

STRATEGIES FOR IMPROVING THE UTILIZATION OF ICTs FOR TEACHING AND LEARNING IN FEDERAL COLLEGE OF EDUCATION (TECHNICAL), ASABA, DELTA STATE

Lawrence Ekene Uzomah; Dr. Kelvin S. Onwubuya And Adesuwa Deborah Enoghomwase

Abstract

This study was carried out to determine the strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba, Delta State. The study adopted a descriptive survey design. Two research questions were answered and two null hypotheses were tested at 0.05 level of significance. The population of the study comprised of 365 teachers in Federal College of Education (Technical), Asaba. The sample size for the study is 124 comprising of 62 male and 62 female teachers from each of the five schools randomly selected to represent the entire population. The instrument used for data collection is a structured questionnaire, which was structured by the researcher and validated by two experts, one in School of Secondary Education (Science), and the other in the Field of measurement and evaluation, both in Federal College of Education (Technical), Asaba. One hundred and twenty five (124) copies of the validated questionnaire were administered on the selected teachers in Federal College of Education (Technical), Asaba, Delta State by the researcher with the help of 3 research assistants and all the copies were retrieved and analyzed using mean statistics. Based on the findings, it was revealed that there are some basic strategies that could be adopted in order to improve the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba, Delta State. It was recommended that the Federal government and the school management should not only make ICT infrastructures available in the school but should also sponsor teachers on retraining workshops such as seminars and conferences at least twice a year to enable them to be encouraged to utilize ICTs for teaching and learning in the school.

Keywords: Strategies, Utilization, Information and Communication Technology (ICT), Teaching, Teaching and Learning

Introduction

Education is the bedrock of development. Education is the process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment, and generally of preparing oneself or others intellectually for mature life (Etuk, 2006). Offorma in Mfam and Etino (2018), opined that education is a social mechanism which is designed to bring about in the person that submitted to it certain skills and attitudes that are useful and desirable in the society. Education is given credence as primary vehicle in meeting the goals of a nation. The National Policy on education (2013), the Nigerian philosophy of education is founded on three principles: a)

the development of individuals into a sound and effective citizen, b) the full integration of the individual into the community and c) the provision of equal access to educational opportunities for all citizens of the country at the primary, secondary and tertiary levels both inside and outside the formal school system.

Tertiary education consists of Universities, Polytechnics and Colleges of Education. The mandate of Colleges of Education in Nigeria is to produce quality teachers for the Basic Education sub-sector. It equally prepares students to be productive members of the society (Jegade & Owolabi, 2003). In developed countries, Colleges of education are seen as the gateway to providing not only an educated citizenry but also a capable workforce. According to Jegede and Owolabi, Colleges of Education are now being recognized as the cornerstone of the educational system in the 21st century. It therefore means that quality College of Education program is indispensable in creating a bright future for individuals and nations alike. Jacob and Tomoko (2001) also stated that Colleges of Education are crucial for economic growth. Colleges of Education therefore provides countries with the skills and knowledge needed for economic growth, including furthering learning and training of professionals such as technicians, scientists and entrepreneurs. Colleges of Education can also be decisive in fostering positive social and civic values and yields considerable private returns, offering young people the chance to acquire skills that were unlikely to be developed in the primary and secondary schools. This in turn enables youth to develop job-oriented skills, participate fully in the society, take control of their own lives and continue learning.

In order to meet up with science and technological advancement in the world today, the use of Information and Communication Technology (ICT) for teaching and learning in tertiary institutions and especially the colleges of education have become imperative. The importance of ICT in promoting quality education cannot be overemphasized. According to Rosenberg (2005), information and communication technology is concerned with the storage, retrieval, manipulation, transmission or receipt of information electronically in digital form. Therefore to achieve the general objectives of utilization of ICTs for teaching and learning, it is important that ICT facilities such as computer, internet, modems etc are not only available, but also put into full utilization in order to facilitate effective teaching and learning between the teachers and students.

Utilization according to Mark (2011), is the primary technique wherein success and performance efficiency are determined. It is also used to describe the act of using materials, products and services to make things function, extend the lifespan of machineries, improve durability of materials and other things that can lead to better performance and less risk of damage (Obindu, 2008). For the above to be achieved, strategies are needed.

