Challenges Junior High School Pupils Face in the Use of Information and Communication Technology (ICT) Tools for Learning in Ghana

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Authors' contributions

This work was carried out in collaboration among all authors. Author GTB designed the entire study, wrote the protocol and wrote the first draft of the manuscript. Authors SO and BK performed the statistical analysis and managed the analyses of the study. Author PM managed the literature searches and assisted in the data collection process. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: This paper seeks to explore the challenges Junior High School pupils in the South Tongu District in the Volta Region of Ghana face in the use of Information and Communication Technology tools for learning. The rationale was to identify the challenges these pupils face in the use of ICT tools for learning and the possible means to overcome these challenges in the school.
Research Design: To achieve the purpose of this studya descriptive research design was used.
Place and Duration of Study: Agorkpo D.A. J.H.S in the South Tongu District of Ghana was used for this study for over six months.
Methodology: The study adopted the quantitative approach, employed descriptive research design and used questionnaire to collect data from 60 students. 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 also used to present the data.

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Results: The research revealed that the commonest challenges of using ICT tools for learning were lack of opportunity provided by teachers for students to use the tools on their own, inadequate ICT tools and difficulty teaching ICT practical lessons without demonstration.
Conclusion: Measures identified to improve the use of ICT tools in the school include the call on government to provide the required ICT tools to the school. Secondly, in order to achieve meaningful academic improvement in the school, teachers must spend more time to teach the ICT subject and create the enthusiasm in the students. Thirdly, supervision of ICT teachers should be taken seriously to ensure that they meet time-table requirements for ICT in the school. Also, requisite ICT tools should be used by the teachers to demonstrate the processes and application of ICT in everyday life. This way, pupils would easily understand the concept and be able to apply it practically and independently. Finally, the study recommended that an ICT laboratory be built for the school to house the ICT department and provide an atmosphere that can motivate the teachers and learners to show more interest in the subject.

1. INTRODUCTION

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 in Ghana. There is also no doubt that, in a relatively short period, Information Communication Technology has increasingly become very important in our daily lives and also in our Ghanaian educational system. This has given birth to the virtual library where users can access a myriad of information by a click of a computer button regardless of their geographical location [1]. It has been recognized that conventional media technologies can no longer meet the needs of teaching and learning processes; as a result, they are being replaced by multimedia technology. This means that ICT has been an essential requirement in educational institutions for teaching and learning in the present day of digital environment. Learners access, use, capture lecture videos and digital notes through electronic gadgets for their learning needs.

Similarly, 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.

According to the Ministry of Education (MOE) [2], it is the Government's desire that through the deployment of ICT in education, the culture and practice of traditional memory-based learning will be transformed to education that stimulates critical thinking, creativity, collaboration and communication necessary to meet the challenges of the 21st century. As a result, a national policy has been adopted to serve as a roadmap for progress.

In recent observation by the researchers on their visit to Agorkpo D. A. J.H.S, it was discovered during the Social Studies lessons that the pupils found it difficult to search simple concepts using the internet. Also, they were not able to use the computer and smart phones for assessing and processing information. A critical observation of an ICT lesson taught 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 gadgets or tools. In another instance, where pictures of computer components were used, the learners held on to the idea of repeated memorisation and definition of concepts. Additionally, during the lesson delivery, it was observed that many of the learners were not able to perform basic operations such as simple searches on a laptop computer and smart phones. Some of the learners were also not able to appreciate information such as images and documents on screens. However, all of them were very enthusiastic about the teacher-learner activities as class was in progress. They all wanted to have a hands-on experience viz to press a key or touch the screen of the phone.

In an attempt to encourage the teaching of ICT in schools, Ghana has made appropriate policy interventions through the Ghana Education Service by incorporating ICT into the educational system and thereby making ICT an examinable subject at the Basic Education Certificate Examination (BECE). The policy was aimed at ensuring that every Ghanaian student acquire

adequate knowledge and skill on the usage of ICT device [2].

