

Secondary School Teachers' and Students' Level of Utilization of ICT Tools for Teaching and Learning Mathematics

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Abstract

Information and Communication Technology (ICT) is an instrument par excellence that a nation can rely upon to bring about self-reliance in an educational system. Therefore, there is the need to integrate ICT into teaching and learning; hence, the study investigated the assessment of Teachers' and Students' level of utilization of ICT tools for teaching and learning mathematics in Indian education system. Survey method was used for the present study. The population for the present study was all secondary schools in Salem District. A total number of 120 students and 70 mathematics teachers were randomly selected from secondary schools in Salem District. The tools used for the study was researchers-designed questionnaire, which comprised of 24 ICT tools. The instrument was validated and the reliability index of 0.856 was obtained. The data gathered was analyzed statistically using percentage analysis. The research findings from the study shows that the more number of secondary school mathematics teachers and students frequently utilized ICT Tools for teaching & learning mathematics.

Keywords: Information Communication Technology (ICT), secondary school, teachers', students', utilization of ICT Tools.

Introduction

Mathematics is one of the most important core subjects offered at the primary and secondary school levels of Indian educational system. As stated in the National Curriculum for secondary schools of the Federal Ministry of Education (FRN, 2013), the aims and objectives of Mathematics teaching at this level of education are to; help develop further conceptual and manipulative skills and their applications; provide an intermediate course of study and meet the needs of potential mathematicians, engineers, scientists and other professionals, such as businessmen, administrators and architectures.

Information and Communication Technology (ICT) is a tool that comprise of electronic devices which are utilized for the information and communication needs of institutions, organizations, students and individuals. The use of information and communication technology (ICT) creates a powerful learning environment and it transforms the learning and

teaching processes in which students deal with knowledge in an active, self-directed and constructive ways (Volman & Van Eck, 2001). ICT is not just regarded as a tool, which can be added to or used as a replacement of existing teaching methods, but seen as an important instrument used to support new ways of teaching and learning. It should be used to develop students' skills for communication, problem solving and lifelong learning of mathematics (Voogt, 2003). The study therefore sought to find out secondary school teachers' and students' level of utilization of ICT tools for teaching and learning mathematics.

Statement of the problem

The importance of Mathematics as a compulsory subject at the senior secondary school level cannot be overemphasized. Despite the importance of Mathematics to the development of the nation, the achievements of students have remained consistently poor over the years (Eze, 2003;

Betiku, 2003; Aprerbo, 2003). The use of ICT tools has captured the attention of the education community to enhance teaching and learning of mathematics, but also has the capability not only of engaging students in instructional activities to increase their learning, but of helping them to solve complex problems in mathematics to enhance their cognitive skills (Jonassen & Reeves, 1996).

Numerous teaching strategies have been developed by expert to respond to the problem of students' poor performance in Mathematics. One of such strategies is the use of ICT (Adeyemo, 2010), which have now detracted from teaching and learning due to so many reasons such as insufficient and limited access to computer hardware and computer software, Sufficient time in the school timetable to involve students in using ICT for learning mathematics, Lack of opportunities for teachers on ICT training and teachers' lack of knowledge in integrating ICT into teaching and learning to enhance performance and innovation in curriculum development.

Straub (2009) reported that for the use of ICT tools in teaching and learning to remain sustained, personal factors such as teacher's skills, knowledge, competencies, readiness characteristics of the love for innovations and the influences of individual's context should never be ignored as part of the planning process. Aina (2013) concluded that ICT is very good if fully integrated in Mathematics class; and it can improve students' academic achievements in mathematics. Furthermore, it has been proved that new technologies have lots of benefits on the students. Based on these various importance of ICT tools in teaching and learning of mathematics, hence, the study assessed secondary school teachers' and students' level of utilization of ICT tools for teaching and learning mathematics.

OBJECTIVES OF THE STUDY

- To find the level of secondary school mathematics teachers' utilization of the ICT tools.
- To study level of secondary school students' utilization of the ICT tools.

- To investigate the level of competency of secondary school mathematics teachers' utilization of ICT tools.
- To find level of competency secondary school students' utilization of ICT tools.

HYPOTHESIS OF THE STUDY

- The level of secondary school mathematics teachers' utilization of the ICT tools is high.
- The level of secondary school students' utilization of the ICT tools is high.
- The level of competency of secondary school mathematics teachers' utilization of ICT tools is high.
- The level of competency secondary school students' utilization of ICT tools is high.

METHODOLOGY OF THE STUDY

The study was a descriptive research of the survey type. In a survey research, information are

obtained from the respondents and are used to describe the population. This is a survey research because information was obtained from respondents to describe them with regards to their level of utilization of ICT tools for teaching and learning Mathematics.

The population for the study comprised of all secondary schools' mathematics teachers and students in Salem District, the target population consisted of mathematics teachers and students in secondary schools' in Salem. Fifty (70) mathematics teachers and one hundred and twenty (120) secondary school students were randomly selected from government, government aided and private schools. The tools used for data collection was researchers-designed questionnaire that was validated by three experts in mathematics education and an expert in educational technology. Test re-test method was used to determine the reliability of the tool. A reliability coefficient of 0.856 was obtained using

Pearson Product Moment Correlation (PPMC) at 0.05 level of significance. The study lasted for a period of two weeks during which the questionnaire was administered on the

mathematics teachers and students. Percentage analysis were used to the present study.

