

# USE OF COMPUTERS AND INTERNET AS SUPPLEMENTARY SOURCES OF EDUCATIONAL MATERIALS: A STUDY AKANU IBIAM FEDERAL POLYTECHNIC UNWANA

<sup>1</sup>OSU, CHIDIEBERE MOSES

mcosu@akanuibiampoly.edu.ng

<sup>2</sup>IKPOR PATRICK NWACHI

<sup>1,2</sup>Information and Communication Center  
Akanu Ibiam Federal Polytechnic, Unwana  
Afikpo, Ebonyi State

## ABSTRACT

*This study was conducted to access the use of computers and internet as supplementary sources of educational material to enhance quality education, and improve educational management and planning. Identify how students use computers and internet to facilitate their learning, and how lecturers in Tertiary Institutions use computers and internet to teach and guide students. Education is a very socially oriented activity and the quality of education has been associated with a strong teacher having a high degree of personal contact with learners. The use of ICT in education lends itself to a student-centered learning setting and often this creates some tensions for lecturers. Data collection was done using a structured questionnaire and the data were subjected to SPSS version 15.0 for analysis, while descriptive statistics was used to find the percentage. The result shows that a high percentage of the respondents preferred using ICTs in teaching and learning. In conclusion, we suggest that more improvement in digital technology, applications and more intensive training for lecturers be included in the school curriculum development and evaluation process. We also suggested for further study on the topic.*

**Keywords:** Computer, Internet, Educational Materials, Learning, Students, Network.

## **Introduction**

Computers and related electronic resources have come to play a vital role in education. In today's knowledge platform, learning is needed to survive and thrive. In this sense, knowledge is power, and the proliferation of knowledge through e-learning is not a luxury but a necessity for current and future generations. Electronic tools make classes more efficient. Lectures are more compelling, informative, and diverse; reading of assignments is more extensive, interesting, and accessible; discussions are free ranged and not challenging; students' papers more original and well researched. This rapid development in Information and Communication Technologies (ICTs) has made tremendous changes in the twenty-first century, as well as affected the demands of modern societies, recognizing the impact of new technologies on the workplace and in everyday life; today's educational institutions try to restructure their educational programs and classroom facilities in order to minimize the teaching and learning technology gap between developed and the developing countries. This restructuring process is providing learners with knowledge of specific subject areas, promotes meaningful learning, and enhances professional productivity (Tomei, 2005). Today technology leads the way to productivity and the internet has become the vehicle for educational institutions. Students and lecturers now depend more on computers and internet

for research; education over the internet is unlimited access to materials.

## **Review of related literatures**

Information and communication technologies (ICTs) have become commonplace entities in all aspects of life. Over the past twenty years, the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavors within business and governance. Within the education sector, ICT has begun to have a presence but the impact has not been as extensive as in other fields. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. The use of ICT in education lends itself to more students-central learning settings and often this creates some tension for some teachers and students. But with the world moving rapidly into digital media and information, the role of ICT in education cannot be over-emphasized.

Information and communication technology is a force that has changed many aspects of the way we live. John and Sutherland (2004) concluded that these communication tools or technology provide a powerful and rich learning experience and from her research "the use of ICT method is strongly correlated with motivation, independent learning, control over learning, exchange of information and improvement in research skills". The

growing use of ICTs as a tool for everyday life has seen the pool of generic skills expanded in recent years to include information literacy and it is highly probable that future development and technology applications will see this set of skills growing even more

Adwa-Ogiegbaen and Iyamu (2005) stated that education through the use of technologies in learning, is helping to prepare members of the society for this new information age. This has been a number of factors impeding the wholesale uptake of ICT in education across all sectors. These have included such factors as a lack of funding to support the purchase of the technology, lack of training among established teaching practitioners, and lack of motivation and need among teachers to adopt ICT as teaching tools (Starr, 2001).