One of the objectives of ICT education is to prepare the pupils for future occupation and social life. Meanwhile, ICT tools utilisation in schools has become a grave issue for the Ghanaian educational sector as most schools have not been able to appropriately and efficiently implement the educational policy. A study conducted by Simpson, Payne [3] revealed that in the teachers' delivery of ICT lessons, students seldom experienced demonstrations of the use of ICT as a teaching tool. This implies that pupils would not be able to appreciate the use of ICT tools in learning, which defeats the policy direction of the government.

What is most unfortunate is that Government's ICT in education policies had lost focus such that many pupils still write ICT at the BECE level without seeing or touching a computer. Many districts like the South Tongu equally face similar challenges and where the computers have been provided, pupils do not get full advantage of utilizing it due to other factors such as unavailability of teachers to teach the course, non-existence of electric power and also unavailability of a designated room to serve as computer laboratory for students. To add more insults to injury, it was discovered by [Peprah [4], Buabeng-Andoh and Issifu [5]] in their study that previous researches conducted did not dwell much on the use of ICT facilities for learning among basic schools especially, in Ghana. It is against this backdrop that this paper explores the challenges schoolchildren face in the use of Information and Communication Technology tools for learning in Ghana, more specifically, in a Junior High School in the South Tongu District. The rationale was to find out various measures that could be used to improve upon the use of ICT in learning among children in the South Tongu District and Ghana as a whole. The paper is structured basically into six main parts. These are the introduction, conceptual and theoretical issues, data sources and methods, results and discussions, conclusion and policy recommendations.

2. LITERATURE REVIEW

2.1 Challenges of Use of Information and Communication Technology Tools for Learning

According to Adzobu, Okyere [6], 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.

Due to its importance in society as well as in the future of education, identifying the possible challenges to integrating these technologies into the school curriculum would be an important step in improving the quality of teaching and learning. Balanskat, Blamire [7] argued that although teachers appear to acknowledge the value of ICT in schools, they continue encountering obstacles during the process of adopting these technologies into their teaching and learning. And as a result, most teachers who are not able to overcome these challenges transfer the repercussions to the learners in an indirect manner. A typical challenge is that the learner may end up losing the exposure that he or she deserves.

Despite the adoption of ICT in the Educational policy of Ghana by the Ministry of Education in order to promote virtual learning platform in schools and to enhance ICT usage among learners, it appears ICT usage has not been fully adopted in the teaching and learning process in most schools in the country. Only a few teachers are using ICT as teaching and learning tools [8]. This is because the challenges outweighed the benefits [9]. Therefore, this study is expected to generate information on the challenge's children encounter as ICT facilities are integrated into the entire process of teaching and learning.

Studies have shown that, there are some factors that determine teachers' use and non-use of the new technologies for teaching and learning in the advanced countries and these have varying impacts on the learners. These include the needs of the learner, the characteristics and experience of teachers, the technology available, the environment within which teachers work and how valuable they perceived the use of technology for teaching their students [6,10]. It is also influenced by the subject area in which the teacher is trained [11]. This is confirmed by other researchers that there are disciplinary and

subject differences in the way ICT tools are being used and adopted in teaching and learning [12]. And in developing countries such as Ghana, factors that determine teachers' use and non-use of the new technologies for teaching and learning include factors like teachers' attitude, perception and use of media [5]. Additionally, availability of infrastructural facilities in schools, cost of purchasing; use/knowledge of computer power supply, amongst others were also identified [13].

Interestingly, Ani [14] in a similar study discovered some challenges that hamper ICT development and usage to involve issues of inadequate infrastructure, financial challenges and poor attitude of policymakers on the issues of ICT. According to Hennessy, Harrison [15], a lot of students who are in the developing countries do not have adequate technical knowledge on the use of ICT and as a result, experience challenges in an attempt to use them.

Finally, Qasim and Khan [16] also identified some factors that affect the use of electronic information as; lack of technical knowledge, lack of terminals, difficulty in language, slow downloading speed, poor networking, inappropriate library timing and lack of supports. According to Haliso [17], inadequate computer skills among staff and students inhibit effective use of ICT tools. He concluded that in this era of information explosion, knowledge in computing and searching skills is a very important commodity in the field of learning and research.

