# Social Studies Teachers' Challenges in Applying ICT Tools for Effective Instruction in Schools for the Deaf in Ghana

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## ABSTRACT

This study investigated the challenges faced by Social Studies teachers in applying Information and Communication Technology (ICT) tools for effective instruction in schools for the deaf in Ghana. The study was conducted in accordance with the pragmatist research philosophy and employed a mixed method approach through convergent parallel research design and used questionnaires and semi-structured interviews to collect data from 28 Social Studies teachers and 14 headteachers from the fourteen public schools for the deaf in Ghana. The data from the questionnaire were analyzed using means and standard deviations and that from the interview were thematically analyzed. The findings revealed that teachers used ICT tools such as projectors, presentation clickers, visualizers, and computers in teaching their students with hearing impairments The findings also revealed that Social Studies teachers faced several challenges such as lack of ICT infrastructure, lack of ICT skills, lack of frequent ICT training, lack of ICT support, and lack of ICT motivation. The study recommended more investment by the Ghana Education Service in ICT infrastructure support for Social Studies teachers in schools for the deaf in Ghana to enhance their ICT integration and instructional effectiveness.

**Keywords:** Social Studies, ICT tools, challenges, instruction, schools for the deaf.

## INTRODUCTION

The need for access, equity, equality, and quality delivery of teaching and learning to all students regardless of their human impairment in order to achieve sustainable development goals, Information and communication technology (ICT) has become an essential tool for enhancing teaching and learning in various subjects and levels of education. ICT can provide diverse and interactive learning experiences, facilitate access to information and resources, and promote collaboration and communication among learners and teachers (Das, 2019). However, ICT integration in education is not without challenges, especially for teachers who work with learners with special needs such as deafness. Deaf learners face unique barriers in accessing and using ICT due to their hearing impairment and communication difficulties (Krishnan et al., 2020). Therefore, teachers who teach deaf learners need to have adequate ICT skills, knowledge, and attitudes to effectively apply ICT for their instruction (Tohara, 2021). Social Studies is one of the subjects that can benefit from ICT integration, as it aims to develop learners' critical thinking, civic competence, and global awareness (Mutiani & Faisal, 2021). However, there is limited research on how Social Studies teachers integrate ICT in their instruction for deaf learners, especially in developing countries such as Ghana. This study aimed to fill this gap by exploring the challenges faced by Social Studies teachers in applying ICT for effective instruction in schools for the deaf in Ghana.

There is need for access, equity, equality and delivery of quality teaching and learning to all students with no exception in order to achieve the sustainable development goal (SDGS4) which promotes inclusive and equitable quality education and lifelong learning opportunities for all students and teachers across the world in

this era of technology. The effective integration of Information and Communication Technology (ICT) in education is crucial for enhancing teaching and learning experiences.

Nyanja and Musonda (2020) noted that teachers in most developed countries are well trained in ICT, and they rely heavily on it as part of their teaching strategies in all subjects. For example, Leduc et al. (2019) noted that across Europe and in most North America, ICT has been used to increase the independence of students with hearing disabilities by enabling them to access visual information. This has helped in their knowledge and skills acquisition by providing alternative methods to learn.

