International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182, Print ISSN: 2349-5979, Impact Factor: RJIF 5.72
www.allsubjectjournal.com
Volume 3; Issue 6; June 2016; Page No. 160-164

Effectiveness of educomp smart classroom teaching on retention in mathematics at elementary level

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Abstract
This study analyses the effect of Educomp Smartclass room teaching on Retention in Mathematics at elementary level. The study consists of 80 students of class VIII of Navyug Public School, Sonipat (Haryana). Achievement test containing 60 Questions was used to collect the data. Experimental group, consisting of 40 students was taught using Educomp Smartclass room and control Group of 40 students was taught using Conventional classroom. It was found that the mean retention scores of experimental and control groups' in mathematics differ significantly. Educomp Smartclass teaching helps in enhancing the retention of students in mathematics in comparison to the Conventional classroom teaching. The mean retention in mathematics of male and female VIII Graders using Educomp Smartclass teaching does not differ significantly. Sex has nothing to do with the retention in mathematics among VIII Graders using Educomp Smartclass teaching. The mean retention in mathematics of male and female VIII Graders using Conventional Classroom teaching does not differ significantly. Sex has nothing to do with the retention in mathematics among VIII Graders using Conventional Classroom teaching.

Keywords: Educomp Smartclass, Conventional Classroom, Achievement, Retention

1. Introduction

Teaching and learning in the 21st century should be markedly different from earlier times, as to teaching and learning are now occurring in an increasingly online world. Traditionally, learning environments were restricted to face– to- face delivery or where distance education was undertaken, delivery was largely characterized by the posting of printed resources and communications were often slow and cumbersome.

Integrating technology into teaching-learning transaction has been found to transform the teacher's role from being the traditional 'Sage on the Stage' to also being a 'Guide on the side,' and students' roles also change from being passive receivers of content to being more active participants and partners in the learning process (Alley, 1996; Repp, 1996; Roblyer, Edwards and Havriluk, 1997).

ICTs are a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information. Communication and information are at the very heart of the educational process, in formal and non-formal settings, in programmes provided by governmental agencies, public and private educational institutions, profit corporations and non-profit groups, and secular and religious communities.

"The illiterate of 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn."

ICTs offer great potentials and advantages in enhancing students' learning as revealed by Lopez (2003), among others. First, information and communication technologies offer a constructivist approach to learning through the provision of interactive learning experiences. Second, learning through ICTs is more effective as they provide opportunities for using multiple technologies (Video, Computer, Telecommunication, etc.), thereby providing visualization aids in the internationalization and understanding of difficult concepts and processes. This gives opportunities for providing links between theory and practice. Third, ICTs provide opportunities for students to gain valuable computer skills which are germane in today's job market. ICTs also provide students with repertoire of resources to enhance learning. Students have access to current and up-to minute information; with ease students can revise and update learning resources available to them. The use of ICT in education can improve memory retention, increase motivation and generally deepen understanding (Dede, 1998). Selinger (2004) claimed that ICT can improve the quality of education because multimedia contents help to illustrate and explain difficult concepts in ways that were previously inaccessible through traditional teaching resources and methodologies.

One of the most commonly cited reasons for using ICTs in the class- room has been to better prepare the current generation of students for a workplace where ICTs, particularly computers, the internet and related technologies, are becoming more and more ubiquitous. Technological literacy, or the ability to use ICTs effectively and efficiently, is thus seen as representing a competitive edge in an increasingly globalizing job market.

Concept of Smart Class

Smart Classes, providing education better through presentations and videos. A student can learn better through visualization. All the students may not understand the teaching methodology of a teacher, but can understand by smart classes. This can be seen in case of movies, i.e. students remember movies better than the lessons taught in classroom. This type of teaching creates an attention called as interest in them. So e-learning is absolutely better. But this should not be applied to all the topics in every subject, because imagination and visualization and application capability of student regarding the subject may be reduced, so smart classes are

better only up to a certain limit. Smart classrooms are very much beneficial in teaching-learning process. We make use of an appeal to audio-visual senses of students in using smart boards. These smart boards are like a computer screen which is finely handled by a teacher and also by students to provide active participation.