2.2 Measures to Improve the Use of ICT Tools for Learning in Schools

It has been argued that the option of computer technology is neither remedy for educational challenges nor a solution for educational reforms, but it is a tool that can be used to support learning and enhance the quality of education Keengwe [18]. Evidence from the literature shows that technology has the ability to improve learning in the classroom and that it has the potential for changing the way teachers teach and how students and pupils learn [19]. This relationship between the quality of teaching and learning and ICT may have been the cause for advanced countries such as the United Kingdom, USA, Australia and the Netherlands to integrate ICT into their curriculum [20]. In Ghana, the Ministry of Education (MoE) supports the idea that technology can be a vehicle to improve teaching and learning and this is clearly evident in its ICT strategy of 2015. The ministry, in the strategy, observes that the quality of teaching

and learning will improve considerably once ICT has been fully incorporated into teaching and learning. In recognition of this fact, the MoE with the help of NGOs have put up measures to equip schools with appropriate ICT facilities to boost teaching and learning.

According to Parkinson, Kennewell [21], it is important to put the learners at a focal point in the use of ICT tools in the learning process. This means that the ICT curriculum should be able to maximize the learners' sense of control of the technology. And that even though researchers and stakeholders have well-intentioned ICT plans for learning, learners' view should be sought [21].

Additionally, technology should be connected to the learning contexts of the learner and should be needed by the learners themselves [22,23]. Making their contribution to this argument, Deaney, Ruthven [24] were of the opinion that learners are the important part in the social system and that their perspectives play a crucial role in the formation of the activities that take place in schools. According to Biatchford [25] and Rudduck, Chaplain [26], in using ICT tools, it is important for the stakeholders to tune in to the learner's voices and listen to their views keenly. This would help in understanding what the learners think about their experiences and what they think to be of importance in their learning, which in turn would lead to their overall good performance. It is evident from the literature therefore that learners are important stakeholders within the school system and that their views play a crucial role in the use of ICT and also providing feedback to teachers and other stakeholders on the type of ICT tools to recommend for the schools since this provides end-user insights in the integration of ICT in schools.

3. MATERIALS AND METHODS

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. 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 pupils as recommended by Amedahe [27]. The pupils 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 pupils 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 pupils 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, totaling 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.

4. RESULTS AND DISCUSSION

4.1 Socio-demographic Characteristics of Respondents

This section describes the socio-demographic characteristics of the respondents.

The results in Table 1 indicates that the respondents who were engaged for this study were predominantly males. Out of the sixty pupils 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, 65% were aged within 13 and 15 years, while 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 (41.7%) have stayed for 2 years and fifteen (25%) have stayed for 3 years. However, twenty (33.3%) of them are in JHS 1, twenty-one (35%) are in JHS 2, whiles 19 (31.7%) are in JHS 3.

4.2 Challenges Junior High School Pupils Face in the Use of ICT Tools for Learning

This section explores the challenges the respondents encountered in the strife to use ICT tools for learning in the Agorkpo D. A. JHS. Their views were presented in Fig. 1 as below:

On the issue of inadequate ICT tools, most (thirty-five) of the respondents representing 58% agreed that there encountered the challenge of inadequate ICT tools whereas twenty of the respondents representing 33.3% disagreed to the assertion. The result revealed that the ICT tools in the school studied were inadequate. This finding is line with Mangesi [28] as he indicated that resources are inadequate to support the ICT policy objectives in Ghana.

