

UNIVERSITY OF EDUCATION, WINNEBA

**EVALUATING TEACHERS' ACCESS TO DIGITAL TECHNOLOGIES IN
BASIC SCHOOLS IN ASANTE AKIM CENTRAL MUNICIPALITY**



2021



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**EVALUATING TEACHERS' ACCESS TO DIGITAL TECHNOLOGIES IN
BASIC SCHOOLS IN ASANTE AKIM CENTRAL MUNICIPALITY**

BY

GODFRED SARPONG



**A dissertation in the Department of Information Technology Education, Faculty
of Applied Sciences and Mathematics Education, submitted to the School of**

Graduate Studies in partial fulfillment

of the requirements for the award of the degree of

Master of Science

(Information Technology Education)

in the University of Education, Winneba

JUNE 2021

DECLARATION

CANDIDATE'S DECLARATION

I, GODFRED SARPONG, declare that this dissertation, with the exception of quotations 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 or whole, for another degree elsewhere.

Candidate's 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 the University of Education, Winneba.

DR. F. O. BOATENG

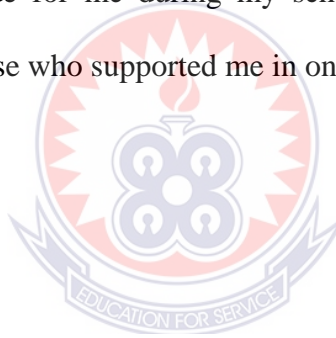
Supervisor's Signature:

Date:

ACKNOWLEDGEMENTS

I would like to appreciate the immense contribution of Dr. Francis O. Boateng, my supervisor, for his professional guidance and advice in this research work. I cannot thank him enough so I wish God's blessings for him. I would also want to register my sincerest gratitude to my siblings; Kumi Alex, Evans Asante, Patricia Adu Asabereh, Cynthia Boakyewaa, Boamah Samuel, Comfort Antwiwaa, and Samuel Opoku Adu Asabereh for their words of encouragement and moral support.

I finally want to acknowledge Janet Asantewaa and Mary Asantewaa for their strong emotional and material support towards my academic journey. I cannot forget the sacrifices they made for me during my schooling. May God bless all these personalities and all those who supported me in one way or the other.



DEDICATION

To my dearest mother, Janet Asantewaa and Mary Asantewaa, for their contribution towards my education.



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ABSTRACT

The purpose of this study was to evaluate teachers' access to digital technologies in basic schools within Asante Akim Central Municipality in the Ashanti Region of Ghana. It precisely looked at the levels of access of the teachers based on the successive kinds of access to digital technology model. A descriptive survey design was employed. A total of 108 participants who were basic school teachers in Asante Akim Central Municipality was used as a sample size. The study revealed, among other things, that teachers had access to a number of ICT tools such as laptops, internet, computer software, printers, learning management systems and desktop computers. The study also found that teachers had operational, informational and strategic skills, and they used the ICT tools for personal and professional engagements. Teachers' skills were found to have a substantial impact on their usage access, whereas physical access had no significant relationship with motivational access. It was recommended that basic school teachers should purchase statistical software packages and make research as prerequisite of teaching at basic level to get teachers more exposed to statistical tools. Also, in the introduction of digital technologies to teachers, the perceived usefulness and perceived ease of use representing intrinsic motivation should be emphasised. Further, it is recommended that teachers in the basic schools should organise periodic ICT seminars to increase teachers' use of the ICT tools. Lastly, Municipality should make strong ICT skills as part of the pre-requisite skills for appointment of teachers at basic level.

CHAPTER ONE

INTRODUCTION

Background to the Study

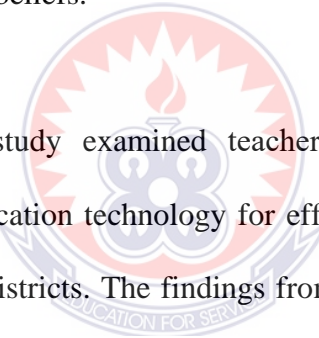
There has been a momentous technological transformation worldwide over the last three decennia. The world now is not the same as it used to be some years ago. The transformation is not only apparent in the slangs used, dressing, clothes or preferences but in the way the brain is corded in today's generation. There is no turning around for this observed phenomenon (Prensky, 2001). In today generation, young ones are born and embroidered with ideas about computing devices. Right from the hospitals where they are born, they are exposed to biomedical equipment, which is entirely technological. Growing up, these learners work with and have computers at homes. Students are surrounded by technology, and therefore, find it comfortable living in digital environments (Waycott, Bennett, Kennedy, Dalgarno, & Gray, 2010).

Internationally, Secondary school pupils and instructors place a high value on technology. During the high school years, school administration teams work on ensuring that students have access to computers (Egemen, 2018). For this reason, students of today, all through their education to the university, live with many digital tools like smartphones, computers, video games, cameras, and other digital devices (Prensky, 2001). These students have different traits and behaviours from that of yesteryears, where access to digital technologies was a big problem. This avowal is also true of Ghanaian students. Almost every Ghanaian student in higher education institution have possession, at least, a digital device to use in collaboration and communication with peers and lecturers. In Ghana, we can attest to the fact senior high school students have access to digital devices.

Yusuf (2004) stated that the field of education has been affected by Information and Communication Technology, and which have undoubtedly affected teaching, learning and research. UNESCO (2011) also suggested that teachers need to use teaching methods which are appropriate for acquiring the needed knowledge in particular communities. Students were not asked only to receive an in-depth knowledge of their studies but also to understand and appreciate how they can generate new knowledge, using information and communication technology (ICT) as a tool (Sammi, 2006). The recent curriculum in Ghana recommends Information and Communication Technology (ICT) as a tool for effective teaching and learning. ICT is about the use of electronic devices for information and communication in institutions, organizations, among students and individuals. The electronic devices in ICT include computers (software and hardware), networking, telephones, video, multimedia and internet. The use of information and Communication Technology creates a powerful learning environment and it transforms the learning and teaching processes in which students deal with knowledge in an active, constructive ways and self-directed (Volman & Van Eck, 2001). ICT is not just seen as a tool, but regarded as an important instrument used to support new ways of teaching and learning. It should be well utilised at basic education level that will in turn to develop students holistically for communication, leadership, problem solving and lifelong learning (Voogt, 2003).

More importantly, Information and Communication Technology (ICT) is now perceived catalyst for changes in teaching styles, learning approaches and access to information (Watson, 2005). ICT has tremendously changed the conventional ways of leaning and proposes a needed way of rethink in education in terms of more current

context (White, 2010). Haffar (2011) suggested to Ghanaian educators that the world we lived in is quite different from the one we inhabit now. Today we live in the Information and Digital Age! And in some cases, progressive people and companies are shifting into paperless offices and lifestyles. Therefore, there is need for basic teachers to acquaint themselves with ICT tools to enhance effective teaching and learning in the country. It has been observed in several basic schools in Asante Akim Central that teachers frequently use ICT for informative, organization of lesson plan, students' reports and scores to enhance students' learning and engagement. Asante Akim Central teachers consulted revealed that successful integration of ICT into teaching depends to a large extent on teachers' self-confidence, competence, access to computers and values and beliefs.



Oladosu (2012) in his study examined teachers' awareness and utilization of information and communication technology for effective basic and higher education in Lagos state education districts. The findings from the study show that the level of utilization of ICT resource for teaching and learning at basic education is very low. This implies that there is low utilization of ICT tools for teaching and learning in Lagos state education districts.

Access to technology is pivotal to its usage and people's attitudes and behaviours towards it. However, despite the universal accessibility of the internet and digital technologies, access to and use of these technologies are still uneven. It is against this notion that Soomro, Kale, Curtis, Akcaoglu, and Bernstein (2017) developed four constructs to study teachers' access to digital tools in higher education and these constructs explain four kinds of access to digital technologies. The access constructs

were physical, motivational, skills and usage access. The first construct was physical access to digital technologies. They explained physical access as when an individual has in their custody an information and communication technology (ICT) tool(s) or has the authorisation to use it (Soomro et al., 2017). The ICT tools include digital devices which teachers possess themselves or have been purchased by their institutions and are allowed to use them.

Affective variables play a critical role in technology acceptance and usage. The second kind of access considered was motivational access. Motivational access involves individuals' mental readiness to "adopt, acquire, learn, and use" ICT tools (Van Dijk, 2005, p.27). Two aspects of motivation were considered. They are endogenous and exogenous motivational access. While endogenous motivational access sub construct dealt with the intrinsic desire to use or purchase ICT tools, the exogenous motivational access sub construct refers to the external factors that affect someone's access to ICT tools. Hence, the respondents' perception of beliefs was evaluated in the current study.

Despite the unwavering recognition of physical access to technology at all levels of education, it is equally imperative that teachers possess a set of technical skills required to implement high-quality technologies in higher education. One's capability to use technology depends on their skills in manipulating the device. Skills access refers to the capability of a teacher to "learn, use, and manage digital hardware, software, and internet connection" (Soomro et al., 2017 p.7). The writers described skills access as the ability to operate a computer and also search for information.

Under this construct, three sub constructs were considered; strategic, informational and operational skills access.

The study further introduced usage access construct that appears new in the literature (Soomro et al., 2017). The construct generally dealt with how teachers used ICT tools for their personal and professional use. The construct was classified into general usage access and instructional usage access. General usage access deals with how ICT tools are utilised for personal purpose in terms of communication, social interactions, office duties or entertainment. The instructional usage access also indicated how teachers use ICT to augment instruction in higher education. It is therefore expected that a blend of these constructs would help to explore teacher's access to digital technologies in basic education.

Statement of the Problem

Technology is functionally using scientific knowledge acquired to solve a problem in society (US National Library of Medicine, 2019). Digital technologies have been weaved into the fabric of life; education, work, communication, recreation and entertainment (Czaja, Charness, Fisk, Hertzog, & Rogers, 2006). Every profession has incorporated some levels of technology tailored to their specific needs. Professions do that because everyone sees the power of Information Communication and Technology (ICT) as transformative and captivating to the world of work. Technology may not be the panacea for dealing with all society's problems, but it can make a significant impact (Fong, 2009). Technology such as the internet can bridge the geographical gap between students and teachers: anytime and anywhere (Tu, 2005).