Educomp Smartclass

Educomp Smartclass, is a technology solution within the classroom that has transformed teaching and learning, across nearly 20,000 schools, reaching out to millions of learners. Using mapped to curriculum 2D-3D digital content across all school subjects it has, (as testified by a Dun and Bradstreet research) paved the way for vastly improved teaching learning outcomes. For learners it has meant aroused interest levels, more engagement, and yes better comprehension of critical concepts. For teachers it has meant ease of facilitation and superior teaching outcomes.

Significance of the Study

Technology offers many benefits to enhance education. Most importantly, technology integration has the potential to increase student motivation (Anderson, 2000).

Technology empowers students by engaging students in the learning process. The nature of the task shifts from teacher centered to student-centered. Research indicates that challenging and engaging academic tasks that build upon students' prior knowledge and enable students to construct their own understanding of the content are more apt to enhance student motivation and increase student self-confidence in the cognitive abilities (Brophy, 1983; Meece, 1991; Miller, Meece, 1999). Research also identifies the benefits of technology integration as the technical aspects to enhance the quality of work, promote access of resources, positively impact student learning, and promote student meta-cognitive skills (Heafner & McCoy, 2001; Scheidet, 2003).

As noted by Driscoll (1994), *"We no longer can view learners as empty vessels waiting to be filled, but rather as active organisms seeking meaning."*

In today's world, teachers need to be equipped not only with subject expertise and effective teaching methodologies but with the capacity to assist students to meet demand of the emerging knowledge based society with new forms of ICT and need to have the ability to use that technology to enhance the quality of learning. The search for ways to integrate technology into mathematics education is influenced by two main factors. First is the explosion of technologies that is influencing all aspects of life and the development of human resource. Knowledge-based workers need to be technology savvy as well as having critical and creative thinking skills. Second is the mathematics education reform that is now emphasizing the development of mathematical processes.

During the last two decades, researchers have become increasingly aware of the important role teachers play for student achievement, with the implicit assumption that better teacher performance in terms of mathematical content knowledge, pedagogy and technology integration in combination with knowledge about research outcomes would sufficiently prepare teachers for an easy and effective integration of new technology into their classrooms. Hence, the need for the study effect of Educomp Smartclass room on Retention in Mathematics at Elementary level.

Objectives of the Study

1. To compare the effect of Educomp smart classroom and conventional classroom teaching on the retention in mathematics among VIII graders.
2. To compare the mean Retention scores of male and female VIII graders in mathematics to be taught through Educomp Smart Classroom teaching.
3. To compare the mean Retention scores of male and female VIII graders in mathematics to be taught through Conventional Classroom teaching.

Hypotheses of the Study

1. There will be no significant difference in the effects of Educomp smart classroom and conventional classroom teaching on the retention in mathematics among VIII graders.
2. There will be no significant difference in the mean retention scores of male and female students in Mathematics to be taught through Educomp Smart Classroom teaching.
3. There will be no significant difference in the mean retention scores of male and female students in Mathematics to be taught through conventional classroom teaching.

Method of research

The present study is an attempt to study the effect of Educomp Smartclass on the students' Retention in mathematics. Keeping this thing in mind, the investigator used pre-test, post-test experimental method to conduct this study.

Research Design

In the present study, pre-test post-test control group quasi experimental, design was employed. Experimental group was taught using Educomp Smartclass and the control group was taught using Conventional classroom using chalk and talk method for a period of 30 working days.

Sampling

In the present investigation, Sonipat district of Haryana was the field of study. The sample of the study comprised 40 pupils each studying in two sections of the VIII class of Navyug Public School, Sonipat situated in Haryana. One section formed the control group and the other section formed the experimental group, the selected sections were equated on intelligence and socio-economic status.

A schematic view of the phases of experiment is presented in Table - 1.

