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EXPLORING THE USAGE OF INFORMATION COMMUNICATION TECHNOLOGY TOOLS AND THEIR BENEFITS IN BASIC SCHOOLS IN GHANA: A CASE OF AGORPKO D.A. JUNIOR HIGH SCHOOL IN THE SOUTH TONGU DISTRICT, GHANA

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ABSTRACT

This paper seeks to identify the Information and Communication Technology (ICT) tools available for students. It also investigates how Information and Communication Technology (ICT) tools benefits students' in learning in a basic school in Ghana. A total of 60 students from Agorkpo D.A. JHS in the South Tongu District were surveyed. A descriptive design was used for the study. A set of questionnaires was used to collect data from the respondents. The entire questionnaires were retrieved and IBM Statistical Package for Social Sciences version 22.0 in combination with the Microsoft excel were used to analyse the data. Simple frequency tables were used to present the data. The study discovered that laptop was the most used ICT tool in the school investigated and the benefits students derive from the use of the ICT tools in the school included support for classroom teaching and learning, facilitation of skills learning, helps in contacting other people (building network) and assisted in vocabulary building. The study recommended that government and other stakeholders should support the school with ICT tools in order to promote teaching and learning.

KEYWORDS: Information and Communication Technology; ICT Tools; Students; Basic School; Academic performance; Agorkpo D. A. J.H.S; Ghana.

Introduction

Information and Communication Technology (ICT) is used as a generic term to refer to technologies used for collecting, editing, storing and disseminating information in various forms (Thiyagu, 2016). According to Thiyagu (2016), since the inception of the 21st century ICT has remained the major contemporary tool shaping the global economy and producing rapid changes in society. Similarly, ICT has transformed the nature of education, where and how learning takes place and the role of students in the teaching and learning process. However, its benefits and related challenges are increasingly becoming a topic of debate. As a result, different developing countries have initiated public policies aimed at promoting information communication technology and maintaining its integrity in schools.

In 2003, Ghana formulated its first ICT in education policy, which saw three reviews in 2006 and 2008, and metamorphosed to the current document adopted in 2015 (Ministry of Education, 2015). The ICT in education policy has a vision of integrating ICT tools into the curriculum for all subjects and at all levels of education in Ghana. It has an overarching goal “to enable all Ghanaians including teachers and learners in either the formal, informal and non-formal systems to use ICT tools and resources to develop requisite skills and knowledge needed to be active participants in the global knowledge economy at all times” (MOE, 2015). The policy was directed at using ICT tools to facilitate teaching and learning within the Ghanaian educational system and also promote e-learning.

According to the then Minister of Education, as quoted in the foreword of the policy document, “the Government shall put in place measures to strengthen science education at all levels ... with an emphasis on the use of ICT to facilitate the training and learning process” as part of this policy commitment (MOE, 2015). As a result, this policy has sustained the foundation of a successful production of a teaching syllabus for ICT in the Junior High Schools and other levels of education in Ghana by the Ministry of Education. Based on the policy formulated by MOE, the Ghana Education Service had been empowered with the responsibility of ensuring that the integrated and coordinated implementation of the ICT policy and its associated activities in the Junior High Schools across the Country were implemented.

The Problem

It has been observed over the years that since the adoption of the ICT policy, most schools in the country have not been able to teach and learn ICT as a subject, let alone integrate it into the teaching and learning of other subjects and co-curricular activities. This could be as a result of the lack of teachers to teach the subject and the unavailability of concrete teaching and learning

materials in the schools. Although the Government of Ghana, since 2008 has distributed laptops to pupils through RLG Company dubbed “one laptop per child project”, many of the pupils who received the laptops could not boast of it today because they did not realise its value at the time and thereby defeating the objective of the project (Kwode, 2015).

