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EFFECT OF DIGITAL INSTRUCTION IN ACADEMIC ATTAINMENT OF MATHEMATICS

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ABSTRACT

This study examines the effect of digital instruction and class room instruction in learning of mathematics. This study provides descriptive data on students' attainment in mathematics from their learning (digital/traditional). The sample constitute of 466 students drawn from five schools from Chennai. Random sampling technique is adopted to select the sample. The researcher conducted pre-test on four concepts in mathematics. Based on the pre-test score, students were divided into two groups, students learning by Traditional method (group A) and students following the digital instruction (group B). Group A was subjected to the traditional class room teaching and group B was exposed to digital instruction. After teaching, the researcher conducted the post-test for all the 466 students. The answer scripts were evaluated and the scores obtained by each individual were tabulated concept-wise. The findings of the study indicate that digital learning students performed better than the traditional learning students. There is significant difference between digital and Traditional learning methods. Comparing the performance of English and Tamil medium students following the digital method, it is found that the English medium students performed better than Tamil medium students.

Key words: digital instruction, traditional instruction and attainment in mathematics

Introduction

Mathematics is the foundation of science and technology that have made our life more rapid, sophisticated and of comfort. Mathematics is used in a number of areas, because it provides a precise way to describe complicated situation and analyze difficult problems. That is why the Kothari Commission (1966) rightly recommended the study of mathematics compulsory for all, for the first ten years of schooling. Recent technological advances have created the possibility for new ways of learning and teaching. The Web has captured the imagination of more people than any other computer innovation (McCormack and Jones, 1998, p. xi). Taking full advantage of the potential of the digital requires teachers to think about learning and teaching in new ways, as well as to master the technology itself. The digital classroom can

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support an existing teaching method or be used as a replacement. The World Wide Web can be used to provide instruction and instructional support. Digital instruction offers learners unparalleled access to instructional resources, far surpassing the reach of the traditional classroom. It also makes possible learning experiences that are open, flexible, and distributed, providing opportunities for engaging, interactive, and efficient instruction (Kahn, 2001).

Need of the Study

The most important fact emerges that children find mathematics learning to be most difficult and most significant. In this competitive world the parents tend to go from pillar to post, to find mathematics experts to provide extra guidance and coaching to their wards. With the high expectations of their children securing top marks in subjects like mathematics. At all level mathematics teaching develops a spirit of inquiry required for any walk of life. In our country, the parents are very particular to send their children to professional courses like engineering, medicine, charted accountancy, master of business administration, etc. The school, the parent and the significant others keep thinking only of these professions for themselves, whatever may be the marks secured in mathematics and the other relevant subjects. The first and the most important reason for not learning mathematics is poor teaching. Teaching is ineffective because it is inadequately planned and sometimes exhibit violations of learning. Some teachers are poorly motivated. Some teachers teach the subject (Mathematics) rapidly without giving time to think. Some teachers ignore the fact that pupils are individuals with varied backgrounds, talents and interests and attempt to teach everyone the same material, the same rate, in the same way. In this age of rapidchange and uncertainty, teachers need to adapt to change if they are to survive and keep pace with new methods and technologies.

Objectives of the Study

- To study the differences in the attainment in mathematics of the students with respect to the method of teaching (digital / Traditional)
- To study the mathematics attainment of the students with respect to gender and medium of instruction (English / Tamil)
- To study the interaction effect of method of teaching and gender / medium of instruction of the XI standard students on their post test scores in mathematics

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Limitations of the Study

- The study is restricted to a sample chosen only from Pondicherry
- The investigation is restricted to XI standard students
- The pre-test and post-test questionnaire is prepared by the investigator

Design of the Study

The sample constitute of 466 students drawn from five schools from Pondicherry. The random sampling technique is adopted to selectthe sample. Descriptive method of research is appropriate to study the Effect of Digital Instruction and Traditional Instruction on attainment in Mathematics of XI standard students.

Tools Used

The investigator adopted the questionnaire method which falls under the preview of inquiry method.

- Study material – XI standard mathematics text book by government of Tamil Nadu
- For the pre-test and post-test, the investigator used the questionnaire method
- Personal data sheet was prepared by the investigator

Collection of Data

The reformulated test paper was administered to all 466 students based on four concepts namely trigonometrically equations, Properties of triangles, Solutions of triangles, Inverse trigonometrically functions. The researcher evaluated all the answer scripts carefully. The scores obtain were tabulated systematically for each student, considering the scores obtained concept-wise and also the total score for all the four concepts taken together. Based on the pre-test score students were divided into two groups, students learningby Traditional method (group A) and students following the digital method (group B). Group A was subjected to the traditional classroom teaching, revolving around the lecture method and group B was exposed to digital instruction which was basically “interactive” in nature with total multimedia support. The digital instruction students hadthe advantage of acquiring more knowledge related to the topic. After teaching, the researcher conducted the post-test for all the 700 students. The answer scripts were evaluated and the scores obtained by each individual were tabulated concept wise and also for the entire questions (40) covering all four concepts.

