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Integrating Information Technology into the Teaching and Learning Process of Second Cycle Institutions in Ghana: A Case of Walewale Senior High Technical School

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Abstract:
It has become necessary for people especially teachers and learners to have the ability to utilize Information Technology (Info Tech) since it has become a reigning literacy in this 21st century. Info Tech literacy has posed numerous challenges for teachers and learners as well as technically their ability, knowledge and expertise in the field if Information Technology. Info Tech Education Policy by the MOE in 2009 identified some challenges which include the effects of Info Tech on access, the cost of effective and quality education, involving in the information technology society and integrating technology into teaching and learning. This research is pivoted on integrating Info Tech into teaching and learning processes to enable the researcher investigate trends and dimensions of style in teaching and learning in Ghana especially in Walewale Senior High Technical School in order to provide grounds for an objective, measurable placement or categorization of the phenomenon that could be deduced or constructed as the basis for scientific proof. In this study, the accessible population used was the Headmaster, Headmaster in charge of academics, the headmaster in charge of administration, heads of departments, some selected teachers and learners in Walewale Senior High Technical School (WALSCTECH). Qualitative data was collected and analysed accordingly.

Keywords: Info Tech – Information Technology, WALSECTECH Walewale senior technical high school

1. Introduction

Information Technology integration into teaching and learning processes in Ghanaian schools has been on its peak, particularly with the release of Info Tech in Education Policy in November 2009. The government of Ghana has acknowledged the significance and the essence of information technology training in schools, colleges and universities and the enhancement of educational system as a whole.

Deploying Info Tech into education will yield in the creation of new chances for teachers and learners to have a bond in new ways of acquiring and analyzing information thereby enhancing access to improved education and quality of education delivery on equitable basis. It is the government of Ghana's desire that, through the deployment of Info Tech in Education, the culture and practices of traditional memory-based learning will be transformed to education that stimulates thinking and creativity necessary to meet the challenges of the 21st century" (Tettey-Enyo, 2009).

The adoption and integration of Information Technology is a complex and challenging process for schools, especially where there is limited experience in the Information Technology industry to support teaching and learning processes. (Hodgkinson-Williams ,Wilson-Strydom & Thomson , 2005).

1.2. Statement of the Problem

Although, there has been a series of debate and talks about the Info Tech integration into teaching and learning, a few teachers/tutors who are practicing know exactly how to continue as a real integration that requires change in the classroom practices. Teachers lack the hidden model that can be used to guide the changes they require to come out for a successful integration of Info Tech into teaching and learning classrooms (Liu & Johnson, 2000). Many research outcomes on integrating Info Tech in teaching and learning in developed countries have reported its general effectiveness as a method of instruction (Thomas & McRobbie., 2000). Some teachers are well equipped with skills, there is little or no evidence of Info Tech integration into classroom activities e.g. systematic planning and lesson implementation that demand learners to critically think, work together for effective integration in support of this nature.

The general aim as far as this study is concerned is to find out and describe the experiences of teachers and learners in Walewale Senior High Technical School (WALSECTECH) when there is an effective integration of Info Tech in teaching and learning. Hence, the research aims to achieve the objectives listed below:

- To explore how teachers and learners frequently take into consideration the use of information technology in the processes of teaching and learning in the classroom.
- To describe the extent of accessibility to information technology by teachers and learners in schools.
- To provide evidence on the challenges encountered by teachers and learners when integrating information technology into teaching and learning processes.

1.3. Research Questions
The research seeks to answer these questions:

- What is the frequency of technology usage at WALSECTECH?
- To what extent do teachers and learners have access to technology?
- What challenges do teachers and learners face in Info Tech integration process?

1.4. Significance of the Study
The findings of this research will help teachers in planning, implementing and integrating information technology into their instructions in the classroom. In embracing the demands of the technological skills in the 21st century. It will also guide teachers to develop a user-friendly lesson plan for Info Tech integration into the curriculum. Finally, Specialists in curriculum to bridge gaps between schools in integrating Info Tech into the teaching and learning environment.

2. Review of Related Literature

2.1. Information Technology Development and Information Age
Information technology has been the driving force causing the rapid revolution in communication and transforming the world from islands which seem to be isolated to interconnected super highways (Britton & Herselman, 2002). These authors explain further that, people experience a world of greater interconnectivity and accelerated flow of data today. The economy of the world today is presently in the center of immersed transformation which is spurred by globalization and backed by the rapid development of information technologies which accelerates the transmission and use of Info Tech based on the assertion of interconnectivity and data acceleration. From this point of view, information technology development over the last thirty years outputted in an information explosion and has spearheaded a knowledge revolution and an information age.
One finds the unparalleled development in IT aside its core opportunities it has created and its commensurate costs over the three decades. These developments include the following:

- Increase in computing ability and a sharp decrease in cost as a result of microprocessor evolution development.
- Digital development that are able to exploit the ability of computing in achieving at a fraction of its previous cost (Ghosh & Chandrasekhar, 2001).