However, in the context of Schools for the Deaf in Ghana, Social Studies teachers face specific challenges when it comes to applying ICT for effective instruction in the Social Studies curriculum, which most teachers teach in abstract (Aljedaani et al., 2023). Schools for the Deaf in Ghana often lack adequate ICT infrastructure, including computer laboratories, internet connectivity, and access to necessary hardware and software. This limited access hampers the ability of Social Studies teachers to effectively incorporate ICT tools into their instructional practices (Mwanza, 2022). Many Social Studies teachers in Schools for the Deaf may not have received sufficient training on how to effectively use ICT tools and resources in their instruction. The absence of specialized training programmes tailored to the unique needs of deaf students limits teachers' ability to utilize ICT tools optimally to enhance learning experiences in the Social Studies classroom (Almahasees, 2021). Deaf students primarily rely on sign language as their primary mode of communication. However, there is a scarcity of ICT resources that are specifically designed to accommodate sign language, such as sign language videos, interactive sign language dictionaries, or software that supports sign language recognition. The lack of these resources poses a significant challenge for Social Studies teachers to deliver content in an accessible and inclusive manner (Farooq et al, 2021). Social Studies teachers in Schools for the Deaf may face attitudinal barriers and misconceptions regarding the effectiveness of ICT integration. However, there is limited research on how Social Studies teachers integrate ICT in their instruction for deaf learners, especially in developing countries such as Ghana. Ghana is a West African country with a population of about 31 million people, of which about 3% are estimated to have some form of hearing impairment (Ghana Statistical Service, 2014). Ghana has 14 public schools for the deaf that cater for about 3000 deaf learners from pre-primary to high school levels. The curriculum for schools for the deaf is based on the national curriculum for regular schools, which includes Social Studies as a core subject from primary to junior high school levels (Howgego et al., 2014). However, the curriculum does not provide specific guidelines or standards for ICT integration in Social Studies or other subjects for deaf learners. Therefore, it is important to investigate how Social Studies teachers in schools for the deaf in Ghana apply ICT for effective instruction.

Some teachers apart from holding traditional beliefs about teaching methods also discourage ICT integration in instructional practices, assuming that ICT is not suitable or effective for deaf students. These attitudes and misconceptions may discourage Social Studies teachers from embracing and utilizing ICT tools in their instructional practices (David et al., 2023). Also, insufficient funding and financial constraints in Schools for the Deaf can restrict the acquisition of ICT infrastructure, training programs, and specialized resources for Social Studies teachers. The lack of financial support hinders the implementation of effective ICT strategies in the Social Studies curriculum, making it challenging for teachers to integrate ICT tools into their instructional practices (Agbonlenomen & Amos-Faith, 2023).

Addressing these challenges is crucial to promote the effective application of ICT in Social Studies instruction for deaf students in Schools for the Deaf in Ghana. By addressing infrastructure limitations, providing specialized training, developing sign language-based ICT resources, fostering positive attitudes towards ICT, and allocating adequate funding, the educational system can better support Social Studies teachers in their efforts to incorporate ICT for more engaging and inclusive instruction.

The purpose of this study was to investigate the ICT tools used by Social Studies teachers and the challenges they go through to teach learners with hearing impairments in Ghana.

The following research questions were formulated to guide the study:

1. What ICT tools do Social Studies teachers use in teaching deaf students in Ghana?
2. What challenges do Social Studies teachers face in the use of ICT in teaching deaf students in Ghana?
3. What approaches do Social Studies teachers employ to circumvent the challenges in the use of ICT in teaching deaf students in Ghana?

The answers to the above research questions would be significant because of its contribution in unearthing some of the challenges Social Studies teachers face in integrating ICT in teaching deaf students. Additionally, the findings could help the Ministry of Education, the Department of Special Education, University of Education, Winneba, to identify the areas that have not received enough attention from the policymakers and the policy implementers. Social studies teachers would benefit from the findings because they would have access to strategic measures on how to overcome the challenges they encounter in the use of ICT integration in teaching deaf students.

## LITERATURE REVIEW

ICT integration in education has been widely advocated as a means of improving the quality and equity of education (Francisco et al., 2020). ICT can offer various benefits for teaching and learning such as enhancing motivation, engagement, creativity, collaboration, communication, problem solving, and higher-order thinking skills (Bingimlas, 2009). ICT can also support differentiated instruction and assessment, accommodate diverse learning styles and needs, and provide access to a variety of information and resources (Almekhlafi & Almeqdadi, 2010). However, ICT integration in education also poses several challenges for teachers and learners. Some of the common challenges include lack of ICT infrastructure, lack of ICT skills, lack of ICT training, lack of ICT curriculum, lack of ICT support, lack of ICT policy, and lack of ICT motivation (Bingimlas, 2009). These challenges can affect teachers' attitudes, beliefs, and practices regarding ICT use in their instruction (Ertmer & Ottenbreit-Leftwich, 2010). Furthermore, these challenges can be exacerbated for teachers who work with learners with special needs such as deafness.