Schools all over the world have exploited the power of ICT to enlarge access and ensure quality delivery. ICT gives schools a clear opportunity to enhance the quality of teaching and learning. Jr, Kara, and Kaynak (2005) were right to assert that higher education has recognised that they are service-oriented institutions, and that they find ways of meeting the expectations of the customers, i.e., students. Higher education institutions that do not depend on government subventions treat students' retention a priority. One of the key players in ICT access in schools is the teacher (Gasaymeh, Al-hasanat, Kraishan, & Khaled, 2017). The teacher is expected to be well skilled with technology usage to facilitate the integration of ICTs into teaching and learning. Students' academic development depends on the teacher and can be enhanced if teacher use ICT tools to support the teaching and learning process. It is for this reason that Garrison and Kanuka (2004) opines that teachers' access to ICT is essential. The teacher who constructively engages students at their level to increase retention is expected to make maximum use of the emerging technologies which almost every student is familiar with. The students, whom teachers are seeking to lead into a new light, are digital natives (Prensky, 2001) as against the digital immigrant teacher. How these students want to be interacted with is entirely different. The situation is not different from Ghana. This denotes that student want a more constructivist approach to their learning compared to the behaviourist approach. Rambe and Chipunza (2013) suggest that teacher can use pervasive technologies in generating learner-centred constructive knowledge. Teachers' access to and usage of digital technologies in their teaching produce a positive impact on students, teachers, schools and countries (Gasaymeh, Al-hasanat, Kraishan, & Khaled, 2017). It is; however, not clear what kind of digital technologies are accessible to teachers and what kind of access influences their usage. Besides, little research has been directed to

teacher's access to digital technologies. In Ghana, quite a few studies had been done on teachers' access in basic educational schools. Most of this research bothers on physical access. The literature gathered expose that Ghanaian teachers in higher educational institutions have access to desktop/laptop (Appiah, 2017; Atuahene, 2019), Learning Management Systems (Ofori, 2019), internet connectivity and computer softwares (Appiah, 2017). The literature corroborates that most researches are focused on physical access (Al-Ansari, 2006; Khan & Kumar, 2014), leaving the other aspects of access to digital technologies. In as much as physical access is vital to the use of technology, other aspects of access should also not be neglected since this would go a long way to address the other factors that continue to broaden the technology gap (van Deursen & van Dijk, 2011). This study evaluates the teachers' access to technology in the following levels: physical, motivational, skills and usage access in Asante Akim Central Public Basic Schools.

Research Objectives

The purpose of this study is to evaluate teacher's access to digital technologies at Public basic schools in Asante Akim Central Municipality using the four digital access constructs developed by Soomro et al. (2017). The specific objectives of the study are to;

1. identify Information and Communication Technology (ICT) tools teachers have access to in teaching and learning.
2. determine the teachers' motivational and physical familiarity to digital technologies.
3. determine teachers' skills and usage access to digital technologies.

Research Questions

1. What are the Information and Communication Technology (ICT) tools teachers have access to in teaching and learning?
2. What are the teachers' motivational and physical familiarity to digital technologies?
3. What are the teachers' skills and usage access to digital technologies?

Research Hypotheses

H₀₁ - Teacher's skills access has no statistically significant effect on their usage access.

H₀₂ -Teacher's physical access has no statistically significant effect on their motivational access.

Significance of the Study

The study focuses on examining the teachers' ICT access at public basic schools. It is expected that the findings of the research would help basic schools' management to understand the level of ICT in the schools. The study would also reveal the impact of the various constructs, thus adding to knowledge in that area. This would afford future researchers more information about teachers' access to technology in Ghanaian basic education. It would afford ICT departments in various tertiary institutions to know the ICT tools teacher are familiar with and those they are least familiar but are beneficial in their teaching exploit. That would allow the departments to know which tools to orient and periodically train staff on. The study would help basic schools' administrator to know the ICT skills they need to look out for in their prospective teacher. This is because teacher would have had operational, informational and strategic ICT skills.

Delimitation

The research is limited to Public basic in Asante Akim Central. This may limit the generalizability of the findings since teachers in the public basic schools at Asante Akim Central may have different profiles from others in other teachers. The access considered was physical, motivational, skills and usage access. Under motivational access, exogenous and endogenous motivations were studied. Skills access was also limited to strategies, information and operations while usage dealt solely with general and instructional access.

Limitations

The use of the study's findings for generalisation could be limited by the fact that the study used questionnaires to solicit for information from teachers. Issues of dishonest answers by respondents to conform to the socially acceptable standard in filling the questionnaires can decrease the generalizability of the study.

Definition of terms

Digital divide – this is the gap between those who have access to ICT tools and those who do not have.

Technology - Technology is functionally using scientific knowledge acquired to solve a problem in society.

Teacher – These are people who qualify to teach a basic school. These groups of people have a minimum of Diploma in basic education.

Digital technologies – These are a range of digital services and resources that help to form a link between the individuals rapidly, effortlessly and cost-effectively. Digital

technologies include computers, laptops, tablets, smartphones, mobile phones, the internet, computer software, and so forth.

Organisation of the Study

The study was organised into five chapters. The first chapter is the general introduction to the study consisting of background to the study, statement of the problem, the purpose of the study, research objectives, research questions, research hypothesis, significance of the study, limitations and delimitations. The second was about the review of relevant literature related to the study. In this study, scholars view on ICT access, and the theoretical underpinnings were also reviewed. Out of these, the research model was developed to guide the research.

Chapter Three explains in details the methodology used for the study. It comprised of the research design, population, sample and sampling procedure, research instrument, data collection procedure and data analysis. The last but one chapter chronicled the results realised from the study and the discussion of the findings. Moreover, the last chapter covered the summary of the study and made conclusions based on the findings. The discussion was made based on the research hypotheses and questions. Sequel to that, recommendations for further research was outlined.

CHAPTER TWO

REVIEW OF LITERATURE

Overview

This chapter focuses on the review of relevant related literature. The review covered the concept of the digital divide, theoretical framework and empirical review of key concepts.

Concept of Digital Divide

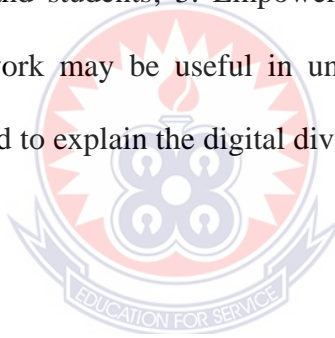
The digital divide is a term generally used in the Information technology world. It refers to the gap between those who have access to information and Communication Technologies (ICTs) and use the internet for various undertaking (van Dijk, 2006). The digital divide has gained prominence in the discussion front globally over the past decade because of the advent of the worldwide web (www) and computers that support multimedia (Ghobadi & Ghobadi, 2015; van Dijk, 2005). The phenomenon is complex and dynamic. It is seen as complicated because the concept of access to technology is multifaceted resulting in a debate in the US and Europe over whether there is a digital divide in these developed countries (van Dijk & Hacker, 2003). Development in ICTs increase the digital divide (Fong, 2009) and the developed countries like the United States are even no exception (Goh & Kale, 2016). One would have expected the advent of the internet with its attendant free supply of information to reduce the gap but that is not so. Though some basic access reduces, other access levels are left to expand (van Dijk, 2005). Research into digital divide started with observing the number of individuals who have access to computers and network connectivity. This idea led to equating technology access to only physical access (van Dijk, 2006). Many current studies are on physical access and few on the

types of access. However, in the last two decades, attention has been directed to other aspects of the technology access (Ferro, Helbig, & Gil-Garcia, 2011; Tien & Fu, 2008; van Dijk, 2006; van Dijk & Hacker, 2003)

Every proper research must be set within the confines of a framework (Moore & Kearsely as cited in Hohlfeld, Ritzhaupt, Barron, & Kemker, 2008). Several frameworks have thus been developed to help explain the phenomenon. One such framework is the one put forth by Hohlfeld et al., (2008) to explain the levels of the digital divide in schools. This framework outlines the levels of the digital divide are:

1. Hardware, Software and internet access support for technology;
2. Use of technology by teachers and students;
3. Empowerment of student to utilise digital technology.

This framework may be useful in understanding the digital divide in schools but cannot be used to explain the digital divide among teachers because of the following reasons.



The first reason is that though the first level looks at physical access, there is no consideration for motivation which is a precondition for the usage of technology (van Dijk, 2012) in the second level.

Secondly, the framework focuses on students and not teachers because its third level is directly concerned with the empowerment of students (Soomro et al., 2017)

Thirdly, several researchers have reported that skills (implied in the third level) influences usage or intention to use (Chang, Wong, & Park, 2016; van Deursen & van Dijk, 2011; Wixom & Todd, 2005) but the skill component is instead after usage.

Theoretical Framework of the Study

Resources and Appropriation Theory

The study is grounded in van Dijk's (2005) theory of resources and appropriation. The core concepts (see Figure 1) in this theory are

1. Personal and positional categorical inequalities in society;
2. Distribution of resources relevant to this type of inequality;
3. Kinds of access to ICTs and
4. Participation in society.

The first two elements are seen as the cause, while the third element is the concept to be explained. The fourth element is the potential ramifications of the entire process. The fourth element feeds to element one and two, meaning the more or fewer individuals participate in several fields of society, the correlation between categorical inequalities and distribution of resources change. A side factor, i.e., characteristics of ICTs, is added to define the type of inequalities being assessed (Soomro et al., 2017).

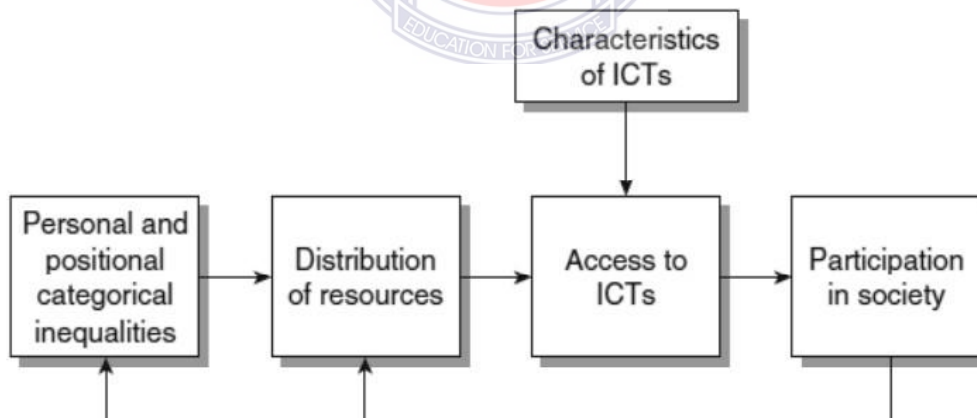


Figure 1. A causal model of Resources and Appropriation Theory (van Dijk, 2012)

The proponent of the theory (van Dijk, 2005) makes the following arguments:

1. Categorical inequalities lead to the uneven appropriation of resources.

2. Uneven appropriation of resources would account for inadequate access to digital technologies.
3. Unequal access to digital technology depends on the characteristics of the technology involved.
4. Unequal access to digital technology leads to unequal participant society.
5. Categorical inequalities and unequal distribution of resources are reinforced by unequal participation in society.

Personal categorical inequalities in the Resources and Appropriation

Theory includes age, gender, race/ethnicity, intelligence, personality and health. In the same vein, positional categorical inequalities construct include labour position, education, household and nation.

Resources constructs include temporal (having the time to use digital media), material (possession and income), mental (technical ability; innovation), social (access to social network to assist in digital media), and cultural (status and liking of being in the digital world) (van Dijk, 2012).

Cumulative and Recursive Model of Successive Kinds of Access

The core of the Resources and Appropriation Theory is the model of Successive Kinds of Access to Digital Technology (see Figure 2 page 17) (van Dijk, 2012). In this model, four successive kinds of access were carved to explain the process of appropriating new technology. The model explains that one needs to be motivated or “want” digital technology to use it. Once the individual wants the digital technology, he/she proceeds to either purchase or find a means to access the technology. After accessing the material, there is the need to develop the skill to make effective use of

the said materials. The skill would lead the individual to use technology in their everyday endeavour. Let us look at the constructs in detail.