The information age keeps evolving daily though it is not totally a new concept. Information Technology that has spearheaded the birth of information age keeps changing almost every aspect of lives in the world today. This is reflected on the way people communicate and interact culturally, come out with information, learn and conduct business. Through the use of internet, consumers are able to enquire about prices of products offered on the World Wide Web (www) within micro seconds. Through internet, almost all markets in the world have become accessible every second.

The paradigm-shift in the way in which companies, offices learning institutions, individuals and families manage their data. This shift is reflected on how people are topping relying on paper, files and filling cabinet for information storage and dissemination to electronic media usage, e.g. the use of electronic media (e-mail) and the internet, computer hard-drives and diskettes, flash drives, CDROMs etc.

The use of Info Tech in teaching and learning brings out a new area of knowledge and offers a tool that has the ability to change the ineffective and traditional methods of teaching (Duru & Acikalin, 2005).

2.2. Information Technology Integration
Information Technology integration sprouted as a reaction to early computer-in-school programs where the key notes laid on developing computer literacy or technical knowledge of computer applications. Info Tech integration recently has been recognized as "using computers to learn, (Kotrlik & Redmann, 2004), teachers in the process of teaching and learning integrate Info Tech in several ways. Firstly, using Info Tech for classroom instruction, using practice drills, the use of computer applications, requiring research by the use of internet, learning to use computers" (UNESCO & COL, 2004). According to requiring the learner to use Info Tech to solve problems and data analysis, assigning graphical presentation of materials, assigning demonstrations and simulations, assigning learners to correspond with others over the internet, requiring the leaner to carryout research by the use of CD-ROMs, and assigning learner to produce multimedia reports and projects.

Numerous factors that are likely to affect Info Tech integration were also highlighted by these authors in the teaching and learning process arena. The factors may include:

- The availability of technology.
- Support for teachers' Info Tech integration in the form of technology training.

- Barriers to the integration of Info Tech.
- Teachers' perceived teaching effectiveness
- Info Tech anxiety.

Teachers who go to the classroom and practice routinely, the skills they had acquired during training experience more change and become more comfortable with the idea or innovation compared to those who practice the skills less often. School leadership largely determines the output of Info Tech integration, teachers however, cannot effectively or fully support Info Tech if they do not understand it. "Administrators must understand both the capabilities and limitations of technology. Only then can they plan for, budget for, purchase carefully, install properly, maintain dutifully, schedule adequately, distribute appropriately, and replace systematically the electronic technology best suited for their needs" (Mecklenburger, 1989).

2.3. Strategies for Integrating Info Tech into Teaching and Learning

Computer literacy is defined as knowledge and understanding of computers and how to use them (Shelly, Cashman, Gunter, & Gunter, 2008). Computer literacy comprises not only the knowledge, comprehending and values of technology that are needed for teachers to feel confident with classroom integration, but also equipped with positive attitude in the teachers' ability to apply concepts related to theory in real classroom instructions (Regina, 1999).

ISTE, an international society provided the following guidelines for Info Tech application in educational settings as listed below:

- There should be modification in pacing of instructions for Info Tech to be included in a methodology course. This takes more time for preparation and often more time for implementation. The teacher should expect hardware failure, difficulty of software been opening, servers that may crash, double booked computer labs etc. The teacher has to be comfortable with modelling flexibility, problem solving techniques, troubleshooting when there is a rise of any difficulty.
- The concept of accommodation must be sensitive to the teacher for individual differences and constant monitoring of instructional pace, explanation and feedback and implementation when requiring the use of Info Tech. there should be a consideration of inequitable access when Info Tech use is embedded in assignments.

The teacher should prepare for additional emphasis on the concept of the teacher and learner learning together. Learners most of the time suggest Info Tech options, shortcuts or modifications, and sometimes one student or learner in the class who may be more skilled and confident with Info Tech then the teacher. (ISTE, 2000). In view of these guidelines, teachers must understand Info Tech integration more completely. The role of the Info Tech teacher is to open the door of knowledge where the learner can be invited inside. Therefore, teachers must create a conducive environment for effective learning and effective transmission of knowledge must be extended (Ali, 2005). He again states that, a teaching pedagogy the teacher intends to use must take care of how to teach, what teaching aids to use in the process and what to teach. Teachers who has adapted to the process of integrating Info Tech would attest to the benefits the process can bring to the learning experiences.