Burden, Kearney, and Hall (2019) posit that deaf students in the developed countries with difficulties in holding a pen, using a mouse or keyboard are now able to use a combination of built-in functionality, visual recognition systems, or other ICT assistive solutions to interact with the computer in ways that make learning easy. Madani (2019) noted that many teachers in schools for students who are deaf in Ghana have limited or outdated knowledge and skills in ICT. Echoing this assertion, Odame et al., (2020) found that most of the schools lack a well-resourced ICT laboratory, and for the few that have it, the teachers are not encouraged to use the tool to enhance teaching.

Deafness is a condition that affects one's ability to hear and communicate with others. Deaf learners have diverse characteristics and needs depending on their degree of hearing loss, age of onset, mode of communication, educational background, and cultural identity (Marschark & Spencer, 2010). Deaf learners often face difficulties in accessing and using ICT due to their hearing impairment and communication barriers. For instance, deaf learners may have limited exposure to spoken language and literacy skills that are essential for using text-based or audio-based ICT tools (Jacobs, 2021). Deaf learners may also have limited access to visual or sign language-based ICT tools that are suitable for their communication preferences (Al-Awidi & Alghazo, 2012).

Therefore, teachers who teach deaf learners need to have specific competencies and strategies to effectively integrate ICT in their instruction. According to Al-Awidi and Alghazo (2012), some of the competencies that teachers of the deaf need include: knowledge of deaf culture and sign language; knowledge of deaf learners' characteristics and needs; knowledge of appropriate ICT tools and resources for deaf learners; skills in using and adapting ICT tools and resources for deaf learners; skills in designing and implementing ICT-based instruction and assessment for deaf learners; skills in collaborating with other professionals and stakeholders; and attitudes of openness, flexibility, and willingness to use ICT for deaf learners.

Social Studies is one of the subjects that can benefit from ICT integration for deaf learners. Social Studies is defined as "the integrated study of the social sciences and humanities to promote civic competence" (Herczog, 2013). The main goals of Social Studies are to help learners develop critical thinking, inquiry, and decision-making skills; to foster learners' understanding of themselves and others in a diverse and interconnected world; and to prepare learners for active and responsible citizenship in a democratic society (Herczog, 2013). ICT can support these goals by providing deaf learners with various opportunities to access, analyze, and communicate information about social issues; to explore different perspectives and cultures; and to participate in civic action and dialogue (Berson & Berson, 2015).

The inclusion of ICT into Ghana's educational system is bedeviled with many challenges, especially at the lower levels of education from primary to senior high (Ayoung et al., 2020). According to Boamah (2019), most schools in Ghana have not been equipped with computer laboratories to enable students to get the practical aspects of computer education. For the few schools that have been equipped, Amoako (2019) observed that most of the computers are broken, outdated or malfunctioning. Similarly, Komabu-Pomeyie (2020) observed that most schools do not have a stable electricity supply. In addition, some computer laboratories are not air-conditioned whilst most computers lack security measures such as anti-virus software. According to Teye et al. (2019), the most challenging issue for most schools is a stable Internet connection.

Although, successive governments in Ghana have pledged funding to equip schools with computer laboratories and an internet connection, very little has been achieved in this regard (Ayoung et al., 2020). This situation makes it even more difficult for teachers in special schools when handling students with disabilities. Abdulai et al. (2019) identified the lack of essential knowledge and skills about ICT tools, which makes it difficult for their usage to teach students. Mungai et al. (2020) concluded that this challenge, combined with others, has resulted in behaviours that retard the implementation of ICT in education. For students with disabilities, research shows that access remains a barrier to ICT use in schools (Derkye, 2019; Schenk et al., 2020).

Al-Husseiny (2019) maintained that ICT implementation will be unsuccessful when resources are not well organised, such as poor quality hardware, software and Internet services. For students who are deaf, Addai-Wireko et al. (2020) argued that this negatively affects technology integration and use in schools. Echoing these assertions, Senadza et al. (2019) contended that most of the schools for the deaf across Ghana do not have the ICT infrastructure customized for students who are deaf or to integrate with other subjects to promote learning. Atta (2019) also observed that most special schools in Ghana lack qualified teachers with the requisite knowledge and skills to teach ICT to students with disabilities. Moses et al. (2020) also noted that education authorities have not prioritized ICT as part of the curriculum for students who have disabilities. All these challenges have proven to have adverse effects on teachers' ability to integrate ICT tools in school activities to facilitate teaching and learning.