Motivational access

Motivational access refers to the willingness of an individual to “want” to use ICT (Chang et al., 2016). This type of access indicates the mental preparedness of an individual to use digital technologies. To be a digital citizen (Prensky, 2001), one must be desirous to one technology. Research has shown that we do not only have “have-not”, but there are also “wants not” (people who do not see the need for digital technology use) (van Dijk, 2012).

Motivation is generally classified into intrinsic and extrinsic motivation though some researchers like Reiss (2012) believe human motives are multifaceted to be categorised into two. Intrinsic motivation (non-drive) is defined as “doing something for its own sake” (Reiss, 2012, p. 152). This kind of motivation is evident when a person pursues a sporting activity because he/she wants to. This kind of motivation stems from within. Extrinsic motivation (Hull drive), on the other hand, is defined as pursuing something because of a desired expected outcome (Reiss, 2012). This access indicates an external attraction that drives one to pursue an activity. Motivation is connected with survival needs, i.e., body needs while intrinsic motivation is related to psychological needs, i.e., needs related to the mind. All human motivation arises from a natural source (Reis, 2012), and therefore, the two classes of motivation are not in conflict and can exist together (Soomro et al., 2017).

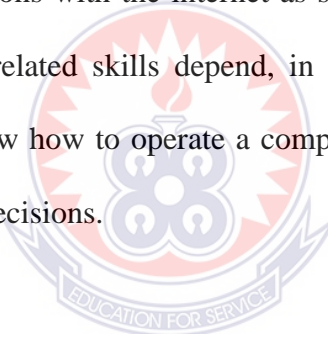
Material or physical access

Material access refers to the possession or authorisation to use digital technologies (Soomro et al., 2017). Major studies in the digital divide have been dedicated to studying physical access (Soomro et al., 2017; van Dijk, 2012). This is mainly because the earliest understanding of the digital divide was limited to this access, i.e., to computers and internet connectivity (van Dijk, 2006). This access is very crucial in developing digital skills and ultimately use of ICT for various endeavours (Soomro et al., 2017). This means that to develop digital skills, one must have digital access tools to lead to its consequent use. Van Dijk (2006) asserts that physical access should not be underemphasized while considering other kinds of access.

Skill access

Skill access refers to the ability of an individual to “learn, use and manage digital hardware, software, and internet connectivity” (Soomro et al. 2017 p.6). Van Deursen and van Dijk (2010) have proposed four types of skills. These skills can broadly be categorised a medium related skill and content related skill. Medium-relation skills are the necessary skills needed in the use of technology. Van Deursen and van Dijk (2010) categorised medium-relation skills into operation and formal internet skills. Operational skills involve concepts such as instrumental skills, technical competence, technological literacy and technical proficiency. Formal skills are a medium related skills bothers on how to navigate and orientate digital technology effectively. Examples are knowing the skill in changing computer settings, shuffling between folders and sub-folders, necessary skills in word processing spread the presentation, media layer, surfing the internet and emailing. Content related skills refer to one’s ability to perform actions to satisfy their information needs, communicate and use the

internet to reach particular goals. Informational and strategic skills are classes of content-related skills. Informational skills involve the ability to search, choose, process and assess information in a computer and computer network (van Dijk, 2006). These sums up the action one takes to satisfy their information needs. Mention can be made of effectively searching online for information and being able to synthesise that information gathered. Strategic skills mean the capacity to use the internet as a means of reaching particular goals and for the general purpose of lifting one's standard in society (van Dijk, 2006). It also involves using technology to find an optimal solution for every problem that may arise. Examples of such skills include consulting the internet for information, feeling confident in using ICT tools to achieve a goal and making appropriate decisions with the internet as support. Because of the sequential nature of skills, content-related skills depend, in a way, on medium related skills because one needs to know how to operate a computer to search effectively and use the information to make decisions.



Usage access

This is the last construction in the Successive Kinds of Access to Digital Technology. It looks at how individuals with the motivation, physical and skills use digital technologies. Soomro et al. (2017) categorised into two, i.e., general access and instructional usage access. General access concerns with how teacher use digital technology personally not related to the professional career. This looks at how teacher use technology for research, communication, voice/video calls, use a spreadsheet or prepare computer presentations. Instructional Usage access implies the teacher's use of technology in planning, delivering, and assessing instructions. Mention can be

made of communication about an assignment, enhancing students' content learning, facilitating students' group works and encouraging peer feedback among students.

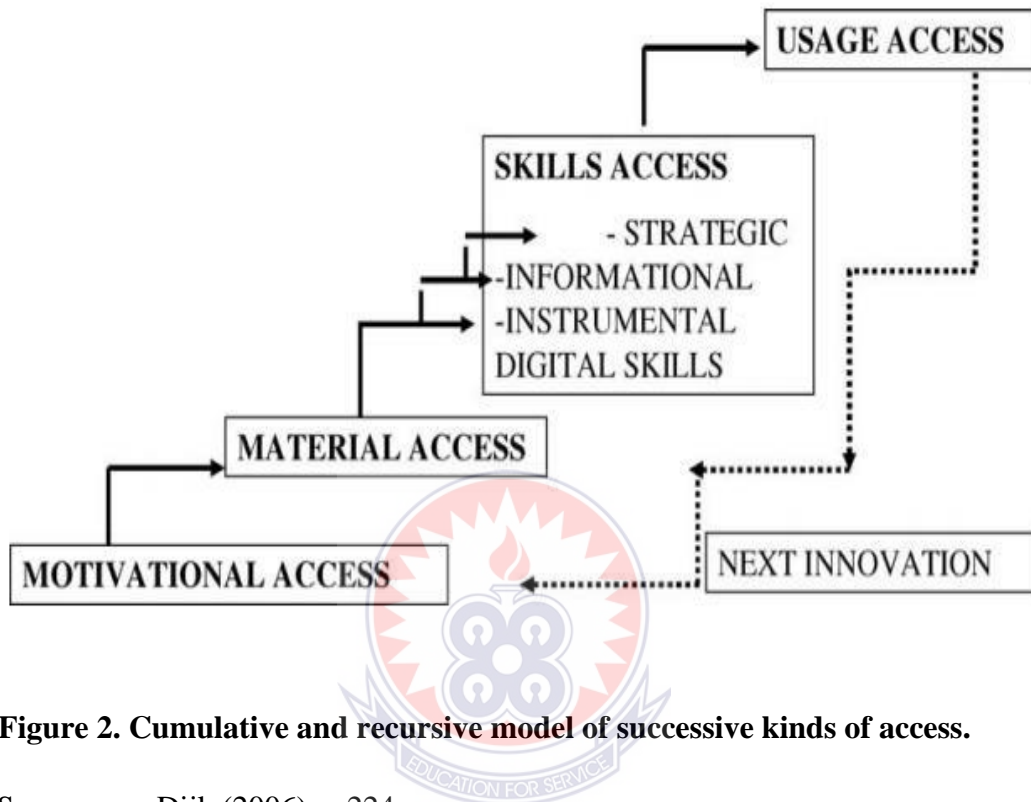


Figure 2. Cumulative and recursive model of successive kinds of access.

Source: van Dijk (2006) p. 224

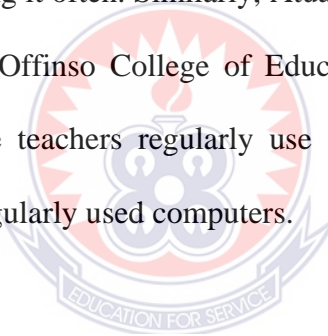
Empirical Reviews

Physical access

Physical access refers to the possession or authorisation to use digital technologies. Several researches have been done about physical access, and literature is reviewed under Desktop/Laptop computer, Broadband/DSL internet, USB flash drive, smartphone/tablet/iPad, printer, office unit software, photo/video editing software, statistical software's LMS.

Access to desktop/laptop computer

Akinde and Adetimirin (2017) studied the extent to which literacy educators use ICT in their teaching in Nigeria. In all, 208 educators were involved in the research. The studies revealed that 103 out of the 208 educators either used the computer daily, weekly or monthly and that represented 63%. Akinde and Adetimirin again reported 37%, representing 77 educators occasionally or never used computers. That indicated there was appreciable use of a computer by educators. Another study was conducted by Ofosu-Appiah (2017) at Wisconsin International University consisting of 150 undergraduates and 55 lecturers. The study revealed that 53(97%) out of the 55 lecturers had access to a computer and used them always or often with a marginal number of 2 (3%) not using it often. Similarly, Atuahene (2019) published the finding of a study conducted in Offinso College of Education among 30 teachers. It was reported that 80% of the teachers regularly use a computer. However, the study revealed only 20% of irregularly used computers.



Access to the internet

Paul and Chandak (2019) studied the use of ICT in an undergraduate college in India. The findings are that only 25% of the respondents used the internet daily; 40% used the facility once a week, whereas 35% used the tool 12 times in a month. In all 20 teachers participated in the research. Another study by Akinde and Adetimirin, (2017) in Nigeria revealed that 136 representing 65.45% of the 208 respondents used cable internet daily, weekly or monthly. Nevertheless, 34.6% (72 respondents) indicated that they occasionally used or never used cable internet. On modems/with/wireless connectivity 67.2% (140 respondents) stated that they used it daily, weekly, or monthly, while 32.6% representing 68 respondents were to never. Ofosu-Appiah

(2017), in his study, found out that all the 55 lectures had access to internet connectivity. A distinction was not made in whether it was wireless, a cable or both.

Access to USB flash drive

Literature in the use of flash drive by teacher is scarce. Lareki, de Morentin, and Amenabar (2010) conducted a study into the training of university teachers on ICTs. The results indicated that 93.9% of the teachers needed no or little training on the use of flash drives. The findings can imply that the lecturers had access to use a flash drive.

Access to smartphone/tablet/iPad

Akinde and Adetimirin, (2017), in their study, reported that 66.3% of the respondents indicated that they use mobile and handheld technologies daily, weekly or monthly. In the study, 33.7% however, were reported to have used these technologies occasionally or never. Boruff and Storie (2014) researched the use of mobile devices in medicine. Boruff & Storie reported that 330 out of the 379, representing 87% had access to mobile technologies, whereas only 12.9% had never accessed these devices. The setting was in four Canadian Universities. Al-Emran, Elsherif, and Shaalan (2016) researched the attitudes of students and teachers in the use of the mobile device in learning. It was reported that 96.3% of the teachers own or had access to smartphones/tablets or both. Only 3.7% representing two teachers who had neither access to smartphones or tablets.

Access to a printer

Printers are digital tools that help to print hard copies of documents on their own Personal Computers. Akinde and Adetimirin, (2017) in a study, revealed that 60.4% of the entire participant showed that they use printers daily weekly or monthly whereas 39.4% reported that they never used it or does so occasionally.

Access to computer software

Teachers access computer software for various reasons, including preparing learning aids and for communication. Ofosu-appiah, (2017) in his research conducted on 55 lecturers in Wisconsin International University College, Ghana reveals that the majority of the lecturers had access to Microsoft office suite software and SPSS with varying degrees of skills. Eze, Okoli, and Ehushie, (2017) researched the extent of utilisation of ICTs by business education in four tertiary institutions in Imo state. In all, 99 business educators were used for the study. The findings showed that the educators had access to Microsoft office suite software though they use the presentation software moderately.