Table 1. 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
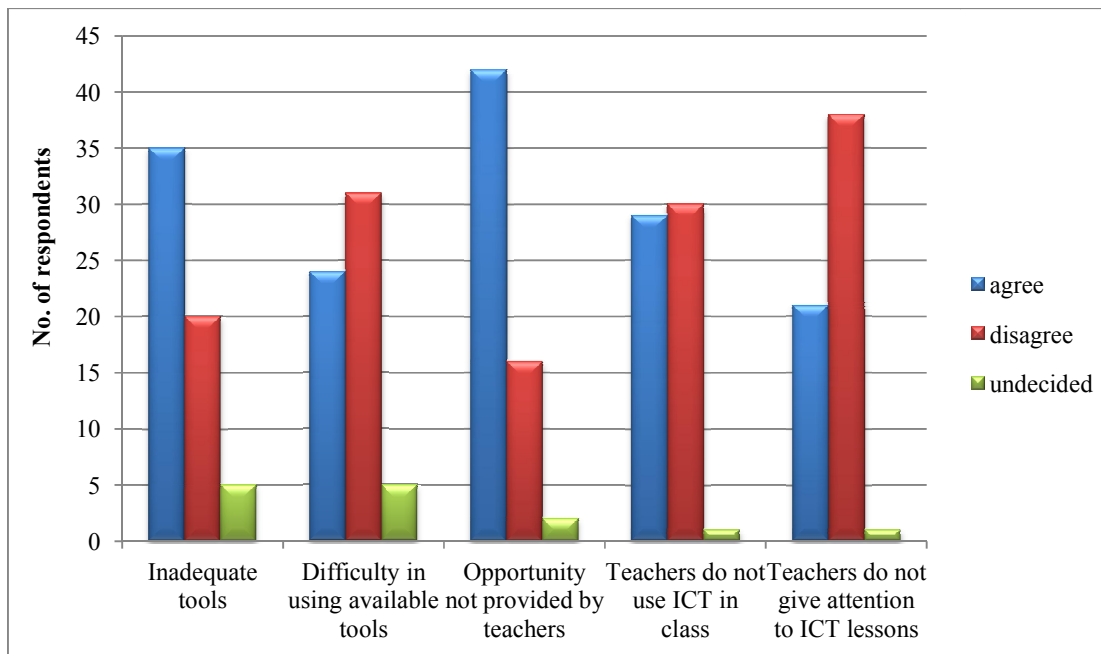
Fig. 1. Challenges students face in using ICT tools in Agorkpo D. A. JHS

On the issue of difficulty using the available ICT tools, twenty-four of the respondents representing 40.0% agreed while thirty-one representing 51.7% disagreed to the difficulty in using ICT tools. The rest 8.3% remained undecided on the assertion. This means that majority of the respondents indicated they could use the ICT tools; however, they just did not have it to use. This is in consonance with Ani [14] who discovered in his study that some challenges that hamper ICT development and usage involved issues of inadequate infrastructure, financial challenges and poor attitude of policymakers on the issues of Information Communication Technology.

Another finding indicates that majority of about 70.0% of the respondents agreed that teachers did not provide opportunity for them to use the available ICT tools. About 26.7% of the pupils disagreed with the assertion that opportunity was not provided for them by the teachers to use the available ICT tools. It would be inferred from the Fig. 1 as above that the ICT tools were not available hence, the perception that teachers denied them (pupils) the possibility of accessing and using them for learning. In other words, if the tools were to be available, teachers would have provided the opportunity for them to use them on their own. This is in consonance with the postulation of Ministry of Communication and Transport [8] that ICT has not been fully adopted

in the teaching and learning process in most schools in the country, and that only a few teachers are using ICT tools to augment teaching and learning. Additionally, Ani [14] supported that view by indicating that some challenges that hamper ICT development and usage involved issues of inadequate infrastructure, financial challenges and poor attitude of policymakers on the issues of Information Communication Technology.

Finally, with respect to teachers not giving attention to ICT lessons, about 63.3% disagreed, 33.3% agreed and 3.4% were undecided on the assertion. It can be inferred that the teachers are doing their best to impart ICT knowledge to the pupils but the unavailability of the ICT tools made their efforts fruitless. The result disagrees with Balanskat, Blamire [7] as they argued that although teachers appear to acknowledge the value of ICT usage in schools, they continue encountering obstacles during the processes of adopting these technologies into their teaching and learning and thereby transfer the repercussions to the learners in an indirect manner. Haliso [17] concluded it by saying inadequate computer skills among staff (teachers) and students inhibit effective use of ICT tools. He added that in this era of information explosion, knowledge in computing and searching skills is a very important commodity in the field of learning and research.