Strategies are a carefully developed plan or method with which an organization or establishment defines possible means of achieving its goals and objectives (Zahra, 2003). In order words, it involves the art of directing overall operations within an organization. Without strategies, it becomes very difficult to achieve an organization's objectives, which is supposed to give direction to any serious minded organization that intends to achieve its set goals. According to Wakefield (2010), any organization facing serious challenges in achieving its set goals, needs to go back to the drawing board and develop implementable strategies that will turn its fortunes around. This can be likened to the Federal Government's strategy towards educational development in Nigeria by setting up an educational fund in 2011, known as the Tertiary Education Trust Fund (TETFUND), a body charged with the responsibility for imposing, managing and disbursing the tax to public tertiary institutions in Nigeria. As a result of these strategies, there is bound to be an improvement in the development of education in Nigeria.

According to Joshua (2013), the utilization of ICT tools by those who need to put them into full use for the purpose of improvement is one of the major challenges facing the digital era. Improvement is the act of transforming something from its current state to a better state or standard (Stone, 2010). Therefore, there is need to make conscious efforts in utilizing the available ICT tools in the educational institutions for the purpose of improving teaching and learning processes.

Teaching and learning are processes of guiding the less informed to acquire knowledge which brings about changes in the individual's behavior (Morrison, 2001). Nwangwu (2007) however noted that teaching and learning can be actualized in this information age through the use of ICT. It has no barrier, for it cuts across every discipline. Teaching and learning as far as education is concerned, takes place globally, hence the improvement of the utilization of ICT for teaching/learning will go a long way in developing the education sector in Nigeria.

Statement of problem

The need for ICT in tertiary schools and more especially, Colleges of education has become enormous. The world is a digital village, information dissemination and transmission are now done in schools, and offices are turning into a paper-less office (Edhuze, 2003). All these could be attributed to digitalization which is facilitated by information and communication technology devices such as fax, mobile phones and satellites (Batubo & Digitemie, 2008). This digitalization can only be made useful if schools, offices, business organizations etc put these ICT devices into full utilization.

The Federal government through the Nigerian Communications Commission (NCC), and the Tertiary Education Trust Fund (TETFUND) have set up well furnished ICT centers in most colleges of education in Nigeria, including the Federal College of Education (Technical), Asaba, Delta State. However, these ICT centers are well equipped with laptop computers, desktops, internet servers, electronic boards etc and are either not utilized or not fully utilized by the teachers and students of Federal college of education (Technical), Asaba for teaching and learning. This is either as a result of the fact that the teachers do not have the necessary prerequisite skills to utilize these ICT resources, or do not have all the resources they need to make these ICT devices functional.

It therefore means that without improvement on the utilization of these available ICT resources for teaching and learning, graduates from the college become displaced in the face of digitalization in this technological era and the teachers become obsolete where technology has become the order of the day in our society. It is on this basis that the researchers deem it necessary to conduct a study on the strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba, Delta State.

Purpose of the Study

The major purpose of the study is to determine the strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba. The study specifically seeks to determine:

1. Teacher training Strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.
2. Instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Research Questions

The following research questions are raised to guide the study:

1. What are the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba?
2. What are the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba?

Hypotheses:

The following hypotheses are formulated for the study:

1. There is no significant difference in the mean ratings of male and female teachers on the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

2. There is no significant difference in the mean ratings of male and female teachers on the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba

Related Empirical Study

Orakwe (2008) carried out a study on strategies for retooling instruction in secondary health education for the information age. The descriptive design survey was adopted. Three research questions were used. A random sample of 210 health education teachers in secondary schools in Anambra state participated in the study. Mean and standard deviation was used to answer the research questions. The findings of the study indicated that retooling health education instruction would involve the provision of information and communication technology (ICT) infrastructure, building teachers' capacity and the acquisition of ICT skills by health education teachers. Some recommendations were suggested on what government, PTA, principals and health education teachers should do such as provision of ICT facilities, development and provision of reliable locally produced software that will be easy to maintain. Subsequently, the teachers agreed that in terms of the global trends, ICT infrastructure is important for retooling health education in secondary schools in Oshimili North and South Local Government Area of Delta State. This is very much related to this work in that both researches identified capacity building workshops as strategies. However, they are similar but different in scope.