For effective integration of Info Tech into educational curriculum, there should be proper planning, adequate time, dedication and resources. Many researchers including (Ken &Anderson 1990; Heinich et al 1996; Shelly et al 2008; Alessi & Trollip 1991; Shelly et al 2008) pointed out many programs including word Processor, Spreadsheet, Databases and PowerPoint that can be used to enhance the effective integration of Info Tech into teaching and learning processes.

2.4. Uses of Info Tech in Education

Roblyer (2006) highlighted four uses of Info Tech in education. These are listed below:

- Learners become motivated when teachers use Info Tech in the classroom thereby gaining their attention, supporting manual operations in the course of high-level learning, illustrate real world relevance via highly visual presentations, engaging them via production work and connecting them with audiences in their writings.
- Through Info Tech, methods of instruction can be enhanced by supplying interaction and immediate results to support skill practice, learners visualizing underlying concepts in unfamiliar or abstract topics, illustrating connections between skills and real life applications, learners studying systems in unique ways, providing permission to unique information sources and populations, capable learners been supplied with self-paced learning, providing access to learning opportunities and providing opportunities and support for cooperative learning.
- Via Info Tech, teachers and learners are able to work more productively by saving more time on production tasks, grading and tracking learners work, provision of faster access to information sources and saving much money on materials that are consumable.
- Info Tech can help learners learn and sharpen Information Age skills in information literacy, technological literacy, and visual literacy.

These examples show that, Info Tech, when placed in the hands of teachers and learners, can provide unique, effective, and powerful opportunities for many different types of instruction and learning.

2.5. National Policies and Practices on Information Technologies in Developed and Developing Countries

Parents, societies and employers introduced Info Tech into schools for many reasons as highlighted below by (ISTE, 2000):

- Parents demand Info Tech in order for their children to be prepared for the world of work or for tertiary education.
- Employers demand Info Tech for they prefer employees who are literates so far as technology is concerned.
- Society demand Info Tech for the reason been that citizens who are technology literate can make an effective contribution towards society.

Teaching at the school level and training of teachers are aspects of critical significance when considering the introduction of Info Tech in schools. Teachers are recommended to involve learners, members of the community, parents when teaching Info Tech.

It is discovered from the above recommendations that, Info Tech as a global phenomenon is growing fast and this growth can be seen mostly in education. Developed and developing countries have expressed concerns in participating in and shaping the global info society. These visions invariably emphasize education as a primary way for Info Tech to produce competent learners, preferably qualified and skilled to contribute to the growth of economy.

Policy statements have been addressed by various governments that highlight the use of Info Tech in Schools. Most of these policy statements are written documents and others are not documented for circulation to schools but are embedded in existing educational policies (Odera, 2005). The integration of Info Tech, however, is a serious issue that requires well planned policies that will aid schools to implement Info Tech into the curriculum. Polies the come from developed countries are more established generally and are related to strategic actions with enough funding. Developing countries have forged partnerships that facilitate the implementation of such policies but sometime they face the challenge of financing multiple components of their policies in partnership environment with industry and embryonic nature of the private sector (Howell & Lundall).

2.6. Information Technology Policies in the Developed Countries - United States of America (USA)

Computers and internet are abundant in schools and classrooms in industrialized nations like the United State of America. Teachers' tools for the twenty first century survey in 1999 proclaim that, majority of teachers; about 99% reported having computers available somewhere in their schools, and again 84% are reported having computers available in their classroom and a greater proportion of schools are connected to the internet (US Department of Education, 2000).

Many reports on government policies on computer usage noted the American government formulating policy on computers in 1996 titled: "Getting America's learner ready for the 21st century"(Pearson, 2001). This policy document included provision of technology and the number of microcomputers in schools was in the ratio of 1 computer to each 10 learners during the last decade. Info Tech is still used in schools in America as a strategy to enhance quality of education. Again, the country (USA) has the greatest level of connectivity all over the world and the highest use of internet. The USA is the number one which most prepared for the Information Age as stated by International Data Corporation (IDC).

It is the intention of the government of USA to transform this technological infrastructure to social and economic development via educational policy released by the secretary of education in 1997. Almost the same as the strategy of the British, the frame work policy of the USA outlines areas of focus over a five-year period until 2001 including connecting to schools especially those in poorer areas, enhancing student or learner access to Info Tech, coordinating the effort of the school via the process of management, and educating teachers professionally (USA Working Document, 1997). Culture and practice of Info Tech has been established in education through the USA legislature. This seeks to provide financial support for using Info Tech to enhance the reforms of school and Improves America' Act which stresses on professional educator development. It is most comprehensive and explicit American legislation targeted at promoting educational technology.

The USA is ranked among the developing countries as a result of its major role in the integration of Info Tech in its curriculum based on the above description. The importance of these features will help inform the study of Info Tech integration in Ghanaian education context.