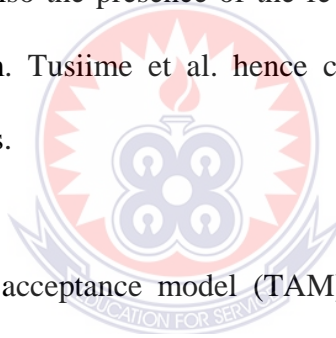
Access to Learning Management Systems

Ohei and Brink (2017) believe that Learning Management Systems (LMS) can improve “students’ knowledge creation” (p.7), but few educators encourage its use. Therefore, literature was reviewed to support or refute the assertion by Ohei and Brink (2019) studied the user satisfaction of management student use of LMS. The result indicated that 93.4% of the respondents were satisfied with the e-learning system an indication of the fact that they had access. Ofori (2019) in a study in

Sunyani Technical University (STU) reported that 93.3% of the respondents of 108 had no knowledge of LMS and hence had no access.

Influence of Motivational Access on Physical Access

There are fewer studies that look into motivational and physical access as a whole. The majority of the studies investigate the constructs severally to other constructs. Tusiime, Johannesen, and Gudmundsdottir (2019) studied the use of ICT in Arts and Design education in a developing country. The respondents for this qualitative study were ten, drawn from two teacher training institutions in Uganda. The study reports that some of the educators used digital technology because of the inherent benefit ICT has to offer. Moreover, also the presence of the few digital tools motivated some of the teachers to use them. Tusiime et al. hence conclude that motivational access influences physical access.



Using the Technology acceptance model (TAM), Phua, Wong, and Abu (2012) studied the relationship between intention to use the internet (BI) and perceived usefulness (PU), perceived enjoyment (PE) and perceived ease of use (PEU). The findings reveal a positive correlation between behavioural intention and perceived usefulness ($r=.625$; $N=106$; $p < 0.01$), perceived enjoyment ($r=.704$; $N=106$; $p < 0.01$), and perceived ease of use ($r=.536$; $N=106$; $p < 0.01$). PU, PEU, and PE are all forms of motivation (Deci, 1975) as cited in Ramayah, Jantan, and Ismail (2003). Therefore it can be concluded that motivational access has a positive relationship with behavioural Intention to use the internet. Akinde and Adetimirin (2017) studied the extent to which literacy educators use ICT in their teaching in Nigeria. In all, 208 educators were involved in the research. The study found that there is a

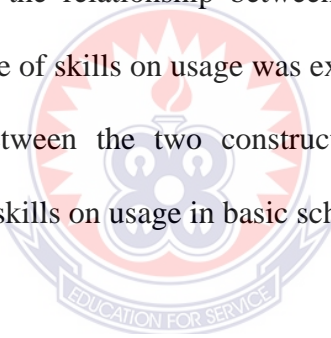
positive correlation between perceived usefulness (motivational access) and extent of the use of digital technologies ($r = 0.174$; $N=208$; $p < 0.05$). Chang et al., (2016) compared intention to participate online in a developed and developing countries. A total of 595 university students participated. The setting was Cambodia and Korea. The findings according to Chang et al. indicated a positive relationship between extrinsic motivation and Technological access (physical access) in Cambodia ($r = 0.31$; $N=288$; $p < 0.05$) and Korea ($r = 0.48$; $N=307$; $p < 0.05$). Chang et al continued to report that a positive relationship exists between intrinsic motivation technological accesses in Cambodia ($r = 0.27$; $N=288$; $p < 0.05$) and Korea ($r = 0.39$; $N=307$; $p < 0.05$).

Influence of Skills Access on Usage Access

Osman, (2017) in a study conducted in the University of Health and Allied Sciences (UHAS). Osman reported that those with very high and high searching skills used the e-database at least two times a day and at most twice a day, respectively. Those with very low and low searching skills use the e-database once a week. The research concludes that skills access affects the extent of use. Shirazi, Heidari, Fard, and Ghodsbin (2019) researched Iran on internet use. It was a cross-sectional, descriptive survey with 162 nursing learners chosen by simple random sampling. The authors reported a relationship between internet skills and usage. Chang et al., (2016) compared intention to participate online in developed and developing countries. A total of 595 university students participated. The setting was Cambodia and Korea. The findings according to Chang et al. indicated a positive relationship between skills and intention to use in Cambodia ($r = 0.44$; $N=288$; $p < 0.05$) and Korea ($r = 0.39$; $N=307$; $p < 0.05$).

Summary of Chapter

A review of the literature indicates that the teachers or teachers has access to digital tools. It has also come to light that teacher have access to desktop/laptop, internet, USB flash drive, smartphone/tablet/iPad, printer, computer software, and learning management system. Teachers or Faculties use the tools daily, weekly and monthly. It was also reported that some never have access and hence do not use them. It was, therefore, necessary to measure these items about teachers at basic in Asante Akim Central to know its conformity to existing literature. There is reported in literature a positive relationship between motivational access and physical access. Review of literature reports varying strength of the relationship. This study sought to explore the strength of the relationship between the two constructs. Lastly, the literature on the influence of skills on usage was explored. The outcomes indicated a positive relationship between the two constructs. This study would, however, explore the influence of skills on usage in basic schools at Asante Akim Central.



CHAPTER THREE

METHODOLOGY

Overview

This chapter captures the research design, location and setting of the study, the population description and sampling procedure, and how data was collected and analysed. The rationale of this research was to evaluate the ICT access of public basic schools' teachers in Asante Akim Central. The study explored the ICT access of teacher based on van Dijk (2005) model of successive kinds of access to digital technologies. The constructs were motivational access, physical or material access, skills access, usage access and gender.

Research Design

This is a quantitative study that used the descriptive survey design since it involved assessing the teacher's access to technology. This study observes what is currently happening in terms of teacher's ICT access hence the use of descriptive research (Liu, 2010). This is particularly useful because the research was to observe the ICT access phenomenon without interfering the process of technology access. The descriptive design was also used because the study was to describe the concept in great detail with higher precision and accuracy. One observed weakness was that an unfocussed descriptive study could lead to "mindless fact-gathering" (Mill, as cited in Liu, 2010).

Study Area

The study was conducted at Basic Schools at Asante Akim Central. It is located in the Ashanti Region of Ghana. Asante Akim Central Basic schools were chosen because they are closer to the researcher and thereby reduce transport cost. The schools were also selected because they are schools the researcher work with. One can find a blend of the very old, middle-aged, and young teachers. The researcher having worked with these schools also made it easier to access the respondents of the study.

Population

The population of the study was basic schools' teachers, but the accessible population was public basic school teachers in the municipality who numbered 154. The public basic schools were selected is in all senses like their counterparts in the private basic schools. Since that the public basic school teacher are represented. The teachers range from Senior Superintendent II to Deputy Director I.

Sampling Procedure

Samples are used to represent a population. The sample's data collected can be used to make conclusions about the entire population (Wilson & Abibulaeva, 2017). The sample must adequately represent the population, and thereby, the selection must be cautiously made. The sample for the study was 108. The sample size selected for the study was based on Krejcie and Morgan's (1970), recommendation for determining a sample size from a given population. This is shown in Table 3.1.

Table 1: Krejcie and Morgan's Table for determining sample size for a given population

Table for Determining Sample Size for a Given Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	300	234	2000	322	40000	380
85	70	260	152	350	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382

Note: "N" is population size

"S" is sample size

Source: Krejcie and Morgan's (1970)

The research employed convenient sampling method which is a non-probability sampling technique to select respondents. Convenience sampling is a form of non-probability sampling technique. The non-probability sampling focuses on sampling methods on the researcher's judgment. The motivation to use convenient sampling method was its ability to produce data faster (Acharya, Prakash, Saxena, & Nigam, 2013). It was fast because since the teachers are busy any of them seen selected to be part of the sample. The convenient sampling was used because the population was homogenous meaning, they all possess similar characteristics.

Data Collection Instrument

A research instrument is any tool for getting and assembling research data. The instrument was also based on the research objectives, questions and hypotheses as posited by Zohrabi (2013). There are several research instruments, but the most common tool used in the collection of quantitative data is a questionnaire. In this study, questionnaire was used to gather data from teachers for the study. The questionnaire was used because they are easy to distribute, and there are higher levels of objectivity in the sense that the respondents had the liberty to express their feeling without fear of being identified. The questionnaires were closed-ended for easy quantitative analysis (Beliger & Shohany, as cited in Zohrabi, 2013). The questionnaire is one of the main primary tools used to collect data in most quantitative research (Zohrabi, 2013).

This study adapted the Faculty's Information and Communication Technology Access) scale FICTA for assessing digital technology access (Soomro et al., 2017) with few modifications. The FICTA Scale was developed based on the cumulative

and recursive model of Success kinds of access to digital technologies (Van Dijk, 2005). The 57 items with 5-point Likert type of scale were developed to explain teachers' access to ICT in higher education. The items are open such that it can be used in other educational levels as well. The scale has been used and validated (Soomro et al., 2017). The questionnaire was divided into two sections: Section A, which deals with the respondents' demographics while the second section deals with FICTA.

The demographics included gender, age, teaching positions and experiences. The gender was original on FICTA scale and was formatted as male and female.

The second part dealt with the teacher access to ICT, and they were under the four constructs originally developed by Soomro et al., (2017). The constructs were physical, motivational, skills and usage access.

The first construct was physical access. Physical access is when an individual has in their custody an ICT tool or has the authorisation to use it (Soomro et al., 2017). This construct includes digital devices which teachers possess themselves or has been purchased by their institutions and allowed to use them. The items used were: laptop, desktop, Smartphone/Tablet/Ipad (cell phone internet functionality), Broadband/DSL internet, USB Flash drive (memory stick), Printer, Office Software Suite (e.g., Microsoft Office, Open Office), Photo editing software (e.g., Adobe Photoshop, Corel Paint), Video editing software (e.g. iMovie, Movie Maker), Statistical Software (e.g., SPSS, SAS, R, AMOS, STATA), and Learning Management System (e.g., Blackboard, Moodle, google classroom, Desire to learn, Schoology). An item like

webcam was removed because it can be found in a laptop or a smartphone and therefore may not be separately needed. Tablet/Ipad was added to smartphones because someone with smartphones may not necessarily need tablet/Ipad and vice versa. Some of the familiar Learning Management Systems like Blackboard, moodle, google classroom, Desire to learn, and Schology were added. The responses for these items were “Yes” or “No”.

The second construct considered on the scale was motivational access. On the scale, two aspects of motivation were represented. They are endogenous and exogenous motivational access. The responses were formatted from Strongly Agree – 1 to Strongly Disagree – 4. The lower number denotes higher motivational access.

The third construct was skilled access. All three sub constructs were represented. The construct was formatted using the 4-point Likert scale (from Strongly Agree – 1 to Strongly Disagree – 4. The lower number denotes higher skills access.

The last construct on the scale was usage access. The categories considered were general usage access and instructional usage access. The construct was formatted using the 4-point Likert scale (rom Strongly Agree – 1 to Strongly Disagree – 4. The lower number denotes higher usage access.

One limitation Soomro et al. (2017) note with the instrument was that the data collected would be self-reported hence may not reflect the actual situation of teachers’ access. The researchers posited that the best way would be to use a performance test.

They also noted that because of how busy the teachers are, they might not be able to take the test effectively.