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Analysis of Data

The entire data collected in order to study the Effectiveness of digital instruction and Traditional classroom instruction in the learning of mathematics of XI standard students with respect to gender and medium of instruction. The data were analyzed with the help of mean, standard deviation, t-test, F-test techniques of the statistics. The descriptive analysis, differential analysis and two-way ANOVA were carried out based on the objectives and hypotheses of the study.

Post test total scores	**Instruction**	
	Digital	**Traditional**
N	231	235
Mean	20.97	19.96
SD	5.786	5.364
t	1.96*	
Significance	0.05	

Table 1: Consolidated Post-Test Results with respect to Instruction

The above table shows that there is no significant differences in post test total mean score of the students in traditional learning and e- learning at 0.05 level of significance.

Post test total scores	**Gender**	
	Girls	**Boys**
N	95	171
Mean	20.30	20.59
SD	5.235	5.843
t	0.548	
Significance	NS	

Table 2: Consolidated Post-Test Results with respect to Gender

The above table shows that there are no significant differences in post-test total mean score of the boys and girls at 0.05 level of significance.

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Post test total scores	Medium	
	English	Tamil
N	129	137
Mean	22.68	18.33
SD	5.385	4.91
t	9.100**	
Significance	0.01	

Table 3: Consolidated Post-Test Results with respect to Medium of Instruction

The above table shows that there are significant differences in post-test total mean score mean score of the English medium and Tamil medium students at 0.01 level of significance.

Source	df	Sum of squares	Mean Square	F	Significance
Instruction	1	234.91	234.91	7.33	Sig
Gender	1	20.55	20.55	0.64	NS
Instruction & Gender	1	234.91	234.91	7.33	Sig
Error	262	14808.11	32.05		
Total	265	14711.897			

Table 4: Interaction between the Method of Learning and Gender on the Post-Test Total Scores of the Students

The above table shows that there is significant interaction between the method of learning and gender on the post test total scores of the students

Source	df	Sum of squares	Mean Square	F	Significance
Instruction	1	70.88	70.88	2.714	Sig
Medium of Instruction	1	2164.11	2164.11	82.85	Sig
Instruction & Medium	1	3758.57	3758.57	143.90	Sig
Error	262	12065.99	26.12		
Total	265	14546.94			

Table 5: Interaction between Method of Learning and Medium of Instruction on the Post-Test Total Scores of the Students

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The above table shows that there is significant interaction between the method of learning and medium of instruction on the post test total scores of the students

Major Findings of the Study

Digital instruction students performed better than the traditional instruction students in their post-test total mean scores. There is a significant difference between digital and Traditional methods. Hence it can be inferred that the attainment level of the students depends upon the method of teaching and learning. The attainment levels of digital students are more than that of the traditional method XI standard students in mathematics. The attainment level of XI standard students in learning a topic in mathematics is irrespective of gender difference. Comparing the performance of English and Tamil medium students following the digital instruction it is found that the English medium students performed better than Tamil medium students. Comparing the performance of English and Tamil medium students following the traditional method it is found that the English medium students performed better than Tamil medium students. Digital English medium students performed better than the English medium students following Traditional method.

Conclusion

Digital instruction is an essential tool for learning mathematics in the 21st century, and all schools must ensure that all their students have access to technology. Effective teachers maximize the potential of digital instruction to develop students' understanding, stimulate their interest, and increase their proficiency in mathematics. When digital instruction is used strategically, it can provide access to mathematics for all students. It may be concluded that the attainment level of the XI standard students in mathematics depends heavily upon the method of teaching. It has been inferred from this study, to improve the attainment level of the XI standard students in mathematics, digital instruction must be implemented in teaching learning process. This study shows that the attainment level of girls is higher in digital instruction and boys in traditional instruction. It can also be concluded that the attainment level of students in digital instruction does not depend on gender difference. The finding of the study also shows that, on the whole, the attainment level of English medium students is higher than the Tamil mediumstudents. There is an urgent need to improve the attainment level of the school students' particularly Tamil medium schools, using the major findings of the study, supported by digital teaching-learning technique.

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