3. Methodology

In this study, qualitative approach was used. This research is about the experiences of teachers and learners. "the researchers wanted to describe experiences as they are lived."(Grove, 1993). To understand and able to describe an event from participants perspective, use qualitative approach (Mertens, 1998). Semi-structured interviews with teachers, Headmasters, Learners and IT teachers; focus group interviews with learners and observed classroom lessons. Relevant documents from teachers, headmasters, individual Heads of Departments, textbooks and policy documents, activities carried out by learners and students' records were review by the researcher.

The researchers for the purpose of this study handpicked the cases to be included in the sample on the basis of the cases' judgement. The sample size in purposive sampling is small and it is purposively selected among the individuals who have the most experience with the study phenomenon.

The data collected was coded via a process of grouping responses into categories that came out with similar ideas, concepts of themes one had discovered. Following the coding was data being grouped into categories that allowed for comparison said by different participants, the discussed themes and how concepts were understood (Rubin & Rubin, 1995).

3.1. Research Procedures on the Field

The field research of the study was carried out in four different phases as shown in the table below:

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
There was a visit to the Headmaster WALSECTECH to seek permission to arrange for interviews with the headmaster in charge of academic and administration with the researcher who is an Info Tech inclined.	The second was a visit to the Heads of Departments to conduct semi-structured interviews.	The third was a visit to sampled individual teachers to conduct semi-structured interviews in the school.	The fourth phase was to visit classrooms to observe Info Tech and other subject lessons taking place in WALSECTECH during instructional or contact hours.	The fifth phase was to conduct focus group interviews with learners at the sampled course areas in the school.

Table 1: Field Research Procedures

4. Data Analysis

4.1. Background Characteristics

Category	Code	Description
Student's population or enrolment	SE1	There are approximately 2,283 learners in this school.
Number of teachers/educators employed	NE1	80teachers/educators in the school. Out of these educators, 75 are employed by the Ghana government, the rest (five) were provided by the National Service secretariat.
	NE2	There are 80teachers/educators.
Number of Teachers/educators trained for technology use	NT1	Not specific about the number of teachers/educators who are trained in the area of Info Technow, but there are three graduate teachers from the university of education, Winneba who did Information Technology as a course.
	NT2	We also have some internship students from the University of education from the Info Tech department.
Technology experience and amount of training received	TQ1	I own a computer in my office and also in the house. I started using computer since 1999, I bought it myself and I used to do personal letters. I have not had any formal training, through try and errors, I learned many things.
	TQ2	I have little experience in computing when I was doing my first degree many years ago.

Table 2: Coding System

Student enrolment, number of teachers/educators employed, teachers trained for the usage of Info Tech, technology experience and the amount of training received

The findings with regards to student population or enrolment indicate that, the school has a good number of population or enrolment as well as teachers/educators tasked to teach the learners as indicated in the response to the background characteristics. The code SE1 proves that the school has a total population of approximately 2,283 learners. The findings indicate that, with respect to the number of teachers/educators there are about 80 of them. There are about 75 regular or trained teachers and 5 national service persons.

Responding to questions regarding the number of teachers/educators who are trained for Info Tech and the degree of training received, the findings indicate that, some teachers are well trained in the area of Info Tech whiles some had a little knowledge since they had it as a course when they were in school as indicated in QT. Some of them do not have any training at all.

"I own a computer in my office and also in the house. I started using computer since 1999, I bought it myself and I used to do personal letters. I have not had any formal training, through try and errors, I learned many things. I have little experience in computing when I was doing my first degree many years ago". These findings are backed by what Odera (2005) that training of teachers in the practice of Info Tech is a step direction in motivating them to change their beliefs about the use of computers and aid them utilize Info Tech skills more efficiently in the teaching and learning processes. Training teachers is a key in enhancing learners' successful manipulation of multiple literacies (Merkley & Schmidt, 2001).