The strength of this instrument is that it combined the strengths of several instruments in the FICTA scale design. This amalgamation gives the FICTA a greater strength over the individual tools.

Validity and Reliability

Validity refers to “the extent to which an instrument measures what is supposed to measure” (Thatcher, 2010 p.124). Veeriah (2017) cautions that validity is an important aspect every researcher has to consider when designing an instrument. Soomro et al. (2017) in the development of the FICTA scale took the issue of validity seriously. The authors subjected the scale to content related validity, discriminant validity, retrospective interview, and Principal Component Analysis. Creswell (2014) opined that in content-related validity, the view of experts is sought to find out if the questions were clear, reasonable and understandable. So, the 74-point FICTA scale was given to four experts to review, and the outcome indicated that eight items were not valid and hence were removed from the tool (Soomro et al., 2017). The only issue is that the expertise of the experts was not made known. Again, the discriminant validity was applied to the 66-point scale. Confirmatory Q-sorting procedure was followed as proposed by Zait and Berteau (2011). The result indicated that two items were not valid and thus were dropped from the tool.

A retrospective interview was conducted using the 64-point FICTA scale on four respondents and led to the removal of one of the items to be left with 63 items. The

instrument was administered on 322 respondents, and then the Principal Component Analysis (PCA) with Varimax rotation was applied to the data collected to remove from the scale, leaving it to the 57-point scale.

Reliability is the consideration given to an instrument to measure and approve the coherency of results or data after some series of trials (Mugenda & Mugenda, 2003; Hair, Black, Babin, Anderson, & Tatham, 2010; Chua, 2012). The internal consistency reliability analysis of the whole 57-point FICTA scale yielded a Cronbach coefficient alpha of .868. Table 3 shows the reliability coefficient of the various constructs and sub constructs.

Table 2: Reliability Coefficient of the Various Constructs and Sub constructs

Constructs/ Sub construct	Reliability Coefficient
Physical access	$\alpha = .680$
Endogenous Motivational Access	$\alpha = .806$
Exogenous Motivational Access	$\alpha = .881$
Operational Skills Access	$\alpha = .885$
Informational Skills Access	$\alpha = .853$
Strategic Skills Access	$\alpha = .820$
General Usage Access	$\alpha = .800$
Instructional Usage Access	$\alpha = .815$

Source: Soomro et al., (2017)

The above discussion reveals that the FICTA scale is valid and reliable and best for the study. Table 3.2 shows that all the reliability coefficient were more than .60 which is considered adequate reliability although .90 is preferred.

Data Collection Procedure

Permission was sought from headteachers through school coordinator at the Municipal Education Office of various basic schools. Hardcopy of the questionnaires were presented to the School Coordinator and Circuit Supervisor (CS) currently known as School Improvement Support Officers (SISO) who permitted me to carry on with the data collection. It was done to seek their approval and support for the exercise. The questionnaires were coded into google form and distributed to the teachers online through their various social media (WhatsApp) platforms and the researcher later went to the selected respondents in their various schools and guided them answer the questionnaires and submit them online.

Data Processing and Analysis

According to Judd, McClelland, and Ryan, (2011), data analysis means tasks the researcher use to organise, provide structure, and cause meaning. It would prompt the researcher if questions were uniformly answered. The data collected from the google form was assessed and cleaned to make sure they were of good quality. The questionnaire was serially numbered to ease identification and to make sure none was recorded twice. The data were coded and analysed using SPSS V 23 and Excel Spreadsheet. Descriptive statistics were presented using tables. The data were extracted for presentation and discussion in the subsequent chapters of this study.

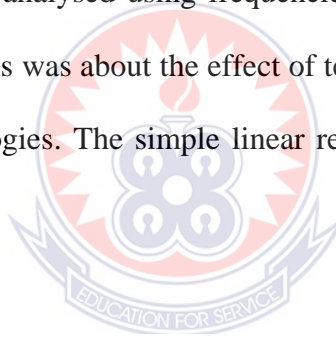
The first research question was about the tools' teachers had access to. The items were coded 1- Yes and 2-No. The data were analysed using frequencies and percentages. Those items were used because the researcher needed to know the tools,

they had access to and the frequencies enabled the researcher to ascertain the tool the teacher had the most access to.

The second set of questions dealt with the teacher's motivational access to digital technologies. The items were scored as 1- Strongly Agree, 2-Agree, 3-Disagree and 4-Strongly Disagree. The data were analysed using frequencies, means and standard deviation.

The third set of questions was to assess the teacher's Skills and Usage access. The items were scored as 1- Strongly Agree, 2-Agree, 3-Disagree and 4-Strongly Disagree. The data were analysed using frequencies, means and standard deviation.

The fourth set of questions was about the effect of teacher's skills access on the usage access to digital technologies. The simple linear regression was used to analyse the data.



Chapter Summary

In this chapter, the research design, location and setting of the study, the population description and sampling procedure, and how data was collected and analysed were covered. The use of the study's findings for generalisation could be limited by the fact that the study used questionnaires to solicit for information from public basic teachers in Asante Akim Central. Issues of dishonest answers by respondents to conform to the socially acceptable standard in filling the questionnaires can decrease the generalizability of the study. The purpose of this research was to evaluate teachers' access to digital technologies in basic schools in Asante Akim Central.

CHAPTER FOUR

RESULTS AND DISCUSSION

This section provides the results, using a questionnaire from the information gathered. The discussion includes interpreting the results based on prior results and theory. Through logical deduction, each finding is examined, and its consequences are assessed about the present theoretical stand on teachers' ICT access in Asante Akim Central.

This section arranged into two. The first section deals with respondents' population information and includes fields such as the gender, age, teaching positions and teaching experiences. The second part is dedicated to the respondents' answers according to the study goals. One hundred and eight in Asante Akim Central supplied information for the research at the end of information collection.

Demographic Information of the Respondents

Results of a cross-tabulation of respondents age, teaching experience, teaching positions and level by their gender are presented in tables 3, 4, 5 and 6. Table 3 point out that 46.29% of the respondents are between 20 and 30 years of age, 37.04% are aged between 31 and 40 years, 10.19% aged between 41 and 50 years, 6.48% aged between 51 and 60 years and 0% are beyond years. It can be shown that many of the respondents are within the age of 30 and 60 years and no one of the respondents are beyond 60 years. On the whole, teachers' demographic studied have been consistent with what were earlier reported by many researchers (Akinde & Adetimirin, 2017; Al-Emran et al., 2016; Atuahene, 2019; Paul & Chandak, 2019).

Table 3: Distribution of Teachers' Age

Age Group	Total	
	N	%
20 – 30	50	46.29
31 – 41	40	37.04
41 -50	11	10.19
51-60	7	6.48
60+	0	0.00
Total	108	100

Source: Field Data (2021)

Table 4: Distribution of Teachers' Teaching Experience

Teaching Experience	Total	
	N	%
0 – 5 yrs	47	43.52
6 – 10 yrs	22	20.37
11 – 15 yrs	19	17.59
16 – 20 yrs	7	6.48
21 – 25 yrs	9	8.33
25+ yrs	4	3.70
Total	108	100

Source: Field Data (2021)

Table 4 indicates that 43.52% of the respondents had taught between 0 – 5 years; 20.37% of the respondents had taught between 6 – 10 years; and 17.59% of the respondents had taught between 11 – 15 years. The table further reveals that 6.48% of the respondents had 16 – 20 years' experience in teaching; and those who have 21 – 25 years of teaching experience is 8.33% and 3.70% of the respondents had over 25 years of teaching experience.

Table 5: Distribution of Teachers' Teaching position

Teaching Position	N	%
Headteacher	17	15.74
Classroom Teacher	42	38.89
Subject Teacher	48	44.44
Total	108	100

Source: Field Data (2021)

Table 5 shows that 15.74% were Headteachers; 38.89% were classroom Teachers and 44.44% were Subject Teachers.

Table 6: Distribution of Teachers' Teaching level

Teaching Position	N	%
KG	13	12.04
Lower Primary	16	14.85
Upper Primary	29	26.85
JHS	49	45.37
Total	108	100

Source: Field Data (2021)

Table 5 shows that 12.74% were KG teachers; 14.85% were Classroom Teachers and 44.44% were Subject Teachers.

Main findings of the study

This section focusses on answering the research questions. The research questions were addressed by means and standard deviations, cross-tabulation, correlation and linear regression analysis.

The ICT tools teachers' have access to for teaching and learning

This research question was to find out the physical access of teachers of Asante Akim Municipality. It is meant to investigate ICT tools teachers had purchased and used or digital tools they have been authorised to access while teaching in the municipal. In order to answer the question, respondents were asked to indicate “yes” if they have access to the said tools or “no” if they had no access to these digital technologies. The items were coded as 1- Yes and 2-No. The items were described using means, standard deviation, frequencies and percentages as presented in table 7.

Table 7: ICT tools teachers have access to at school and/or at home

	Yes		No		Total N (%)
	N	%	N	%	
Laptop computer	62	57.41	46	42.59	108(100)
Smartphone/Tablet/Ipad	101	93.52	7	6.48	108(100)
USB Flash drive (memory stick)	69	63.89	39	36.11	108(100)
Office Software Suite	67	62.04	41	37.96	108(100)
Broadband/DSL internet	36	33.33	72	66.67	108(100)
Learning Management System	43	33.33	65	60.19	108(100)
Printer	22	39.81	86	79.63	108(100)
Statistical Software	11	10.11	97	80.81	108(100)
Desktop computer	32	29.63	76	70.37	108(100)
Photo editing software	31	28.70	77	77.30	108(100)
Video editing software	24	22.22	84	77.78	108(100)

Source: Field Data (2021)

Table 7 shows that 62 respondents (57.41%) have access to the laptop computer, whereas 46 (42.49%) did not have access. One hundred and one respondents (93.52%) had access to cell phones with internet functionality, while 46 (6.48%) had no access. On USB Flash drive, 69 respondents (63.89%) had access, while 39 (36.11%) had no access. On office suite software, 67 respondents (62.04%) had access, while 41 (37.96%) had no access. Thirty-six respondents (33.33%) had access to Broadband/DSL internet while 66 (66.67%) had no access.

Table 7 again indicates that Forty-three respondents (39.81%) had access to the Learning Management System, while 65 (60.19%) had no access. On access to printers, 22 respondents (20.37%) had access, while 86 (79.63%) had no access.

Eleven respondents (10.19%) had access to Statistical software, while 97 (89.81%) had no access. The table further shows that Thirty-two respondents (29.63%) had access to Desktop computers, while 76 (70.37%) had no access.

The last items reported on the table were photo editing and video editing software. Thirty-one respondents (28.70%) had access to photo editing software, while 77 (71.30%) had no access. About video editing software, 24 respondents (22.22%) had access to video editing software, while 84 (77.78%) had no access.