Uba (2006) undertook a study on strategies for enhancing the teaching and learning of computer in secondary schools in Ebonyi state. The study adopted a survey research design. Two research questions were formulated to guide the study. A 15 item questionnaire was formulated and administered to 120 respondents, which include computer teachers and computer students from fifteen secondary schools in the three zones of the state. Random sampling technique was used in the study, while frequency and simple mean was used for data analysis. The result of the study revealed that for appropriate methodology, adequate facilities, employment of qualified teachers, establishment of cordial relationship between parents and teachers, instructional materials, practical task and monitoring of students' ability and the need for developing problem solving skills to boost students learning abilities for teaching and learning of computer in secondary schools. This is very much related to this work in that both researches focused on teaching methodology and instructional delivery techniques. However, they both differ in the sense that while one looks at strategies for enhancing teaching and learning, the other looks at strategies for enhancing the utilization of ICTs.

Methodology

This study adopted a descriptive survey design. According to Nworgu in Uzomah (2017), a descriptive survey is a type of study that examines existing and current observable occurrence on the particular study. Thus, survey design was considered suitable for this study because it uses a representative sample of the entire population, and because it enabled the researchers to collect data and describe facts on the strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

The population of the study is 365. There are 365 teaching staff in Federal College of Education (Technical), Asaba, comprising of 170 male teachers and 195 female teachers. The sample size for the study is 124, comprising of 62 male teachers from each of the 5 schools and 62 female teachers in Federal College of Education (Technical), Asaba, randomly selected to represent the entire population.

The instrument for data collection was constructed by the researchers. The questionnaire is titled "Questionnaire on strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba" (QSIUFCETA) and consisted of two sections 'A' and 'B'. Section 'A' deals with the demographic information of the respondents and section 'B' deals with information on the specific purpose of the study and was developed into 2

clusters. The questionnaire had four points scale which were coded and weighted as follows: SA - Strongly Agree (4), A - Agree (3), D – Disagree (2), SD - Strongly Disagree (1). The bench marck was fixed at 2.50. Therefore, any item with the mean of 2.50 and above was considered Agreed, while items with mean below 2.50 were considered Disagreed.

The research instrument was subjected to face validation by two experts. One from the department of Computer Education, and the other in the field of measurement and evaluation, Federal College of Education (Technical), Asaba. In the course of validation, experts were requested to examine the instrument in terms of clarity, relevance and appropriateness of the content. Their observations and suggestions were put into consideration while making the final copy of the instrument. To ensure the consistency of the validated instrument, a pilot study was carried out on ten (10) teaching staff of College of Education, Warri, Delta State. Instruments were collected and analyzed using Pearson Product moment correlation to estimate the reliability which yielded a correlation of 0.78 which shows that the instrument is reliable.

The instrument for data collection was administered by the researchers with the help of three (3) research assistants. These assistants were briefed on the purpose and nature of the study and how to distribute, collect and handle the retrieved copies of the questionnaire. This was necessary because in cases where it was not possible to collect the completed questionnaire on the spot, the research assistants helped the researcher in retrieving them at a later date agreed upon.

The data collected from the questionnaire was analyzed using mean and standard deviation to answer each of the two research questions. However, each of the two hypotheses was tested using ANOVA statistic at 0.05 level of significance. The analysis was computer based with the use of SPSS. Any item with a mean of 2.5 or above was regarded as agree while items below 2.5 were regarded as disagree. The hypotheses of no significant difference was accepted for any item whose F-calculated value is equal to or less than the F-ratio value and rejected for any item whose F-calculated value is greater than the F-ratio value.

Results

Research Question 1

What are the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba?

