using a five point Likert's scale from strongly disagree to strongly agree. The mean and standard deviation were used to summarize and derive meaning from the data gathered. While the standard deviation was used to find variations in respondents' responses, the mean score was used to find similarities in respondents' responses.

It is evident in Table 4.4 that the mean scores of the question items ranged from 3.85 to 4.35 the question item, "The best way for teachers to learn more is to participate in professional development activities" had the lowest mean score, while the question items, "Professional development activities help teachers to develop their instructional skills, and Participating in professional development activities makes me feel better about myself" had the highest mean score. The mean scores of all the question items were above the midpoint scale, and this suggested that majority of respondents agreed to all the question items.

Majority of respondents per the mean scores agreed that professional development activities help teachers to develop their instructional skills, professional development activities are valuable enough to justify the time spent, participating in professional development activities makes me feel better about myself, the best way for teachers to learn more is to participate in professional development activities, and they enjoy participating in professional development activities.

Table 4.4 Perception about Professional Programme

Perception	Mini	Max	Mean	Stan Dev.
Professional development activities help teachers to develop their instructional skills	3	5	4.35	.615
Professional development activities are valuable enough to justify the time spent	3	5	4.17	.448
Participating in professional development activities makes me feel better about myself	2	5	4.35	.743
The best way for teachers to learn more is to participate in professional development activities	3	5	3.85	.402
I enjoy participating in professional development activities	3	5	4.23	.582

Source: Field Data, 2021

4.5 Challenges Associated with Teachers' Inability to go for Professional Development in Technology

The third and last specific objective was ascertained by asking respondents to respond to question items relating to challenges associated with teachers' inability to go for professional development in technology. Respondents responded to question items

using a five point Likert scale from strongly disagree to strongly disagree. The mean and standard deviation were used to derive meaning from the data gathered on the challenges. As usual, the mean score was used to examine commonalities in respondents' responses, while the standard deviation was used to assess variation in respondents' responses.

The mean score of the question items were found to range from 3.44 to 4.48. The question item with the highest mean score was "Expenses for travel", while the question item with the lowest mean score was "Inadequate support from school". The mean scores of all the question items were found to be above the midpoint scale, and it is an indication that majority of respondents agreed to the question items.

In other words, it was highlighted by majority of respondents that the challenges associated with teachers' inability to go for professional development in technology include; lack of funding for additional personnel to cover classes, family responsibilities, expenses for travel, teaching-related duties, professional development activities are not offered at the time when I am available, and headteachers' attitude.

Table 4.5 Challenges Associated with Teachers' Inability to go for Professional Development in Technology

Challenges	Mini	Max	Mean	Stan Dev.
Lack of funding for additional personnel to cover classes	3	5	4.47	.633
Family responsibilities	2	5	4.19	.601
Expenses for travel	3	5	4.48	.633

Teaching-related duties	3	5	4.23	.584
Professional development activities are not offered at the time when I am available	3	5	3.85	.402
Headteachers' attitude	3	5	4.18	.456
Unfavorable Ghana Education Service policies	1	5	3.81	.975
Inadequate resource	1	5	3.79	1.11
Inadequate support from school	1	5	3.44	.962

Source: Field Data, 2021

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusion and recommendations of the study. The summary of the study, summary of key findings, as well as conclusion of the study was presented under the chapter. The recommendations based on the outcome of the study, and the recommendations for further studies were also captured in this chapter.

5.2 Summary of the study

The study examined teachers' professional development in Information and Communication Technology. It specifically focused on teachers' knowledge level on Information and Communication Technology, professional development programme for teachers, and the challenges associated with teachers' inability to go for professional development in technology. The study utilised the case study design as well as the quantitative approach to research. The population of the study involved Personnel in District Education Office and teachers in Sekyere Kumawu District. The study used stratified, simple random, convenient and purposive sampling techniques to select 175

respondents. Data were solicited from respondents using questionnaires. The researcher personally gathered data from respondents. Data were analysed using the statistical package for social science. The Descriptive statistics was employed. Results from the study will help to promote teachers involvement in Information and Communication professional programme.

5.3 Summary of Key Findings

The summary of key findings was done based on the specific objectives of the study.

