Factors inhibiting students' ICT knowledge acquisition and utilization at Oguaa School for the Deaf in Ghana

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Abstract

This paper reports part of a graduate thesis which investigated students' ICT knowledge, skills, and utilization at Oguaa School for the Deaf in the Central Region of Ghana. A randomly selected sample of 40 students completed researcher-developed questionnaire. Descriptive and inferential statistical methods were used to analyze the data. The results revealed that majority of the students were novice in ICT knowledge and utilization; they only had access to computers during ICT lessons. They lacked access to functional computers for private studies, training, and interest in ICT usage for learning. The researchers concluded that the students could not confidently and creatively use ICT for learning. It was recommended that the school extended ICT application to other subjects.

Introduction

One of the major concerns of stakeholders, including special needs educators, who have interest in Deaf Education, is the search for an effective communication mode which can enhance the participation of the deaf in learning. Literature shows that literacy has been a critical concern in the education of the deaf, because it is in this area that the language delay is obviously clear. Indeed, the average profoundly deaf adult has a reading age of about 8 and so is debarred from many educations and training programmes (British Educational Communications and Technology Agency [Becta], 2001). Additionally, even children with relatively slight or transitory hearing problems, such as glue ear, have difficulty with reading and writing in primary school and not only fall behind their peers without hearing loss but they also, experience significant loss of confidence (ibid, 2001), a vital ingredient for effective learning.

In Ghana, lip reading features prominently in communication modes used in special and inclusive schools, which enroll learners with deafness (the deaf). As pointed out by Becta (2001), however, lip reading draws on phonological awareness, which is the link between symbol and sound, and crucial to literacy development. The concern is, how can the deaf access sound visually? While in some cases, studying the shape of sounds on the lips might be helpful, lip reading can also be ambiguous. Also, how do we teach the deaf to break words into syllables when they cannot hear? The length of the word may not relate to the number of its syllables; for instance, beach /ˈbēch/ is monosyllabic while video /ˈvid-ē-ˌō/ has three beats, yet both words have five letters (Ibid, 2001).

Owing to this and many other challenges experienced by the deaf, educators and other stakeholders have continuously searched for means to support learners with deafness to participate successfully in learning. Subsequently, the emergence and introduction of Information and Communication Technology (ICT) into education is perceived as timely and promising for learners who are deaf in both segregated and inclusive schools. ICT, particularly, computers and internet can improve quality of life of learners with disabilities by increasing their participation and reducing their social exclusion. ICT can be used to manipulate and

communicate information through voice and sound, or images such as computers, computer-based assistive technology, special software, communication aids, in schools by students with disabilities, including the deaf to facilitate their participation in learning (Hakkarainen, Ilomäki, Lipponen, Muukkonen, Rahikainen, Tuominen, et al., 2003; Lei & Zhao, 2007).ICT in this context refers to a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They also include radio, television, mobile phones, computers, satellite and wireless technology and the Internet with their attendant tools, as well as hardware, processes and systems that are used for storing, managing, communicating and sharing information (Ministry of Education[MOE], 2008).

Mindful of the prospect of the use of ICT to expand access to quality education, particularly for learners with disabilities including the deaf, the Government of Ghana, over the past decade, has placed emphasis on the use of ICT in teaching and learning by introducing a national policy on ICT in education. According to the Ministry of Education, the Government is committed to a comprehensive programme of rapid deployment, utilization and exploitation of ICTs within the educational system from primary school upwards. Consequently, the Government has put in place measures to strengthen science education at all levels, as well as promote technical and vocational training with an emphasis on the use of ICT to facilitate the training and learning process (MOE, 2008).

In the foreword to the ICT in Education Policy the then Minister of Education, stated that:

…. the deployment of ICT into Education will result in the creation of new possibilities for learners and teachers to engage in new ways of information acquisition and analysis. ICT will enhance access to education and improve the quality of education delivery on equitable basis (MOE, 2008, p 4).