To provide the answer to this research question, the data collected was subjected to mean and standard deviation (see table 1)

Table 1: Mean ratings and standard deviation of the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

| ITEM STATEMENTS | | N | X̄ | S | DECISION |
|-----------------|---|---|----------|----------|---------------|
| 1 | Heads of Departments should be sponsored on ICT training workshops and they should in turn train other teachers | 1 | 3 | 1 | AGREED |
| | | 2 | . | . | |
| | | 4 | 2 | 0 | |
| | | | | 5 | |
| 2 | Teachers should attend free and compulsory training on ICT-assisted instruction | 1 | 3 | 1 | AGREED |
| | | 2 | . | . | |
| | | 4 | 1 | 0 | |
| | | | | 7 | |
| 3 | Teachers in the College should be provided with free ICT training kits (containing ICT training manuals, illustrations and basic tips) by the Federal Ministry of Education | 1 | 3 | 1 | AGREED |
| | | 2 | . | . | |
| | | 4 | 4 | 0 | |
| | | | | 6 | |
| 4 | The Academic Staff Union in the College (COEASU) should provide ICT training for their members | 1 | 3 | 1 | AGREED |
| | | 2 | . | . | |
| | | 4 | 5 | 2 | |
| | | | | 1 | |
| 5 | Teachers should take part in-school ICT training for teachers in order to develop themselves | 1 | 2 | 1 | AGREED |
| | | 2 | . | . | |
| | | 4 | 6 | 0 | |
| | | | | 8 | |
| 6 | The ICT literate teachers in the College should collaborate and mentor the non-ICT literate teachers | 1 | 2 | 1 | AGREED |
| | | 2 | . | . | |
| | | 4 | 9 | 1 | |
| | | | | 0 | |
| 7 | Teachers should enroll for the intensive computer training program in the College | 1 | 3 | 1 | AGREED |
| | | 2 | . | . | |
| | | 4 | 0 | 0 | |
| | | | | 6 | |
| CLUSTER | | | 3 | 1 | AGREED |
| | | | . | . | |
| | | | 1 | 0 | |
| | | | | 9 | |

Data presented in Table 2 revealed the cluster mean to be 3.1 which is above the bench mark of 2.50. The mean responses of teachers to all the 7 items are also greater than the cut-off point of 2.50. This indicated that majority of the respondents used for this study agreed with these items as the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Research Question 2:

What are the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba?

The data for answering research question two is presented in Table 2.

Table 2: Mean ratings of instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba

| S/ N | ITEM STATEMENTS | N | \bar{X} | S D | DECISI ON |
|----------------|--|-------------|---------------------------|---------------------------------------|--------------------|
| 8 | All lectures should be delivered through power point application package | 1 2 4 | 3 . 5 | 1 . 1 5 | AGREE D |
| 9 | Practical and non-practical assignments should be used to engage the students within and outside the classroom | 1 2 4 | 3 . 2 | 1 . 0 9 | AGREE D |
| 10 | Participation among students in practical ICT related project work should be encouraged by the teachers | 1 2 4 | 2 . 7 | 1 . 1 7 | AGREE D |
| 11 | Problem-solving skills should be developed in students as a methodology in teaching ICT and ICT related courses | 1 2 4 | 3 . 1 | 1 . 1 5 | AGREE D |
| 12 | Adequate ICT facilities like smart boards and projectors should be used to facilitate understanding during teaching. | 1 2 4 | 3 . 5 | 1 . 1 3 | AGREE D |
| 13 | ICT related Practical continuous assessment tests should be used as appropriate means of evaluating students | 1 2 4 | 3 . 1 | 1 . 1 4 | AGREE D |
| 14 | The use of social media network for interaction between teacher/student should be encouraged by teachers | 1 2 4 | 3 . 4 | 1 . 0 7 | AGREE D |
| CLUSTER | | | 3 . 2 | 1 . 1 3 | AGREE D |

Data presented in Table 2 revealed the cluster mean to be 3.2 which is also above the bench mark of 2.50. The mean responses of teachers to all the 7 items are also greater than the cut-off point of 2.50. This indicated that majority of the respondents used for this study agreed with these items as the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Test of Hypotheses

The two hypotheses were tested using ANOVA. Summary of the analysis for the two null hypotheses are shown in tables 3 and 4.