5.3.1 Teachers' Knowledge Level on Information and Communication

Majority of respondents disagreed that they have positive attitude towards the use of technology, they have knowledge on standard technologies such as books, dry erasers boards, chalkboards, etc, they have knowledge on modern/advanced technologies such as computer, internet, interactive white board, digital video and overhead projectors, they can use computer software and hardware within the educational context, and they possess the technological skills needed to use innovative resources. Majority of the respondents also disagree that they create electronic templates or graphic organizers for student work, they record students' grade and print reports with grade book programme, they use technology in the development of strategies of solving problem in the real world, they have had sufficient opportunities to work with different technologies, they know about a lot of different educational technologies, and they know how to solve their own technical problems.

5.3.2 Professional Development Programme

Results showed that majority of respondents have attended professional development programmes such as; training for elementary education institution, preparatory education programme, course in computer and internet use, education technologies, seminar on emergency medical service, and seminar on learning-leader teacher. Major of respondents also responded that they have attended seminar on disaster and emergency preparedness, as well as seminar on COVID-19. The results indicates that majority of respondents have participated in professional development programmes.

Majority of respondents per the mean scores agreed that professional development activities help teachers to develop their instructional skills, professional development activities are valuable enough to justify the time spent, participating in professional development activities makes me feel better about myself, the best way for teachers to learn more is to participate in professional development activities, and they enjoy participating in professional development activities.

5.3.3 Challenges Associated with Teachers' Inability to go for Professional Development in Technology

It was highlighted by majority of respondents that the challenges associated with teachers' inability to go for professional development in technology include; lack of funding for additional personnel to cover classes, family responsibilities, expenses for travel, teaching-related duties, professional development activities are not offered at the time when I am available, and headteachers' attitude.

5.4 Conclusion

The study sought to assess teachers' professional development in Information and Communication Technology. The level of teachers in Sekyere Kumawu District was generally found to be low. However, most teachers in the district have experienced a number of professional development programmes, and showed positive attitude towards professional development programmes. The study identified challenges associated with teachers' inability to go for professional development in technology. There is a need for educational authorities in the district to have a critical look at the identified challenges so as to encourage more teachers to fully participate in Information and Communication Technology professional programme. This is because the current situation has called for the need to embrace Information and Communication Technology in the teaching and learning process. The full participation of teachers in technology is a requirement in today's dynamic educational environment. Therefore, the government and other institutions must join hands to ensure that the impact of technology is felt in the classroom.

5.5 Recommendations

Based on the outcome of the study, the measures have been suggested to help improve teachers' participation in Information and Communication Technology professional programme.

1. The government through the Ministry of Education must ensure that District Education Offices are provided with funds to enable them train teachers in the district in Information and Communication Technology. Also, philanthropist and

other institutions can come in to provide financial support in helping to promote teachers participation in technology.

2. A way to combat the challenge of expenses for travel is that all travelling expenses relating to teachers professional development in Information and Communication Technology must be subsidized or totally back by the government or Ghana Education Service. When the travel expenses are paid by Ghana Education Service, it will motivate teachers to go for professional programmes. The District Education Service can organize vehicle for teachers in the district to go for professional programmes.
3. It is also recommended that the Ghana Education Service must come out with policies that are conducive to create sound environment for teachers to use appropriate educational technologies.
4. If teachers go for Information and Communication Technology programmes, and there are no or limited technological resource available, teachers may not be able to practicalise what they learnt. As a result, their training will yield no impact and this can serve as a disincentive to teacher to go for series of professional development programmes. There should be adequate education technological resources in schools to enable teachers use them to broaden their horizon. The government must provide more computers in schools, and make access to internet easier.

5.5.1 Recommendations for further studies

The study narrowed itself to Sekyere Kumawu District, and this can raise argument when generalizing findings. There is a need for future studies to broaden the

scope of the study by looking at other districts that share similar characteristics with the study area. This is because sometime the geographical position of an area can affect the outcome of a study. In other words, the challenges of schools in rural communities may not be the same like those on urban centres. Only quantitative approach was used. Future studies must adopt mixed method to have an insight into teachers' professional development in Information and Communication Technology. The role of the government in promoting teachers' professional development can also be investigated.



REFERENCES

- Abadiano, H. L. & Turner, J. (2004). Professional staff development: What works? The *NERA Journal*, 40(2), 87-91.
- Adeyanju, R.J. (1999). *Basic concepts in educational technology. A handbook for pre-service and in-service teachers in West African Countries*. Winneba-Ghana.
- Ajayi, I. A. (2008). Towards effective use of information and communication technology for teaching in Nigerian colleges of education. *Asian Journal of Information Technology*, 7(5), 210-214.
- Akbulut, G. (2010). Contemporary educational technology. *Journal of Social Science*, 34, 56-67.
- Amos, N., & Benton, G. (1988). *Teacher attitudes toward staff development and related activities in a rural educational consortium*. Paper presented at the annual meeting of the Mid-South Educational Research Association.

