

A Survey of Teacher Perceptions of Educational Technology in Selected Primary Schools

Oladiran Kayode Omoniyi

Federal College of Education (Special)
Akinmoorin, Oyo, Oyo State, Nigeria

Abstract

This study investigated the awareness and perceptions of primary school teachers about educational technology. A 15- item questionnaire was administered on subjects comprising 100 teachers randomly selected from some primary schools in Afijio local government area of Oyo State in Nigeria. The responses obtained were corroborated by direct observations. The results indicated that although teachers were generally qualified, their awareness and utilization of educational technology was very low, even in the 21st century. This was made explicit by the teachers' inability to perceive educational technology beyond mere production or improvisation of instructional materials, and their non-application of systems approach to instruction. Many of them hardly make use of learning resources other than the chalkboard; few charts and pupils' textbooks while some could not even state instructional objectives in behavioral terms. Since the integration of educational technology into classroom practices is largely dependent on teachers' awareness and perceptions of the concept, the study suggested that more emphasis should be placed on teaching, learning, and utilization of educational technology in the teacher education program for both pre-service and in-service teachers.

Keywords: Awareness, Perceptions, Systems Approach, Educational Technology

Introduction

Over the years, educational technology has been defined in various ways by many educators and media practitioners. Some of such definitions have led to the misconceptions which many people had, and perhaps still have, about the concept of educational technology. The concept is at times equated with mere application of audiovisuals to educational or instructional practices, or the integration of computer and its allied information communication technologies to facilitate teaching and learning as evident in many educational technology related studies (Abidoye & Fatoki 2014; Almekhlafi & Almeqdadi, 2010; Cope & Ward 2002; Dogan, 2010; Erişti, Kurt & Dindar, 2002; Mas'od, Ngadiman & Sulaiman, 2013; Mundy, Kupczynski & Kee, 2012; Oladosu, 2012).

The real problem lies in seeing educational technology as mere 'technology in education' which amounts to grasping the concept of educational technology at only the tool level (Akinyemi, 1984; Ogunranti, 1984). It has been observed that traditionally, the popular image of educational technology is of gadgetry whether audiovisuals or any other teaching machine and their application to teaching and learning process (Gbamanja, 1984). Stewart (1999) emphasized this problem by saying "when we try to examine the approach of educational technology in the developing world, we are very quickly forced to the conclusion that it is largely a technology in education which is being pursued...Emphasis has always been on the use of media and visual materials". This narrow conception of educational technology has, however, been corrected in many literature by experts in educational technology, and one would expect that by now the 21st century teachers would have had a better understanding of the concept but this does not seem to be so. Therefore, if it is assumed that there are teachers who are yet to have a full grasp of what educational technology is in the 21st century, it then becomes a matter of concern to revisit the issue of teachers' awareness and perceptions of educational technology with a view to fostering better understanding of the concept and its proper integration into the educational system in general, and the instructional system in particular. It is against this background that this study investigated the primary school teachers' awareness and perceptions of the concept of educational technology in some selected schools in Afijio Local Government of Oyo State in Nigeria. This is important because teachers' awareness and perceptions of the concept will largely determine the extent to which it will be put into use in classroom practices.

Literature Review

Akinyemi (1984), in an effort to make the concept very clear, described educational technology as the application of "technology in instruction and technology of instruction". Ogunranti (1984; 1988) and Omoniyi & Arotiba (2003) also made a distinction between 'technology in education' and 'technology of education'. The former implies the use one makes of products of technology in the educational system in general, and in the school system in particular while the latter (i.e. technology of education) has been described as systematic management of teaching/learning events designed to put one's knowledge of theories of human learning and human behavior into practice in a predictable and effective manner to attain specific learning objectives (Heinich, Molenda & Russell, 1982). In other words, technology of education is a comprehensive process that emphasizes systematic planning, systematic development, systematic implementation and proper evaluation of the whole educational process in general and instructional process in particular. It has been described as a technological process whose origin lies in the application of behavioral sciences to problems of human learning, motivation,

reinforcement, readiness, perceptions, etc. (Abimbade, 1997; Ogunranti, 1984). It is thus the combination of both technology in education and technology of education that makes for educational technology proper.