In view of this, the overall policy goal is to enable graduates from educational institutions in Ghana, confidently and creatively use ICT tools and resources to develop requisite skills and knowledge needed to be active participants in the global knowledge economy by 2015. Regrettably, the implementation of the ICT in education policy has been abysmally slow; currently, the emphasis of the official curricula has been on the development of students' skills in operating ICT and not necessary using technology as a means of learning subjects other than ICT (Mereku, Yidana,Hordzi, Tete-Mensah &Williams, 2009).

Granting that the ICT Policy is designed to promote among others inclusive education by addressing inequalities in gender, language, disability (MOE, 2008), it is imperative to ascertain whether or not students at the Oguaa School for the Deaf are being groomed to use ICT tools and resources confidently and creatively. It is also important to identify factors inhibiting students' use of ICT for learning in order to suggest strategies for improvement.

ICT Policy development in Ghana and people with disabilities

According to UNESCO (2011), there are numerous international policies that make reference to ICT and people with disabilities. However, the most significant policy among the lot is the UN Convention on the Rights of

Persons with Disabilities (CRPD), adopted by the UN General Assembly on December 13, 2006. The key statement within the CRPD which focuses on ICT and people with disabilities is within Article 9, which states:

> *To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and other facilities and services open or provided to the public, both in urban and rural areas.* (p. 9)

Prior to the signing and subsequently ratifying of the UNCRPD, the Government of Ghana in 2006 enacted the Persons with Disability Law (Act 715), to safeguard the rights of persons with disabilities in the country. Although, Act 715 does not specifically mention the rights to access to ICT for persons with disabilities, the Law makes provision for access to quality education of which ICT is a vital component.

Elsewhere, for example in Poland, for 10-13 year olds, the ICT Policy in Education mandates the use of selected programmes and educational games to expand learners' interest, safe use of computers and software; awareness of risks and limitations associated with the use of computers and the internet; communication through a computer and ICT; finding and using information from various sources; the development of computer drawings, themes, texts, animations, presentations, and media figures; problem-solving and decision-making with the use of a computer; the use of computers to increase knowledge and skills in various fields and to develop interests (ICT for Inclusion, nd).

Benefits of ICT to Deaf learners

Information and communication technology (ICT) is of particular importance in developing the language experiences of learners with hearing loss (Becta, 2001). Becta (2001) further argues that ICT provides visual medium with pictures, signs or texts on screen, which enable learners to extend both their general knowledge and use of language without being dependent on the spoken word. Besides, collaboration on ICT activity can enable group of deaf students to expand their language and understanding of concepts as they plan and carry out their work.

According to Becta (2001), deaf students benefit from various types of ICT;for instance, CD-ROM and Multimedia, which can provide such students access to information in a more immediate and visual form than previously possible. In countries such as Britain, the use of multimedia presentations, which combine text, pictures and sound, enable deaf students to experiment with different methods of combining sound and vision. Additionally, there are also control software, data logging software and logo or turtle graphics for supporting deaf students to improve their language (Becta, 2001).

There are other types of products that help deaf students in reading and writing; these include but not limited to An Eye for spelling, Teaching Handwriting Reading and Spelling Skills (THRASS-IT), as well as the Sign Graphics programme, which enables teachers and deaf students to put together body parts to create a still form of sign language (Becta, 2001). Additionally, the use of Sign Graphics programme over time enables deaf students to learn to sign and then approach reading and writing of their second language. With the Sign Graphics, the deaf can have immediate access to storybooks; and as they begin to enjoy reading in their first

language, they gain confidence and become more independent learners (Becta, 2001).The first language for the deaf in this context is Sign Language.

Furthermore, in Britain, there are other ICT products available to support the students with deafness to learn such as Co-Writer, which is a predictive software programme that helps deaf learners in developing writing skills; as well as Mind mapping software, Sign Now, which is a type of dictionary with over 3,500 signs, and SIGN IT, a course type software programme with over two hundred video clips of conversations on topics which students need to study for stage 1 and stage 2 exams (Becta, 2001).