4.2. Personal Views on Technology Integration

Category	Code	Description
Donors and sponsors	DS1	Ghana Cocoa Board, World Vision, and the WMD provided the school with some three, four, and two slightly used computers. Through NEPAD E-School project, the school was also provided with 15 computers and some two air-conditions to the school. They also provided multi-choice DSTV decoder for life educational channels and video cassettes to record some of the programs that would be shown on those channels. NEPAD E-school project also donated a smart board for the for the school's computer lab built by the WMDA. Africa Development Bank also provided six multi-point servers to help reduce the pressure on the few existing ones.
	DS2	We were also fortunate to have CISCO training some of our teachers for on how to use the system. It is so unfortunate majority of the teachers do not inculcate the acquired skills into their teaching and learning activities.
Vision of technology education	VE1	It is our vision that, in the near future, all teachers in this school should cultivate the habit of using Info Tech or computers as a tool for teaching. There are many computers in the lab, hence, no student/leaner should complete or leave this school without acquiring computer skills.
	VE2	I am very certain that, the District Education office in the WMD is aware of the importance of computers.
Major challenges faced	GC1	There are some teachers who are very old and are rebellious to Info Tech. I even doubt as at now, if 15% has gotten an e-mail address and the school has had computers since 1999. The Info Tech department sometimes conduct some kind of in-service training for the teachers in this school and at the end, the fail to utilize the acquired knowledge. Fixing some parts of the computer is even a problem and it is a stumbling block in one way or the other as technology is used for correspondence these days.
	GC2	Fortunately, at the moment, the school has about five printers that can be used or networked to serve all the computers in the lab but the printing becomes so much that it is so costly due to the number students who come to the lab for practice. The class sizes depending on the course range from 35 to 80. In such classes, to print whatever they have to print becomes impossible.
Technical Problems	TP1	The school is so fortunate to have teachers who are able to replace and maintain the machines should anything go wrong with the exception of some photocopiers which they find a bit difficult to maintain but they are not sufficient.
	TP2	We have teachers who are expert. A teacher who is very familiar with, for example the use of projectors will have to assist the other teachers. We do not have technicians.
Support	VS1	Though we have facilitators for Info Tech in our district but they do not offer any assistance to our school and other schools in the district. Such people are also trained Info Tech teachers from Universities and they are very scarce.
	VS2	There is no support especially for the government schools. The school has to provide their own training and pay for it herself. We hardly see district representatives when conducting in-service training for our members.

Table 3: Coding System: Participants' Views to Donors and Sponsors' Vision of Info Tech Education and the Greatest Challenges Faced

Participants' responses based on vision about Info Tech education indicates a keen interest in the use of computer as a tool for teaching and learning. It is indicated in one of the codes-VE1 from one of the participants that, it is his vision to see all students/learners to be computer literates when leaving the school. One of the participants came out with a challenge confronting their vision in the case of cost of printing due to large class size, though there are a lot of printers

available of which some majority of them are not of high quality. One of the factors may be due to the school's inability to purchase materials for such activities.

In addition to problems encountered is support on the part of the school. This is due to insufficient qualified teachers/personnel who can be of aid and facilitate in the field of Info Tech education as explained by one of the participants in code VS2.

"The school has to provide their own training and pay for it herself. We hardly see district representatives when conducting in-service training for our members".

4.3. Coding of the Responses of the Assistant Headmasters of the School (Walsectech)

4.3.1. Info Tech Integration Policy

Category	Code	Description
Availability of Info Tech policy	CP1	Emphatically, there is a policy of Info Tech integration
	CP2	There is a policy on everything that happens and how it should happen in the school. Every teacher has his or her own subject policy which addresses the integration of the subject with the use of computers.
Info Tech integration with other subjects	TI1	The government of Ghana provided the school with RLG laptops for the students/learners and teachers. Some teachers also have their own laptops of which they have been taking them to classes if there is the need.
	TI2	The computer lab is always opened for learners to do their own research or do research through the internet for their subject areas of which there is an attached string. The string is that, each and every student will have a reason in each and every subject to visit the lab or use the facility, the printer or the computer.

Table 4: Coding System: Availability of Info Tech Policy and the Integration with Other Subjects

This data's findings with regards to the school has designed an Info Tech integration system or policy to aid them in controlling, planning and managing their technological equipment. To be more precise, one of the participants pointed out clearly in Code CP2 that:

"There is a policy on everything that happens and how it should happen in the school. Every teacher has his or her own subject policy which addresses the integration of the subject with the use of computers".

Supporting this finding by (Tondeur, Keer, Braak, & Valeke, 2007) when teachers in the school with an explicit Info Tech school policy which makes emphasis on shared goals are using Info Tech more regularly in their classroom. They included that as a consequence, an Info Tech policy plan seems to be more relevant to foster the integration of Info Tech use in the classroom, but only when the contents are made known to the teachers. Adding to the point, these authors see successful Info Tech integration as becoming much more likely when values expressed by teacher are within the policy of the school and comprehend their implications.

The findings again indicate that, the school is integrating technology into her daily teaching activities, however, one of the participants who was Coded TI1 is not quite certain of the integration procedures. To stress on this finding, one of the participants Coded TI2 described that Info Tech is already integrated in most of the school subjects and both teachers and learners are using it in their daily teaching and learning activities. This statement verifies the finding:

"The computer lab is always opened for learners to do their own research or do research through the internet for their subject areas of which there is an attached string. The string is that, each and every student will have a reason in each and every subject to visit the lab or use the facility, the printer or the computer".