- Association for Educational Communications and Technology. (2004). *The meaning of educational technology*. Definition and Terminology Committee, Bloomington. Retrieved from http://ocw.metu.edu.tr/file.php/118/molenda_definition.pdf.
- Ayas, C. (2006). An examination of the relationship between the integration of technology into social studies and constructivist pedagogies. *The Turkish Online Journal of Educational Technology*, 5(1), 64-72.
- Babajide, V. F. T. & Bolaji, O. A. (2003). *Perception of lecturers and service teachers towards the use of communication media in teaching pure and applied science related discipline*. Paper presented at the 44th Annual STAN
- Balogun, T.A. & Abimbade, A. (2002): *Introduction to instructional technology*. Centre for External Studies, University of Ibadan: Unpublished Master's Thesis.
- Bandele, S.O. (2006). Development of modern ICT and internet system. In Agagu AA (Ed). *Information and communication technology and computer Applications*. Abuja: Panof Press pp. 1– 3.
- Bayar, A. (2013). *Factors affecting teachers' participation in Professional development activities in turkey*. A Dissertation Proposal Presented to the Faculty of the Graduate School at the University of Missouri. In Partial Fulfillment of the Requirement for the Degree Doctor of Philosophy.
- Bayindir, N. (2009). *Teachers' perception levels of activities directed towards professional progress*. Retrieved from http://findarticles.com/p/articles/mi_qa3673/is_1_130/ai_n35666692/pg_6/

- Bijker, W. E., Hughes, T. P. & Pinch, T. (1987). *The social construction of technological systems: New directions in the sociology and history of technology*. Cambridge: MIT Press.
- Bozeman, B. (2000). Technology transfer and public policy: A Review of Research and Theory. *Research Policy*, 29,627-655. [http://dx.doi.org/10.1016/S0048-7333\(99\)00093-1](http://dx.doi.org/10.1016/S0048-7333(99)00093-1)
- Bryers A. P. (2004). Psychological evaluation by means of an on-line computer. *Behaviour Research Method and Instruction*, 13, 585 –587.
- Collinson, V. & Cook, T. F. (2000). “I don’t have enough time” Teachers’ interpretations of time as a key to learning and school change. *Journal of Educational Administration*, 39(3), 266- 281.
- Cook, N. D., Walker, W. S., III., & Weaver, G. C. (2012, October). *The Indiana Science Initiative: Lessons from a classroom observation study*. Session presented at the National Outreach Scholarship Conference, Tuscaloosa, AL.
- Cope, C. & Ward, P. (2002). Integrating learning technology into classrooms: The importance of teachers’ perceptions. *Educational Technology & Society*, 5, 67-74.
- Craft, A., (2000). *Creativity access the primary curriculum: Framing and develop practice*. London: Prentice-Hall.
- Darling-Hammond, L. (2010). *The flat world and education: How America’s commitment to equity will determine our future*. New York, NY: Teacher’s College, Columbia University.

- Dauda, Y. A. & Akingbade, A. W. (2011). Technological change and employee performance in selected manufacturing industry in Lagos Nigeria. *Australian Journal of Business and Management Research*, 1(5), 32-43.
- David, M., & Bwisa, H. (2013). *Factors influencing teachers' active investment in continuous professional development: A survey in Trans Nzoia West District, Kenya*.
- Demirtas, Z. (2010). Öğretmenihizmetinde yetistirmenin bir aracı olarak denetim [As a tool for training teacher in-service, supervision]. *Electronic Journal of Social Sciences (Elektronik Sosyal Bilimler Dergisi)*, 9(31), 41-52.
- Easton, L. B. (2008). From professional development to professional learning. *Phi Delta Kappan*, 89(10), 755-761.
- Elnaga, A., & Imran, A. (2013). The effect of training on employees performance. *European Journal of Business and Management*, 5, 137.
- Ertmer, P. A., Ottenbreit-Leftwich, A. & York, C. S. (2007). Exemplary technology-using teachers: Perceptions of factors influencing success. *Journal of Computing in Teacher Education*, 23, 55-61.
- Ertmer, P.A., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59, 423-435.
- Fullan, M. (2000). The three stories of education reform. *Phi Delta Kappan*, 81(8), 581–584.
- Fullan, M. (2011). *Change leader: Learning to do what matters most*. San Francisco, CA: John Wiley & Sons.