The study reveals that the tool teachers having most access is the smart cell phone, followed by USB flash drive, Office software suit, laptop computer, Learning Management System (LMS), DSL internet, desktop computer, photo editing software, video editing software, printer and statistical software in that order. It was found out that about less of the respondents had access to statistical software. This was anticipated because most of the teachers at pre-tertiary level have not been exposed to

research, the majority of them do not see the need of using the statistical software at pre-tertiary level. This study, however, in contrast with studies by Ofori (2019) in Sunyani Technical University, where the author indicated that the majority of the educators had access to statistical software. It can be concluded that most teacher at pre-tertiary level have not been exposed to the important of doing research. Access to the desktop was also moderate. This I believe is because the majority of them have access to a laptop so they may not need a desktop despite being part of the top ICT tools used by teachers when combined with a laptop as reported by Akinde & Adetimirin, (2017). Photo and video editing software access were very low just like statistical software because I believe most respondents think it is of no benefit to them.

On the whole, teachers access to all the ICT tools studied have been consistent with earlier reported by many researchers (Akinde & Adetimirin, 2017; Al-Emran et al., 2016; Atuahene, 2019; Boruff & Storie, 2014; Eze et al., 2017; Lareki et al., 2010; Ofosu-appiah, 2017; Paul & Chandak, 2019).

Teachers' Motivational Access to Digital Technologies

The import of this request ion was to find out the level of motivational access to teachers of Asante Akim Central Municipality. The results for motivational is captured in table 8. As a guideline to explain the individual mean ratings, the scale under the table was used.

Table 8 indicates that on the statement “using computer and Internet can improve my work performance”, respondents strongly agreed (M=1.5, SD=.66, N=108) that

computers and internet can increase their performance in their teaching. Considering the statement “using the Internet can provide me with information that would lead to better decisions”, respondents strongly agreed ($M=1.5$, $SD= .66$, $N= 108$) that using the internet can give them information to make better choices. Respondents on “using computer and the Internet seem to be enjoyable”, strongly agreed ($M=1.6$, $SD=.64$, $N=108$) that computer and internet usage is perceived to be fun. Respondents agreed ($M=1.7$, $SD=.70$, $N=108$) that seeing other teachers use the computer and the internet inspires them to use it as well.



Table 8: Teachers' Motivational Access to Digital Technologies

	SA	A	D	SD		
	N (%)	N(%)	N(%)	N(%)	Mean	SD
1. Using computer and Internet can improve my work performance.	63 (58.3)	37 (34.3)	7 (6.5)	1 (.9)	1.5	.66
2. Using the Internet can provide me with information that would lead to better decisions.	58 (53.7)	42 (38.9)	7 6.5	1 .9	1.5	.66
3. Using Computer and the Internet seems to be enjoyable.	50 (46.3)	51 (47.2)	6 (5.6)	1 (.9)	1.6	.64
4. Seeing other teachers using Computer and the Internet inspires me.	47 (43.5)	50 (46.3)	9 (8.3)	2 (1.9)	1.7	.70
5. I am interested to adopt digital technologies because my district provides enough technology support	19 (17.6)	28 (25.9)	37 (34.3)	17 (8.3)	2.5	.98
6. I want to use ICT because my superiors expect me to use it.	17 (15.7)	35 (32.4)	43 (39.8)	13 (12.0)	2.5	.91
7. I wish to use computer and the Internet because my students think that I should use them.	17 (15.7)	34 (31.5)	40 (37.0)	17 (15.7)	2.5	.93
8. Using ICT will be of no benefit to me.	6 (5.6)	19 (17.6)	31 (28.7)	51 (47.2)	3.2	.92

SD= Standard Deviation

Source: Field Data (2021)

The table 8 again shows that teachers disagreed ($M=2.5$, $SD=.98$, $N=108$) that they are interested in adopting digital technologies because the district provides enough technical support. The statement “I want to use ICT because my superiors expect me to use it” attracted a negative response that they disagree ($M=2.5$, $SD=.91$, $N=108$) that they use digital tools because the academic administration expects that of them. Respondents further disagreed ($M=2.5$, $SD=.93$, $N=108$) that they wish to use a computer and the Internet because their students think they should use them. Also, lastly, respondents disagreed ($M=3.2$, $SD=.92$, $N=108$) that using ICT will be of no benefit to them.

It is established that the majority of respondents see intrinsic motivation as a contributing factor in their use of ICT tools. It was, however, noted that most of the respondents reject extrinsic motivation as playing a role in their use of ICT tools. The later findings might probably be due to how the questions were stringed. Many researchers agree that teachers have motivational access (Akinde & Adetimirin, 2017; Chang et al., 2016; Phua et al., 2012; Tusiime et al., 2019).

Teachers’ skills and usage access to digital technologies

The objective of this question was to find out the level of skills and usage access of teachers of Asante Akim Central. In answering the question, a four-point Likert was used to measure the skills and usage access of the teachers in the municipality. The responses were captured using means and standard deviations. The results for skills and usage access are captured in tables 9 and 10 respectively. As a guideline to explain the individual mean ratings, the following ranges of the means were used.

Table 9 indicates that on the statement “I feel comfortable in creating and editing a text file in a word processing program”, respondents agreed ($M=1.64$, $SD=.81$, $N=108$) that they feel comfortable using a word processor. On “it is easy for me to create a computer presentation”, respondents agreed ($M=1.81$, $SD=.90$, $N=108$) that they find it easy using presentation software. Respondents on “I feel difficulty to change some basic computer settings (wallpaper, time/date, sounds etc.)”, said they disagreed ($M=1.94$, $SD=.97$, $N=108$) that they can change the settings of a computer. Respondents agreed ($M=1.71$, $SD=.85$, $N=108$) that they can save images and text from a website unto their computers. It is also reported from the table that respondents agreed ($M=1.44$, $SD=.70$, $N=108$) that they feel confident to download from the internet. They also agreed ($M=1.58$, $SD=.78$, $N=108$) that they can send an attachment with emails. On “I know enough about transferring files from hard disk to a USB flash drive and vice versa”, respondents agreed ($M=1.65$, $SD=.82$, $N=108$) that they are good at transferring files to and from USB flash drive. The above statements discussed represents the operational skills access of the teachers. It can be gleaned from the table that the respondents agreed ($M=1.68$, $SD=.83$, $N=108$) that they have operational skills access.

Table 10 indicates that respondents agreed ($M=1.65$, $SD=.79$, $N=108$) that they know what search terms to use when surfing the internet. On “I can use advanced search options to reach my required information”, respondents agreed ($M=1.80$, $SD=.89$, $N=108$) that they can use advanced search options their search for needed information. Again on “I feel confident to evaluate the sources of the information found on the Internet” the respondents agreed ($M=1.70$, $SD=.81$, $N=108$) that they can decipher good from irrelevant information from the internet. Teachers further agreed ($M=1.82$, $SD=.89$, $N=108$) that they are comfortable synthesising

information from the internet. On “it is easy for me to retrieve a Website on the Internet”, the respondents agreed ($M=1.77$, $SD=.88$, $N=108$) that they can access any website from the internet. On “I can easily choose from search results”, they agreed ($M=1.60$, $SD=.78$, $N=108$) that they can choose from many search hits. On the whole, the respondents agreed ($M=1.65$, $SD=.74$, $N=83$) that they have informational skills access.

On strategic skills access in table 11, the respondents on “I can choose by consulting the Internet”, the teachers agreed ($M=1.65$, $SD=.74$, $N=83$) that they can make choices by using the internet. On “I can reach my intended goal while using the Internet” teachers agreed ($M=1.49$, $SD=.50$, $N=83$) that they can use the internet to achieve their set objectives. On “On the Internet, it is easy for me to work toward a specific goal”, the respondents agreed ($M=1.72$, $SD=.84$, $N=108$) that on the internet, they reach their aim for which they went there. Respondents on “I can gain benefits from using computer and the Internet”, ($M=1.53$, $SD=.75$, $N=108$) agreed that they find the computer and internet usage beneficial. For “using various ICT tools, I feel confident in achieving my goals”, the respondents agreed ($M=1.52$, $SD=.74$, $N=108$) that they can confidently use ICT tools to achieve their aims. Lastly, respondents on “I feel confident in making important decisions with the help of the Internet”, agreed ($M=1.40$, $SD=.77$, $N=108$) that they can rely on the internet in making important decisions. On the whole, the teachers agreed ($M=1.53$, $SD=.79$, $N=108$) that they have strategic skills access.

Table 12 and 13 presents the teachers’ usage access. The analysis and discussion are in two-fold. The first part deals with general usage access while the other part bothers

on Instructional Usage access. On “I search the information of my interest on the Internet”, it was reported that the respondents search the internet very often for information that interests them ($M=1.59$, $SD=.79$, $N=108$). It was further noticed that teachers use ICT very often to support their research ($M=1.79$, $SD=.88$, $N=108$). Teachers reported that they use emails very often as a primary means for communication ($M=1.86$, $SD=.93$, $N=108$). Respondents reported that they often make voice/video calls over the internet ($M=1.66$, $SD=.81$, $N=108$). The teachers who participated in the study reported that they often use word processing software ($M=1.80$, $SD=.89$, $N=108$). The respondents reported they very often use presentation software on their computers ($M=1.92$, $SD=.96$, $N=108$). Teachers again reported that they often use spreadsheets for their personal activities ($M=1.86$, $SD= 0.92$, $N=108$). They reported that they often use digital technologies to watch movies or television ($M=1.61$, $SD=.80$, $N=108$). The respondents on the whole reported that often use digital tools for their general use ($M=1.74$, $SD=.84$, $N=81$).

On how the teachers use ICT in teaching and learning, the following were gleaned from the table. Respondents admitted that they often use ICT to communicate to students about their assignments ($M=1.76$, $SD=.87$, $N=108$). They also reported that they often use ICT to enhance students’ learning ($M=1.65$, $SD=.56$, $N=108$). Teachers responded that they often facilitate students’ group work ($M=1.46$, $SD=.73$, $N=108$); often use ICT to help enhance the students’ problem-solving skills ($M=1.67$, $SD=.83$, $N=108$) and often use ICT tools to teach ($M=1.90$, $SD=.84$, $N=108$). Respondents again reported that they often use ICT tools to communicate with students ($M=1.72$, $SD=.96$, $N=108$); prepare teaching/Learning materials ($M=1.46$, $SD=.77$, $N=79$); and develop in them critical thinking skills ($M=1.67$,

SD=.92, N=108). Teachers finally reported that they often use digital tools to enhance student to student interaction (M=1.46, SD=.83, N=108). Overall, teachers often use digital technologies in the instruction (M=1.41, SD=.81, N=108).

The idea behind the question was to find out the skills teachers have and how they used the ICT tools in general and in their career. The findings are that respondents have skills in operating the computer and using some basic software; searching for information over the internet and had skills in using the internet to making decisions. It was also discovered that teachers use digital tools for their personal enrichment and their teaching career. This resonates with literature where they all agreed to teachers having skills and using the ICT tools for various purposes. (Chang et al., 2016; Osman, 2017; Shirazi et al., 2019; Soomro et al., 2017).