In an observation during a visit to the study area (Agorkpo D. A. J.H.S), it has been observed that pupils in the school found it difficult to search simple concepts using the internet. Secondly, they were not able to use the smartphone and the computer for assessing and processing information. A critical observation of an ICT lesson taught also indicated that learners were not able to get the concepts of ICT applications well. This was because, the lesson was taught in abstract, without the use of practical ICT tools. In a better instance where pictures of computer components were used, the learners hold unto the idea of repeated memorisation and definition of concepts.

Consequently, with the recent mass education by the Ghana Education Service and ICT-oriented Non-Governmental Organisations (NGOs) and pressure groups, ICT in education has now gained recognition in many schools in order to ensure harmony between education and the contemporary job industry. This paper therefore seeks to:

- Explore the ICT tools being used by students for learning in Ghana and most importantly in a deprived community school (Agorkpo D. A. J.H.S.)
- Investigate the benefits students of this community derive from the use of ICT tools for their academic work (learning).

Literature review

ICT Tools Used for Learning in Schools

Information and Communication Technologies (ICT) is defined by Blurton (1999) as cited in World Bank (1998) as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information”. These technologies include computers, the internet, broadcasting technologies (radio and television), and telephones. A personal computer is one of the best-known examples of the ICT tools used in education, but the term multimedia is also frequently used. Multimedia can be interpreted as a combination of data carriers, for example video, CD-ROM, Floppy disc and internet and software in which the possibility for an interactive approach is followed (Oshinaike & Adekunmisi, 2012).

According to Agnew et al (1996), schools must not remain places for the transmission of a prescribed set of information from teachers to learners over a fixed period of time, which has

been the case for the past decades, rather, schools must promote “learning to learn”, implying the acquisition of knowledge and skills that make possible continuous learning over the lifetime (Kools & Stoll, 2016). Oshinaike and Adekunmisi (2012) argued that conventional media technologies can no longer meet the needs of our teaching and learning processes; as a result, they must be replaced by multimedia technology.

In the same study, Oshinaike and Adekunmisi (2012) further revealed that the internet and its facilities as well as the Computer and CD-ROMs were the mostly used multimedia resources whilst the television and transparencies were the least being used. The study further revealed that all the ICT tools can be classified in two major categories called hardware and software. Hardware consist of physical equipment that are used for processing information in various ways, and software consists of the instructions or programs that determine tasks being performed by the hardware and the way these tasks are performed.

Similarly, the use of ICT in education although the term encompasses a host of devices most of which are used complimentarily but the term multimedia is also frequently used. Multimedia can be interpreted as a combination of data carriers, for example video, CD-ROM, Floppy disc, the internet and software, in which the possibility for an interactive approach is followed (Oshinaike & Adekunmisi, 2012). According to Oshinaike and Adekunmisi (2012), advanced hardware and sophisticated devices would not work without the use of software because they are designed specifically to be nothing without software. Table 1 presents the ICT tools (hardware and software) used in schools for teaching and learning.

Table 1: Information and Communication tools used in teaching and learning in schools

Hardware	Software
Desktop computer	Reference software
Laptop computer	Drill and practice software
Smart phones	Educational games
Tablets	Tutorial software
Projector	Speed reading software
Smart board	Spelling software

Radio	Maths problem solving software
Television	Vocabulary software

Source: Adapted from (Ghavifekr, et al, 2016; Sharma, et al, 2011 and Kenyanote, 2019)

From the table 1, it has been identified that the ICT tools used in schools could be categorised into hardware and software. The hardware consists of desktop computers, laptops, smart phones, tablets, projectors, smart board, radio and television whereas the software includes things like reference managers, drill and practice software, educational games, tutorial software, speed reading software, spelling software, maths problem solving software and vocabulary software.