The drive to promote such developments stems from general moves among institutions to ensure that their graduates demonstrate not only skills and knowledge in their subject domains but also general attributes and general skills. Traditionally generic skills have involved such capabilities as the ability to reason formally, solve problems, and communicate effectively, to be able to negotiate outcomes, manage time, project management, collaboration, and teamwork skills. Just as technology is influencing and supporting what is being learned in schools, so too, is supporting changes to

the way students and pupils are learning. Moves from content-centered curricula to competency-based curricula are associated with moves away from the teacher-centered forms of delivery to student-centered forms. Through technology-facilitated approaches, contemporary learning settings now encourage students to take responsibility for their own learning. However, since traditional media can now be digitized, the distinction between the different media is gradually fading. Contemporary ICTs are able to provide strong support for all these requirements and there are now many outstanding examples of world-class settings for competency and performance-based curricula that sound use of the affordances of these technologies (Oliver, 2000).

The use of information and communication technology in the delivery of education and management training has major implications for teachers, learners, and schools whilst there is potential for major benefit for all concerned, it also continues to set challenges for providers to develop new strategies for teaching and learning and raise fundamental questions about the learning processes. The concept of flexibility in the delivery of educational programs is not new (Moore and Kearsley, 1996), the emergence of ICTs as learning technologies coincided with growing awareness and recognition of alternative theories for learning. The theories of learning that hold the greatest

sway today are based on constructivist principles; these principles posit that learning is achieved by the active construction of knowledge supported by various perspectives within a meaningful context.

### **Review of related empirical studies**

Computers have been used to create electronic libraries and catalogs to enhance academic research work. According to Heek (1999), many libraries now provide online resources to facilitate learning and resource electronically. Hakkavainen *et al* (2000) reported that ICT is a transformative tool and its full integration in school system is necessary to prepare students for the information society they will inherit. ICT has been incorporated into the school curriculum; ICT is now a subject on the schools' timetables from primary to secondary schools (Asamoah, 2008).

The internet allows cost-effective information delivery services, and collaborative and distance education more than ever been imagined (Clyde, 1995; Todd, 1997). The internet has myriad websites to help teachers develop or improve lesson plans, exchange ideas, obtain information, and find animations and simulations to enliven their lessons. According to Awotua-Efebo (1999), most internet-based collaborative learning projects include teacher support and training, and conference proceedings are published regularly on the web. Chat rooms or

forums may become a laboratory for new ideas. Online study resources can also provide an interactive tool for teachers to access feedback from students. Computer-based assignments are effective ways of ascertaining students' understanding of concepts, students also learn more quickly, demonstrate greater retention, and are better motivated to learn when they work with computers (Koert, 2000).

From the early 1990s, education stakeholders in Nigeria and Federal Government have been concerned about how teachers and students can use a computer in schools and how their use supports learning. Teachers use computers to write lesson plans, prepare materials for teaching, record and calculate students' grades, and communicate with other teachers. As such, computers have become a routine tool for helping teachers accomplish their professional work (Becker, Ravitz, & Wong, 1999). Computer-based tests are easier to administer and are quicker to mark. Research showed that the use of computers for drill and practice and for instruction delivery, combined with traditional instruction, results in increases in learning in the traditional curriculum and basic skill areas as well as higher test scores in some subjects compared to traditional instruction alone (Fouts, 2002). ICT enhanced learning mobilizes tools for examination, conclusion, and analysis of information, providing a platform for students' inquiry, analysis, and



construction of new information. Learners, therefore, learn as they do and whenever appropriate, work on real-life problems in-depth, making learning less abstract and more relevant to learners' life situations. In this way, and in contrast to memorization-based or not learning, ICT-enhanced learning promotes increased learned engagement (Waston, 2002). Educational organizations need to make well-considered and discerning choices about the courses that are most relevant for their own specific needs and where ICT can really add value. This will help to manage expectations and channel efforts in the right direction. Computers and the internet can provide teachers instructions and lecturers with more up-to-date support materials. The introduction of ICT in school requires human capacity and effective local support mechanisms. It is necessary to develop a tool of skilled professionals that can install, maintain and repair systems, as well as provide sound advice on hardware and software in the educational field. Training in the use of computers and internet provides opportunities to a wide range of professionals and can provide employment opportunities to students for self-reliance.