Looking at educational technology from a broader perspective, Richmond (1990) saw it as that which brings about the explicit search for effective contribution to learning, appropriately designed learning situation and effective learning more than what the application of audiovisuals could only provide. The teacher who rewards a student by smiling, saying “well done” when the student gives a correct response is said to be employing educational technology, just as if the student is responding to a fully automated system that gives immediate feedback (Sheath, 1999). It is thus the main goal of educational technology that effective and efficient human learning is ensured in all its ramifications.

The Association for Educational Communications and Technology (AECT, 1979) gave a more comprehensive and widely accepted definition of educational technology as a complex integrated process involving people, procedures, ideas, devices and organisation for analyzing educational problems and devising, implementing, evaluating and managing solutions to those problems involved in all aspects of human learning.

This definition implies that the application of educational technology requires the efforts of man and machine, systematic designing, planning and delivery of instruction, effective management, and evaluation of the teaching and learning processes (Dogan, 2010; Omoniyi & Arotiba, 2003). The evaluation of the total instructional processes demands that both instructional objectives and learners’ behavioral objectives be clearly and specifically stated. Writing of instructional objectives in behavioral terms is, therefore, one of the essentials in the application of educational technology to instruction (Omoniyi & Arotiba, 2003).

For more understanding of the concept and the scope of educational technology, some of its elements have been well documented (Imogie, 1984; Ogunranti, 1984). They include:

- (i) Understanding of audience and its needs
- (ii) Identification of educational problems that should be resolved
- (iii) Establishment of priorities among problems
- (iv) Specification of goals and objectives
- (v) Identification of various alternative strategies for solving the identified and analysed educational problems
- (vi) Identification of necessary financial, physical and human resources- prerequisites to the achievement of established goals and objectives
- (vii) Analysis of content or message which leads to the achievement of objectives
- (viii) Development of evaluation system, a “feedback” system (an assessment mechanism).

These identified elements, according to Chadwick (1979), show clearly that educational technology has as one of its basic tenets systems approach to educational change and improvement.

Abimbade (1997), Aremu, (1999) and Omoniyi & Arotiba (2003) also added that educational technology uses systems approach, behavioural sciences theories and communication principles along with all human, financial and material resources to solve the many educational problems that may beset any country- be it a developed or a developing one. According to Beane (2001), it is essentially one part alongside curriculum development, staff development and development of student learning. Though educational technology is not limited to the application of hardware and software to instruction, several authors on the subject agree that its approach to curriculum development and implementation demands a wide range of combination of media to

achieve various goals (Agun, 1988; Davies, 2001; Omoniyi, 2000). The more the media is used in the teaching and learning, the better it is for learners. Therefore, educational technology requires teachers to be very resourceful and use variety of strategies and means to enhance learning (Obanya, 1988). Gbamanja (1984) was of the opinion that a teacher will have used a part of educational technology if he runs around to get extra materials, uses batteries or any other means instead of electricity and finds appropriate ways of managing the large class. In other words, educational technology demands that teachers should be innovative, using variety of methods and means in their approach.

Statement of Problem

It was observed in the 20th century that the concept of educational technology was not clearly understood by many educators in developing countries, especially the teachers while those who claimed to understand it did not always put it into use in their classroom practices. Many could not perceive educational technology beyond the 'tool level' (i.e. technology in education). One would expect that the situation by now would have changed for better. It is against this backdrop that this study sought to investigate the 21st century primary school teachers' level of awareness, perceptions and utilization of educational technology.

Purpose and Significance of the Study

The purpose of the study is to show the current level of understanding of the primary school teachers about educational technology and the extent to which they apply some of its major tenets or principles, particularly the systems approach, to their classroom practices. It is also to let the teacher trainers see some areas where they need to focus their attention. It is hoped that the study would spur immediate and adequate interventions from all teacher education program stakeholders, especially those that are directly connected with the primary school educational system.

Scope of the Study

This research was a small scale investigation on the level of awareness and perceptions of primary school teachers about the concept of educational technology. It was a small scale investigation in that the investigated level of awareness was based on, and limited to just few aspects of educational technology which student- teachers were supposed to have been exposed to during the course of their study, and which they were expected to put into use as professional teachers on the field. The study was also limited to the primary school teachers in Afijio local government area of Oyo State, Nigeria.

Research Questions

The study sought answers to the following questions:

- (i) Do primary school teachers receive any training on educational technology (ET)?
- (ii) In which areas of educational technology do teachers receive training?
- (iii) To what extent can teachers in primary schools identify elements of educational technology (ET)?
- (iv) To what extent do teachers in primary schools understand the concept of systems approach and apply it to classroom teaching and learning?