Hypothesis 1

H₀₁: There is no significant difference in the mean ratings of male and female teachers on the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Table 3: ANOVA analysis of mean responses of male and female teachers on the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

| | Sum of squares | df | Mean Square | F-ratio | Sig. (2-tailed) | Rem |
|----------------|----------------|-----------|-------------|---------|-----------------|-----|
| Between Groups | .137 | 2 | .061 | .084 | .918 | NS |
| Within Groups | 223.582 | 12 | .805 | | | |
| Total | 223.730 | 2 | | | | |
| | | 12 | | | | |
| | | 4 | | | | |

The one-way ANOVA presented in table 3 above showed the result of Fraction not to be significant at 0.05 level of significant: $F(2, 122) = .084$; $p > 0.05$. The F-ratio of 0.084 with a p-value as .918 calculated at 0.05 level of significance and at 122 degree of freedom to be greater than 0.05. The null hypotheses was therefore accepted as postulated not to have any significant difference in the mean ratings of male and female teachers on the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Hypothesis 2

H0₂: There is no significant difference in the mean ratings of male and female teachers on the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Table 4: ANOVA analysis of mean responses of male and female teachers on the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

| | Sum of squares | df | Mean Square | F-ratio | Sig. (2-tailed) | Rem |
|----------------|----------------|------------|-------------|---------|-----------------|-----|
| Between Groups | .607 | 2 | .303 | .440 | .644 | NS |
| Within Groups | 192.329 | 122 | .689 | | | |
| Total | 192.36 | 124 | | | | |

The one-way ANOVA presented in table 3 above showed the result of Fraction not to be significant at 0.05 level of significant: $F(2, 122) = .440$; $p > 0.05$. The F-ratio of 0.440 with a p-value as .644 calculated at 0.05 level of significance and at 122 degree of freedom to be greater than 0.05. The null hypotheses was therefore accepted as postulated not to have any significant difference in the mean ratings of male and female teachers on the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Findings

The following findings emerged from the study based on the research questions and hypotheses tested+:

1. Seven strategies were required for improving the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba
2. Seven strategies were required for improving the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba

3. There was no significant difference in the mean ratings of male and female teachers on the teacher training strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

4. There was no significant difference in the mean ratings of male and female teachers on the instructional delivery strategies for improving the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba.

Discussion of Findings

The data provided in Table 1 provides answers to research question one. This finding is in consonance with Olaitan (2008) who asserted that teachers need to develop themselves in ICT through capacity building workshops, seminars, webinar and so on in order to be able to utilize ICT tools for the purpose of teaching and learning in the classroom. Also, Akpan (2016), noted that in the modern day ICT era, where the use of ICT and computer has become the order of the day, teachers will have to improve on their technical know-how with regards to the use of ICT especially in this post pandemic era where nobody can predict what the world will bring forth in the coming days or years. Akpan therefore recommended that the government should introduce more educational funding programs to help sponsor teachers to workshops and other training programs in order to develop their skills in the use of computer and other ICT infrastructure.

The data presented in table two provided answers to research question 2. The findings revealed that apart from practical and non-practical assignments being used to engage the students within and outside the classroom, participation among students in practical ICT related project work should be encouraged by the teachers and problem-solving skills should be developed in students as a methodology in teaching ICT and ICT related courses amongst others. This finding is in line with Etuhu (2007), who remarked that teachers need to be more pragmatic in their approach to teaching in order to enhance innovations in teaching and learning rather than just seeing ICT as a surrogate teaching. Gary (2011) also noted that teaching should not just be all about the teacher, since that would make learners passive, especially in ICT related courses. Gary posited that teaching and learning should also be learner centered as learners will have the opportunity to put into practice what has been taught.

Conclusion

The study concludes that the above listed strategies are some basic strategies that could be adopted in order to improve the utilization of ICTs for teaching and learning in Federal College of Education (Technical), Asaba. The study is also of the view that ICTs should be utilized and integrated into teaching and learning by both teachers and students, thus should be relied upon to enable teachers and students become ICT compliant, especially in this digital world where ICT has become a prerequisite knowledge for job seeking and employment or to pursue further studies in and outside the country.