- Gurung, B., & Rutledge, D. (2014). Digital learners and the overlapping of their personal and educational digital engagement. *Computers & Education*, 77, 91–100.
- Hermans, R., Tondeur, J., van Braak, J., & Valcke, M. (2008). The impact of primary school teachers' educational beliefs on the classroom use of computers. *Computers and Education* 51 (4), 1499-1509.
- Hodkinson, H. & Hodkinson, P. (2005). Improving schoolteachers' workplace learning. *Research Papers in Education*, 20(2), 109-131.
- Hsu, S. (2010). The relationship between teacher's technology integration ability and usage. *Journal of Educational Computing Research*, 43, 309-325.
- <http://karvediat.blogspot.com/2009/07/meaning-of-technology.html>. Retrieved on January 25, 2020
- Jagoro, N., & Komba, V. H. (2012). Relationship between on the job training and employee's performance in courier companies in Dares Salaam, Tanzania.
- Juran, M., Magbool, N., Shafiqi, H. (2004). Impact of technological advancement in employee performance in banking sector. *International Journal of Human Resource*, 4, 34-45.
- Karve, V. (2009). *The meaning of technology*. London: Prentice-Hall.
- Kay, R., Knaack, L. & Petrarca, D. (2009). Exploring teacher's perceptions of web-based learning tools. *Interdisciplinary Journal of E-Learning and Learning Objects*, 5, 527-550.
- Kolb, A. & Kolb, D. A. (2005). *The Kolb Learning Style Inventory – version 3.1 2005 Technical Specifications*. Retrieved June 10, 2009
- <http://www.learningfromexperience.com>.

- Kolb, A. Y. & Kolb, D. A. (2011). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. In Armstrong, S. J. & Fukami, C. (Eds.), *Handbook of management learning, education and development*. 10.4135/9780857021038.n3.
- Krishnaswami, O. R., & Satyaprasad, B. G. (2010). *Business research methods*. Mumbai India: Himalaya Pub. House.
- Kumpikaitė, V. & čiarnienė, R. (2008). New training technologies and their use in training and development activities: survey evidence from Lithuania. *Journal of business economics and management*, 9 (2), 155-159.
- Kurt, S. (2013). Examining teachers' use of computer-based technologies: A case study. *Education and Information Technologies*, 18 (4), 557–570.
- Leonard, L. & Leonard, P. (2003). The continuing trouble with collaboration: Teachers talk. *Current Issues in Education (Online)*, 6 (15), 1-5.
- Lohman, M. C. (2006). Factors influencing teachers' engagement in informal learning activities. *Journal of Workplace Learning*, 18(3), 141-156.
- Lyle, K. E. (2009). *Teacher f their technology education curricula*. (Doctoral dissertation). Retrieved from [http:// gradworks.umi.com/33/85/3385448.html](http://gradworks.umi.com/33/85/3385448.html). (UMI Number: 3385448).
- McCaughtry, N., Martin, J., Kulinna, P. H., & Cothran, D. (2006). What makes teacher professional development work? The influence of instructional resources on change in physical education. *Journal of In-service Education*, 32(2), 221-235.

- McLaughlin, M. W., & Talbert, J. E. (2006). *Building school-based teacher learning communities: Professional strategies to improve student achievement*. New York: Teacher College Press.
- McPherson, M. A.; Nunes, J. M. & Zafeiriou, G. (2003). New tutoring skills for online learning: are e-tutors adequately prepared for e-learning delivery? In Szucs, A.; Wagner, E. & Tsolkidis, C. (eds.). *Proceedings of the 12th European Distance Education Network Annual Conference on The Quality Dialogue; Integrating Quality Cultures in Flexible, Distance and eLearning (EDEN 2003)*, 15–18 June 2003, Rhodes Palace Hotel, Rhodes, Greece, 347–350.
- Meister, D., M. (2010). Experienced secondary teachers' perceptions of engagement and effectiveness: A guide for professional development. *The Qualitative Report*, 15(4), 880- 898.
- Mundy, M., Kupczynski, L., & Kee, R. (2012). *Teacher's perceptions of technology use in the Schools*. retrieved from, <http://sgo.sagepub.com/content/2/1/2158244012440813>, Accessed on 04-02-2020.
- Noe, R. A. (2005). *Employee training and development* (3rd ed.).USA: The McGraw Hill.
- Ofodu G. O. (2007). Nigeria Literary educators and their technological needs in adigital age. *Educational Focus* 1(1): 22 – 30.
- Opfer, V. D. & Pedder, D. (2011).The lost promise of teacher professional development in England. *European Journal of Teacher Education*, 34(1), 3-24.