The concept of flexibility in the delivery place of educational programs is not new (Moore & Kearsley, 1996). Educational institutions have been offering programs at a distance for many years and there has been a vast amount of research and

development associated with establishing effective practices and procedures in off-campus teaching and learning. The use of technology, however, has extended the scope of this activity and whereas previously off-campus delivery was an option for students who were unable to attend campuses, today many students are able to make this choice through technology-facilitated learning settings. With the technology-facilitated learning, there are now new opportunities to extend the teaching pool beyond normal learning and research methods. The changing role of teachers has seen increased opportunities for others to participate in the process including workplace trainers, mentors, specialists from the workplace, and others. Through the affordances and capabilities of technology, today we have a much-expanded teacher with varying roles, able to provide support for learners in a variety of flexible settings. This trend seems set to continue and to grow with new ICT development applications.

### **Theoretical foundations**

In the past, educational institutions have provided little choice for students in terms of the method and manner in which programs have been delivered, students have typically been forced to accept what has been delivered and institutions have tended to be quite staid and traditional in terms of delivery of their programs. ICT applications provide many options and choices and many institutions are now creating

competitive edges for themselves through the choice they are offering students. The emergence of ICTs as learning technologies has coincided with growing awareness and recognition of alternative theories for learning. The theories of learning that hold the greatest sway today are those based on constructivist principles (Duffy and Cunningham, 1996).

According to Vygotsky (1978), learning is achieved by the active construction of knowledge supported by various perspectives within a meaningful context. According to Duffy & Cunningham (1996), learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of knowledge transmission. The strengths of constructivism lie in its emphasis on learning as a process of personal understanding and the development of meaning in ways that are active and interpretative. In this domain, learning is viewed as the construction of meaning rather than the memorization of facts (Lebow, 1993; Jonassen & Reeves, 1996).

According to Berge (1998) and Barron (1998), learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resources-based, students centered settings and by enabling learning to be

related to context and practice. Any use of ICT in learning settings can act to support various aspects of knowledge construction and as more and more students employ computers and internet in their learning processes.

According to Haddad and Drexler (2002), an effective teaching and learning process must stimulate intellectual curiosity and offer a sense of enjoyment that will move the students from the passive role of recipients of information to the active role of builders of knowledge. Yet, engaging the learner in this process can be the most challenging task for teachers. Computers and internet are effective instructional aides to engage students in the learning process. As learning shifts from the teachers-centered to learner-centered model, a lecturer or a teacher becomes less the sole voice of authority and more, the facilitator, mentor, and coach from “sage on stage” to “guide on the side”. The teacher's or lecturer's primary task becomes to teach the students how to ask questions and pose problems, formulate hypothesis, locate information, and then critically assess the information found in relation to the problems posed. Students also learn more quickly, demonstrate greater retention, and are better motivated to learn when they work with computers.

### **Research method and design**

The research study utilized qualitative and quantitative design approaches. The design has grounded the theory of

Diffusion of innovations (Rogers, 2003). According to Rogers, diffusion focuses on the conditions which increase or decrease the likelihood that all members of a given culture will adopt a new idea, product, or practice. Again according to Rogers, people's attitude toward new technology is a key element in its diffusion theory. The researcher uses the qualitative and quantitative design since the design seek to find out the uses of computers and internet as supplementary sources of educational materials to students and lecturers in the institution.

### Analysis of research questions

**Research question 1:** How can lecturers use computers and internet in teaching in Akanu Ibiam Federal Polytechnic Unwana?