Since deaf learners depend on signed support to access the curriculum, they require other visual reference points to help them learn. Arguably, quality teaching supported by creative use of technology enhances deaf learners' communication (Lidström & Hemmingsson, 2014). Additionally, the use of visual props enhances learning by speeding up and aiding comprehension; also, supplementing text with visual clues benefits all leaners and, in particular, those with deafness (Li & Kirkup, 2007)

Cath Scott, an ICT Coordinator was quoted as saying, "using email and computer-generated text gives deaf children another choice in how they communicate. It is non-confrontational, non-judgmental and easy to edit" (Richards, 2004). While it is widely agreed that the most effective forms of ICT to use for deaf learners are highly visual rather than those based on the written word or sound; deaf learners at Elm field through training enjoy using interactive smart boards to explain, demonstrate and share their work (Ibid, 2004).

ICT can support the exploration of information and encourages independent learning. Individualized resources saved on a school intranet can be called up for the deaf child working outside the classroom. Incorporating ICTs, particularly computers and the Internet, into teaching and learning in education to increase deaf students' digital skills has become imperative in all countries (Ciccarelli, Straker, Mathiassen & Pollock, 2011; Li & Kirkup, 2007), including Ghana.

Barriers associated with ICT in education

Regrettably, the introduction of ICT in education in Ghana has been affected by many challenges. In a study of 10 Ghanaian mainstream schools, Merekuet al. (2009) reported that some of the schools had computer laboratories; however, the few available computers easily broke down because of lack of functional air-conditioners in the computer laboratories, unstable electric power supply, and virus infections. Again, none of the computer laboratories were networked and only four computers in one of the schools had internet connectivity. According to Mereku et al. (2009), the emphasis of the official curricula was on the development of students' skills in operating ICT but not necessarily using technology as a means of learning subjects other than ICT. The study also found that the Ministry of Education was then at the stage of deployment of ICT resources for developing the needed ICT literacy required for its integration into teaching and learning. Eight years after that study, the situation has not changed, and ICT has not been integrated into teaching and learning in the country.

Generally, access to ICT tools and usage among students with disabilities has been difficult for several reasons; primary among them is the lack of essential knowledge and skills about ICT tools (Bordbar, 2010; Peralta & Costa, 2007), which makes it difficult for their usage (Ozcelik & Kurt, 2007). This challenge combined

with others have resulted in the formation of attitudes that do not ensure or promote continuous use of ICT tools, especially for educational purposes (Afari-Kumah & Acheampong, 2010).In fact, studies have consistently revealed lack of access as a complex barrier to the utilization of ICT, especially among students with disabilities (Adebi-Caesar, 2012; Bingimlas, 2009; Sicilia, 2005), which include those with deafness. According to Becta (2004), lack of access to ICT resources is not always merely due to the non-availability of the hardware and software or other materials; sometimes, inaccessibility is caused by factors such as poor organization of resources, poor quality hardware or inappropriate software. This assertion was endorsed by Empirica (2006) who perceived lack of access as the dominant challenge in the use of ICT. In Saudi Arabia, Al-Alwani (2005) reported that lack of computers and hardware resources, as well as lack of access to internet have adversely limited technology integration and use in schools. Also, insufficient computers, and old or slow ICT systems (Toprakci, 2006), insufficient technological resources were the impediments to technology integration and use in schools (Albirini, 2006), as well as lack of appropriate infrastructure (Gomes, 2005)are among the barriers to the utilization of ICT in schools.

In a review of literature, Shan (2013) argued that few previous studies have examined the challenges or barriers to ICT integration from students, teachers, and administrative perspectives with involvement of specific teaching strategies and activities. In Ghana, the researchers maintain that there is dearth of studies on factoring inhibiting ICT knowledge and skill acquisition among deaf students, which justifies the need to conduct of this study.

