



Extent of Acquisition of Information and Communication Technology (ICT) Skills among Mathematics Teachers in Anambra State

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Abstract

The study sought to investigate the extent of acquisition of ICT skills possessed by mathematics teachers in Anambra State. The descriptive survey research design was used for the study. Two research questions and one hypothesis guided the study. The total population of the study was 1900 mathematics teachers, while the sample size was 300 respondents. A structured questionnaire was the instrument used for data collection. The data collected were analyzed using mean, standard deviation, and t-test statistics. The study indicated among others, that there is moderate ICT acquisition among mathematics teachers in Anambra State. The study also showed that there is no significant difference in the mean ratings of the male and female respondents with respect to extent of ICT acquisition among mathematics teachers in Anambra state. Based on these findings, some recommendations were made.

Keywords: Information and Communication Technology, mathematics teachers, Gender.

Introduction

Mathematics is one of the science subjects taught in the primary, secondary and tertiary institutions in Nigeria. It consists of thinking in a logical manner, formulating and testing conjectures, making sense of things, forming and justifying judgements, inferences and conclusions (Ahmad, 2019). According to Ekwueme (2020), mathematics is the study of measurement, patterns, structure, relationships and properties of numbers, figures and sets. This implies that mathematics is a very vital subject that traverses every sphere of life and is also used in everyday life, hence the need for basic mathematical ideas in all fields of study.

There is an already erroneously conceived idea about mathematics by most secondary school students in particular and the public in general that mathematics is difficult and seen as 'a terrorist'. No doubt, there are evidences of discontentment in the achievement of students in mathematics at the senior secondary school certificate examinations (Agwagah, 2018; Galadima & Okogbenin, 2018; Odetola & Salman, 2017). This was compounded by some traditional methods of instructions adopted by most mathematics teachers, which led to poor students' comprehension of relevant mathematics concepts. Extensive studies have been conducted on effective ways of delivering instructions in mathematics class (Imoko, 2019, Ezeanyi & Okigbo, 2020) of which the use of ICT tends to be highly favoured.

Developments in Information and Communication Technology (ICT) have made a tremendous impact in the world that we live in today. According to Ezeanyi, Enemuo and Ngwu

(2019), Information can now travel around the globe just in a matter of seconds, making communication easy and affordable. ICT has been found to have a significant impact in virtually every facet of human activity with the effect that teaching and learning have received a boost as a result. Evidence from empirical studies point to the fact that ICT can positively affect students' outcomes, hence teachers at all levels of education and mathematics can effectively use them in their instructional delivery.

Information and Communications Technology refers to a systematic process of gathering, processing, storing, sending and retrieving of information through the broadcast, computing and telecommunications media (Ezeanyi, 2021 & Ikokwu, 2018). It embraces hardware like computers, scanners and digital camera as well as software like standard office applications. The scope also covers the communication aspects such as digital TV, digital radio, e-mail, Internet, broadband, networks (wired and wireless), mobile phones, Global positioning systems (GPS), videoconferencing, instant messaging, and fax. There abounds a wide range of applications of these ICT resources in the teaching and learning environment. The Internet is very central to speedy access and dissemination of education information and thus widely used by faculty and students of tertiary institutions all over the world. The trend in advanced countries is that the use of ICT resources has replaced the conventional instructional facilities such as the board, chalk, flipchart, pen, paper, etc. Instructional resources can be searched on-line, projected on the wall, assignments given and submitted via the electronic-mail. Internet



accessibility is not an issue while students' possession of internet-compliant computer systems is taken for granted (Osisioma, 2021).

Gender is an important variable that is commonly reported as a factor that influences classroom instructional delivery. The way ICT is applied today makes a lot of difference in addressing gender in ICT (Ndiddle, 2018). Traditionally, women have had a subordinate position to men in the acquisition of ICT skills, where for example; she may contribute materially to the household but her husband makes the decision on how the income is spent. In the context of ICT, it is necessary to consider how ICT impacts Women's multiple roles and examine changes brought about. Gender role analysis is useful to understanding to what extent women and men possess ICT in the teaching process; this will help to examine the significant difference between male and female lecturers as regards to ICT in the classroom. Are female lecturers more disposed in the use of ICT during classroom instructions as against their male counterparts or vice versa? This question is expected to be handled by this study.

Statement of the Problem:

Mathematics is known to be a useful instrument for national technological development, but the rate at which students perform poorly in mathematics is alarming according to some examination bodies like the West African Examinations Council (WAEC) and has been a bone of contention in the Nigerian educational system. The traditional method of lesson delivery in the classroom among others has been a contributory factor to the generally low level of interest and achievement in mathematics. Therefore, Information and Communication Technology can be utilized for teaching and learning in mathematics. An innovative and activity-oriented teaching strategy is more likely to foster learning outcomes than the conventional methods of teaching. But one cannot give what he/she does not have. As a result, the researchers deemed it fit to ascertain the extent of acquisition of ICT among mathematics teachers in secondary schools in Anambra state.