In an attempt to explore ICT tools used in schools, there have been many studies on students' integration of ICT into learning across the world. For instance, a study conducted by Kennedy, Judd, Churchward and Grey (2008) on 2000 Australian students revealed that some students use computer for general study purposes, others use computer to develop web pages but a great number of students use computer to play music every day or once a week. Further, Kvavik (2005) conducted a study on 4374 students to investigate their use of ICT in schools. The study found that students frequently use ICT for email, instant messaging, word processing and internet surfing. Again, Zakaria, Watson and Edwards (2010) conducted a research on Malaysian students' use of ICT in schools. The result showed that students use email to disseminate and share digital contents. In a similar study, Yukhymenko and Brown, (2009) investigated the use of ICT among 122 Ukrainian high school students. The result discovered that 53.3% of the students use ICT in school once a week but 33.5% indicated that they never use ICT in school. However, the study was silent on what the students used ICT for in schools. As a comparison with advanced countries, the technology use in education in developing countries is relatively limited.

Benefits of using ICT tools in learning

In recent years, there has been an upsurge of interest in how computers and the internet can best be harnessed to improve the efficiency and effectiveness of education at all levels of education in Ghana. It has been recognized that conventional media technologies can no longer meet the needs of our teaching and learning processes; as a result, they are being replaced by multimedia technology. According to Al-Shboul, Al-Saideh et al. (2017), ICT has been an essential requirement in educational institutions for learning and teaching in the present day of

digital environment where learners access, use, capture video lectures, and digital notes through electronic gadgets.

It is an indisputable fact that ICT has the potential for increasing access to and improving the relevance and quality of education, especially for developing countries. It thus represents a potentially equalizing strategy for developing countries as most of them have exhibited it in the adoption of ICT in education policies. Perhaps, the ultimate goal in promoting the use of ICT in schools has been to increase the effectiveness of teaching and improve pupils' learning. This is buttressed by the World Bank (1998) research that stated that:

“Information Communication Technology greatly facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, is their sense of isolation. The new communications technologies promise to reduce that sense of isolation, and to open access to knowledge in ways unimaginable not long ago.”

Oshinaike and Adekunmisi (2012) indicated that information technology application serves many different purposes; search engines and knowledge sharing portals. Oshodi (1999) posits that awareness created towards the use of information and communication technology over the years is increasing in the classroom learning environment in the third world, such that mere verbalization of words alone in the classroom to communicate ideas, skills and attitude to educate learner is no more yielding results. This view is supported by Omagbemi et al (2004) that access to multimedia information could stimulate changes and create conducive learning environment and make learning more meaningful and responsive to the localized and specific needs of learners.

Many educational communities absolutely share the vision concerning the central role and importance of ICT in the educational contexts of the future (Wood, 1993). That vision is associated by an acknowledgement that in order to realize this vision, three factors – access, training and targets must be provided (Simpson, Payne, Munro and Hughes, 1999; MOE, 2015) which informs the adoption of policies by governments. Also, the many kinds of ICT tools used for teaching and learning can be used in education for different purposes. For instance, some of the tools helped students with their learning by improving their ability to access and comprehend simple concepts using search engines and other software (Valasidou et al 2005).

In a study conducted to explore the benefits of the use of ICT in schools, Simpson et al (1999) found out in their study that 64% of the teachers used ICT tools in the production of handouts using standard word processing package; about 27% indicated that they made use of and had experience with more powerful communication and presentation software; and only 32% incorporated the use of any ICT software into the lectures. All these practices affect learner experience in various ways.

Research Methodology

A descriptive research design was used for this study. The descriptive design involves the description of the present status of event or phenomenon under investigation (Banji, 2018). A set of questionnaires was used to collect data for this study. The questionnaire was administered by the researchers and their research assistants including the heads and teachers of the school. Some of the items were read and explained to the students as recommended by Amedahe (2002). The students were therefore given the opportunity to voluntarily provide a response to the items in the questionnaire. The questionnaire had three different sections: Section A solicited the socio-demographic characteristics of the respondents; Section B explored the ICT tools being used in the school and Section C investigated the benefits of the use of ICT tools in the school.