Recommendations

The following recommendations were made based on the findings of the study and the implications of the study:

1. School management and the Federal government should ensure that teachers are sponsored on retraining programs at least twice in a year through workshops, seminars and conferences to enable them learn the modern technological skills on ICT and integrate them in their teaching.
2. Teachers should make efforts to expose and update themselves on the latest ICT skills through free online trainings in order to be abreast of modern technological advancements and instructional delivery techniques.
3. Teachers should endeavor to update themselves to so many instructional delivery techniques that would require the use of ICTs so as to make teaching and learning more meaningful.

Reference

- Akpan, S.U. (2016). Problems and prospects of ICT in National development: Journal of school of secondary education. 2(1), 24 - 31
- Batubo, F.B and Digieme, B.N (2008). Challenges in the information and communication technology. Journal of Education in the information Age 1, 550-553
- Edhuze, E.J (2003). The present status of computer studies in secondary schools in Isoko South LGA of Delta State. Unpublished project
- Etuk, G.K (2006). Education financing for Colleges and Universities. Uyo: Aba publication co.
- Etuhu, L.E. (2007). Principles and practices of education technology, London: International publisher Ltd.
- Federal Republic of Nigeria (2013), National Policy on Education. Lagos : NEDRC Press
- Gary, k.F. (2011). Recruiting and retaining teachers for hard-to-staff schools center for teaching quality. Journal of education in the information age. 2, 235 - 242
- Jacob, F.J and Tomoko, G (2001). E-Education in Nigeria: Challenges and prospects. Being text of a presentation at the 8th UN ICT Task force meeting. Retrieved from <http://www.onevillagefoundation.org> on 21/10/2006
- Jegede, O. & Owolabi, J (2003). . Computerisation of Examination Results: A Case for Consideration in Colleges of Education. The Coll. Rev. 8: 151-158.
- Joshua, P.O. (2013). Economics of knowledge management in the improvement of information in the information age. Global challenges and enhancement strategies. Journal of Education in the information age. 1, 65 - 70
- Mark, J.S. (2011). Challenges facing Guidance Counselors in the utilization of ICTs in secondary schools. Journal of Education in information age. 1, 371 - 376
- Mfam, K.I and Ntino, O.N (2008) Basic Vocational Business Education in Nigeria. Calabar: Ethereal Bliss
- Morrison, E.W. (2001). Innovation in the Teaching and Learning: The changing role of teachers of adults in a connected learning environment. International Journal of Education. 5(2), 64 – 72
- Nwangwu, M.N. (2007). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. Eurasia Journal of Mathematics and Technology Education. 5(3), 235 – 245
- Obindu, A.Y. (2008). Factors affecting the utilization of ICT tools in tertiary schools in Anaocha L.G.A of Anambra State. Journal of Science Education. 5(2), 72 - 79
- Olaitan, B.C. (2008). Professional competency capacity building needs of teachers for effective teaching of science subjects in Delta State. Paper presented at the 10th Annual Conference of Nigeria Association of Educational Researchers. June 9th to 13th 2008

Strategies For Improving The Utilization Of Icts For Teaching And Learning In Federal College Of Education (Technical), Asaba, Delta State

- Orakwe , N. (2008). Strategies for retooling instructions in secondary schools health education for the information age. *Journal of education in the information age.* 1, 52 - 58
- Rosenberg, M.J. (2005). *E-learning strategies for delivering knowledge in the digital age.* New York, Mcgraw Hill.
- Stone, L.T (2010). CAI: A strategy for improving the effectiveness of Biology teaching and learning in the new information age. *Journal of Education in the information Age.*1, 311 - 318
- Uba, M.U. (2006). strategies for enhancing the teaching and learning of computer in secondary schools in Ebonyi state. *Journal of education in the information age.* 1, 76 - 83
- Uzomah, L.E (2017). Teacher initiatives in utilizing ICTs for teaching and learning in Colleges of education in Delta State. Unpublished project
- Wakefield, F. (2010). Concept of Personal Initiative: A longitudinal study on organizational behavior. Manuscript submitted for publication
- Zahra, S.A. (2003). Business strategy techn policy and firm performance. *Strategic Management Journal.* 14, 451 – 478