Characteristics of students with deafness

Hearing loss refers to a diminished ability to hear sounds like other people do, while deafness refers to the inability to understand speech through hearing even when sound is amplified. Profound deafness means the person cannot hear anything at all; such individuals are unable to detect sound, even at the highest volume possible (Nordqvist, 2015). In Ghana, students who are deaf are largely educated in segregated special schools for the Deaf; however, from 2005, few of such students have been integrated in selected inclusive schools (Hayford, 2013).

In a study in Nigeria, however, Amusa et al. (2013) found that ninety-two percent (92%) students with hearing impairment had profound or severe hearing loss, while only 8% had moderate hearing loss. The researchers discovered that hearing impaired children failed to develop spoken speech, and lip-reading was a much more common aid to receptive communication for students with severe or profound hearing impairment (79%), or moderate hearing impairment (58%). Also, sign language was noted to be common among students with severe or profound hearing loss (70%). As stated earlier, the researchers endorse the view that ICT can play crucial role in enhancing communication of the hearing impaired and, in particular, those who are deaf (Becta, 2001;Lidström&Hemmingsson, 2014).The study was anchored to Dreyfus' Model of Skill Acquisition, which has been discussed below.

Theoretical Framework

The Model of Skill Acquisition by Dreyfus explains that when individuals undergo external instruction to acquire a skill, they normally go through five developmental stages – Novice, Advanced Beginner, Competent, Proficient, and Expert (Dreyfus & Dreyfus, 1980). At novice stage, the student has an incomplete understanding, and approaches tasks mechanically. In order to improve, the novice needs monitoring and also requires supervision to complete tasks. When students reach the Advanced beginner stage they develop a working understanding of key aspects of practice, and tend to see actions as series of steps. They can also complete simpler tasks without supervision and are able to achieve some tasks using their own judgment; but supervision is needed to complete the entire work (Dreyfus & Dreyfus, 1980).

According to Dreyfus and Dreyfus (1980), at the competent stage students have a good working and background understanding of their skills. They see actions, at least, partly in context, and are able to complete work independently to a standard that is acceptable, though it may lack refinement. The proficiency stage, on the other hand, is characterized by deep understanding, and seeing actions holistically, rather than as separate parts (Dreyfus & Dreyfus, 1980). At this stage, students see and appreciate what is most important in a situation, and can also perceive situations of deviation from normal patterns. Then at the expert stage, students demonstrate authoritative or deep understanding of the skills they possess and implement. They no longer rely on rules and guidelines. They deal with routine matters intuitively, and are able to go beyond existing interpretations to achieve excellence with ease. Also, students take responsibility for going beyond existing standards, and create their own interpretations (Dreyfus & Dreyfus, 1980). Essentially, since schools are human institutions, deaf students may be confronted by challenges which would impinge on their capacity to experience all the benefits pertaining to the use of ICT.

The study therefore, set out to describe factors inhibiting students'ICT knowledge and usage at the Oguaa School for the Deaf in Ghana. All the students who participated in the study were those with severe or profound hearing loss; they relied mainly on the use of sign language for communication. The researchers address the following two research questions and one hypothesis:

1. What is the level of ICT knowledge and skills of students of Oguaa School for the Deaf?
2. What challenges do students of Oguaa School for the Deaf face in the use of ICT for learning?
3. Is there any significant difference in the level of ICT knowledge and skills between male and female students with hearing impairment of Oguaa School for Deaf?

Methods

Study area

The researchers conducted the study at Oguaa School for the Deaf because it is the most well established school for the Deaf in the Central Region of Ghana. At the time of the study the school had a total enrolment of 269 Deaf students which consisted of 150 males and 119 females. It is a boarding institution with facilities for both male and female students. It was the only special school in the country which had modern computer laboratory with some functional computers and internet connectivity (Dadzie-Bonney & Hayford, 2016).