Purpose of the Study:

This study sought to investigate the extent of acquisition of ICT skills among mathematics teachers in Anambra state. Specifically, the study intendsto:

- i. Explore the extent of acquisition of ICT skills among male and female mathematics teachers in Anambra statessecondary schools.

- ii. Identify the constraints militating against the acquisition of ICT skills among mathematics teachers in Anambra state.

Research Questions:

This following research questions guided the study:

1. What is the extent of acquisition of ICT skills among male and female mathematics in Anambra state?
2. What are the constraints militating against the acquisition of ICT skills among mathematics teachers in Anambra state?

Hypothesis:

The following hypothesis guided the study;

Ho1: There is no significant difference between the mean ratings of male and female respondents on the extent of ICT skills possessed by mathematics teachers in Anambra statessecondary schools.

Methodology

A descriptive survey design was used for the study. This type of survey is useful in studies involving opinions and evaluation of prevailing situation at a point in time.

The sample for the study consists of three hundred (300) mathematics teachers out of a population of one thousand nine hundred (1900) teachers from both public and private secondary schools in the state. Sampling was done by a simple random sampling method.

Face validity of the instrument was determined by three experts. Cronbach alpha was used to obtain reliability coefficients of 0.74 and 0.79 for the two clusters of the instrument with an overall coefficient of 0.77.

A 20-item, 5-point Likert rating scale structured questionnaires items was the main instrument used for data collection. The questionnaire items were arranged in four clusters in line with the two research questions each addressing each of the specific purposes of the study. Each of the respondents is expected to indicate one out of five options in each statement of the different clusters.

The data collected was analyzed using mean to answer the research questions and standard deviation to determine the homogeneity or not of respondents mean scores while t-test statistics was used to test the hypothesis at a 0.05 level of significance. In analyzing the mean, value of 3.0 and above were regarded as agreed while those values below 3.0 were regarded as disagree.

Results

Research Question One:

What is the extent of acquisition of ICT skills among male and female mathematics teachers in Anambra state?

Table 1: Mean Responses on the Extent of Acquisition of ICT Skills among male and female respondents.

S/N	Extent of Acquisition of ICT Skills	Male				Female			
		N	X	S.D	Remark	N	X	S.D	Remark
1	I have personal experience with ICT	85	4.24	6.38	Accepted	179	3.23	8.11	Accepted
2	I can use internet to search for teaching materials	85	3.95	4.83	Accepted	179	3.34	9.56	Accepted
3	I can use computer to record information on students	85	3.75	4.47	Accepted	179	3.03	6.52	Accepted
4	I can employ the use of computer for teaching my students	85	2.71	2.85	Rejected	179	2.91	6.58	Rejected
5	I can use computer to distribute information to students	85	2.67	5.55	Rejected	179	3.10	8.10	Accepted
6	I can use PowerPoint presentation for lesson delivery.	85	2.67	3.17	Rejected	179	3.07	4.76	Accepted
7	I can use educational CD's for delivering my lessons	85	3.15	4.20	Accepted	179	3.05	7.69	Accepted
8	I know how to use games in my lessons	85	2.60	3.79	Rejected	179	2.93	8.23	Rejected
9	I can use projector for lesson delivery	85	2.80	3.17	Rejected	179	2.87	6.83	Rejected
10	I can use interactive boards for presentation of lessons	85	2.35	3.32	Rejected	179	2.86	9.23	rejected
	Cluster mean		3.09	4.17	Accepted		3.04	7.56	Accepted

From Table 1, the items' mean ratings male respondents ranged from 2.35 to 4.24. The mean ratings for items 4, 5, 6, 8, 9 and 10 were less than the cut-off point (3.00) and thus rejected. All the other items have mean ratings of 3.00 and above and are thus accepted. It is interesting to note that the cluster mean is 3.09 which is a little above the cut-off point of (3.00). This shows that male respondents possessed a moderate extent of ICT skills but not as generally acceptable in this 21st century.

The item means' ratings for the female respondents range from 2.86 to 3.34. The mean ratings for items 4, 8, 9 and 10 were less than the cut-off point (3.00) and thus rejected. All the other items have mean ratings of 3.00 and above and are thus accepted. It is

interesting to note also that the cluster mean is 3.04 which is a little above the cut-off point of (3.00). This shows that female respondents have an acceptable level of ICT skills which is lower than that of the male respondent but still not at par as generally acceptable in this 21st century.

Research Question 2

What are the constraints militating against the acquisition of ICT skills among mathematics teachers in Anambra state?

Table 2: Mean responses on the constraints to acquisition of ICT skills among the teaching staff.