4.3.2. Problems Encountered in Technology Integration Process

Category	Code	Description
Support	SS1	Can I even say I have support? Some officials from the District Education Office sometimes do come to our lab for workshops. They prefer using our school because it is the only well-furnished lab with computers.
	SS2	We have had a lot of help from some organizations in this country including World Vision Ghana, African Development Bank, CISCO, and NEPAD E-Schools.
Staff Development	SD1	Internet is sometimes made available for teachers and learners from time to time. Teachers are encouraged to use the internet for research in the course of lesson preparation for teaching regularly. Teachers are sometimes given in-service training at least twice a year.
	SD2	We sometimes sit to deliberate on the implementation of Info Tech. I for one, as an Assistant headmaster of the school depend on the Head of the Info Tech department since he is very experienced when it comes to the teaching of the subject for many years. The administration of the school is guided by him.
Encountered Problems	PE1	We do not have many trained teachers to handle the course. For example, there are only three professional Info Tech teachers handling all the 2 283 leaners in the school. Info Tech teachers are very scarce in the country. Many of the teachers do not feel comfortable using the computers in the lab. I would not be surprised to see that, only a small fraction of the teachers (about 10%) has e-mail addresses. These teachers would only touch the computers whenever there is a demand of some kind. For example, during in-service training programs.
	PE2	Maintenance has been a major problem since the inception of info Tech in the school. Many computers are broken down. If all these are to be maintained and added to the few ones we have, there would be in the ratio one computer to one student in the course of teaching and learning to prevent the shifting system in the lab. Security is not a problem in this school. The only instance of stolen computers was when there was a riot the school. All teachers and security persons ran for their lives. This situation led the lab ajar and led to the looting of about 98% of computers we had in the lab. Measures are put in place to prevent learners from stealing some peripherals from the lab.

Table 5: Coding System: Support, Staff Development and Encountered Problems

It is glare from the above findings that, there is no support given to the school from the District Education Service-GES with respect to Info Tech integration. It shows clearly that some GES officials visit the school to make use of technological resources available as one of the participants stated in the Code SS1. It took the interventions of some private organizations to support the school with the integration processes. This is attested by the statement made in the Code SS2 that:

"We have had a lot of help from some organizations in this country including World Vision Ghana, African Development Bank, CISCO, and NEPAD E-Schools".

It can be deduced from the table that the assistant headmasters are playing the role in the equipping the staff of the school in their departments by encouraging them on the use of the computers in the lab via in-service trainings. This is indicated in the stamen made in the code SD2 as:

"Teachers are sometimes given in-service training at least twice a year. We sometimes sit to deliberate on the implementation of Info Tech. I for one, as an Assistant headmaster of the school depend on the Head of the Info Tech department since he is very experienced when it comes to the teaching of the subject for many years. The administration of the school is guided by him".

The school still encounters some problems in the effort to integrate effectively Info Tech despite the fact that the findings indicating that, the school is well resourced with facility and a policy. This is vividly stated by one of participants and coded PE2 as:

"Maintenance has been a major problem since the inception of info Tech in the school. Many computers are broken down. If all these are to be maintained and added to the few ones we have, there would be in the ratio one computer to one student in the course of teaching and learning to prevent the shifting system in the lab. Security is not a problem in this school. The only instance of stolen computers was when there was a riot the school. All teachers and security persons ran for their lives. This situation led the lab ajar leading to the looting of about 98% of RLG laptop computers we had in the lab. Measures are put in place to prevent learners from stealing some peripherals from the lab".

The findings here are in line with Shelly et al 2008 who described that, any phenomena or event that has the chance of effecting a loss of computer software, equipment, data and information or processing ability is a computer risk. She continues to explain some of these risks including unauthorized access and use, viruses, information theft are all acts committed deliberately and are against the law. The act of illegally involving a computer explains what is called computer crime.

4.3.3. Information Technology Teachers Coding Responses

4.3.3.1. Qualifications, Teaching Experience and Support from Departments

Category	Code	Description
Qualifications and teaching experience	QT1	I have a Bachelor of Science (BSc) degree in Information Technology and have had some professional courses in Info Tech. I have been teaching Info Tech since 2014.
	QT2	I also have a BSc Information Technology degree and have been teaching Info Tech since 2002.
Self-development	SD1	Though I have been working on my own, but if I have any difficulty consult my deputy and the other colleague for help. I sometimes go to websites if there is the need and communicate sometimes too some blogs. I don't remember the last time the GES conducted in-service training for us.
	SD2	I have had a lot of In-service training from some organizations in the areas the Microsoft office package suite. The last one I had was conducted by the Blue crest college in Kumasi, and this was about Cloud Computing. I prefer going for such trainings due to the tentative nature of Info Tech.
Support	DS1	We have had some support from the school also. Almost all the equipment and currently have about ten pieces of computers, three printers and one air-condition to be installed in the first section of the lab. When it comes to the GES, I can say I don't have support at all. They do not conduct special in-service training nor workshops to the teachers in this school and other schools. I don't even know the Info Tech coordinator in the District Education Office but they do have one.
	DS2	Some few years ago, there were a lot of old computers and many problems. Leaners sometimes become frustrated when booting the computers. The computers for now, I can say that, there are about 98% working most of time. We have the syllabus in both hardcopy and soft copy forms making it easy to work with. I can now pay more attention to my learners and feel happy working here. The teachers in Info Tech department coach one another.