## METHODOLOGY

This research was conducted in accordance with the pragmatist research philosophy. As a research paradigm, pragmatism avoids debating difficult metaphysical concepts like truth and reality. Instead, it acknowledges that there may be a single or several realities that can be investigated empirically (Creswell & Plano-Clark 2011). Some philosophers believe that neither the scientific procedures proposed by the positivist paradigm nor the socially constructed reality proposed by the interpretivism paradigm are sufficient to comprehend the reality of the universe (Kivunja & Kuyini, 2017). Pragmatism is the primary philosophy of Mixed Method Research, according to Johnson and Onwuegbuzie (2004), since it considers "many viewpoints, perspectives, stances, and standpoints" of the topic under investigation. The study adopted mixed method research, according to Johnson and Onwueegbuzie (2004), mixed method approach "is a type of research in which a researcher or a group of researchers combine elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, and inference techniques) for the broad purposes of breadth and depth of understanding and corroboration." (See p. 123).

This study adopted the convergent parallel mixed method approach to collect, analyse and interpret both quantitative and qualitative data. The use of mixed method approach was appropriate because it provides

strengths that offset the weaknesses of both quantitative and qualitative research (Benuto et al., 2020), affords a strategy for developing better, more context-specific instruments and help to explain findings or how causal processes work (Palermo & Wilson, 2020). Thus, the choice of mixed method approach was appropriate since it provided a complete and a comprehensive understanding of the challenges Social Studies teachers' face in the use of ICT and strategies use to overcome the challenges in using ICT tools to teach in Schools for the Deaf in Ghana.

In this research, the target population consisted of all Junior High School Social Studies teachers in the 14 public Schools for the Deaf in Ghana, numbering 70 as the eligible population. Stratified random sampling technique helped in selecting 28 respondents for the quantitative phase of this study, while convenience sampling technique was used to sample 14 participants for the qualitative aspect of this study. The use of a structured questionnaire and a semi-structured interview guide assisted in obtaining quantitative and qualitative data. A reliability analysis using Cronbach's Alpha statistics was performed to determine the internal consistency of the items on the questionnaire instrument. The reliability of the questionnaire was determined through the use of the Statistical Product for Service Solution SPSS version 20. The reliability measurements for the piloted instrument were calculated and the result was $\alpha = 0.873$. According to Creswell 2007, Cronbach's Alpha reliability coefficient values of 0.70 and above are considered reliable. Trustworthiness was used to verify the validity and reliability of the instruments employed. The aim of trustworthiness in research instrumentation is to support the argument that the inquiry's findings are worth paying attention to (Polit & Beck). To bring about trustworthiness, the researcher incorporated five aspects of trustworthiness into the study: credibility, dependability, confirmability, authenticity and generalizability.

**Table: Population for the Study**

| No. | School | No. of Teachers | No. Head Teachers |
|---|---|---|---|
| 1 | Kibi School for the deaf | 1 | 3 |
| 2 | Ashanti school for the deaf | 3 | 3 |
| 3 | Demonstration school for the deaf | 3 | 3 |
| 4 | Bechem school for the deaf | 2 | 3 |
| 5 | Cape coast school for the deaf | 2 | 3 |
| 6 | State school for the deaf | 2 | 3 |
| 7 | Volta school for the deaf | 2 | 3 |
| 8 | Koforidua school for the deaf | 2 | 3 |
| 9 | Sekondi school for the deaf | 2 | 3 |
| 10 | Gbeogo school for the deaf | 2 | 3 |
| 11 | Swedru deaf | 1 | 2 |
| 12 | Wa deaf | 3 | 3 |
| 13 | Savelugu school for the deaf | 2 | 3 |
| 14 | Sect-Tech school for the deaf | 3 | 3 |
| | **Total** | **30** | **42** |