Table 1: Phases of the study

Stage	Control Group	Experimental Group
I. Pre-testing	1.Measurement of intelligence of pupils 2.Measurement of socio-economic status of pupils 3. Measurement of achievement in mathematics	1.Measurement of intelligence of pupils 2.Measurement of socioeconomic status of pupils 4. Measurement of achievement in mathematics
II. Treatment	Teaching mathematics through conventional method	Teaching mathematics through Educomp Smartclass method
III. Post-testing	1. Measurement of Retention in mathematics (after 30 days)	1.Measurement of Retention in mathematics (after 30 days)

Independent Variables
Educomp Smartclass used teaching and traditional teachings were the two independent variables for the study.

Dependent Variables Retention in mathematics was taken as dependent variables. Retention in mathematics was measured 30 days after the treatment stage. i.e., 30 days after the post-test.

The independent variables, dependent variables, control variables and the kind of control employed in the study are summarized in Table - 2.

Table 2: Control Employed to Variables

Independent Variables	Dependent Variables	Control Variables	Control Employed
Method of Teaching	1.Achievement In Mathematics 2. Retention in Mathematics	1. Nature of school	1. Administrative (Single School)
		2. Grade Level	2. Administrative (Only VIII class chosen as sample and taught)
		3. Teacher	3. Both the groups were taught by the same teacher (investigator hereby)
		4. Subject to be Taught	4. Administrative (Same units of Mathematics taught in both groups)
		5. Duration of treatment	5. The two groups taught for 30 days, 40 minutes each period daily.
		6.Pupils' socio-economic status	6. Belonged to the same milieu.
		7.Pupils' intelligence	7. No need.

Tools Used
For the present investigation, the following tools will be used:

A. Standardized Tests
1. Group Test of Intelligence (GGTI) by Dr. Ahuja GC. (1990)
2. Socio-Economic Status Scale (SESS-UR), by Ashok K. Kalia and Sudhir Sahu (2011) [13].

B. Self-developed Tools
3. Mathematics Achievement Test (To be developed by investigator)

Statistical Techniques
Descriptive statistics such as mean and S.D worked out on the score of achievement in Mathematics and 't' test was employed for testing the significance of difference between the means of pupils' achievement in mathematics on pre - test, post -test and gain scores.

Results and Discussion
Concerned Null Hypothesis ($H_0$1) - There will be no significant difference in the effects of Educomp Smartclass teaching and conventional classroom teaching on the retention in mathematics among VIII graders.

Table 3: Mean, S.D and t–value of Retention in mathematics of VIII Graders using Educomp Smartclass teaching and Conventional Classroom teaching.

Groups	N	Mean	S.D.	t-value	Significance
Conventional Classroom	40	40.075	5.0656	8.952	.01*
Educomp Smartclass	40	49.800	4.642		

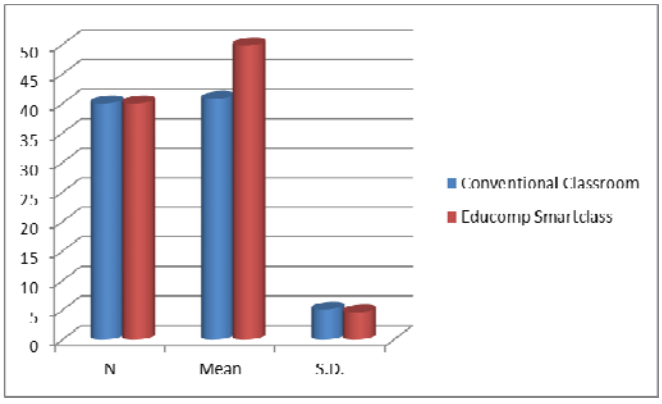

Fig 1

From table - 3, it is evident that the t-value is 8.952 which is highly significant at 0.01 level (critical value=2.66) with df =78. It reflects that the mean retention scores of experimental and control groups' in mathematics differ significantly. Thus the null hypothesis namely, $H_0$1 i.e., 'There will be no significant difference in the effects of Educomp Smartclass and Conventional classroom teaching on the retention in mathematics among VIII graders' is rejected. Further, the mean achievement score of experimental group is 49.80, which is significantly higher than the mean achievement score of control group i.e. 40.075. It may therefore be concluded that Educomp Smartclass teaching helps in enhancing the retention of students in mathematics in comparison to the Conventional classroom teaching.