Table 6: Coding System: Participants' Qualifications, Teaching Experience and Support from the Departments

The findings reveal from the table regarding the necessary qualifications and Info Tech teaching that, all the teachers in the Info Tech department are professionally qualified teachers when it comes to teaching Info Tech. It can be seen from the stamen made by two of the participants coded in QT1 and QT2 as respectively quoted below:
"I have a Bachelor of Science (B Sc) degree in Information Technology and have had some professional courses in Info Tech. I have been teaching Info Tech since 2014" and "I also have a B Sc Information Technology degree and have been teaching Info Tech since 2002".

This outcome is in agreement with Russel et al 2000 who described that, been able to identify the teacher's information technology skills is a prerequisite for the future professional development.
Wood et al 2005 also agree with the notion that, the level of teacher experience and state "One of the most critical features for the integration of technology is the individual educator's level of experience and comfort with technology".
Issues based on the training attended sprouts that, teachers have not had workshops or in-service training from the district Education Office, rather they get a lot of workshops from organizations and also coach each other and learn through the use of the websites, internet and blogs as indicated in the statement made by one of the participant and coded DS2 as:
"I have had a lot of In-service training from some organizations in the areas the Microsoft office package suite. The last one I had was conducted by the Blue Crest College in Kumasi, and this was about Cloud Computing. I prefer going for such trainings due to the tentative nature of Info Tech".
With respect to the question on support from the school and the District Education Office, the findings indicate that, there has been some kind of support from the school itself by proving some equipment to the lab indicated in DS1 and DS2 as:
"We have had some support from the school also. Almost all the equipment and currently have about ten pieces of computers, three printers and one air-condition to be installed in the first section of the lab. When it comes to the GES, I

can say I don't have support at all. They do not conduct special in-service training nor workshops to the teachers in this school and other schools. I don't even know the Info Tech coordinator in the District Education Office but they do have one" and "Some few years ago, there were a lot of old computers and many problems. Leaners sometimes become frustrated when booting the computers. The computers for now, I can say that, there are about 98% working most of time. We have the syllabus in both hardcopy and soft copy forms making it easy to work with. I can now pay more attention to my learners and feel happy working here. The teachers in Info Tech department coach one another" respectively.

Dawson and Rakes 2003 support these findings by stating that, the Headmaster of the school is expected to behave much more as the instructional leader and see that, the important preparation and interventions are given to teachers. The leadership of the school in this respect is greatly determined by the outcome of Info Tech integration. Administrators cannot however, fully, partially of effectively support Info Tech if they do not comprehend it. Redmann and Kotrilik (2004) concur that, the support comes in diverse forms which may include availability of Info Tech for teachers and learners use, public support, time released for planning and learning, training of teachers, technical support, administrative support and availability of instructional materials.

4.4. Challenges Met by Teachers with Regards to Information Technology Use

Category	Code	Description
Networks	CN1	All the computers are not networked in this school. 30 of the computers are networked.
	CN2	The other section of the lab is yet to be networked by the TELEVIC company in partnership with Ghana government. There is a Local Area Network (LAN) in which the server is located in the HOD's department.
Technology use	UC1	We actually use computers for teaching and learning in the school. Teachers are always invited to use the internet in the lab for research activities. We sometimes allow the learners to use the internet in their research study. Some of the teachers especially those in the science department have integrated their subject areas with the use of computers.
	UC2	Teachers and learners use computers in their study. A few of the teachers send their learners in groups to the lab to do activities by using the computers. This normally takes place in the afternoons.
Software	SW1	Software such as Windows 7 as an operating system, windows server 2003 for the server, Microsoft Office 2007 and 2010 and GW Basic for programming are used and Encarta for the leaners.
	SW2	The learners use many software. The Info Tech teachers have installed some programs including games, typing tutor (Mavis Beacon) for typing practices.
Allocated time	NT1	40 minutes are allotted for each period with respect to Info Tech learning and teaching for five days (from Monday to Friday) till vacation. Learners sometimes are given the opportunity to have extra hours in the lab under strict supervision of the Info Tech teacher responsible for such schedule. A maximum of 160 minutes are allotted per day.
	NT2	
Challenges	TC1	The greatest challenge is from the community since learners come from deprived and poor nearby communities. It becomes very difficult for guardians to get or buy computers and other educational software for their wards to study at home during vacations. Inadequate resources like software for teaching and learning is also a challenge. The software we are using is my own. The school has not provided such programs for study. The only software the school purchased was an antivirus about four years ago. The second-year learners are supposed to write ICT as an elective of which GW Basic is one of their software to use but nothing has been done about it so far as the school administration is concerned. We normally depend on trial version software.
	TC2	Lesson presentation is also a serious challenge due to the group of leaners we have. We have learners who are fast leaners, slow learners, some are also clever. No matter the scope of the learners, there is the need to accommodate all of them. Starting a lesson is a big problem.