Table 2. Measures to improve the use of ICT tools for learning in schools

Measures to improve the use of ICT	Measures to improve ICT tools use for learning in the Schools			Total
	Agree	Disagreed	Undecided	
	Freq. (%)	Freq. (%)	Freq. (%)	
Government should provide ICT tools	60(100%)	0(0.0%)	0(0.0%)	60(100%)
Teachers should provide access to tools	58(96.6%)	2(3.3%)	0(0.0%)	60(100%)
Allocate more time for ICT lessons	59(98.3%)	1(1.7%)	0(0.0%)	60(100%)
Give more attention to ICT lessons	59(98.3%)	1(1.7%)	0(0.0%)	60(100%)
Use ICT tools to teach other subjects	30(50.0%)	30(50.0%)	0(0.0%)	60(100%)

4.3 Measures to Improve the Use of ICT Tools for Learning in Schools

This section presents the measures that could be adopted to improve the use of ICT tools in learning in schools. The views of the respondents are presented in Table 2.

The results suggest in Table 2 that, the total of 60representing 100% of the respondents expressed that one of the measures to improve the use of ICT tools for learning in schools is that government should be encouraged to provide ICT tools to the schools. This implies that the respondents were of the view that government has a responsibility to support in providing ICT tools to schools per the policy of the implementation of ICT tools in schools. This is in line with the finding of Peprah [4] that government must provide ICT resources to schools to ensure the achievement of its ICT policy targets. It is also in consonance with the findings of Buabeng-Andoh and Issifu [5] that government and other stakeholders must help provide ICT infrastructure to schools to help bridge the digital divide.

On the assertion of teachers providing access to ICT tools when they are available, 96.6% of the respondents agreed. Only 3.3% disagreed that teachers should provide access to ICT tools in the school. This result is a confirmation of Peprah [4]'s study which recommended that students must be provided access to ICT facilities in order to enhance the achievement of government's policy or goals on ICT implementation in schools. It is also in line with Parkinson, Kennewell [21] who advocated the importance of putting the students or learners at the focal point in the use of ICT tools in learning.

Additionally, in order to improve ICT usage in schools, the finding discovered that 98.3% of the respondents agreed that more time should be allocated for ICT practical lessons and just one respondent representing 1.7% disagreed to allocating more time for ICT practical lessons. This result confirms the position of the Ministry of Education (MOE) in its ICT strategy of 2015 that more time should be allocated to ICT lessons and made it a compulsory subject of study across schools in Ghana.

Surprisingly, there was a tie on the assertion that ICT tools should be used to teach other subjects in order to make the lessons very interesting. Finally, on the issue of giving more attention to ICT lessons in schools, a total of about 98.3% of the respondents agreed to it. This has buttressed the recommendation of Peprah [4] that more attention should be given to ICT lessons with more emphasis on practical lessons, if government's policy goals are to be achieved successfully.

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

Pupils of Agorkpo D. A. JHS have identified several challenges to the use of ICT tools in their school. The study discovered that the commonest challenge of ICT use was lack of opportunity provided by teachers for students to use ICT tools on their own. And this was attributed to the fact that teachers used their personal laptops for teaching and could not allow pupils to also use it. Inadequate ICT tools and difficulty teaching ICT practical lessons without demonstrations were identified as the other challenges. It was also discovered that some of the pupils did not know the relevance of ICT in the current dispensation, especially with regards to their academic progression.

Measures identified to improve the use of ICT tools in the school include the call on government to provide the required ICT tools to the school. The study also recommended that in order to

achieve meaningful academic improvement in the school, teachers must spend more time to teaching the ICT subject and create the enthusiasm in the pupils. The 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 by the teachers to demonstrate the processes and application of ICT in every day's life. This way, pupils would easily understand the concept and be able to apply them practically and independently.

Finally, it is recommended that an ICT laboratory is built for the school to house the ICT department and provide an atmosphere that can motivate the teachers and learners to show more interest in the subject. Teachers should also provide access to the few ICT tools available in the school. This way, pupils can actually appreciate what the tools are used for.

CONSENT

As per international standard or university standard, participant's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

The researchers addressed ethical issues related to this study. The respondents were assured of confidentiality of the information they provided. They were also assured of anonymity if the information given was to be quoted in the study or elsewhere. The respondents were given the opportunity to indicate their willingness to participate in the study or not. Official permission was also sought from the management of the school investigated. The respondents were also encouraged to ask questions, seek clarification of questions they do not understand, and provide responses that are as honest as possible.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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