Stratification of sample was done at two levels. First the target population was categorized into the number of schools and secondly based on number of teachers chosen from each school as shown from the table above and formula below. Stratified random sampling involves dividing a school into smaller sub-groups known as strata based on the teachers' shared attributes or characteristics such as gender, age, educational level, geographical location, challenges in applying ICT and strategies adopt in overcoming those challenges. Similarly, Nguyen et

al. (2020) regard stratified random sampling as proportional random sampling or quota random sampling. This is because the researchers can obtain a sample of teachers for the study that best represents the entire Social Studies teachers in each school. The stratification process first starts with determining the number of schools to select for the task using the Krejcie and Morgan (1970) formula shown in equation 1

$$ss = \frac{(X^2NP(1-P))}{d^2(N-1) + X^2P(1-P)}$$

Equation 1 Krejcie and Morgan (1970) formula

Where

**N** is the population size, **P** is the Population proportion (expressed as a decimal) (assumed to be 0.5 (50%) and **d** is the degree of accuracy (5%), expressed as a proportion (0.05); It is a margin of error. **S** is the sample size of a finite population size; **X** is the z-value or confidence level of 95%, which is 1.96. Therefore, for this research, where N is the population size of each stratum. However, to avoid lengthy formula work, the study references the Krejcie and Morgan (1970) table where all the sample size for each corresponding population group has been pre-calculated.

N= 14

$$S = \frac{(1.96)^2\,(14)(0.5)(1-0.5)}{(0.05)^2\,(14-1) + (1.96)^2\,(0.5)(1-0.5)}$$

$$= \frac{3.8416 * 14 * 0.25}{(0.0025)(13) + (3.8416)(0.25)}$$

$$= \frac{(13.4456)}{0.0325 + 0.9604}$$

$$= \frac{13.4456}{0.9929}$$

$$ss = 13.54ss \approx \mathbf{14}$$

The results indicate that all fourteen schools should be selected for the study.

About the Krejcie and Morgan (1970) table in appendix C, for a total population of 30 Social Studies teachers in table 1, a sample size of 28 teachers should be selected for the study. By using equation 2, the exact number of teachers to be chosen from each school is shown in table 2

$$\text{Sample Size (s)} = \frac{\text{Populaiton of Stratum}}{\text{Population of Strata}} * SS$$

Equation 2: Stratified sampling procedure

**Table: Sample Size of Teachers for each School**

| No. | School | Stratification | Sample Size |
|---|---|---|---|
| 1 | Kibi School for the Deaf | $\frac{1}{30} * 28$ | 1 |
| 2 | Ashanti School for the Deaf | $\frac{3}{30} * 28$ | 3 |

| | | | |
|---|---|---|---|
| 3 | Demonstration School for the Deaf | $\frac{3}{30} * 28$ | 3 |
| 4 | Bechem School for the Deaf | $\frac{2}{30} * 28$ | 2 |
| 5 | Cape Coast School for the Deaf | $\frac{2}{30} * 28$ | 2 |
| 6 | State School for the Deaf | $\frac{1}{30} * 28$ | 2 |
| 7 | Volta School for the Deaf | $\frac{2}{30} * 28$ | 2 |
| 8 | Koforidua School for the Deaf | $\frac{2}{30} * 28$ | 2 |
| 9 | Sekondi School for the Deaf | $\frac{1}{30} * 28$ | 1 |
| 10 | Gbeogo School for the Deaf | $\frac{2}{30} * 28$ | 2 |
| 11 | Swedru School for the Deaf | $\frac{3}{30} * 28$ | 3 |
| 12 | Wa School for the Deaf | $\frac{3}{30} * 28$ | 3 |
| 13 | Savelugu School for the Deaf | $\frac{2}{30} * 28$ | 2 |
| 14 | Sect-Tech School for the Deaf | $\frac{1}{30} * 28$ | 1 |
| | **Total** | | **28** |

Convenience sampling was used to select 14 head teachers to participate in the study. Convenience sampling relies on available participants who agree to participate in the study. Scholars like Polit and Beck (2010) argue that for qualitative study, samples are typically small and based on information needs. Further, what makes it appropriate for the school's management is that the sampling method requires the researchers to have prior knowledge about the purpose of the study so that eligible members of management can be identified and chosen. Therefore, the researchers thoroughly thought about establishing a sample population even if it is not statistically representative of the more significant population at hand.