Data Analysis of the study

Table 1

Demographic variable of secondary school teachers and students based on gender

Demographic Variable (Gender)		Respondents	Percentage (%)
Teachers'(70)	Male	31	44.29
	Female	39	55.71
Students'(120)	Male	43	35.83
	Female	77	64.17

From the above table shows that, seventy (70) secondary school mathematics teachers participated in this study comprised of 39 (55.71%) female and 31 (44.29%) male teachers. Meanwhile 120 secondary school students participated in this study that comprised of 77 female and 43 male students. The secondary school female students

participated more in the study with 77 representing 64.17 % while their male counterpart was 43 representing 35.83 %.

Hypothesis 1

The level of secondary school mathematics teachers' utilization of the ICT tools is high.

Table 2

Table showing the level of utilization of ICT Tools of secondary school mathematics teachers

Utilization of ICT Tools	Number of teachers	Percentage
Frequently Used	33	47.14
Rarely Used	23	32.86
Not Used	14	20.00
Total	70	100.0

From the above table shows that the secondary school mathematics teachers frequently utilized ICT Tools for teaching mathematics as by 33(47.14%) of the respondents. Also, it was revealed that 23(32.86%) of secondary school mathematics teachers rarely utilized ICT tools with the responses and some of the secondary school mathematics teachers do not utilized ICT Tools for teaching mathematics as the frequency for these responses was 14 (20.00%).

Conclusion

The level of secondary school mathematics teachers' utilization of the ICT tools is high.

Hypothesis 2

The level of secondary school students' utilization of the ICT tools is high.

Table 3

Table showing the level of utilization of ICT Tools of secondary school students

Utilization of ICT Tools	Number of students	Percentage
Frequently Used	57	47.50
Rarely Used	34	28.33
Not Used	29	24.17
Total	120	100.0

From the above table shows that the secondary school students frequently utilized ICT Tools for learning mathematics as by 57(47.50%) of the respondents. Also, it was revealed that 34(28.33%) of secondary school students rarely utilized ICT tools with the responses and most of the secondary school students do not utilized ICT Tools for learning mathematics as the frequency for these responses was 29 (24.17%).

Conclusion

The level of secondary school students' utilization of the ICT tools is high.

Hypothesis 3

The level of competency of secondary school mathematics teachers' utilization of ICT tools is high.

Table 4
Table showing the level of competency in using ICT Tools of secondary school mathematics teachers

Level of Competency	Number of teachers	Percentage
Highly Skilled	33	47.14
Skilled	23	32.86
Not Skilled	14	20.00
Total	70	100.0

From the above table notices that the secondary school mathematics teachers frequently utilized ICT Tools for teaching mathematics as by 33(47.14%) of the respondents. Also, it was revealed that 23(32.86%) of mathematics teachers rarely utilized ICT tools with the responses and some of the mathematics teachers do not utilized

ICT Tools for teaching mathematics as the frequency for these responses was 14 (20.00%).

Hypothesis 4

The level of competency secondary school students' utilization of ICT tools is high.

Table 5
Table showing the level of competency in using ICT Tools of secondary school students

Level of Competency	Number of students	Percentage
Highly Skilled	54	45.00
Skilled	46	38.33
Not Skilled	20	16.67
Total	120	100.0

From the above table shows that the secondary school students frequently utilized ICT Tools for learning mathematics as by 54(45.00%) of the respondents. Also, it was revealed that 46(38.33%) of secondary school students rarely utilized ICT tools with the responses and most of the secondary school students do not utilized ICT Tools for learning mathematics as the frequency for these responses was 20 (16.67%).

Conclusion

The level of competency secondary school students' utilization of ICT tools is high.

Major findings of the study

- The level of secondary school mathematics teachers' utilization of the ICT tools is high.

- The level of secondary school students' utilization of the ICT tools is high.
- The level of competency of secondary school mathematics teachers' utilization of ICT tools is high.
- The level of competency secondary school students' utilization of ICT tools is high.

Recommendations

Based on the findings of this study, the following recommendations were made:

- The educational resource centers should join hand with state Ministries of Education to create awareness about ICT tools and their usefulness to both teachers and students. Also, both parties should organize workshops and seminars for in-service teachers irrespective of their gender, experience and qualification on the application of ICT tools for effective delivery of instructions.
- Teachers should communicate and utilize some ICT tools effectively with their students to extricate fear that may show up amongst them.
- The government should properly encourage the teachers by providing them ICT tools, monetary and non-monetary benefits to enable them put in more effort and increase their efficacy in teaching mathematics with the technology.

Conclusion

The finding reveals amongst others that the mathematics teachers and students utilized ICT tools for teaching and learning mathematics respectively. The research findings from the study shows that the more number of high school mathematics teachers and students frequently utilized ICT Tools for teaching & learning mathematics.

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