Methodology

Research Design

The study adopted a descriptive field survey design. This method was chosen because the study was to collect data that described existing phenomena in an attempt to answer questions about the current level of teachers' awareness and perceptions of the concept of educational technology, and the extent to which it is applied to classroom practices.

Population and Sampling

All the primary school teachers in Afijio local government area of Oyo State, Nigeria constituted the population for this study.

Out of this population, one hundred (100) teachers were selected for the study by random sampling. The subjects that were randomly selected comprised thirty-eight (38) male and sixty-two (62) female teachers. The schools from which the teachers were drawn were selected using stratified sampling technique.

Research Instrument

A 15-item questionnaire and direct observation were used for this study. The questionnaire was developed by the researcher and given face validity by experts in educational technology (ET). Their objective suggestions were found useful and incorporated.

The questionnaire was divided into two sections (A & B). Section 'A' sought for demographic data in respect of each subject's qualifications, age, sex, and years of teaching experience while section 'B' sought for information concerning the survey.

The 15 items under section B were grouped into three parts. Part I contained items (i)-(vi) which sought for information on the knowledge of ET acquired by the subjects while in training. Part II was made up of eight (8) items to test the subjects' present perceptions of ET, while part III was an open-ended question asking respondents to describe what they understood by the term 'educational technology'.

Data Collection

The researcher went round the schools of the respondents at different times to administer the questionnaire. The subjects were made to complete the questionnaire and return same immediately. This made it possible for the researcher to have a 100% return rate of the questionnaire administered.

On few occasions, the researcher observed some respondents in the class while teaching.

Data Analysis

The data collected from the questionnaire were analyzed by finding the percentages of respondents' responses to the items contained therein.

Presentation and Analysis Results

Research Question 1

The content of table 1 answers the research question as to whether the primary school teachers that were used in the study received any training in educational technology.

S/N	Qualification	No of teachers in possession and %
i	B.A. Ed. /B.Sc. Ed.	(24) 24%
ii	Nigerian Certificate in Education (NCE)	(72) 72%
iii	Associateship Certificate in Education (ACE)	(1) 1%
iv	Grade Two Teachers' Certificate	(3) 3%

Table 1: Teacher Qualifications

N=100

The above table shows that out of 100 teachers that were involved in the study 24% were graduate teachers while 72% had the Nigeria Certificate in Education (NCE). Majority of those with NCE, however, indicated that they were either undergoing a bachelor's degree course or awaiting its result. Very few of the respondents did not have beyond either Teachers' Grade Two Certificate (3%) or Associateship Certificate in Education (1%).

This finding shows that 96% of the respondents had tertiary teacher education training, and must have studied educational technology while in school. Educational technology is always taught as a discipline or a core course in the colleges of education as well as polytechnics or universities where teacher education program is offered.

Research Question 2

Research question 2 investigated the aspects of educational technology in which the respondents received training. The subjects were asked to indicate if they ever received training in some identified areas of educational technology.

The result is shown on table 2.

S/N	Training received	No. of teachers responding and %
i.	Instructional/Educational technology as a discipline or a course of study	(96) 96%
ii.	Use of audio, visual and audiovisuals including OHP, filmstrips, slides, CDs, video, etc. for teaching	(47) 47%
iii.	Production/Improvisation of teaching learning resources	(98) 98%
iv.	Variety of teaching methods	(97) 97%
v.	Programmed learning (PL) and computer assisted instruction (CAI)	(18) 18%
vi.	Systems approach to planning, delivery and evaluation of instruction	(41) 41%
vii.	Formative and summative evaluation strategies	(53) 53%
viii.	Use of reinforcement techniques	(61) 61%
ix.	Teaching as a communication process	(88) 88%
x.	Educational radio and educational television	(42) 42%
xi.	Micro-teaching	(95) 95%

Table 2: Areas of Educational Technology in which Teachers received Training

N=100

As shown above, more than 90% of the respondents indicated that they received training on aspects of educational technology such as production/improvisation of teaching and learning resources (98%), variety of teaching methods (97%) and micro-teaching (95%).

Only 88% of the respondents could, however, perceive teaching as a communication process. The number of teachers who indicated that they were trained in the application of systems approach to planning, delivery and evaluation of instruction was below average i.e. 41%

although 53% and 61% expressed that they received training in evaluation strategies and reinforcement (reward system) respectively.