- Ozer, N. & Beycioglu, K. (2010). The relationship between teacher professional development and burnout. *Procedia Social and Behavioral Sciences*, 2(2), 4928-4932.
- Payne, D. & Wolfson, T. (2000). Teacher professional development: The principal's critical role. *NASSO Bulletin*, 84(13), 13-21.
- Pedder, D., James, M. & MacBeath, J. (2005). How teachers value and practice professional learning. *Research Papers in Education*, 20(3), 209 -243.
- Postholm, M., B. (2011). A completed research and development work project in school: The teachers' learning and possibilities, premises and challenges for further development. *Teaching and Teacher Education*, 27, 560-568.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9 (5), 1-6.
- Rogers, E.M. (2003). *Diffusion of innovations*. New York: Free Press.
- Rogers, M. P., Abell, S., Lannin, J., Wang, C-Y, Musikul, K., Barker, D. & Dingman, S. (2007). Effective professional development in science and mathematics education: Teachers' and facilitators' views. *International Journal of Science and Mathematics Education*, 5, 507-532.
- Rooney, D. (1996). *Playing second fiddle: A history of the relationship between technology and organisation in the Australian music economy 1901 – 1990*. Griffith University: Unpublished Ph.D Dissertation.
- Ross, J. & Bruce, C. (2007). Professional development effects on teacher efficacy: Results of randomized field trial. *The Journal of Educational Research*, 101(1), 50-60.

- Royer, R. (2002). Supporting technology integration through action research. *Clearing House*, 75, 233.
- Sahlberg, P. (2015). *Finnish lessons 2.0: What can the world learn from educational change in Finland?* (2nd ed.). New York, NY: Teachers College Press.
- Sandholtz, J. H. & Scribner, S. P. (2006). The paradox of administrative control in fostering teacher professional development. *Teaching and Teacher Education*, 22, 1104-1117.
- Savery, J. R. (2002). Faculty and student perceptions of technology integration in teaching. *Journal of Interactive Online Learning*, 1(2), 1-16.
- Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization (Revised edition)*. New York: Currency Doubleday.
- Shafer, F. K. (2009). *An investigation of selected factors that influence middle-level teachers' professional development choices* (Doctoral dissertation). Available from Pro Quest Dissertations and Theses database.
- Takacs, M.B.N. (2017). *Teachers' Perceptions of Professional Development on the Effective Integration of Technology to the Classroom*. Dissertation submitted to the Faculty of the College of Education in partial fulfillment of the requirements for the degree of Doctor of Education in Teacher Leadership.
- Thompson, D. J. (2015). *Elementary school teachers' perceptions of the process of integrating technology* (Doctoral dissertation). Retrieved from <http://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=2369&context=dissertations>, Accessed on 03/03/2020

- Torff, & Sessions, (2009). Teachers' attitudes about professional development in high-SES and low-SES communities. *Learning Inquiry*, 3(2), 67-77.
- Torff, B. & Sessions, D. (2008). Factors associated with teachers' attitudes about professional development. *Teacher Education Quarterly*, 35(2), 123-133.
- United States Department of Education (2004). *Federal funding for educational technology and how it is used in the classroom: A summary of findings from the integrated studies of educational technology*. Washington, D.C.
- Retrieved from <https://www2.ed.gov/rschstat/eval/tech/iset/summary2003.pdf>. Accessed on the 03/02/2020.
- Venkatesh, V., Morris, M., Davis, G. & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.
- Wang, Y. (2002). When technology meets beliefs: Pre-service teachers' perception of the teacher's role in the classroom with computers. *Journal of Research on Technology in Education*, 35, 150.
- Ware, H. & Kitsantas, A. (2007). Teacher and collective efficacy beliefs as predictors of professional commitment. *The Journal of Educational Research*, 303-310.
- Wexler, M.N. (2000). Emotional intelligence: A review and appraisal. *Optimum, The Journal of Public Management*, 30(2), 1-8.
- Wilson, B. K. (2014). Impact of Emerging Technologies on Teacher Education: Experiences of Teacher-Trainees. *Journal of Education and Practice*, 5(28), 168-175.