Concerned Null Hypothesis ($H_0$2) - There will be no significant difference in the mean retention scores of male and female students in Mathematics to be taught through Educomp Smart Classroom teaching.

Table 4: Mean, S.D and t – value of Retention in mathematics of male and female VIII Graders using Educomp Smartclass teaching.

Groups	N	Mean	S.D.	t- alue	Significance
Males	20	50.10	4.103	0.404	Not Significant
Females	20	49.50	5.216		

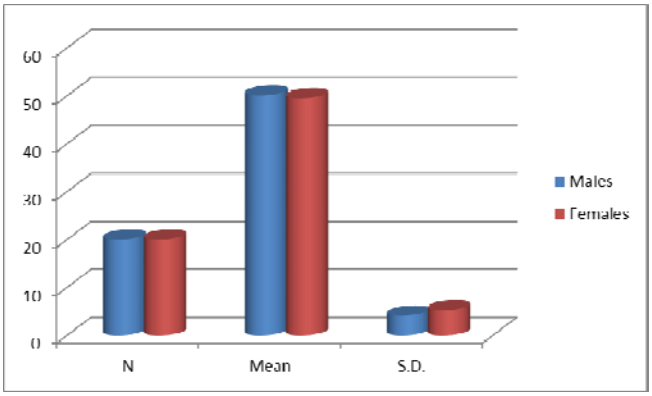

Fig 2

The table - 4, clearly shows that the t-value 0.404 is not significant at 0.01 level (critical value=2.70) with df =38. It reflects that the means of retention in mathematics of male and female VIII Graders using Educomp Smartclass teaching does not differ significantly. Thus the null hypothesis namely, $H_0$2 i.e., There will be no significant difference in the mean retention scores of male and female students in Mathematics to be taught through Educomp Smartclass teaching' is accepted. Further, the mean retention score of male students is 50.10, which is slightly higher than the mean achievement score of female students i.e. 49.50. It may therefore be concluded from the findings that sex has nothing to do with the retention in mathematics among VIII Graders using Educomp Smartclass teaching.

Concerned Null Hypothesis ($H_0$3) - There will be no significant difference in the mean retention scores of male and female students in Mathematics to be taught through conventional classroom teaching.

Table 5: Mean, S.D and t – value of Retention in mathematics of male and female VIII Graders using Conventional Classroom teaching.

Groups	N	Mean	S.D.	t-value	Significance
Males	20	40.85	5.008	0.967	Not Significant
Females	20	39.30	5.131		

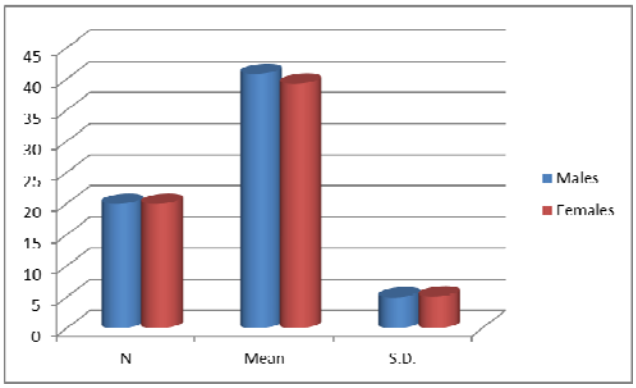

Fig 3

The table - 5, clearly shows that the t-value 0.967 is not significant at 0.01 level (critical value=2.70) with df =38. It reflects that the value of retention in mathematics of male and female VIII Graders using Conventional Classroom teaching does not differ significantly. Thus the null hypothesis namely, $H_0$3 i.e., 'There will be no significant difference in the mean retention scores of male and female students in Mathematics to be taught through conventional classroom teaching' is accepted. Further, the mean retention score of male students is 40.85, which is slightly higher than the mean achievement score of female students i.e. 39.30. It may therefore be concluded from the findings that sex has nothing to do with the retention in mathematics among VIII Graders using Conventional Classroom teaching.

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