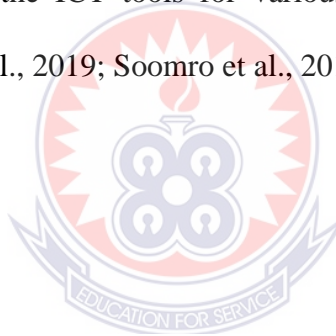


Table 9: Teachers' Operational Skills Access to Digital Technologies

	SA	A	D	SD		
	F (%)	F (%)	F (%)	F (%)	Mean	SD
1. I feel comfortable in creating and editing a text file in a word processing program.	36 (33.3)	50 (46.3)	19 (17.6)	3 (2.8)	1.64	0.81
2. It is easy for me to create a computer presentation.	24 (22.2)	52 (48.1)	29 (26.9)	3 2.8	1.81	0.90
3. I feel difficulty to change some basic computer settings	14 (13.0)	29 (26.9)	44 (40.7)	21 (19.4)	2.90	0.96
4. I can save images and text from the website on the hard disk.	32 (29.6)	51 (47.2)	23 (21.3)	2 (1.9)	1.94	0.97
5. I feel confident to download programs from the internet.	41 (38.0)	57 (52.8)	7 (6.5)	3 (2.8)	1.71	0.85
6. I can send an attachment with an email.	37 (34.4)	52 (48.1)	14 (13.0)	5 (4.6)	1.58	0.78
7. I know enough about transferring files from hard disk to a USB flash drive and vice versa.	37 (34.3)	44 (40.7)	21 (19.4)	4 (3.7)	1.65	0.82

SD= Standard Deviation OSA= Operational Skills Access, SD(OSA) = 0.68 , Mean (OSA)=1.66; Scales are 4 – 3.45 = Strongly Disagree (StD); 3.44 – 2.45 = Disagree (D); 2.44 – 1.45 = Agree (A); 1.44 – 1.00 = Strongly Agree (SA).

Source: Field Data (2021)

Table 10: Teachers' Informational Skills Access to Digital Technologies

	SA	A	D	SD		
	F(%)	F(%)	F(%)	F(%)	Mean	SD
1. I always know what search terms to use when searching the internet.	31 (28.7)	58 (53.7)	15 (13.9)	2 (1.9)	1.65	0.79
2. I can use advance search options to reach my required information.	24 (22.2)	51 (47.2)	27 (25.0)	3 (2.8)	1.80	0.89
3. I feel confident to evaluate the sources of the information found on the Internet.	28 (25.9)	60 (55.6)	17 (15.7)	3 (2.8)	1.70	0.81
4. I feel comfortable to synthesise online information.	22 (20.4)	58 (53.7)	26 (24.1)	1 (.9)	1.82	0.89
5. It is easy for me to retrieve a Website on the Internet.	28 (25.9)	51 (47.2)	27 (25.0)	1 (.9)	1.77	0.88
6. I can easily choose from search results.	36 (33.3)	55 (50.9)	15 (13.9)	1 (.9)	1.60	0.78

SD= Standard Deviation ISA=Informational Skills Access SD(ISA) = 0.74,

Mean (ISA)=1.65; Scales are 4 – 3.45 = Strongly Disagree (S D); 3.44 – 2.45 = Disagree (D); 2.44 – 1.45 = Agree (A); 1.44 – 1.00 = Strongly Agree (SA).

Source: Field Data (2021)

Table 11: Teachers' Strategic Skills Access to Digital Technologies

	SA	A	D	SD		
	F(%)	F(%)	F(%)	F(%)	Mean	SD
1. I can make a choice by consulting the Internet.	38 (35.6)	58 (53.7)	11 (10.2)	1 (.9)	1.53	0.75
2. I can reach my intended goal while using the Internet.	40 (37.0)	56 (51.9)	11 (9)	1 (.9)	1.52	0.74
3. On the Internet, it is easy for me to work toward a specific goal.	42 (38.9)	51 (53.7)	15 (10.2)	0 (0.00)	1.55	0.77
4. I can gain benefits from using computer and the Internet.	56 (51.9)	41 (38.0)	10 (9.3)	1 (.9)	1.40	0.79
5. Using various ICT tools, I feel confident in achieving my goals.	43 (39.8)	50 (46.3)	14 (13.0)	1 (.9)	1.53	0.76
6. I feel confident in making important decisions with the help of the Internet.	48 (44.4)	48 (44.4)	11 (10.2)	1 (.9)	1.46	0.72

SD= Standard Deviation SSA= Strategic Skills Access SD(SSA) = 0.54, Mean (SSA)=1.49; Scales are 4 – 3.45 = Strongly Disagree (SD); 3.44 – 2.45 = Disagree (D); 2.44 – 1.45 = Agree (A); 1.44 – 1.00 = Strongly Agree (SA); Never=N; Seldom=S; Often=O; Very Often = VO.

Source: Field Data (2021)

Table 12: Teachers' General Usage Access to Digital Technologies

	VO	O	S	N	Mean	SD
	N(%)	N(%)	N(%)	N(%)		
1. I search the information of my interest on the Internet.	42 (38.9)	43 (39.8)	18 (16.7)	5 (4.6)	1.59	.79
2. I use ICT to support my research activities.	34 (31.5)	31.5 (22.89)	42 (38.9)	9 (8.3)	1.79	0.88
3. I use emails as one of the primary means of communication.	21 (19.4)	33 (30.6)	35 (32.4)	19 (17.6)	1.86	0.93
4. I make voice/video calls via the Internet.	32 (29.6)	46 (42.6)	17 (15.7)	13 (12.0)	1.66	.81
5. I create letters, reports and/or papers on computer.	27 (25.0)	32 (29.6)	32 (29.6)	17 (15.7)	1.80	.89
6. I prepare presentations on computer.	16 (14.8)	23 (21.3)	43 (39.8)	26 (24.1)	1.92	.96
7. I store and manipulate data in a spreadsheet program.	20 (18.5)	27 (25.0)	31 (28.7)	29 (26.9)	1.86	.92
8. I use digital technologies to watch movies or television programs.	44 (40.7)	32 (29.6)	22 (20.4)	10 (9.3)	1.61	.80

SD= Standard Deviation IUA= Instructional Usage Access. SD(IUA) = 0.86,

Mean (IUA)=1.83;

Source: Field Data (2021)

Table 13: Teachers' Instructional Usage Access to Digital Technologies

	Usage Access				Mean	SD
	VO	O	S	N		
	N(%)	N(%)	N(%)	N(%)		
1. I use ICT for communication about assignments among students.	30 (16.7)	33 (27.8)	25 (30.6)	2 (23.1)	1.65	0.56
2. I use ICT for enhancing students' content learning.	45 (14.8)	29 (41.7)	10 (26.9)	4 (5.06)	1.46	0.83
3. I use ICT for facilitating students' group work.	14 (13.0)	29 (26.9)	36 (33.3)	27 (25.0)	1.67	0.92
4. I use ICT to improve students' problem-solving skills.	16 (14.8)	39 (36.1)	30 (27.8)	22 (20.4)	1.90	0.84
5. I use digital technologies for the delivery of my instruction.	10 (9.3)	40 (37.0)	31 (28.7)	26 (24.1)	1.72	0.96
6. I use digital technologies to communicate with students.	10 (9.3)	32 (29.6)	36 (33.3)	30 (27.8)	1.46	0.77
7. I prepare learning materials using computer and internet resources.	18 (16.7)	45 (41.7)	31 (28.7)	14 (13.0)	1.67	0.92
8. I develop critical thinking skills among students with the help of ICT.	18 (16.7)	42 (38.9)	30 (27.8)	18 (16.7)	1.46	0.83
9. I use ICT to encourage peer feedback among my students.	15 (13.9)	31 (28.7)	37 (34.3)	25 (23.1)	1.42	0.92

SD= Standard Deviation IUA= Instructional Usage Access. SD(IUA) = 0.86,

Mean (IUA)=1.83;

Source: Field Data (2021)

Hypothesis Testing

A null hypothesis was tested at 0.05 significance level in the research.

The finding is shown as follows.

Hypothesis 1: Teachers' Skills access has no statistically significant effect on their Usage access. The import of this is to test whether skills access had significant effect on usage access. The results are presented Table 13.

Table 14: Simple Linear Regression Analysis of the effect of skills access on Usage access (N=108)

Variable	Mean	SD	B	SE B	β
Skills Access	28.96	12.21	1.101	.101	.768*
Constant			-4.260		
R^2			.590		
F			118.174		
p			.000		

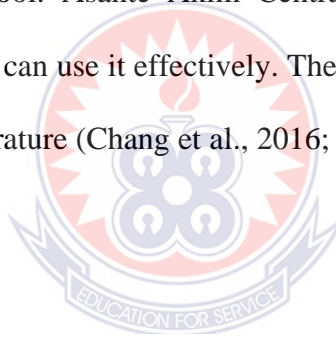
* $p < 0.05$

Source: Field data (2021)

A simple linear regression was calculated to predict Usage access based on Skills access. The dependent variable (DV) was Usage access, while the Independent or predictor variables (IV) variables was Skills access. A significant regression equation was found ($F(1,82) = 118.174, p < .000$), with an R^2 of .59. Respondents' predicted usage access is equal to $-4.260 + 1.101$ (skills access) where both genders were selected, and Skills access is measured as 1=Strongly Agree, 2=Agree, 3=Disagree, 4=Strongly Disagree. Usage access increased 1.101 for each Skills access. It is, however, significant to observe that the proportional contribution (R^2) of the

independent variables is 0.590, with an adjusted R^2 of 0.585. This means that skills access explains 59% of variations in teachers' usage access. This further indicates that other factors will contribute 41% to teachers' usage of ICT tools for personal and professional use.

The reason for the research question was to find out the impact of skills of teachers on their use of ICT tools. The finding is that there is a strong impact of teachers' skills on their usage of digital technologies. It came to light that skills access can predict about 59% of the teachers' usage access. This means the teachers' use of any digital tool would be largely dependent on their skills. It is recommended teachers are trained to have skills in an ICT tool. Asante Akim Central Municipality teachers want to introduce to them so they can use it effectively. The positive impact of skills on usage is also reported in the literature (Chang et al., 2016; Shirazi et al., 2019; Soomro et al., 2017).



Hypothesis 2: Teacher's physical access has no statistically significant effect on their motivational access. The import of this is to test whether physical access had a significant relationship with motivation access. The results presented in Table 11 indicates that there is a low positive correlation ($r=.128$, $p=.124$) between teachers' extrinsic motivation and their acquisition of ICT tools. Again, a negative low correlation ($r=-.031$, $p=.391$) between teachers' intrinsic motivation and teachers' physical access. The correlations are not significant; therefore, I fail to reject the null hypothesis.

The import was to discover if physical access relates in any way to motivational access. The researcher found out that there is no significant relationship between physical access and motivational access. This is to say that owning or being authorized to use an ICT tool does not create a desire or a want. In the same vein, the desire to use digital technology does not guarantee that someone would purchase or ask for access to use digital technology. The findings are in contrast to that of Chang et al. (2016) indicated a significant positive relationship between extrinsic motivation and Technological access (physical access) in Cambodia. Chang et al. again shows a significant positive relationship existing between intrinsic motivation technological accesses in Cambodia.

Table 15: Correlation between physical access and motivational access (N=108)

	PA(<i>p</i>)	IMA(<i>p</i>)
Pearson Correlation Physical Access		
Intrinsic Motivation Access	-.031(.391)	
Extrinsic Motivation Access	.128(.124)	.037(.368)

Source: Field data (2019) PA= Physical Access, IMA = Intrinsic Motivation Access

Chapter Summary

The following keys findings have been arrived at. It was found that teachers have access tools like laptop, smartphones, printers, computer software, desktops and Learning Management systems. It was also discovered that Teachers' intrinsic motivation affects their use of technology unlike the extrinsic. The motivation of teachers had no relationship with their physical access. Lastly, teachers' skills have an impact on their usage of ICT tools.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter captures the summary and the key findings of the study. Conclusions were drawn from the major findings and based on that; recommendations were made. Suggestions have also been made for further research.