The population for this study includes all the students of Agorkpo D.A Junior High School in the South Tongu District of the Volta Region in Ghana. To generate the sample for this study, a list of all the students in Agorkpo D. A. Junior High School was requested from the school administrator. Since the JHS has three classes, the population was then stratified into three groups representing the three classes of the Junior High School. From each stratum, a proportionate number of respondents were selected at random using the lottery method. Since students in the three classes have varying lengths of stay and learning experience in the school with JHS 3 staying longest and JHS 1 staying shortest, 50% of the sample was selected from JHS 3, 30% from JHS 2 and 20% from JHS 1, totalling 60 students. Data collected was coded, captured and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 22. The results were presented with simple frequency tables.

Results and Discussion

Socio-demographic characteristics of respondents

Table 2 presents description of the socio-demographic characteristics of the respondents as below:

Table 2: Socio-demographic characteristics of respondents

Characteristic	Frequency	Percentage (%)
Age		
10 - 12	4	6.7
13 - 15	39	65
16 - 18	17	28.3
Total	60	100.0
Gender		
Male	32	53.3
Female	28	46.7
Total	60	100.0
Length of stay in the school		
1 year	20	33.3
2 years	25	41.7
3 years	15	25.0
Total	60	100.0
Class		
JHS 1	20	33.3
JHS 2	21	35.0
JHS 3	19	31.7
Total	60	100.0

Source: Field Data, 2019

The results in Table 2 as above demonstrates that respondents were predominantly males. Out of the sixty students surveyed, thirty-two of them were males, constituting 53.3%, and the remaining twenty-eight were females, constituting 46.7%. Also, 6.7% of the respondents were aged below 13 years, about 65% were within 13 and 15 years, whilst 28.3% were aged above 15 years. Twenty of the respondents representing 33.3% have stayed in the school for a year, twenty-five of them representing 41.7% have stayed for 2 years and fifteen of them, representing 25% have stayed for 3 years. However, 20 (33.3%) of them were in JHS 1, 21(35%) were in JHS 2, whilst 19 (31.7%) were in JHS 3.

ICT tools used for learning by Agorkpo D.A J.H. S students

Table 3 as below presents the respondents' views on the ICT tools used for learning in the school studied. A likert scale was provided for the respondents to select from the options ranging from: Agree (A), Disagree (D) and Undecided (U).

Table 3: ICT tools used for learning by Agorkpo D.A J.H. S students

ICT Tools	Agree Freq. (%)	Disagreed Freq. (%)	Undecided Freq. (%)	Total Freq. (%)
Desktop PC	12(20%)	43(71.7%)	5(8.3%)	60(100%)
Laptop	40(66.7%)	16(26.7%)	4(6.6%)	60(100%)
Tablet	1(1.7%)	52(86.6%)	7(11.7%)	60(100%)
iPad	1(1.7%)	48(80%)	11(18.3%)	60(100%)
Smartphones	20(33.3%)	32(53.3)	8(13.4%)	60(100%)
Projector	0(0)	54(90%)	6(10%)	60(100%)
TV	1(1.7%)	55(91.7%)	4(6.6%)	60(100%)
Radio	4(6.7%)	50(83.3%)	6(10%)	60(100%)

Source: Field Data, 2019 Data is presented as frequency with percentage in parenthesis

From Table 3, 20% of the respondents agreed that the ICT tools used in their school included Desktop PCs whilst 43 (71.7%) disagreed. An insignificant number of five respondents (8.3%) were undecided on the issue. Although, Sharma et al (2011) posited that desktop PCs is an essential ICT tool used in schools, it can be inferred from this result that they are not used for learning in Agorkpo D. A. J.H.S. About 40 (66.7%) respondents agreed that laptop computers are used for learning in the school while 16 (26.7%) disagreed. It can be inferred that teachers who possess laptop computers bring them to school to facilitate the teaching and learning process. This confirms the assertion of Ghavifekr et al (2016) that laptops are gaining prominence among the ICT tools being used by schools.

