



ORIGINAL RESEARCH PAPER

Education

IMPACT OF SMART CLASSROOM ON ACHIEVEMENT OF MATHEMATICS OF HIGHER SECONDARY SCHOOL STUDENTS

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ABSTRACT

This study the impact of Smart classroom on the achievement of Mathematics of Higher secondary school students. . The study investigated 200 Class XI students from Vellore District. Achievement test in Mathematics of 40 items was used to collect the data. Experimental group was taught in smart classrooms and control group was taught by conventional mode of instruction. The results revealed that students achieved higher when taught in smart classes as compared to conventional mode of instruction. Learning styles of students did not affect their achievement in experimental and control group. No interaction effect of instructional strategies and learning style was found.

INTRODUCTION

The role of the teachers in educating the children has gained paramount importance. On one side the classrooms are overcrowded with overloaded syllabi where the pupils are expected to gain knowledge and on other side the role of teachers has become significant to develop interest and meaningful understanding amongst the students. An alternative process or method of teaching has to be adopted, in this fast developing world, where knowledge explosion has been taking place every day in every sphere of life. It is unreasonable to expect that spoken or written words alone to convey the volume of relevant information to the learner. The selection of teaching method and techniques depends upon the nature of the test, learning objectives on one side and entering behaviour of the students on the other side.

Information and Communication Technology is an important instrument, which can transfer the present isolated teacher and book centred learning environment into a rich learning environment. Blurton (1999) stated that 'ICT' stands for Information and Communication Technologies "a diverse set of technological tools and resources used to communicate, to create, to disseminate, to store and to manage information."

To make teaching-learning environment richer and more effective, teachers through power point presentations deliver their lessons. This involves a detailed and complex preparation on the part of the teacher. The typical classroom was once characterized by students sitting through hour long teaching monologues. Now, technology is making life easier for both educators and students. New method of teaching has been introduced which is publically known as Smart Class. Smart Class is a revolutionary classroom technology leveraged teaching- learning system that is transforming the way teachers teach and the students learn in schools. It makes use of mapped curriculum 2D and 3D digital content which the teacher could access right in the classroom and project it on whiteboard, to elucidate and explain critical concepts, across virtually all subjects.

Smart board makes the teaching easy for the teachers and learning the concept easy for the students. Students become more interactive and volunteering in the classes. In a smart classroom enabled schools, the classrooms are connected to what is known as the knowledge centre where all the digital contents are linked to the server. Teachers can access the lessons they want to teach during their teaching periods, they can use it to demonstrate; take learners through an audio-visual journey and above all help them to learn better. Schools are increasingly adopting digital teaching solutions to engage with a generation of pupils well-versed with the Play stations and I Pads, and trying to make the classroom environment more inclusive and participatory.

FEATURES OF SMART CLASS

- Smart classes help teachers to meet new challenges and developing students' abilities and performance.
- Smart classroom enables teachers to access multimedia content and information that can be used for teaching students more effectively.

- Smart class enables teachers to express their views and ensures that every child is understanding the undertaken concept which ultimately affects his achievement.
- Achievement is possible only if concepts are clearly understood. It is possible though Smart class where all domains of knowledge are affected.
- A well designed module of smart class allows a student to visualize the concept much better than static images.
- Smart class teaching is a step towards development where students' achievement is highlighted.
- Makes learning an enjoyable experience for students.

SIGNIFICANCE OF THE PROBLEM

The traditional approach of lecture and note taking has lost its effectiveness as the modern day around education grows. In efforts to grow academically it must be considered that differentiated modalities of teaching and learning are necessary to implement deeper levels of growth and conceptual development. Since every student is not interested in all subject matters. However, it is the responsibility of the education system to employ a variety of opportunities for the students to gain interests, orchestrating academic growth and progression throughout childhood and adolescence.