**Table 1:** The use of computers and internet has greatly improve teaching and learning in this institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	30	60.0	60.0	60.0
	Agree	20	40.0	40.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 2:** The use of computers and internet has improved educational policy making

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	10	20.0	20.0	20.0
	Agree	17	34.0	34.0	54.0
	Strongly Disagree	16	32.0	32.0	86.0
	Disagree	7	14.0	14.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 3:** Can the use of computers software help in eliminating repetition of information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	39	78.0	78.0	78.0
	Agree	10	20.0	20.0	98.0
	Disagree	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 4:** Can the use computer software enhance information storage and retrieval

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	32	64.0	64.0	64.0
	Agree	18	36.0	36.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Research question 2:** What is the benefit of computers and internet to the students in Akanu Ibiam Federal Polytechnic Unwana?

**Table 5:** Can computers and internet greatly help students understand better?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	26	52.0	52.0	52.0
	Agree	24	48.0	48.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 6:** Can the use of computers provide students with better view of the topics?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	6	12.0	12.0	12.0
	Agree	22	44.0	44.0	56.0
	Strongly Disagree	14	28.0	28.0	84.0
	Disagree	8	16.0	16.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 7:** Can students use of computers and internet in doing assignment and other class work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	32	64.0	64.0	64.0
	Agree	16	32.0	32.0	96.0
	Strongly Disagree	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 8:** The use computer has provided better information security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	36	72.0	72.0	72.0
	Agree	14	28.0	28.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Research question 3:** How can computers and internet help improve educational management and planning in Akanu Ibiam Federal Polytechnic Unwana?

**Table 9:** Can Educational planning, management and decision making be done fast using computers and internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	4.0	4.0	4.0
	Agree	19	38.0	38.0	42.0
	Strongly Disagree	25	50.0	50.0	92.0
	Disagree	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Research question 4:** How can computers and internet are used to improve access and participation in education?

**Table 10:** Using computers and internet has eliminated over-crowding of students in the classroom

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	36	72.0	72.0	72.0
	Agree	14	28.0	28.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 11:** Do you think that using computers and internet is more preferred than the face-to-face methods of learning?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	16.0	16.0	16.0
	Agree	22	44.0	44.0	60.0
	Strongly Disagree	17	34.0	34.0	94.0
	Disagree	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019



**Table 12:** The use of computers and internet supports collaborative learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	40	80.0	80.0	80.0
	Agree	10	20.0	20.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Research question 5:** How can computers and internet are used to supplement educational materials to enhance quality of education in Akanu Ibiam Federal Polytechnic Unwana?

**Table 13:** Through the use of computers and internet, education is now accessible everywhere

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	37	74.0	74.0	74.0
	Agree	13	26.0	26.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 14:** Can the cost of computers and internet access affect student's performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	4.0	4.0	4.0
	Agree	6	12.0	12.0	16.0
	Strongly Disagree	23	46.0	46.0	62.0
	Disagree	19	38.0	38.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

**Table 15:** Through the use of computers and internet, result is processed with accuracy and timeliness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	35	70.0	70.0	70.0
	Agree	15	30.0	30.0	100.0
	Total	50	100.0	100.0	

Source: Field Data, 2019

## **Discussion of findings**

According to the theory Gregoire, Bracewell, and Lafarrie (1996) along with John and Surtherl (2004), the benefit to students of using new technology is greatly dependent, at least for the moment, on the technological skill of the teachers and the teacher's attitude to the presence of the technology in teaching, it was, therefore, evident that respondent student and lecturers were really benefiting from the new technologies in school. This is shown in table 1, where a high percentage of respondents strongly agree that computers and internets have greatly improved teaching and learning in institutions while 40.0% of respondents do not strongly agree but agree that computers and internet have greatly improved the institution.

Judging from the figure in the Table 1, it is encouraging to observe that a good number of the activities of the institution are done through the use of computers and internet. It was, therefore, evident that the teachers were technologically knowledgeable, and then the benefit of ICT to the school is high.