Two different instruments were used to collect qualitative and quantitative data according to each research objective's requirements. For the quantitative data, questionnaires were used to gather the primary data on the ICT tools used as well as the challenges faced in using them for effective instruction. The Social Studies teachers indicated the extent to which they agreed or disagreed with each scenario based on a five-point Likert scale, with 1 (strongly agree), 2 (agree), 3 (not sure), 4 (disagree), and 5 (strongly disagree).

The data were collected from the school's management through direct interviews. They were encouraged to provide any other information relating to ICT challenges in teaching Social Studies to students who are deaf that may not be captured in questions. The interaction during the interview session was recorded using a tape recorder and phone; some critical points were written down. The interviewers gathered information about the school's general ICT infrastructure and its integration into the teaching and learning processes for the students who are deaf (Klar & Leeper, 2019).

Data analysis involves the breaking up of data into manageable themes, patterns, trends and relationships. The data collected for the study were analyzed separately as quantitative and qualitative data.

After retrieving all the questionnaires, they were thoroughly examined to ensure all the information was provided according to the instructions. Afterwards, numeric codes were assigned to each response and captured into SPSS version 22. For each research objective, factor analysis was used to analyze the data gathered. Text analysis was used to interpret the recorded conversation and other data gathered from the focus group interview for the qualitative data. Text analysis is about paraphrasing texts to extract machine-readable facts from them (Yıldırım & Güler, 2020). The purpose of text analysis is for a researcher to classify and extract meaningful information form unstructured data. The process can be likened to a situation where a researcher is mining for information from all kinds of rocks and soil, which Rigdon et al. (2019) described as "slicing and dicing heaps of unstructured, heterogeneous documents into easy-to-manage and interpret data pieces".

**Research Question 1: What ICT tools do Social Studies teachers use in teaching deaf students in Ghana?**

The table showed that many of the teachers who teach Social Studies to students with hearing impairments reported not using audio devices like microphones during their teaching sessions. This could be attributed to the nature of hearing impairment the students had. Similarly, the teachers indicated they could not use the internet to support the teaching of Social Studies. This affirms Komabu-Pomeyie's (2020) observation that most schools are unable to use ICT tools because they do not have an electricity connection or a well-equipped laboratory. On the other hand, it can be observed from Table 4.4 that, to some extent, the teachers used tools such as projectors, presentation clickers, visualizers, and computers in teaching their students with hearing impairments. On the contrary, most of the teachers indicated that they did not have access to tablets and other computer-aided devices to teach students with hearing impairment.

**Table 1: ICT Tools Social Studies teachers Use**

| **ICT** | **Component** | | | |
|---|---|---|---|---|
| | **1** | **2** | **3** | **4** |
| Visualizer | 0.758 | | | |
| Projectors | | 0.850 | | |
| Whiteboard | | 0.743 | | |
| USB Devices | | | 0.780 | |
| Computers | | | 0.770 | |
| Internet | | | 0.665 | |
| Computer-aided Devices | | | | 0.702 |
| Interactive Videos and Tools | | | | 0.695 |
| **Total Variance Explained (%)** | **17.4** | **15.8** | **14.5** | **9.0** |

**Source: Field data, 2021**

From Table 1, visualizers accounted for 17.4% of all the ICT tools used by Social Studies teachers and projectors, and whiteboards accounted for 15.8% of the tools the teacher used to teach Social Studies. On the other hand, USB devices, computers, and the internet account for 14.5% of the ICT tools teachers use by the Social Studies teachers. In a similar study, Al-Ibrahim (2019) noted that the content material and pre-class assigned work, such as instructional videos and tasks delivered through the learning management system, while active learning activities were carried out in class via presentation. It is interesting to note that, though visualizers were ranked highest among the ICT tools that the teacher teaching Social Studies used, the teachers

did not identify them to be so. These inconsistencies among the questionnaire and interview responses are significant because some responses given by the heads of the schools appeared to contradict what the teachers provided.