Only 42% indicated that they ever received training on educational broadcasts while 47% had the practical knowledge of audiovisuals such as OHP, slide sets, filmstrips, video, CDs etc. as instructional media. Computer assisted instruction is the aspect that the respondents (18%) had the least knowledge about.

The above findings reveal that the primary school teachers' awareness of educational technology was largely limited to the production or improvisation of instructional materials which in most cases are visual graphics, models of objects, specimens and realia. It was also noted that though the respondents were aware of different teaching methods, their knowledge of individualized instruction as well as systems approach was very low.

Research Question 3

To what extent can teachers in primary schools identify the elements of educational technology?

In the second part of the questionnaire were listed some elements from which the respondents were asked to check as many as they considered to be related to the concept of educational technology. The result is shown table on 3.

S/N	Elements of Educational Technology	No of teachers responding and %
i	The use of audio and audio-visual materials	(87) 87%
ii	Understanding of learners and their individual needs	(40) 40%
iii	The application of systems approach to instruction	(32) 32%
iv	Evaluation of teaching and learning during and at the end of each lesson	(38) 38%
v	Specification of goals and objectives	(35) 35%
vi	Selection of various alternative strategies for solving educational problems	(51) 51%
vii	Preparation of simple teaching aids	(95) 95%
viii	The use of radio and television programs in the class	(78) 78%

Table 3: Elements identified as belonging to Educational Technology

N=100

The above table shows that 87%, 95% and 78% of the subjects identified the use of audiovisuals, production of instructional materials, and the use of radio and television programs respectively as elements of educational technology.

On the other hand, 40% of the teachers could identify learners' centeredness in education as a basic component of educational technology. The least recognized elements are items (iii) and (v) on the table. This is not surprising since it is shown on table 2 that only 41% of the teachers claimed to have received training on systems approach while in school.

The table below shows the teachers' scores on the total number of elements recognized as belonging to educational technology.

Number of elements recognized	No of teachers responding and %
8	0%
7	(10) 10%
6	(10) 10%
5	(12) 12%
4	(38) 38%
3	(19) 19%
2	(7) 7%
1	(4) 4%
0	0%

Table 4: Teachers Scoring 0-8 on Recognition of Elements of Educational Technology *N=100*

None of the teachers could identify all the 8 elements of educational technology listed on table 5. While the total of 68% could identify up to 4 elements, only 32% considered educational technology as being made up of 5 or more elements. This again does not justify the claim made by 96% of the teachers (see Table 2) that they studied educational technology while in training. However, none of the respondents is completely ignorant of elements of educational technology.

Research Question 4

To what extent do teachers in primary schools understand and apply systems approach to classroom teaching and learning?

Table 2 item (vi) and table 3 items (ii) – (v) reveal the low level awareness of systems approach among the respondents. This was corroborated by the direct observation of the researcher. Checking through many of the teachers’ lesson notes, it was noticed that quite a number of them did not apply systems approach to their lesson planning. Many could not state their lesson objectives in behavioral terms. The statements of objectives found in their notes were neither: specific, observable, nor measurable. Verbs such as ‘to know’, ‘to understand’ that are open to different interpretations were used instead of action verbs such as ‘to explain’, ‘to list’, ‘to describe’ ‘to apply’ ‘to evaluate’ etc.

It was also noticed that enough time was not spent on lesson note preparation. Their lesson notes did not indicate where they intended to make use of what instructional material, and only few respondents actually made use of instructional materials other than the chalkboard. There was over dependency on charts, many of which were poorly made.

Their classroom evaluation strategy was limited to asking very few questions that test simple recall. The teachers were also monotonous in their use of reinforcement technique during lesson presentation as this was mostly limited to asking class members to clap for the pupils that were able to answer questions correctly.

Discussion of Results

The findings revealed that primary school teachers in the country are professionally trained. That 96% of the respondents used for the study had tertiary teacher education is in consonance with the national policy on education which stipulates that Nigeria Certificate in Education (NCE) shall be the minimum qualification for entry into the teaching profession (FRN, 2004). It is, however, surprising that in spite of this high level of training, the primary school teachers’ level of awareness of educational technology in all its ramifications is very low. Many of the teachers are still operating at what Imogie (1984) described as the ‘tool level’ of

educational technology in which case the concept is viewed as mere production and application of instructional media to teaching and learning.