Table 2 revealed that 20.0% strongly agreed that ICT has improved educational policy-making while 34.0% agree that educational policies. It is also noted that 32.0% of the respondents strongly disagreed, with computer educational policies whereas 14.0% of the respondents disagree. With regards to the use of computers and internet to

improve educational policies, the analysis revealed that a great number of the respondents believe that ICT has not done any change in educational policies.

Table 3 showed that about 78.0% of the respondents strongly agree that the use of computer software will eliminate information redundancy whereas 20.0% of respondents thought not strongly agree but agree that computer software will eliminate repetition of information, while 2 of the respondents disagree.

In Table 4, analysis reveals that 64% of the respondents strongly agree that computer software has enhanced information storage and retrieval. This means that with computer information will be stored in the computer for reference purposes. While 36.0% of the respondents did not strongly agree but agreed that computer software can enhance information storage and retrieval.

Analyzing research questions two (2), Table 5, Table 6, Table 7 and Table 8 presents the details. About (52.0%) and (12.0%) of the respondents strongly agree that computers and internet have greatly helped students to have a better understanding (table5). Only about 48.0% and 44.0% do not strongly agree that computers and internet have helped students have a better understanding of their courses because some students do not have access to the internet or own a computer. While 28.0% strongly disagree whereas 16.0% disagree but do

not strongly disagree in Table 7, a high percentage (about 64.0%) of the respondents strongly agree that with computers and internet, student can do their assignments and class work. 4% of the respondents strongly disagree that computers and internet cannot provide such facilities while 32.0% of the respondents were of the that computer and internets can provide such facilities but not high rate.

Judging from the result, a high percentage of 64.0% and 32.0% were of the opinion that computers and internets help students achieve this. Fouts (2002) however, reported that the use of computer for drill and practice, and for instructional delivery combined with traditional instruction results in increased learning in the traditional curriculum and basic skills areas as well as high test scores in some subjects compared to traditional instruction alone. Lecturers should therefore begin to give more computer-based assignments, test, and some class work in the institution in order to increase student's learning experience.

Information gathered on information security, a high percentage of respondents staff and students (about) 72.0% strongly agreed that ICT can provide a high standard of information security on staff and students' data while 28.0% though not storage agreed but agreed that computer and internet will provide high information security.

The study also revealed that though ICT has made fast delivery in distance learning education but education planning, managing, and decision making cannot be done with ICT only. Table 9 shows that 50.0% and 8.0% of the respondents disagreed that computers and internet cannot be done easily whereas 4.0% and 38.0% of the respondents agree that ICT can manage education planning, management and decision making can be done fast and with less manpower.

Table 10 revealed that about 72.0% of the respondents felt that the introduction of ICT in their institution has had a beneficial impact both on them and on their staff. They felt that computers and the internet have eliminated overcrowding in the classroom whereas 28.0% of the respondents though not strongly agree but agree that computers and internet have promoted off-campus learning; that is, the introduction of ICTs in learning and research has enhanced the development of high order skills. Higher-order skills have been enhanced and have resulted in using those skills in other areas of discipline. The adoption of computers and internet innovation could be attributed to trial ability theory (Rogers, 2003). Also, they felt that online resources have helped them in their academic achievement.

About 16.0% of the respondents strongly agree that learning with computers and internet is more preferred, and 44.0% of the respondent

students and staff, despite the contributions of ICTs in learning do not strongly agree but agree that ICTs is good for learning Table 11, whereas 34.0% and 6.0% felt that ICTs has contributed more in learning, strongly disagree, stating that traditional methods of learning, face-to-face classroom learning is more preferred (Table 11).