The researchers adopted the cross-sectional survey design to collect data at one point in time (Creswell, 2005). Creswell cited by Dadzie-Bonney and Hayford (2016) argued that the cross-sectional survey

has the advantage of measuring current practices, such as deaf students' ICT knowledge, skills and usage. The researchers also adopted the random sampling technique to select the students who participated in the study. In order to select the required number of students from each class, pieces of marked and unmarked ballot papers were put in a box for students to pick. Students who picked the marked ballot papers were included in the study. This strategy ensured that each participant had equal chance of being selected for the study. In cases where the selected number of students in a class was not up to ten, the procedure was repeated until the researchers got 10 students from that class.

For the purpose of access, permission was sought from the Headmaster of the school prior to the conduct of the study. As a boarding institution, the headmaster has the state backing to represent the parents and take decisions concerning the students. Also, all the students at the Junior High section were 14 years of age and above, the researchers engaged an expert in sign language to interpret the purpose of the study to them to enable the students to make informed decision about their participation in the study. The students were informed that participation was not compulsory and they could pull out at any time in the process of the study if they felt uncomfortable. They were assured of confidentiality and anonymity in the process and also told the questionnaire was not a test, but rather an exercise to collect their views on their knowledge, skills and ICT usage.

The students were given copies of the questionnaire to complete. The exercise took place in two classrooms, which had been provided by the school authorities, during the school break period. Thus, caution was taken to ensure that the process did not disrupt the academic activities. The Cronbach's alpha value for the students'questionnaire was 0.88, which is higher than the 0.80 generally accepted value in research in social science (Webb, Shavelson & Haertel, 2006).

Results

Table 1 shows students' ICT knowledge and skills.

Table 1: Students' ICT knowledge and skills

Statement	Agree (%)	Neutral (%)	Disagree (%)
1. My school has a well-equipped computer laboratory.	35 (87.5%)	4 (10.0%)	1 (2.5%)
2. I have access to functional computers in my school.	33 (82.5%)	5 (12.5%)	2 (5.0%)
3. My teacher uses computer to teach us at school.	36 (90.0%)	3 (7.5%)	1 (2.5%)
4. I can switch on a computer and shut it down by myself.	33 (82.5%)	2 (5.0%)	5 (12.5%)
5. I can use a computer with the guidance of my teacher.	31 (77.5%)	3 (7.5%)	6 (15.0%)
6. I can browse the Internet for information to do my assignment.	25 (62.5%)	4 (10.0%)	11 (27.5%)
7. I can communicate with others through the use of e-mails.	24 (60.0%)	4 (10.0%)	12 (30.0%)
8. I can download documents from the Internet.	24 (60.0%)	5 (12.5%)	11 (27.5%)
9. I can save documents on storage devices, such as pen drives.	28 (70.0%)	5 (12.5%)	7 (17.5%)

Table 1, shows that 87.5% of the students reportedly stated that their school had a well-equipped computer laboratory, while 2.5% disagreed with the statement. When asked whether they had access to functional computers in the school, the majority (82.5%) agreed, while 5% disagreed. Again, 90.0% of the students reportedly agreed that their teachers use computers to teach, while 2.5% disagreed. Additionally, the majority (82.5%) of the students reported that they could switch on and off a computer, while 5% remained neutral. Also, 77.5% of the students stated that they could use computers with some guidance from teachers, while 15% of them disagreed.

With respect to students' knowledge and skills for browsing the internet for information, Table 1 shows that 62.5% of the students reported that they had the skills required for browsing the internet for information, while a high proportion of them (27.5%) disagreed. Furthermore, 60.0% of the students stated that they could use the Internet to communicate with others through e-mails, while a high proportion of them (30%) reportedly disagreed. Also, another 60.0% of the students indicated that they could download documents from the Internet, but 27.5% of them did not have the skills. Additionally, the analysis reveals that 70.0% of the students reported that they could save documents unto storage devices like pen drives.

The next table (2) provides data on challenges students encountered with respect to usage of ICT for learning.

Table 2: Factors inhibiting students use of ICT for learning.

