



EFFECTIVENESS OF SMART CLASSROOM IN TEACHING SCIENCE FOR IX STANDARD STUDENTS

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ABSTRACT

This study is an experimental one and conducted in Madurai District of Tamil Nadu. The aim is to study the Effectiveness of Smart Classroom in teaching Science for IX standard students. The investigator selected 70 students from Sourashtra Higher Secondary School where the Smart Classroom facility was available. They were divided into two groups. These were treated as Experimental groups. Each group consisted of 35 students. The investigator selected a group of 35 students from Setupati Higher Secondary School where the Conventional method of teaching was adopted. This was treated as control group. The investigator adopted pre-test and post-test equivalent group experimental design. The investigator had constructed and standardized an achievement test which was used for data collection. The investigator prepared 60 objective type questions under six category to conduct an achievement test. A pilot study was conducted to a sample of 100 students. In order to standardise, the responses were subjected to item analysis. Item belongs to the item difficulty level and item discrimination ranging from 0.3 to 0.7 was selected for the final tool. The total number of selected items in the final test was 30 and the time allowed was fixed as 60 minutes. For the purpose of analysis of data descriptive analysis and inferential analysis were used. The result of the study revealed that smart classroom improves the achievement in Science of IX standard students. It is concluded that teaching Science through smart classroom is effective.

KEYWORDS : Effectiveness, Smart Classroom, Achievement.

INTRODUCTION

Education elevates one's mind and intellect through a planned process of learning to a higher level of knowledge and better state of efficiency. It is always aimed at perfection and excellence. In such a pursuit, it has to pass through various improvisations and innovations. The concept education through computer is an important milestone amongst them. It is the latest innovation in the educational technology holding the greatest promise for the needs of the modern society. It aims at shaping the individual to imbibe self-confidence and self-reliance in learning. Teaching through Smart Classroom has its own merits when compared with the traditional methods of teaching. A Smart Classroom is equipped with Multimedia components like Networked Computer, complete with Monitor, Keyboard, Mouse, Ceiling mounted Projector, Screen, DVD players, Remote control, Microphone and Speakers. These are designed to enhance instruction and learning. User need to be confident that technology will work in the classroom without assistance and that, once in the classroom, setup time will take just a few minutes. The investigator aimed to study the Effectiveness of Smart Classroom in teaching Science for IX standard students.

REVIEW OF RELATED LITERATURE

Anderson (2006) investigated the views of 1027 students from central region of Ghana about the Relevance of Science Education (ROSE). His results showed that the majority of students believed that Science and Technology are useful for the society and can help to reduce poverty and famine in the world.

Stefansson (2006) examined the Icelandic Students' views about Science and Technology and also School Science. He suggested that everyone should learn science in school, the school science is interesting and the school science is useful in day to day life.

Basu and Barton (2007) mentioned that the science curriculum is a key factor in developing and sustaining students' interest in science and students may become disengaged from school science if their funds of knowledge are not incorporated into the science curriculum.

Hirata and Hirata (2008) studied Japanese Students' attitude towards hybrid learning. The findings revealed that the blended learning was more effective. However, few students preferred traditional learning.

Lavonen et al. (2008) studied the interests and experiences of students of Finland in Physics and Chemistry. The research was conducted on 3626 Secondary Students with average of 15 years old. According to their results, students have many experiences related to science and technology outside the school.

Adas and Abu Shmais (2011) conducted a study on Palastinian University Students to find out their perception towards blended learning environment. The results show that the majority of learners expressed their positive attitude towards blended learning. However, no significant difference was mentioned.

In a study by Tanveer (2011) with Omani students to explore the students' attitude towards integrating e-learning in classroom, he found that majority of students preferred blended learning and thought that teachers who use e-learning in the classroom were better teachers.

Jena(2013) has investigated the effect of smart classroom learning environment on academic achievement of rural high achievers and low achievers in science. This experimental study was conducted in Jalandhar district of Punjab. The result of the study reveals that smart class learning environment is better to teach both low achievers and high achievers than traditional class.

Anita Menon (2015) conducted a research on effectiveness of smart classroom teaching on the achievement in Chemistry of secondary school students. The researcher investigated 320 Class IX students from Amritsar city. An achievement test 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.

Nasreen Bano (2016) conducted a study on smart classroom learning environment and performance of first grade students. In this study the researcher investigates the effect of smart classroom learning on the performance of first grade students in Science. The study was an experimental one and was conducted in Srinagar District of Kashmir. The investigator has taken 30 first grade students from Govt. High School Bakshipora .The investigator conducted experiment on the basis of pre-test and post-test. Performance test standardized by the investigator was used for the collection of data and t-test(correlated groups) was used to analyse the data. The result reveals smart classroom learning positively effects the performance of first grade students in Science.

