

Integrating Information and Computer Technology in Teaching Mathematics in Junior Secondary School in Akwa Ibom State

Edoho, E. A. Ph.D

Department of Curriculum and Teaching, University of Calabar

Umoh, Joseph B

Department of Science Education, University of Uyo, Uyo

Abstract

The study was concerned with integrating information and computer technology in teaching mathematics in Junior Secondary School in Akwa Ibom State. A total of 8 mathematics teachers were drawn from 4 schools in Uyo Local Government Area that met the criteria like having computer facilities in school and presenting candidate for junior certificate examination for the past 22 years. A total of 100 junior secondary three students in 2012/2013 session took part in the study. The instruments used in gathering data were secondary school teachers' questionnaire (SSTQ) and junior secondary three examination results in mathematics. The questionnaire was face and content validated by a team of experts in internet services. The statistical tools used in analyzing the data were t-test difference of two means and Pearson's Product Moment Correlation Co-Efficient. The result showed that students who were taught mathematics using ICT facilities performed significantly better than those taught without it. Moreover, there was a significant relationship between the availability of ICT facility in schools and students' effective usage. It was recommended amongst others that computer and internet facilities should be provided in schools by government so as to enhance effective teaching and learning of science and mathematics in schools.

Keywords: Information, Computer, Technology and Mathematics

INTRODUCTION

In acknowledging the trend toward using the information and computer technology in mathematics instruction, mathematics teachers would realize that they would soon likely need to undertake various calculations involving large numbers, evaluating CALL materials and websites. Teachers however vary to a large degree in their experience in knowledge and skills of computer technology. In a particular study conducted by Weasenforth, Biasebach- Lucas and Meloni, (2002), teachers expressed the need for understanding the potential of technologies and the appropriate pedagogy for technology integration with regard to how each fits with their personal philosophies of teaching and learning.

With the rapid growth in innovative technologies, teachers need to keep abreast of technological innovation so that they can know where to retrieve information and obtain resources and tools (Browne, Maeers, & Cooper 2000). Improving the quality of education through the diversification of contents and methods of promoting experimentation, innovation, the diffusion and sharing of information and best practices are strategic objectives in education (UNESCO, 2002). Accordingly, the information and computer technology has become a tool for teaching and learning (Fotos,2004.) The most interesting and important innovation in education in recent years is the widespread introduction of computers representing powerful tools that can be used by both teachers and students for instructional purposes (Salau 2002). Oyedeyi (2000) observed that information and communication technology equipment are not put in place by government in schools. Taylor (2002) confirmed that the provision of facilities including computer in schools would lead to education for sustainable development and with the teaching methodologies. Ezeji (2001) holds that the mere fact that computers are inadequate in schools discourage many teachers from engaging themselves in pre-teaching assessment and evaluation as stated in the national policy of education (2004).

PURPOSE OF THE STUDY

The study aims at finding out the extent of integration of information and computer technology in the teaching of mathematics for attainment of educational goals in Akwa Ibom State.

RESEARCH HYPOTHESES

The following hypotheses are formulated to guide the study.

- i. There is no significant difference between students who are taught mathematics using ICT and students taught mathematics without the use of ICT in terms of mathematics achievement.
- ii. There is no significant relationship between the availability of ICT facilities in schools and student's effective usage.

METHODOLOGY

The research was conducted in Uyo Local Government Area of Akwa Ibom State. Out of 26 Secondary Schools in Uyo Local Government Area, four secondary schools met the following criteria, namely

1. School's that have well qualified mathematics teachers
2. Schools that have always presented candidates for Junior Secondary three examinations for the past 22 years.
3. Schools that have student's population not below 600.
4. Schools that present teachers for computer and internet re-training of secondary school teachers on (MDGS) project August 2012.

A total of 8 mathematics teachers were drawn from four schools and a total of 100 junior secondary three students formed the study sample. The instruments used in gathering data was the secondary school teachers questionnaire (SSTQ) which contains 15 items to find out the influence of information and computer technology on the achievements of Junior Secondary School students in mathematics. The questionnaire also tried to find out the effectiveness in the utilization of information and computer technology if at all they are provided in schools. Junior secondary three students' performances were obtained from their schools. The instruments were face and content validated by a team of experts in internet services. Students' result in mathematics taught by 8 mathematics teachers were also collected for purpose of analysis at the end of the administration of the questionnaire.

ANALYSIS

The data collected were analysed under the following heading/tables:

1. T- test comparison of mean performance of students who were taught mathematics using information and computer technology and students taught without the use of information and computer technology.
2. Testing whether there is any significant relationship between the availability of information and computer technology in schools and students effective utilization.