Those who use ICTs facilities attested to the fact that the internet and computers have helped them to achieve new things which they could not have achieved without it, some of these are finishing assignments, solving questions, consulting materials from the online library, increased scope of research. Table 12 showed that not only the assignment, 80.0% of respondent students and staff use it for collaborative learning. Therefore, ICT has made education accessible everywhere, Table 13. Though 20.0% of the respondents in Table 12 and 26.0% in Table 13 agree but they do not strongly agreed on that. Meanwhile; due to some disadvantages in the use of computers and the internet, a high percentage (about 46.0%) of the respondents in Table 13, strongly disagree that computers and internet cannot improve students' performance. In Table 14, only 4.0% of the respondents felt that ICT facilities can help students do well in their course of study. With regard to the use of computers and internet in Akanu Ibiam Federal Polytechnic Unwana, 70.0% of the respondent lecturers and students

strongly agree that ICT have made the processing of their results easy, fast, and accurate, though 30.0% do not strongly agree but agree stating that with time, it will be possible using computers and internet to perform them (Table 15).

### **Implication of the findings**

Pannell (1998) reported that if an innovation generates observable results in a short span, it is easier to learn about the worth of the innovation and its application by the individual. It is also reported that innovation adoption is linked to the relative importance of external influences such as change agent (Roger, 2003). In this case, the effectiveness of the change agent in facilitating this process is also dependent upon the methodology that is employed. Those methodologies that heighten the sense of ownership among the target population tend to be the most successful in the long term (Lamble & Seaman, 1994).

The implication of the findings of this study, therefore, is that computers and internet can be effectively used as supplementary sources of educational materials in the Akanu Ibiam Federal Polytechnic Unwana, Ebonyi State despite the high cost of ICT facilities.

According to Haddad and Drexler (2002), an effective teaching and learning process must stimulate intellectual curiosity and offer a sense of enjoyment that will move the students from the passive role of recipients of information to the active role of builder

of knowledge. In this regard, ICT have precipitated the students to be builders of knowledge.

### **Conclusion**

Information and Communication Technology (ICT) is a force that has changed many aspects of the way we live, learn and teach. ICT provides educators with technologies for supporting teaching and learning and educational providers. With the use of computers and internet as supplementary sources of educational materials, about 95% of the teachers and 81% of the students of Akanu Ibiam Federal Polytechnic Unwana, have a wide range of access to educational materials all over the world. Although the ICT skill of teachers in the institution is limited, the number of teachers using computers and the internet has gradually risen and so are opportunities to learn more.

Furthermore, technical knowledge about computers was as important as experience using computers professionally, but the exemplary teacher will have objectives for students to use computers that promote students engagement and thoughtful efforts, outside of class time as well as during class (Becker, Ravitz and Wong, 1999).

### **Recommendations**

Computers and other ICT infrastructures have become routine tools for helping teachers accomplish their professional work. The researcher recommends the following as personal

ideas about the contribution that technology can make to the processes of teaching and learning and classroom management:

1. The management of the school should organize seminars and workshops on the use of ICT in education for students and low level staff members.
2. Increase the number of computers and other ICT infrastructure in the institution.
3. Provision of adequate manpower to mount the ICT center and laboratories.
4. Government should provide coherent ICT policy framework for integration of ICT in education. In a related study, Ely (1993) distinguished three major contributions relevant to ICT integration in classrooms. These are dissatisfaction with the status quo, existence of knowledge and skills, and availability of resources.

### **Suggestions for further study**

ICT is an innovation that changes every day; there is a need for further research on this project. The researcher, therefore, recommends further research on this topic, "the use of computers and internet as supplementary sources of educational material". This is not only good but it will reveal the new technologies for integration in teaching and learning and enhance both technology skills and academic competencies.