Statement	Agree (%)	Neutral(%)	Disagree (%)
17. I do not have access to computers to learn on my own.	39 (97.5%)	0 (0.0%)	1 (2.5%)
18. The computers in my school breakdown frequently.	21 (52.5%)	15 (37.5%)	4 (10.0%)
19. I do not have access to the Internet.	19 (47.5%)	5 (12.5%)	16 (40.0%)
20. I do not know how to use a computer for learning.	26 (65.0%)	3 (7.5%)	11 (27.5%)
21. I have not been trained to use computers for learning.	27 (67.5%)	3 (7.5%)	10 (25.0%)
22. We have limited time to learn how to use computers.	2 (5.0%)	4 (10.0%)	34 (85.0%)
23. I am not interested in using computers for learning.	38 (95.0%)	0 (0.0%)	2 (5.0%)
24. My school does not have learning software such as Mavis Beacon and Microsoft Encarta.	37 (92.5%)	0 (0.0%)	3 (7.5%)
25. The computers in my school are not of good quality.	38 (95.0%)	0 (0.0%)	2 (5.0%)

Table 2 reveals that almost all the students (97.5%) reportedly did not have access to computers for learning on their own, but 2.5% of them stated that they had access to computers for private studies. This result reveals that though majority of the students had access to function computers, the computers were not accessible for private studies. This was understandable; the functional computers were accessible to students only during ICT lessons and not for other activities. Also, 52.5% of the students stated that the computers in their

school frequently breakdown, while 37.5% and 10% respectively either declined to respond or disagreed. The high proportion of students who declined to answer perhaps, did so because they did not want to report anything negative about their school. As argued earlier, culturally Ghanaian students or children feel reluctant to make negative comments about their schools. In spite of the assurance prior to completing the questionnaire, still that high proportion of students decided to remain neutral.

Again, while the majority of the students (47.5%) maintained that they did not have access to the Internet; a significant proportion of them (40.0%) disagreed. Perhaps, some of the computers in the laboratory had internet connectivity while others were not; as a result, while some students had the opportunity to use computers with internet connectivity during ICT lessons, others did not. Furthermore, 65.0% of the students reported that they did not know how to use computer for learning, and 67.5% of them stated that they had not been trained to use computers for learning. However, 27.5% and 25% respectively, indicated that they either knew how to use computer for learning or had been trained to use computer for learning. Also, 85.0% of the students disagreed with the statement that they had limited time for learning how to use computers. This was not strange; as a subject on the school timetable students always had specified durations to work with computers during ICT lessons. However, such opportunity was not extended to other subjects, neither were the students allowed access to computers for private studies. This finding confirmed the assertion by Mereku et al. (2009) that the curricula of schools in the country did not emphasize the use of technology as a means of learning other subjects apart from ICT.

Table 2 further shows that 95.0% reportedly were not interested in using computers for learning. This finding was also not surprising because of the number of inhibiting factors which have been mentioned in the ongoing analysis. For instance, lack of access for private studies, no training to use computers to learn other subjects, frequent breakdowns, limited access to internet, and lack of requisite software. In fact, the table (2) shows that 92.5% of the students stated that the school did not have learning software such as Mavis Beacon and Microsoft Encarta; and also, 95.0% claimed that the computers in the school were not in good condition.

Further analysis was conducted to establish whether or not there was any difference in students' level of ICT knowledge and skills at Oguaa School for the Deaf. Table 3 shows the outcomes.

Table 3: Independent Samples t-test result

Gender		*t*	*df*
Male M (SD)	**Female M (SD)**		
3.88 (.715)	4.22 (.603)	1.600	38

* M = Mean ** SD = Standard Deviation

The results revealed that there was no statistically significant difference in level of ICT knowledge and skills of male deaf students (M= 3.88, SD= .715) and their female counterparts [M= 4.22, SD= .603; t (38) = 1.60, p = .174, p > .05] in the school. Thus both female and male deaf students in the study possessed similar level of knowledge and skills in ICT usage.