HYPOTHESIS 1

There is no significant difference between students who are taught mathematics using information and computer technology (ICT) and students taught mathematics without the use of ICT in terms of mathematics achievement.

TABLE 1:

Group of Students	N	\bar{X}	SD	df	t-crit	t-cal
Students taught mathematics using ICT.	55	4.5	2.51	98	1.67	2.64
Students taught mathematics without the use of ICT.	45	3.3	2.02			

Table 1 shows that the calculated t value 2.64 is greater than the t- critical value 1.67 with degrees of freedom 98 at 0.05 level of significance. The null hypothesis is rejected. Hence there is a significant difference in mathematics achievement between students who were taught mathematics using information and computer technology (ICT) and those taught without it. This implies that students that were taught mathematics using ICT performed significantly better than those taught without ICT in terms of mathematics achievement.

HYPOTHESIS 2

There is no significant relationship between the availability of ICT facilities in schools and students effective usage.

TABLE 2

Variables	$\sum x^1$ $\sum y^1$	$\sum x^2$ $\sum y^2$	$\sum xy$	r_{xycal}	r_{xycrit}
Availability of ICT facilities (X)	6704	20541			
Student's effective utilization (Y)	6247	74344	23112	0.59	0.196

Analysis on table 2 reveals that the calculated rxy value 0.59 is greater than the critical rxy value 0.196 at 0.05 significant level. Hence the null hypotheses 2 is rejected. This implies that there is a significant relationship between the availability of ICT facilities in schools and students' effective usage of the facilities.

DISCUSSION OF RESULTS

The result shows that students who were taught mathematics using ICT performed significantly better than those taught without it. This result is in support of Taylor (2002) who confirmed that the provision of facilities including computers in schools would lead to education for sustainable development and with the teaching methodologies. This result is also in support of Salau (2002) who discovered that computers are powerful tools used by teachers and students for instructional purposes.

Moreover there is a significant relationship between the availability of ICT facilities in schools and students' effective usage. This result is in support of Fotos (2004) who said that information and computer technology has become a tool for teaching and learning.

CONCLUSION

From the study, it was discovered that students who were taught mathematics using ICT performed significantly better than those taught without it. It was also found that there is a significant relationship between the availability of ICT facilities in schools and students' effective usage. The world is changing so rapidly especially in education and internet/computer development. There is need for teachers and students to be conversant with the operations of internet and computer services so as to meet up with the needs of the society.

RECOMMENDATIONS

With regards to the research findings, the following recommendations were considered necessary.

1. The computer and internet facilities should be provided in schools by government so as to enhance effective teachings and learning of science and mathematics.
2. Expert computer/internet analysis should be deployed to schools to help reinforce secondary school teachers post workshop and seminar teaching and learning experience.
3. School authorities should introduce 'excellence awards' to encourage students and teachers develop keen interest and excel in performance in computer/internet related courses in schools.
4. School should include computer/internet studies in their curriculum.

REFERENCES

- Brown, N. Maeers, M & Cooper E. (2000); Faculty of Education as a Community of Learners: Growing to meet the demands of Instruction and Technology . In B. Crillan and K. McFerrin (Eds). Faculty Development (Pp. 431-453).
- Ezeji, S. C. (2001) Need for Vocational Trained Workers in Nigerian Schools. Journal of Technical Education Teacher Education Vol. 1.
- FOTOS, S. (2004) writing and talking. E-mail exchange for promoting proficiency and motivation in the Foreign Language Classroom. INS FOTOS & CM Browne (Eds.) New Perspectives on all for second Language Classrooms (pp 109-129). New Jersey: Lawrence Erlbaum Associates.
- Oyedeyi O. A. (2000) Effective Teaching of Mathematics in Nigerian Schools. Ibadan: Sam Bookman Publishers.
- Salau, M. O. (2002) Strategies for Sustaining Mathematics as an indispensable tool for Sustainable Technological Development in the 21st Century. 43rd Annual Conference Proceedings of STAN
- Taylor, I. E. (2001) The Work of the Counsellor. A weekly bulletin Published by UBE Programme Headquarters.

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- New York; Appleton Century Crafts. Vol 1 (7) .
- UNESCO (2002), Information and Computer Technologies in Teacher Education. A Planning Guide Texas, University of Texas Press.
- Weasenforth D, Biesenbech Lucas, S. and Meloni, C. (2002) Realizing Constructivist Objectives through Collaborative Technologies; Threaded Discussions, Language Learning and Technology, 6 (3) 58-86.

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