Summary of the Study

This study was designed to evaluate the Information and Communication Technology access of teachers of Asante Akim Central. It was specifically to look at the levels of access of the teachers based on the Successive Kinds of Access to digital technology model. I examined the various access levels and the interaction between the access levels. The following questions guided the study:

1. What are the ICT tools teachers have access to?
2. What are the teachers' motivational and physical access to digital technologies?
3. What are the teachers' skills and usage access to digital technologies?

A descriptive survey was used for the study. The respondents were teachers of Asante Akim Central who numbered 108. The initial sample was 155, but when the questionnaires were administered, only 108 were responded corrected. The questionnaire, designed by Soomro et al. (2017), was used to collect data from the respondents. The 57-point questionnaire was grouped into seven based on the research questions. The data were analysed using SPSS v23 and excel and reported with frequencies, percentages, means and standard deviation. Linear regression was

performed to ascertain the impact of teachers' skills on their use of digital technologies. This meant how much teachers skills contribute to their usage of ICT tools. The relationship between teachers' physical access and their motivational access using Pearson correlation.

Findings of the Study

The findings have been organised based on the research questions that guided the study.

The ICT tools teachers have access to

Teachers have access to some digital technologies at home and school. These technologies in order of frequency of usage are laptop, smartphones, printers, computer software (MS. Office software suite, statistical software, photo and video editing software), desktops and Learning Management systems. whereas photo and video editing tools were moderately used and Statistical Software was found out to be are least used.

Teachers' Motivational Access to Digital Technologies

It was found from the study that the majority of teachers see intrinsic motivation as a contributing factor in their use of ICT tools. The teachers, however, reject extrinsic motivation as playing a role in their use of ICT tools.

Teachers' Skills and Usage Access to Digital Technologies

It was realised that teachers' have skills in operating the computer and using some computer software's; searching for information over the internet and had skills in

using the internet to making decisions. It was also discovered that teachers use digital tools for their enrichment and in their teaching career.

Effect of Teachers' Skills Access on Usage Access to Digital Technologies

The findings are that there is a strong effect of teachers' skills on their use of ICT tools. It also comes to light that skills access can predict about 59% of the teachers' usage access. This means the teachers' use of any digital tool would be largely dependent on their skills.

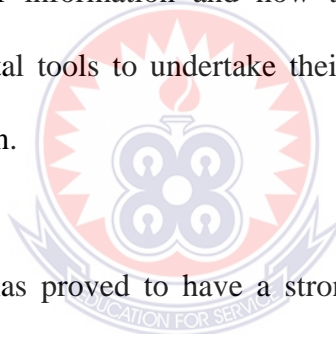
The Relationship between Teachers' Physical Access and Motivational Access to Digital Technologies

It was discovered that there is no significant relationship between physical access and motivational access. This is to say that owning or being authorised to use an ICT tool does not create a desire or a want. In the same vein, the desire to use digital technology does not guarantee that someone would purchase or ask for access to use digital technology.

Conclusions

From the study, it can be concluded that the teachers of Asante Akim Central have adequate access to digital technologies that help them in their day-to-day activities. It was no surprised to see statistical packages as not being part of the highly used ICT tools at Asante Akim Central by teachers. This is because at the basic level teachers do not lay emphasis on research. It can be assumed that teachers are not using the statistical software are because they have been asking by authorities to conduct research hence see no need for such a tool.

It can also be concluded that teachers have the intrinsic motivation that propels their usage of ICT tools. The teachers are self-motivated and needed no external force to influence their usage of digital tools. It was a known fact that extrinsic motivation plays a role in the use of ICT tools, as indicated in the literature, but it turned out to be non-essential. This can be attributed to how the questions were stringed. The questions sought to know whether colleagues, students and administration influence their usage of ICT tools. They may have felt that by answering in the affirmative, it may mean others controlled them hence their prevalent negative responses. The questions should be re-evaluated. Teachers have strong operational, informational and strategic skills. That means that have basic knowledge on the usage of computers, know how to search for information and how to use that information to make decisions. They use digital tools to undertake their day-to-day activities as well as their classroom instruction.



Teachers' skills access has proved to have a strong impact on their use of digital technologies. It can, therefore, be concluded that for teachers to get interested in using any digital tool, they must be taught the skills first before they use it.

It can also be said that there is no significant relationship between teachers' physical access and their motivational access. This was unexpected because I thought one's desire to use technology would lead to the purchase of such a tool. I think the reason for this is that there are other constructs like economic status and geographical divide that may influence the purchase of a tool or getting authorisation to use one. The teachers may wish to have an ICT tool, but if the person does not have the purchasing power, the wish will turn a dream. Again, the teachers may want to use or purchase, but the gap between where the tool is and teachers may be far. An example is trying to

getting access to these emerging technologies like 7D holograms, planetariums and others.

Recommendations

Based on the findings, some recommendations are presented for better teachers ICT access at basic education. Below are the recommendations:

1. One key finding was that the teacher's access to statistical software was moderate. It is recommended that the Municipal authorities should encourage the teachers the need to conduct research in this digital world. Research seminars should be organised for both teachers and students to use both the qualitative and quantitative tools so they become conversant with the software.
2. It is also recommended that in the introduction of digital technology to teachers, the perceived usefulness and perceived ease of use representing intrinsic should be emphasised by the municipal.
3. The study recommends that periodic ICT seminars should be conducted for teachers in the Municipality to increase their use of the ICT tools.
4. It is recommended that strong ICT skills become a pre-requisite for teaching at the basic schools by Ghana Education Service authorities.

Suggestions for Further Research

1. Evaluating teachers' access to digital technologies in Ghanaian Senior High School.
2. Examining the teachers' perception of digital technology usage in public tertiary institutions.
3. The role of gender in the use of ICT tools in teaching students at basic level.

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APPENDIX A

UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY, KUMASI CAMPUS

EVALUATING TEACHERS' ACCESS TO DIGITAL TECHNOLOGIES IN PUBLIC BASIC SCHOOL IN ASANTE AKIM CENTRAL MUNICIPALITY.

TEACHER'S QUESTIONNAIRE

Dear Teacher,

*This questionnaire is intended to collect data to evaluate teachers' access to technology in Asante Akim Central Basic Schools. I therefore entreat you to provide objective responses to facilitate accurate evaluation process. **Your name is NOT required and will NOT at any time be associated with your responses.** Your responses will be kept completely **confidential**. Thank you.*

Please tick [] in the appropriate space provided below and supply response where required.

A. Background information

1. Gender: Male [] Female []

2. Age range of respondents: 20-30 [] 31-40 [] 41-50 []

51-60 [] 60+ []

3. Teaching Experience: 0-5 years [] 6-10 years [] 11-15 years []

16-20 years [] 21-25 years [] 25+ years []

4. Teaching position: Headteacher [] [] Classroom Teacher

[] Subject [] Teacher

5. Level: KG [] Lower Primary [] Upper Primary [] Junior High School []

B. Information on Teacher's Access to ICT

Kindly tick the device under listed that you have access to on campus or at home?

<i>Physical Access</i>	YES	NO
1. Desktop computer		
2. Laptop computer		
3. Broadband/DSL internet		
4. USB Flash drive (memory stick)		
5. Smartphone/Tablet/Ipad (cell phone internet functionality)		
6. Printer		
7. Office Software Suit (e.g., Microsoft Office, Open Office)		
8. Photo editing software (e.g. Adobe Photoshop, Corel Paint)		
9. Video editing software (e.g. iMovie, Movie Maker)		
10. Statistical Software (e.g., SPSS, SAS, R, AMOS, STATA)		
11. Learning Management System (e.g., Blackboard, moodle, google classroom, Desire to learn, Schoology)		

For the following questions, indicate the extent of your agreement or disagreement with each factor by marking it with an X according to the scale.

Rating	Response Mode	Description
SA	<i>Strongly Agree</i>	<i>You agree with no doubt at all</i>
A	<i>Agree</i>	<i>You agree with some doubt</i>
D	<i>Disagree</i>	<i>You disagree with some doubt</i>
SD	<i>Strongly Disagree</i>	<i>You disagree with no doubt at all</i>

Motivational Access	SA	A	D	SD
12. Using the Internet can provide me with information that would lead to better decisions.				
13 Using ICT will be of no benefit to me.				
14. Using computer and Internet can improve my work performance.				
15. Using Computer and the Internet seem to be enjoyable.				
16. Seeing other teachers members using Computer and the Internet inspires me.				
17. I want to use ICT because my superiors expect me to use it.				
18. I wish to use computer and the Internet because my students think that I should use them.				
19. I am interested to adopt digital technologies because my university provides enough technology support				
Operational Skills Access	SA	A	D	SD
20. I feel comfortable in creating and editing a text file in a word processing program.				
21. It is easy for me to create a computer presentation.				
22. I feel difficulty to change some basic computer settings (wallpaper, time/date, sounds etc.).				
23. I can save images and text from the website on the hard disk.				
24. I feel confident to download programs from the internet.				
25. I can send an attachment with an email.				
26. I know enough about transferring files from hard disk to a USB flash drive and vice versa.				
Informational Skills Access	SA	A	D	SD
27. I always know what search terms to use when searching the internet.				
28. I can use advance search options to reach my required information.				
29. I feel confident to evaluate the sources of the information found on the Internet.				

30. I feel comfortable to synthesize online information.				
31. It is easy for me to retrieve a Website on the Internet.				
32. I can easily choose from search results.				
Strategic Skills Access	SA	A	D	SD
33 I can make a choice by consulting the Internet.				
34. I can reach my intended goal while using the Internet.				
35. On the Internet, it is easy for me to work toward a specific goal.				
36. I can gain benefits from using computer and the Internet.				
37. Using various ICT tools, I feel confident in achieving my goals.				
38. I feel confident in making important decisions with the help of the Internet.				

For the following questions, indicate the extent of your agreement or disagreement with each factor by marking it with an X according to the scale.

Response Mode

Description

Very Often

You use it all the time

Often

You use it most of the time

Seldom

You use it sometime but Not Often

Never

You do not use it all.

General Usage Access	Very often	Often	Seldom	Never
39. I search the information of my interest on the Internet.				
40 I use ICT to support my research activities.				
41. I use emails as one of the primary means of communication.				
42. I make voice/video calls via the Internet.				
43. I create letters, reports and/or papers on computer.				
44. I prepare presentations on computer.				
45. I store and manipulate data in a spreadsheet program.				
46. I use digital technologies to watch movies or television programs.				
Instructional Usage Access	Very often	Often	Seldom	Never
47. I use ICT for communication about assignments among students.				
48. I use ICT for enhancing students' content learning.				
49. I use ICT for facilitating students' group work.				
50. I use ICT to improve students' problem solving skills.				
51. I use digital technologies for the delivery of my instruction.				
52. I use digital technologies to communicate with students.				
53. I prepare learning materials using computer and internet resources.				
54. I develop critical thinking skills				

among students with the help of ICT.				
55. I use ICT to encourage peer feedback among my Students.				

Thank you for participating in this study.