It is also surprising and disheartening that in spite of the fact that a good number of the respondents indicated that they received training on the preparation and utilization of media resources, many of them hardly use instructional materials other than the chalkboard, few charts (many of which were badly produced) and pupils' textbooks. This corroborates the findings of Onyenemezu & Olumati (2014) that even while in training student teachers rarely use educational media technology.

The study further revealed that only very few of the subjects, as evident by the findings shown on table 3, understood what is meant by systems approach which is a fundamental concept in educational technology. Educational technology has succinctly been defined by some experts as a systematic approach to solving educational problems (Abimbade, 1997; Aremu 1999; Omoniyi & Arotiba, 2003). It might be that this aspect of educational technology was not well emphasized while the teachers were in training. That none of the respondents could identify all the elements of educational technology as presented on table 4 further lends support to the fact that systems approach and its application to teaching and learning needs to be more emphasized in Nigerian teacher education programs. Unless the concept of systems approach as a step-by-step problem-solving technique is well understood, teachers may not be able to apply effectively and efficiently any other knowledge they might acquire in educational technology.

Just few of the respondents (35%) could link specification of goals and objectives with the concepts of educational technology. Little wonder why there were among the respondents those who could not state their lesson objectives in behavioral terms and in such a manner that will contain the three criteria of 'condition' 'task/behavior performance', and 'standard' as described by Mager (1982) and Omoniyi (2008). It is a common knowledge that without a well stated objective, evaluation becomes rather unfocussed!

It is also a matter of concern in this 21st century that many school teachers are not familiar with the use of computer in instruction. Only 18% of the respondents had the knowledge of CAI while none of the schools visited by the researcher had a single computer. This is a big problem that is likely to take a long time to solve considering the bad shape of public school infrastructures and inadequate funding of the Nigerian educational system.

Conclusion

From the foregoing, one can conclude that primary school teachers' awareness and application of educational technology is not commensurate enough with their academic qualifications. Although Nigerian primary school teachers are trained professionally, their understanding of educational technology leaves much to be desired. It should be noted that adequate awareness of educational technology is a prerequisite for its successful application to teaching and learning. All teachers, therefore, need to be well groomed in the art and science of educational technology.

Recommendations

In view of the findings of this study, the following recommendations are made:

Lecturers of educational technology in teacher training institutions should adequately expose student-teachers to both the theory and practice of educational technology.

More emphasis should be placed on the application of systems approach to solving educational problems in general, and instructional problems in particular.

Workshops, seminars and conferences on educational technology should be organized for teachers from time to time for their professional development. The ministries of education, teaching service commissions, state primary education boards and local inspectors of education should be able to facilitate this.

The local inspectors of education need to intensify their efforts in the area of supervision of teachers in schools. If teachers are not made to put into practice the knowledge acquired while in training, such knowledge can easily fade out of their memory with the passage of time.

Suggestions for Further Studies

The researcher limited the scope of this study to only few public schools. Therefore, the study can be extended to public schools in other local government areas as well as private primary schools to make comparison possible.

The subjects' awareness and understanding of just few aspects of educational technology was investigated. Further studies may look beyond the few areas.

Apart from teachers' awareness and perceptions of educational technology, its extensive integration and application at the primary school level is also worth investigating.

The effects of variables such as gender, age, and years of teaching experience on primary school teachers' perceptions of educational technology can also be looked into.