## REFERENCES

- Aduwa-Ggiegbaen, S. E. & Iyamu, E. O. S. (2005). Using information and communication technology in secondary schools in Nigeria: Problems and prospects. *Journal of Educational Technology & Society*, 8(1), 104-112.
- Asamoah, D. A. (2008). *Learning through ICTs*. Available at: <http://www.digit3learning.in/interveiw/interview-details.asp?>
- Awotua-Efebo, E. E. (1999). *Effective teaching: Principles and practice*. Port Harcourt, Nigeria: Paragraphics.
- Becker, H. J., Ravitz, J. L., & Wong, Y. T. (1999). *Teacher and teacher-directed student use of computers: Teaching, learning and computing national survey* (Report no. 3), Irvine, California, USA: Center for Research on Information Technology and Organizations at the University of California. Available at: [www.crito.uci.edu/tlc/findings/computeruse/](http://www.crito.uci.edu/tlc/findings/computeruse/)
- Boakye, K. B. & Banini, D. A. (2008). Teacher ICT readiness in Ghana. *ICT and changing mindsets in education*. Bamenda, Cameroon; Langaa; Bamako, Mali: ERNWACA/ROCARE.
- Clyde, A. (1995). Computers in school libraries: The Internet and Australian schools. *ACCESS*, 9(2), 26-28.
- Dankwa, W. A. (1997). *SchoolNet: A catalyst for transforming education in Ghana*. [Online]. Available at: [http://www.isoc.org/isoc/whatis/conferences/inet/96/proceedings/c6/c6\\_1.htm](http://www.isoc.org/isoc/whatis/conferences/inet/96/proceedings/c6/c6_1.htm).
- Ely, D. P. (1993). Computers in schools and universities in the United States of America. *Educational Technology*, 33(9), 53-57.
- Fouts, J. (2002). Research on computers and education: Past, present, and future. Retrieved 30 October, 2013 from [http://www.gatesfoundation.org/nr/downloads/ed/evaluation/Computer\\_Research\\_Summary.pdf](http://www.gatesfoundation.org/nr/downloads/ed/evaluation/Computer_Research_Summary.pdf)
- Gregoire, R., Bracewell, R., & Lafarriere, T. (1996). The contribution of new technologies to learning and technology in elementary and secondary school. Available at: <http://www.tact,fse.unlaval.ca/fr/html/impactnt.html>

- Haddad, W. D. & Drexler, A. D. (2002). The dynamics of technologies for education. *Technologies for education: Potentials, parameters, and prospects* (Eds.). Washington DC: Academy for Educational Development,
- Hakkarainen, K., Ilomaki, L, Lipponen, L, Muukkonen, H., & Rahikainen, M. (2000). Students' skills and practices of using ICT: Results of a national assessment in Finland. *Computers and Education*, 34(2), 103-117.
- Heeks, R. (1999). *Information and communication technologies, poverty and development*. Working Paper Series, Paper No. 5. Manchester, England: Institute for Development Policy and Management.
- John, P. O. & Sutherland, R. (2004). Teaching and learning with ICT: New technology, new "pedagogy"? *Education, Communication & Information*, 4(1), 102-107.
- Karsenti, T. & Tchameni-Ngamo, S. (2007). Qualite de l'education en Afrique : le role potentiel des TIC. *International Review of Education*, 53, 665-686.
- Koert, R. V. (2000). *Providing content-and facilitating social change: Electronic media and rural development* (Based on case material from Peru). First Monday, [http://firstmonday.org/issues/issue5\\_2/vankoert/index.html](http://firstmonday.org/issues/issue5_2/vankoert/index.html)
- Lamble, W, & Seaman, D. (1994). Diffusion and adoption: Basic processes for social change. *Extension handbook: Processes and practices*, Ed (pp. 46-56). Toronto, Canada: Thompson Educational Publishing.
- Maclure, R. (1997). *Overlooked and undervalued: A synthesis of ERNWACA reviews on the state of educational research in West and Central Africa*. Bamako, Mali: ERNWACA. Available at: [www.rocare.org/Overlooked and Undervalued.pdf](http://www.rocare.org/Overlooked%20and%20Undervalued.pdf)
- Myhre, O. R. (1998). I think this will keep them busy: Computers in a teacher's thought and practice. *Journal of Technology and Teacher Education*, 6(2/3), 93-103.
- Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers & Education*, 37, 163-178.