Table 7: Coding System: Networks, Technology Use and Software Available Together with Allocated Time and the Challenges Met by Teacher

The findings based on the networks indicate that, the computers in the lab are locally networked, that is the Local Area Network (LAN), and hence teachers and learners are able to get access to internet. One of the participants stated that,

the computers are networked to a LAN. It is of great importance for the school to have an internet network, to enable teachers and learners for internet accessibility. The physical access to a computer is the herculean factor to encourage teachers to integrate Info Tech in their classroom teaching and learning. Accessing the computers physically can be seen as the spectrum whereby certain teachers may have computers connected to the internet in their classrooms and others may have less convenient connections or more remote access in computer labs or libraries.

Addressing the questions with respect to Info Tech usage for teaching and learning, the findings show that, some teachers and learners use computers in the lab for teaching and learning. This is coded in the Code UC1 and described as:
"We actually use computers for teaching and learning in the school. Teachers are always invited to use the internet in the lab for research activities. We sometimes allow the learners to use the internet in their research study. Some of the teachers especially those in the science department have integrated their subject areas with the use of computers".
Findings with respect to software apps used in the school lab indicate quite a number of software packages which are meant for teaching and learning. This is indicated in the Code SW2 as:
"The learners use many software. The Info Tech teachers have installed some programs including games, typing tutor (Mavis Beacon) for typing practices".

It can be seen clearly from the findings that, teachers and learners have a positive attitude with respect to the use of Info Tech in the school. If users are confident and believe in themselves, it is possible. This statement suggests that, attitudes are normally defined as a decomposition or the tendency to react negatively or positively towards a certain event or thin (object, idea, person, or situation). They are closely related or comprise with our opinions and beliefs and are based on past events or experiences. Because attitude sometimes relate to interactions in some way with others, they show some kind of important link between social psychology and cognitive domains.
Heider (1959) describes that, if there is an unbalanced belief, stress is created and there is pressure to change attitudes. Further, he stated two major factor affecting balance as the sentiment like approving, admiring and liking; unity-proximity, similarity, membership qualities of beliefs. When sentiment or unity between beliefs about events or people is equally positive or negative then there is balance. Contrarily, when there is dissimilar in nature, imbalance surfaces.
Teachers attitude on the study proves that, their confidence affects the use of Info tech more than other factors including administrative support, time and access to equipment.

5. Conclusions and Recommendations
It was established from the research that:
- There was a policy that Info Tech should be taught in all schools and needs to be implemented fully by following its guidelines.
- No funds are released for the purchase and maintenance of Info Tech equipment nor partnerships which are built with donors and sponsors to supply such services to the school. The school has to look for sponsors through the headmaster and also raise funds with the help of BOGs to enrich the Info Tech equipment.

The data obtained proved that:
- Just a hand fold of teachers are trained and qualified with regard to the use of Info Tech for teaching and learning.
- Many teachers had pertinent problem that retarded the effective integration of Info Tech to teaching and learning including lack of help from the GES, lack of community support on the side of parents and learners, inadequate learning or learner support material including software and lack of adequate time for teachers and learners so far as Info Tech use for teaching and learning is concerned.

With respect to the use of Info Tech by teachers and learners for teaching and learning, it was evident from the results that:
- Subject like mathematics, science, economics integrates information technology.
- Info tech tools are used to search information as a means of finishing homework, assignments and projects.
- Teachers attested to the fact that, learners are not at the same level when it comes to Info Tech literacy, hence, the findings indicate that, leaners share computers in groups during practical works.
- There was a report from majority of the learners that, they have and use Microsoft Office package suite. Some the learners also use GW-Basic and Encarta which they find very useful.

With regards to the study findings and suggestions for additional or further study, there should be a re-visitation for the designing and implementation of Info Tech policy which should involve stakeholders who are abreast with the conditions in their communities in the northern part of Ghana. This will enable teachers plan and teach effectively with Info Tech and help learners become technologically compliant with this digital age or 21C demands.

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