Discussion

The study uncovered a gap between policy goals and students' performance with respect to knowledge and utilization of ICT. It is important to state that at a glance, tables 1 & 2 seem to reveal some contradictions in the data from the students. For instance, in Table 1, students reported that their school not only had a well-equipped computer laboratory but they also, had access to functional computers, which their teachers used to teach them. Table 2, on the other hand, showed that students did not have access to computers to learn on their own, they were not taught how to use computers to learn and also they did not know how to use computers to learn. Additionally, the computers in the laboratory broke down frequently. These contradictions could be explained.

On the state of the computer laboratory, the students were right to describe their school's computer laboratory as well equipped. In fact, some of the students had access to functional computers with internet connectivity during ICT lessons. However, not all the computers in laboratory were in good working condition. Some computers broke down frequently, and others did not have internet connectivity. Besides, the students did not have access to computers for private studies. This scenario explains why 95% of the students described computers in their school as not of good quality. From the finding one might state that the school's computer laboratory was sub-standard. The laboratory did not have standard ICT tools and applications as outlined earlier in the review by Becta (2001). Merely having a number of computers in the laboratory is not enough. The school should have functional computers with the requisite applications and software as well as internet connectivity to promote teaching and learning.

In terms of knowledge and utilization, which were the main thrust of the study, the picture was gloomy. As shown in the analysis, students reported very basic knowledge about computers, which consisted of booting on and off, using computers under the guidance of teacher, searching the internet for information or sending emails. It could be stated that the students in the study were operating at the novice stage as described by Dreyfus and Dreyfus (1980) in their Model of Skill Acquisition. The students were far below the goal for the introduction of ICT in education in Ghana, which was the use of ICT creatively and confidently (Mereku et al., 2009; MOE, 2008).The students could also not use ICT to manipulate and communicate information to facilitate their participation in learning (Hakkarainen et al., 2003; Lei & Zhao, 2007).

The lower level of students' ICT knowledge and skills was the result of lack of access to computers to learn privately, lack of guidance in the use computers for learning, frequent break down of computers, as well as insufficient internet connectivity. Besides, the school did not have requisite applications and software for the computers. Even ordinary software such as Mavis Bacon and Microsoft Encarta were not installed for students to use. These factors largely contributed to lack of students' interest in the use of computers for learning. Indeed, interest in the use of ICT for learning does not come automatically; students have to be trained and guided in the use of ICT tools for learning. While it has become imperative to increase deaf students' digital skills through the incorporating of ICT into education and learning (Ciccarelli, Straker, Mathiassen & Pollock, 2011; Li &Kirkup, 2007); regrettably, the students in the study were not taught to use computers for learning, and they therefore lacked essential knowledge and skills in the use of ICT tools(Bordbar, 2010; Ozcelik & Kurt, 2007;Peralta &

Costa, 2007).In that circumstance, the students had developed attitudes that did not ensure the continuous use of ICT tools for educational purpose (Afari-Kumah & Acheampong, 2010).

In the nut shell, Oguaa School for the Deaf does not have functional computers with internet connectivity and requisite applications and software. Unlike schools in countries such as Britain (Becta, 2001) and Poland (Poland Country Report, nd) where ICT has been fully integrated into teaching and learning, and used effectively to enhance the learning of students with deafness, at the Oguaa School for the Deaf, ICT is yet to be fully integrated into education to facilitate teaching and learning, in order to support students to learn.

Again, the school's computers did not have essential applications and software, which could be used to support deaf students to improve their reading and writing skills (Becta, 2001) and ultimately learning. The school lacked appropriate infrastructure (Gomes, 2005) to promote ICT knowledge and utilization by deaf students.

Conclusion and Recommendation

The researchers concluded that the students did not have sufficient knowledge and skills to use ICT creatively and confidently for learning; this was mainly due to a number of factors ranging from poor infrastructure, and slow implementation of policy. It was therefore recommended that the school should improve on its stock of quality computers in the laboratory, ensure that the computers have requisite applications and software, as well as internet connectivity and train students in the application of ICT knowledge and tools to other subjects. In the long term, the Ministry of Education should review the policy directive to improve the use of ICT in basic education in the country.

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