The H6 explained that:

Due to the condition of our students, we avoid all audio-related devices and focus more on visuals and computer-aided devices suited to the needs of deaf students.

On the contrary, the H2 noted that.

Computers, USB devices and the internet has become an integral part of modern tuition. However, when the government is making purchases for ICT equipment for schools, they do not pay attention to the needs of students with hearing impairment. This is because they sometimes bring machines that are designed for normal students. Currently, we are struggling with internet connection, the school must use its internal generate funds to pay for internet connection for teachers and students. This is not sustainable due to the cost involved, when the schools are unable to pay for connection; teachers and students are forced to use their money for data bundles on their phones.

These sentiments appear to echo the concerns among all the headteachers who complained bitterly about lack of sustainable internet connections and computer-aided devices designed for students with special needs. Similarly, Tam et al. (2018) opined that educators and school administrators are interested in the myriad possibilities new technologies offer to enrich teaching materials and provide ubiquitous learning environments to enhance students' learning.

Teaching students with disabilities entails many challenges, and those challenges become even more complicated for students with hearing impairments. Specifically, since most classrooms instructions are predominantly delivered verbally (i.e., lecture method), the teacher of students with hearing impairments must find other ways to present information to their non-hearing and non-speaking students. The use of ICT could be helpful in that regard, but its successful implementation would depend on how those challenges are adequately addressed.

**Research question 2:** What challenges do Social Studies teachers face in the use of ICT in teaching deaf students in Ghana?

**Table 2: Challenge's Social Studies teachers face in the use of ICT**

| **Challenges** | **Mean** | **S.D** |
|---|---|---|
| Internet accessibility problems | 1.27 | 0.54 |
| Teachers' competency | 1.43 | 0.55 |
| ICT tools for students with deafness | 1.33 | 0.49 |
| Students' lack of training in ICT tools | 1.48 | 0.64 |
| Lack of multimedia content | 1.36 | 0.61 |
| Limited technical support | 1.52 | 0.62 |
| Access to ICT-aided reading software | 1.58 | 0.75 |
| Lack of in-service training for teachers | 1.60 | 0.69 |
| Lack of motivation for students | 1.59 | 0.68 |
| Lack of professional development in ICT | 1.57 | 0.72 |

**Source: Field data, 2021**

The Social Studies teachers and school administrators identified the challenges that adversely affect the successful implementation of the teachers' ICT knowledge and skills in teaching social skills to students with deafness: (a) internet accessibility problems; (b) Teachers' ICT competency; (c) ICT tools for students with deafness; (d) Students' lack of training in ICT tools; (e) Lack of multimedia content; (f) Limited technical support; (g) Access to ICT–aided reading software; (h) Lack of in-service training for teachers; (i) Lack of motivation for students; (j) Lack of professional ICT training.

The challenges the teachers identified are not peculiar to teachers in special schools. However, they are, in many ways, more significant regarding the education of students with deafness. For instance, the non-availability of computer-aided ICT devices that are designed for students with hearing impairments can adversely affect their learning in today's technology-based classroom. Similarly, teachers' ICT incompetency and lack of in-service training would not improve well for teaching and learning Social Studies in schools for the deaf.

The present findings are similar to findings reported by Abdulai et al. (2019), who identified the lack of essential knowledge and skills about ICT tools, which makes it difficult for their usage to teach students who are deaf, and Addai-Wireko et al. (2020), argued that such limitations adversely hinder technology integration and use in schools. In addition, Senadza et al. (2019) concluded that, in most schools for students with hearing impairments across Ghana, the ICT infrastructure was not customized for the students or integrated with other subjects to promote learning.

The H3 explained that:

> Schools for the deaf are unable to acquire customized ICT tools for students with special needs since they are very expensive. Government have made pledges to supply us with ICT tools and ICT -aided devices for the deaf. However, for many years now special school rely on donors for such equipment.

At H7 noted that:

> Some parents have provided their wards with smartphones, laptops and other ICT tools customized for the deaf to study well. But at least almost all students have access to phones now; hence, teachers capitalize on these during teaching. Some teachers provide the theoretical guide for the students using diagrams, charts and other forms of visualization.