Wilson, J. D., Notar, C. C. & Yunker, B. (2003).Elementary in-service teacher's use of computers in the elementary classroom. *Journal of Instructional Psychology*, 30, 256-264.

Yamagata-Lynch, L. C. & Haudenschild, M. T. (2009).Using activity systems analysis to identify inner contradictions in teacher professional development. *Teaching and Teacher Education*, 25, 507-517.



QUESTIONNAIRE

The researcher is a Masters student of University of Education, Winneba, pursuing M. A. Educational Leadership. He has selected your organization as part of a sample for a survey among selected schools in Sekyere Kumawu District, titled “teachers’ professional

development in Information and Communication Teaching”. This research is for academic purpose only and any information gathered on this checklist would be treated confidential. Thank you for your cooperation.

Instruction: Please tick (✓) or write where appropriate.

Section A: Background of Respondents

1. Gender? A. Male [] B. Female []
2. Age? A. 18 – 25 years [] B. 26 – 35 years [] C. 36 – 45years []
D. 46 – 55 years [] E. Above 55 years []
3. Educational qualification? A. Diploma [] B. First Degree [] C. Postgraduate []
4. How long have you worked as a teacher in this district? A. Up to 5 years []
B. 6 – 10 years [] C. 11 – 15 years [] D. Above 15 years []

SECTION B: Teachers’ Knowledge Level on Information and Communication

Technology

The following statements seek information about your knowledge in ICT, kindly indicate the extent to which you agree or disagree using; 1 = strongly disagree; 2 = disagree, 3 = neutral; 4 = agree; and 5 = strongly agree

	Statements	1	2	3	4	5
1	Technology is the process by which humans modify nature to meet their needs and wants and to make life easier and better					
2	Have positive attitude towards the use of technology					
3	I have knowledge on standard technologies such as books, dry erasers boards, chalkboards					
4	I have knowledge on modern/advanced technologies such as computer, internet, interactive white board, digital video and overhead projectors					
5	I can use computer software and hardware within the educational context.					

6	I possess the technological skills needed to use innovative resources.					
7	I can create electronic templates or graphic organizers for student work					
8	I record students' grades and print reports with gradebook program					
9	I can use technology in the development of strategies of solving problem in the real world					
10	I have had sufficient opportunities to work with different technologies					
11	I know about a lot of different educational technologies					
12	I know how to solve my own technical problem					

SECTION C: Professional Development Programs

A "professional development activity is defined as "any formal training organized by the government for a determined time and place in order to update and/or improve teachers' content and pedagogical content knowledge."

1. Kindly indicate the professional programs you have attended using; "yes" and "no"

Professional Programs	Yes	No
Training for Elementary Education Institutions		
Preparatory Education Program		
Course in computer and Internet use		
Educational technology programs		
Seminar on Emergency Medical Service		
Seminar on learning-leader teacher		
Seminar on Disaster and Emergency Preparedness		
Seminar on COVID-19		

2. Please, indicate the extent to which you perceive professional development program using the scale of; 1 = strongly disagree; 2 = disagree, 3 = neutral; 4 = agree; and 5 = strongly agree

Statements	1	2	3	4	5
Professional development activities help teachers to develop their instructional skills					
Professional development activities are valuable enough to justify the time spent.					
Participating in professional development activities makes me feel better about myself					
The best way for teachers to learn more is to participate in Professional development activities.					
enjoy participating in professional development activities					

SECTION D: Challenges Associated with Teachers Inability to go for Professional Development in Technology

The following statements relates to the challenges associated with teachers inability to go for professional development in technology. Please indicate the extent to which you agree or disagree using the following scale; 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree

Challenges	1	2	3	4	5
Lack of funding for additional personnel to cover classes prevents me from participating in professional development activities					
Family responsibilities make it difficult for me to					

participate in professional development activities beyond the work day.					
Expenses for travel prevent me from participating in professional development activities					
Teaching-related duties prevent me from participating in professional development activities beyond the work day					
Professional development activities are not offered at the time when I am available					
My head teacher's attitude prevent me from going for professional development program					
Ghana Education Service policies are not favorable for professional development programme					
Inadequate resources for professional development programmes.					
Inadequate support from my school hinders me from engaging in programme					