S/N	Constraints to Acquisition of ICT Skills	SA	A	UN	D	SD	N	X	S.D	Remark
11	Lack of in-service training on ICT prevent me from acquiring ICT skills	88	94	20	18	44	264	3.62	7.25	Accepted
12	Lack of sponsorship hinder me from ICT skill acquisition	93	79	32	31	29	264	3.67	7.20	Accepted
13	Family responsibilities hinder me from ICT skill acquisition	78	84	45	44	13	264	3.64	5.50	Accepted
14	Lack of personal computer hinder me	111	68	13	24	48	264	3.64	4.72	Accepted

	from ICT skill acquisition										
15	Very tight schedule at work hinder me from ICT skill acquisition	104	88	43	23	6	264	3.99	6.83	Accepted	
16	Lack of internet access is a constraint to acquisition of ICT skills	98	86	14	41	25	264	3.72	3.97	Accepted	
17	Fear of incurring damages hinder me from ICT acquisition	51	63	84	39	27	264	3.27	5.95	Accepted	
18	Lack of ICT professionals around me hinder me from ICT skill acquisition	57	59	51	68	29	264	3.18	6.00	Accepted	
19	Lack of ICT proficient colleagues hinder me from ICT acquisition	8	21	42	49	144	264	3.67	5.00	Accepted	
20	Lack of ICT laboratory/workshop hinder me from ICT skill acquisition	85	74	39	61	5	264	3.67	6.28	Accepted	
	Cluster mean							3.61	5.85	Accepted	

From Table 2, the items' mean ratings range from 3.18 to 3.99. The mean ratings for items 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 were all above the cut-off point (3.00) and thus accepted. No item had mean ratings less than the cut-off point of (3.00), and so none of them was rejected. The cluster mean is 3.61 which is above the cut-off point of (3.00). This shows that all the factors listed in the different items are necessary constraints to ICT skills acquisitions among the mathematics teacher interviewed in the state.

Hypothesis

H₀₁: There is no significant difference between the mean ratings of male and female respondents on the extent of skills possessed by mathematics teachers in Anambra state.

Table 4: t-test of male and female respondent on the extent of acquisition of ICT skills.

Gend er	X	S. D	N	Df	t- cal	t- crit	Decision
Male	3.0	4.1	85	26	0.0	1.9	Do not reject
Female	3.0	7.5	17	2	3	6	null hypothesis

From the above table, the calculated value is lower than the critical value; therefore the null hypothesis is accepted. This implies that there is no significant difference between the mean rating of the male and female respondents on the extent of ICT skills acquisition by mathematics teachers in the state.

Discussion of findings

The study indicated a moderate extent of ICT acquisition by mathematics teachers in Anambra state, with an acceptable level of acquisition for teaching and learning. The result is consistent with

Badwar (2017) whose study revealed a moderate level with which software programs were actually used in various school subjects by teachers. This moderate use of ICT by mathematics teachers fall short of the general standard needed in this 21st century. It could be a result of low awareness of the importance of ICT in teaching.

A reasonable number of them affirmed that they have not been having opportunities of attending seminars and workshops on ICT which would have increased their awareness of ICT use. This finding is in line with the finding of Al-Almin, (2019), Alexander, (2020) that unavailability of some ICT components in schools and lack of adequate search skills and access-points in schools hamper teacher's acquisition of ICT and are viewed as forces inhibiting the use of the internet by secondary school teachers. Although, the subjects of these studies were secondary school teachers, academic staff of universities also reported a similar trend. The implication is that, more effort is needed to be done by the education authorities to expose mathematics to ICT facilities so that they improve their skills in ICT for academic purposes.

Conclusion

This study has tried to run an investigation into the extent of acquisition of ICT skills among mathematics teachers in Anambra state. So many factors are responsible for the moderate level of ICT skills possessed by mathematics teachers which if not tackled will greatly affect the quality of mathematics instructions and delivery. The study shows a moderate gap in the level of ICT skills among mathematics teachers in the state. Yet these teachers are faced with the challenge of molding students for this country which is having an increasing technological knowledge that is the computer age. It becomes imperative that something



has to be done and that without delay to beef up the ICT knowledge of these teachers, if the future of the academic curriculum of this country will not be jeopardized.

Recommendations

Based on the findings of this study, the researcher therefore, makes the following recommendations.

1. Government should equip secondary schools in Anambra state with enough ICT resources and facilities necessary to encourage these teachers in possessing the ICT skills.
2. The government should give extra pay/salary to mathematics teachers that discover new ways of ICT skills in teaching and learning, to motivate them and others to follow suit.
3. The government can also organize regular workshops for mathematics teachers in the state on different ICT skills needs in mathematics classrooms.
4. Professional bodies like STAN and MAN should also organize conferences, seminar and workshops on the importance of ICT skills among mathematics teachers.

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