ICT has turned from being a technology of communication and information to a curriculum creation and delivery system for teachers and learners. Such a task in today's time is tremendously being performed by Smart Class that caters K12 curriculum. Present study will help us to know the effectiveness of smart class teaching on the three domains of learners with respect to their performance, achievement, retention and learning. It would also help the policy makers to design the curriculum in such a way that it will help the teacher to teach the subject in an effective manner and maintain pace with the modern education.

OBJECTIVES OF THE STUDY

1. To study the effectiveness of different Classroom teachings i.e. Smart Classroom teaching and conventional mode of teaching on achievement of class XI students in Mathematics.
2. To study the academic achievement in Mathematics of class XI students when taught through Smart Classroom teaching and conventional teaching with respect to gender.
3. To study the interactional effect of Smart Classroom teaching conventional teaching and gender on the achievement in Mathematics of class XI students.

HYPOTHESES

For the present investigation the following hypotheses were formulated:

1. There will be no significant difference in the achievement of class XI students in Mathematics when taught through different Classroom teachings i.e. Smart Classroom teaching and conventional mode of teaching.
2. There will be no significant difference in the achievement of class XI students in Mathematics when taught through Smart Classroom teaching and conventional teaching with respect to gender.

3. There will be no significant interaction effect of Smart Classroom teaching, conventional teaching and gender on the achievement of class XI students in Mathematics.

RESEARCH METHOD

RESEARCH DESIGN

In the present study, 2 X 2 factorial experimental design was employed.

SAMPLE FOR THE STUDY

Stratified Random sampling technique was employed by the investigator for the selection of the sample. In the present study sample of (N=330) students of IX grade was drawn randomly from the different schools of Amritsar city. The sample comprising of 330 students was administered two tests-test of achievement in Chemistry and test of intelligence. Out of 330 students, six students did not respond to all the items of achievement and four students did not respond to some items of intelligence test i.e. total of 10 students were dropped from the sample of 330 students. The scores of these students were not considered at the time of analysis.

Hence sample comprising of 320 students were randomly divided into two groups- the experimental group and the control group. In order to make equivalent groups, matching was done at the pre-test stage for two variables- variable of achievement in Chemistry (pre-test) and intelligence. t-test was employed to compare mean scores on the variable of achievement in Chemistry and Intelligence. Insignificant t-ratio showed that both the groups were matched and equivalent. The experimental group was taught with smart class teaching and the control group was taught with conventional mode of teaching.

SAMPLE DISTRIBUTION ON THE BASIS DIFFERENT CLASSROOM TEACHINGS

As the present study involved two different classroom teachings (Smart Classroom teaching and conventional mode of teaching) hence the students (N=320) were distributed at two stages-on the basis of different classroom teachings.

STAGE I: SAMPLE DISTRIBUTION ON THE BASIS OF DIFFERENT CLASSROOM TEACHINGS

The sample was distributed on the basis of different classroom teachings into two types i.e. Smart Classroom teaching (SCT) and conventional mode of teaching (CMI). The distribution of the sample on the basis of these strategies is presented in table 1.

TABLE 1: SHOWING DISTRIBUTION OF SAMPLE ON THE BASIS OF DIFFERENT CLASSROOM TEACHINGS

S.No	Experimental (Group taught with SCT)	Control (Group taught with CMI)	Total No. of Students
1	63	62	125
2	49	49	98
3	48	49	97
Total	160	160	320

TOOLS USED

In the present study the following tools were used:

1. An achievement test in Mathematics for class IX was constructed and standardized to measure the performance of students before and after the treatment.
2. Smart class program on some topics of Mathematics has been used by the experimenter to give treatment to the experimental group.

PROCEDURE CONDUCTING THE EXPERIMENT

The present study was conducted in four phases:

- Phase I: Development of an Achievement Test in Mathematics
- Phase II (a): Matching the Groups, Phase II (b): Administration of an Achievement Test,
- Phase III: Implementation of Web Based Instructional Package

- Phase IV: Administration of the Achievement Test (post-test)

RESULTS AND DISCUSSION

F values were calculated to study the main effect and interaction effects of two factors viz. different classroom teachings and gender with regard to gain scores of class IX students on the variable of achievement in Chemistry. The F values calculated by using two way ANOVA test is presented in table II.