References

- Abidoye, J. A. & Fatoki, O. R. (2014). Integrating instructional technology into education curriculum in Nigeria. *Greener Journal of Education Research*, 4 (2), 36 - 40.
- Abimbade, A. (1997). *Principles and practice of educational technology*. Ibadan: International Publishers.
- Agun, I. (1988). Educational resources and the manpower to cope. In A. Ogunranti (Ed.), *Problems and prospects of educational technology in Nigeria*. Ibadan: Heinemann.
- Akinyemi, K. (1984). Strategies for improving the impact of educational technology. In K. Akinyemi & A. Dopemu (Eds.), *Educational technology in Nigeria*. Ibadan: Nigerian Audio-visual Association Monograph series.
- Almekhlafi, A. G. & Almeqdadi, F. A. (2010). Teachers' perceptions of technology integration in the United Arab Emirates school classrooms. *Educational Technology and Society*, 13 (1), 165 -175.
- Aremu, A. (1999). Educational technology. In M. Ogunsanya (Ed.), *Basic process in education*. Oyo: Andrian Pub., 126 - 144.
- Association for Educational Communications and Technology (AECT) (1979). *The definition of educational technology*. Washington, D.C: AECT.
- Beane, I. D. (2001). Educational technology and curriculum development. *Media World*. 2(1), 14-18.
- Chadwick, C. B. (1979). Why educational technology is failing: What should be done to create success? *Educational Technology*, 19 (1), 7-19.
- Cope, C. & Ward, P. (2002). Integrating learning technology into classrooms: the importance of teachers' perceptions. *Educational Technology & Society*, 5 (1). Retrieved from www.ifets.info/journals/5-1/cope.html
- Davies, R. B. (2001). Educational technology today. *Media World*, 2 (1), 28 - 31.
- Dogan, S. (2010). Perceptions of teachers about the use of educational technologies in the process of instruction. *Odgojne Znanosti*, 12 (2), 297 – 309. Retrieved from <http://hrcak.srce.hr/file/101916>
- Erişti, S. D., Kurt, A. A. & Dindar, M. (2012). Teachers' view about effective use of technology in classrooms. *Turkish Online Journal of Qualitative Inquiry*, 3 (2), 30 - 41.
- Federal Republic of Nigeria (FRN) (2004). *National policy on education*. 4th ed. Lagos: NERDC.
- Gbamanja, S. P. T. (1984). Educational technology and the 6-3-3-4 educational system. In K. Akinyemi and A. Dopemu (Eds.), *Educational technology in Nigeria*. Ibadan: Nigerian Audio-visual Association Monograph series, 48 - 58.
- Heinich, R.; Molenda, M; & Russell, J. D. (1982). *Instructional media and the new technologies of instruction*. Canada: John Wiley and Sons, Inc.
- Imogie, I. (1984). Factors militating against the development of educational technology in Nigeria. In K. Akinyemi and A. Dopemu (Eds.), *Educational technology in Nigeria*. Ibadan: Nigerian Audiovisual Association Monograph Series, 26 - 46.
- Mager, R. F. (1982). *Preparing instructional objectives*. Palo Alto, C. A.: Fearon Publishers.
- Mas'od, N. H., Ngadiman, M. E. & Sulaiman, S. (2013). Teachers' perception for adoption of instructional technology in schools. 2nd International Seminar on Quality and Affordable Education (ISQAE, 2013). Retrieved from <http://educ.utm.my/wp-content/uploads/2013/11/24.1pdf>.
- Mundy, M., Kupczynski, L. & Kee, R. (2012). Teacher's perceptions of technology use in schools. Retrieved from <http://sgo.sagepub.com.Doi.10.1177/2158244012440813>.
- Obanya, P. A. I. (1988). Toward a return to resourcefulness in teaching. In A. Ogunranti (Ed.), *Problems and prospects of educational technology in Nigeria*. Ibadan: Heinemann.

- Ogunranti, S. A. (1984). Educational technology: Please step-in. An unpublished monograph.
- Ogunranti, Ayo (Ed.). (1988). *Problems and prospects of educational technology in Nigeria*. Ibadan: Heinemann.
- Oladosu, K. (2012). Basic technology teachers' awareness and attitude towards the use of ICT for sustainable development in Lagos State Education District: I, IV & VI. *Journal of Education and Practice*, 3(13), 46 – 50. Retrieved from www.lite.org.
- Omoniyi, O. K. (2000). *Fundamentals of curriculum process*. Ibadan: Foludex.
- Omoniyi, O. K. (2008). Preparation of effective lesson plan. In E. O. Adeniyi, Theo Ajobiewe & A. A. Adejumobi (Eds.), *A handbook on effective classroom practices for participants in Federal Teachers' Scheme*. Ibadan: Glory Land Pub., 1 - 18.
- Omoniyi, O. K. & Arotiba, T. (2003). *Basic concepts in educational technology*. Ibadan: Emola-Jay Comm. (Inc.).
- Onyenemezu, C. E. & Olumati, E. S. (2014). Educational media and technology: A panacea for effective teaching and learning among trainee adult educators in University of Port Harcourt. *British Journal of Education*, 2 (3), 75 81.
- Richmond, W. K. (1990). *The concept of educational technology*. London: Weinfield & Nicolson.
- Sheath, W. B. (1999). Educational technology: Strategies for improvement. *Educational Media*, 3 (2), 24-29.
- Stewart, C. B. (1999). Appropriate current educational technology. *Educational Media*, 3 (2), 14-17.