On the issue of the use of smartphones for teaching and learning in the school. Although majority, 53.3% are in disagreement with the use of the device. Also, 20 respondents representing 33.3% agreed. About 8 (13.4%) of the respondents were however, undecided on the issue. This result justifies the assertion of Kenyanote (2019) that smartphones are used to

supplement the traditional ICT tools in schools since they are widely available and in possession of many individuals.

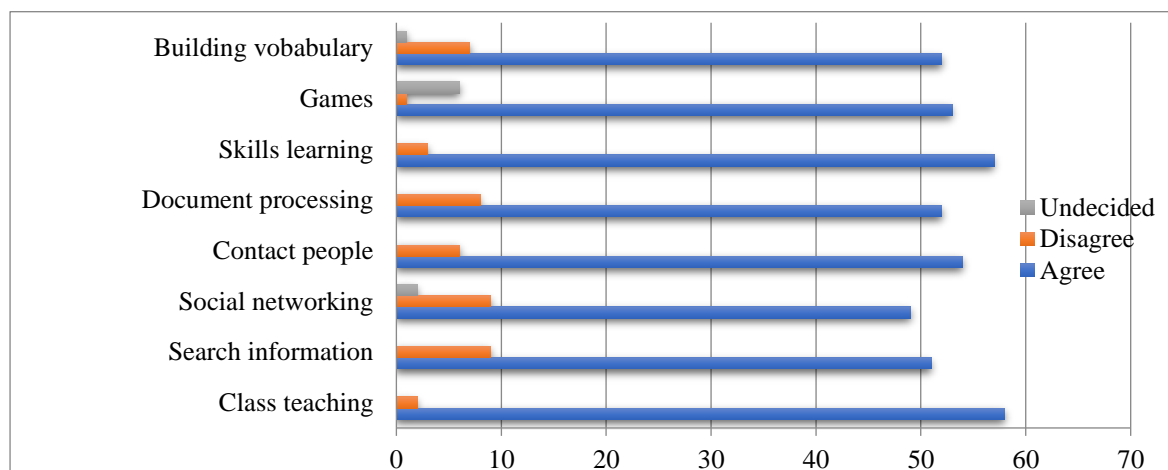
Subsequently, when respondents were asked to indicate if overhead projectors were used in delivering lessons to them, the finding indicates that none of the respondents agreed to the use of overhead projector. However, 10% of the respondents were undecided on the use of overhead projector in the school. This result disagrees with Mangesi (2007), who indicated that projectors are available in schools for educational purposes. It can be inferred from the table that TV and radio were also not used for teaching and learning in the school. As 55 (91.7%) and 50 (83.3%) respondents disagreed with the use of TV and radio respectively while only one (1.7%) and four (6.7%) agreed. This confirmed the finding of Oshinaike and Adekunmisi (2012) that radio and television were the least ICT tools being used in schools.

Generally, the results in Table 3 confirmed the postulations by Ghavifekr et al (2016) and Sharma et al (2011) that the most widely used ICT tools in schools are the desktop and the laptop PCs because respondents have demonstrated knowledge of the ICT tools under studied. However, these ICT tools were not available in the school for the respondents to use for learning. It is the opinion of the researchers that this would go a very long way to affect learning in the school.

Benefits of the use of ICT tools in Agorkpo D. A. J.H.S

Figure 1 presents the description of the benefits respondents presumed to emanate from the use of ICT tools in the school.