H10 noted that:

> Though there are many ICT tools out there, for Social Studies, the teacher needs the internet, projectors and videos to properly present concepts to the students. Further, ICT tools that have been specially customized for Social Studies are quite expensive and sometimes hard to acquire. The schools have relied on the government for many years to provide these tools for teachers but to no avail. Foreign donors and some local institutions have occasionally provided some of the equipment.

Table 4.5 showed that about 16% of challenges Social Studies teachers in the schools for the deaf in Ghana face regarding the use of ICT to teaching students with hearing impairment can be attributed to lack of appropriate training on the usage of ICT in teaching Social Studies and lack of access to ICT aided phonological process in the procedure of reading skill acquisition. On the other hand, the lack of ICT aided tools for orthographic strategy as an alternative to the phonological and limited time for ICT training for teachers also accounts for about 13% of the challenges Social Studies teachers face in teaching students with hearing impairments.

Finally, lack of practical training in ICT and other specialized technology for students with special needs, lack of teachers' competency in ICT and limited access to an internet connection also accounted for about 10% of the challenges Social Studies teachers in the study faced in teaching students with hearing impairments. These findings affirm that of Hashim and Tasir (2020), who investigated the usability of an e-learning environment embedded with sign language videos and students with deafness related academic performances and learning

patterns. The study concluded that the students with deafness, who achieved the best performance increment category, were those who accessed the sign language videos more frequently compared to other students with deafness that did not.

H13 acquiesced to the fact that:

> Teachers do not get opportunity to further their education on ICT related programmes, they are left on their own neither do they get special training offers in the form of seminar, workshops or refresher courses equip them with the requisite knowledge in ICT which they can impact on the students with hearing impairments.

**Research question 3:** What approaches do Social Studies teachers employ to circumvent the challenges in the use of ICT in teaching deaf students in Ghana?

Inferring from the responses by Social Studies teacher respondents and head teacher participants in response to challenges they face in the use of ICT tools to teach students with hearing impairments as captured in research question 2, the following approaches could be stated:

Social Studies teacher respondents suggest the need for provision of available ICT tools and ICT aided devices, for example, reading skills acquisition etc designed to students with hearing impairment. In supporting this, a head teacher participant said the few ICT tools they have in use are provided by donors and parents as pledges by the government have remained unfulfilled. They are of the view that enough ICT tools will help Social Studies teachers provide practical teaching as opposed to theoretical guide in the form of using diagrams, charts and other forms for visualization.

Social Studies teacher respondents suggest regular internet connectivity as a solution to challenges to ICT integration. In corroborating this, a head teacher participant raised the need for the internet, projectors and videos to properly present concepts to students.

Social Studies teacher respondents suggest being provided with ICT knowledge and skills in teaching students with hearing impairment through continuous professional development (CPD) and training. According to a head teacher participant, this will enhance their competency and skills and facilitate technology integration and use in schools. Another head teacher participant said that they do not get opportunity to further their education in ICT related programmes as they are left on their own and do not get assistance to attend seminars, workshops and refresher courses.

Teacher respondents suggest the need for support with multimedia content such as computers and projectors, whiteboards for viewing and beaming materials in the classroom.

## CONCLUSION

The study raises the need to integrate ICT into the Social Studies curricular and instructional practices at the school for deaf in Ghana. The study uncovered many challenges faced in getting access to the ICT tools and its application at the school for deaf in Ghana. Based on the findings the study recommends in-service training and other refresher courses to sensitize teachers and update their ICT knowledge, skills and usage. The implications of the study are as follows; access to educational resources (ICT) for School for deaf appears to be hindered. This affects their quality of learning and educational success. The study has shown that the integration of ICT can significantly improve teaching and learning outcomes in school for deaf in Ghana.

## RECOMMENDATIONS

Recognizing the potential benefits associated with the use of ICT tools, the study recommends that the Government of Ghana through its educational agencies must intensify efforts to upgrade the necessary technological infrastructure and ICT-based tools for instruction and learning for school for deaf in Ghana. The

study again, recommends active involvement of Social Studies teachers to ensure effective integration of ICT in the classroom of school for deaf in Ghana.

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