TABLE II: SHOWING COMPUTATION OF MEANS AND STANDARD DEVIATIONS WITH RESPECT TO GENDER AND METHOD OF TEACHING

Dependent variable Gender	Methods	N	Standard deviation	Mean
Boys	Smart Class Teaching	35	2.119	22.26
	Conventional Teaching	35	2.157	22.63
Girls	Smart Class Teaching	35	2.807	29.94
	Conventional Teaching	35	1.833	22.86
Total	Smart Class Teaching	35	2.493	29.60
	Conventional Teaching	35	1.990	22.74

- Mean score of academic achievement in chemistry of boys when taught through smart class is 29.26 with standard deviation 2.119 and mean score of academic achievement in chemistry of girls is 29.94 with standard deviation 2.807 .
- Mean scores of academic achievement in chemistry of boys when taught through conventional method is 22.63 with S.D. of 2.157 and mean score of academic achievement in chemistry of girls is 22.86 with S.D. 1.833. It means that girls when taught through conventional method as against boys show greater academic achievement.
- Mean scores of academic achievement in chemistry of boys when taught through smart class is 29.26 with S.D of 2.119 and conventional method is 22.63 with S.D. of 2.157. It means that boys when taught through smart class approach have high mean scores as compared against conventional method.
- Mean scores of academic achievement in chemistry of girls when taught through smart class is 29.94 with S.D. 2.807 and conventional method is 22.86 and S.D. 1.833. It means that girls when taught through smart class approach have high mean scores as against conventional method.

Mean scores of group when taught through smart class is 29.60 with S.D 2.493 and conventional teaching is 22.74 and S.D 1.990. It means that group when taught through smart class approach has greater mean scores as against conventional method.

It means Hypothesis that "There will be no significant difference in the academic achievement in chemistry of secondary school students when taught through smart classroom teaching and conventional teaching is rejected as difference is significant .Therefore the two methods i.e. smart classroom teaching method and conventional teaching method significantly affects the achievement scores of the secondary school students.

CONCLUSIONS

In the light of above mentioned interpretation and discussion the main conclusions of the study are given below:

1. From the result of hypothesis-1 we conclude that the academic achievement in chemistry of secondary school students when taught through Smart Classroom teaching show greater achievement than conventional teaching.
2. From the result of hypothesis-2 we conclude that there is no gender difference in the academic achievement in chemistry of secondary school students when taught through Smart Classroom teaching and conventional teaching.
3. From the result of hypothesis-3 we conclude that interaction of gender and teaching method do not significantly affect the academic achievement in chemistry of secondary school students.

EDUCATIONAL IMPLICATIONS

Decamp Smart Class plays an important role in the academic achievement in chemistry of students due to the following reasons:

1. Since there is a positive relationship between Smart Classroom teaching and academic achievement in chemistry of students, it is imperative that the school plays a significant role in developing them.
2. Smart classes help students to a great extent. Students can interact, understand and remember things very easily as these are innovative where visuals have more impact than just reading. So smart class technology must be enhanced.
3. Smart classes provide better education through presentations and videos as well as all students may not understand the teaching methodology of a teacher but can understand by smart classes. So such an audio visual technology needs to be boosted in all kind of schools.
4. Smart classes create an attention in students which is known as interest. Inclusion of such a tool in schools ultimately enhances students' academic interest.
5. Smart class is a good evaluative tool to teachers. To teachers such a digital initiative is so practical in modern times and friendly to use, where teachers can instantly evaluate/assess the learning achieved by their students in the class.

Smart Board is a time saving tutor which has inbuilt diagrams in its memory. So, no wastage of time is involved in drawing the diagrams and time is utilized more for the active learning part.

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