Figure 1: Benefits of the use of ICT tools in Agorkpo D. A. JHS



Source: Field Data, 2019

From Figure 1 as above, most of the respondents agreed that ICT tools are very beneficial in classroom teaching. As illustrated in Figure 1, fifty-eight respondents (96.6%) agreed to the assertion that ICT tools support teaching and learning in class. However, 3.4% of the respondents did not see the beneficial aspect of ICT tools. This confirms the assertion of World Bank (1998) that the use of ICT in schools increases the effectiveness of teaching, and improves the learning of students. The study also agrees with Al-Shboul et al. (2017) who qualifies ICT as an essential requirement in educational institutions for learning and teaching. Figure 1 also indicates that fifty-one respondents (85%) agreed that ICT tools were used to share information. This is in consonance with Oshinaike and Adekunmisi (2012) who found out in their study that ICT beneficially serves the purpose of knowledge sharing.

With respect to ICT tools encouraging networking, most of the respondents agreed that ICT tools promote social networking. As shown in figure 1, forty-nine of the respondents (81.7%) agreed to the assertion. However, nine respondents (15%) disagreed. This confirms the study of Mangesi (2007) that Information and Communication Technology tools are used for networking among individuals and institutions. Additionally, most of the respondents also agreed that ICT tools are used to contact other people. This is shown in Figure 1, where fifty-four respondents representing 90% confirmed the assertion. Only six respondents, representing 10% disagreed. This confirms the findings of Buabeng-Andoh and Issifu (2015), Haddad and Draxler (2002) who discovered in their study that ICT tools are used by students to contact each other through emails and other social applications.

With document processing, about fifty-two (86.7%) of the respondents agreed that ICT tools was very helpful in document processing. This confirms the postulation of Kvavik (2005) that ICT tools such as laptops and desktop PCs are used for processing documents. However, 3.3% of the respondents disagreed. From Figure 1, 95% constituting fifty-seven respondents indicated that student benefit from ICT tools to acquire skills that can be used for diverse activities. Additionally, 86.7% of the respondents also agreed that ICT tools could help students build their vocabulary. Vocabularies could be built using software that are written for the specific purpose. This finding disagrees with Buaben-Andoh and Issifu (2015) that students use ICT to communicate with friends more than any other use.

Generally, majority of the respondents agreed to the benefits of use of ICT tools in learning in the basic schools. Only a minority of five respondents on average disagreed with the benefits with a very insignificant average of one respondent being undecided. Haddad and Draxler

(2002) confirms the findings illustrated in Figure 1 by identifying the level of benefits derived from using ICT in education such as demonstration, drill and practice and social networking. This implies that ICT tools are very relevant in the teaching and learning in schools.

Conclusions and policy recommendations

Students that participated in this study showed much awareness of ICT tools used in schools but demonstrated little knowledge about what the tools holistically look like. Most of the students isolated components or units of the desktop PC as separate ICT tools. This suggests that the ICT tools students know of were not physically in existence in the school. Even if otherwise, there are only units or components of a computer system that teachers use to show as examples. In this case, teachers must be committed to provide the least opportunity to students to use the available ICT gadgets or tools by themselves in order to better appreciate what the tools are actually used for.

The study further suggested that in order to achieve meaningful academic improvement, teachers must spend more time teaching the subject and create the enthusiasm in students. It is no doubt that it is very difficult to teach practical subjects like ICT without demonstrations. That makes the teaching and learning of the subject very boring to the teacher and the student respectively, with less interest. It was also observed that students do not know the relevance of ICT in the current century, especially with regards to their academic improvement and progression.

ICT tools are needed to ensure that its skills are efficiently imparted to students. As such, the Ministry of Education in collaboration with the South Tongu District Assembly (STDA) should help provide ICT tools to the school. School authorities are also encouraged to approach philanthropists and charitable organisations to seek support with the acquisition of common and less expensive ICT tools.

In conclusion, to ensure that students master skills in ICT, more attention should be given to ICT lessons. Supervision of ICT teachers should be taken seriously to ensure they meet time table requirements for ICT in the school. Requisite ICT tools should be used to demonstrate processes and applications so that lessons would be activity-based and learner-focused. This way, students would easily understand the concepts and be able to apply them practically and independently.

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