OBJECTIVES OF THE STUDY

The following are the Objectives of the study:

1. To compare the effectiveness of teaching through Smart Classroom over the Conventional methods of teaching.
2. To compare the effectiveness of teaching through Smart Classroom without teacher support over with teacher support.

HYPOTHESES OF THE STUDY

The following are the null hypotheses of the study:

1. There is no significant difference among the gain scores of achievement in Science of the control group, experimental group with teacher's support and experimental group without teacher's support.
2. There is no significant difference between the gain scores of achievement of control group and experimental group without teacher support.
3. There is no significant difference between the gain scores of achievement of control group and experimental group with teacher support.
4. There is no significant difference between the gain scores of achievement of experimental group without teacher support and experimental group with teacher support.

METHOD AND DESIGN OF THE STUDY

Experimental research design was used for the study. Pre-test Post-test Equivalent Group Experimental Design was adopted. The sample consisted of three groups of IX standard students. Each group consisted of 35 students. Among three group one group was exposed to Conventional Method of Teaching which was the control group. The other two groups were Experimental groups. One group was exposed for teaching through Smart Classroom without the support of the teacher and the other was exposed for teaching through Smart Classroom with the support of the teacher.

SAMPLE OF THE STUDY

Students those who were studying in IX Standard were selected for the study. The investigator selected 70 students from Sourashtra Higher Secondary School where the Smart Classroom facility was available. They were divided into two groups. These were treated as Experimental groups. Each group consisted of 35 students. The investigator selected a group of 35 students from Setupati Higher Secondary School where the Conventional method of teaching was adopted. This was treated as control group. The purposive sampling technique was used. The total size of the sample was 105.

TOOL USED FOR THE STUDY

The type of the test items, construction of test items and time duration of the test was decided in consultation with subject experts and experienced teachers of Science at High School level.

The investigator prepared 60 objective type questions under six category to conduct an achievement test. A pilot study was conducted to a sample of 100 students. In order to standardise, the responses were subjected to item analysis. Item belongs to the item difficulty level and item discrimination ranging from 0.3 to 0.7 was selected for the final tool. The total number of selected items in the final test was 30 and the time allowed was fixed as 60 minutes.

STATISTICAL TECHNIQUES USED

The achievement test marks were analysed to find out the effective method which was helpful to improve the achievement of IX standard students. The achievement test scores were subjected to descriptive and inferential analysis.

VALIDITY AND RELIABILITY OF THE TOOL

The experts in the field of Education scrutinized the tool. Few modifications were done based on their comments. Thus the face validity was obtained.

Content validity is an important measure of achievement. The researcher selected the test content from the course content. Thus the content validity was obtained.

The researcher employed test - retest method to find the reliability of the tool. The test scores were correlated. The correlation coefficient obtained was found to be 0.79. Thus the reliability of the tool was established.

H_0 : 01) There is no significant difference among the gain scores of achievement in Science of the control group, experimental group with teacher's support and experimental group without teacher's support.

Table - 1

One way ANOVA showing the significant difference among the gain scores of achievement in Science of the control group, experimental group with teacher's support and experimental group without teacher's support.

Variable	source of variables	sum of squares	Df	Mean Square	F - Values	Remarks (5% level of significance)
Control group	Between	51.82	2	25.9	6.07	S
Experimental group with teacher's support	Within	435.37	102	4.26		
Experimental group without teacher's support	Total	487.19	104			

S - Significant

In the above table, the calculated value of 'F' (6.07) is greater than the table value (3.07) for df (2, 102), at 0.05 level of significance. Hence, the null hypothesis is rejected. It is concluded that there is a significant difference among the gain scores of achievement in Science of control group, experimental group with teacher's support and experimental group without teacher's support.

H_0 : 02) There is no significant difference between the gain scores of achievement of control group and experimental group without teacher support.

Table - 2

t-test for the gain scores of control group and experimental group without teacher's support

Group	N	Mean	SD	t-value		Remarks (5% level of significance)
				Calculated Value	Table Value	
Control group	35	21.65	2.141	1.019	2.00	NS
Experimental group without teacher's support	35	22.20	2.311			

NS-Not Significant

In the above table, the calculated value of t (1.019) is less than the table value (2.00) for df 68, at 0.05 level of significance. Hence the null hypothesis is accepted. It shows that there is no significant difference in the gain scores between the control group and experimental group without teacher's support.

The mean scores shows that the mean value of experimental group without teacher's support is greater than that of Control group.

H₀: 03) There is no significant difference between the gain scores of achievement of control group and experimental group with teacher support.

Table - 3

t-test for the gain scores of control group and experimental group with teacher's support

Group	N	Mean	SD	t-value		Remarks (5% level of significance)
				Calculated Value	Table Value	
Control group	35	21.65	2.141	3.65	2.00	S
Experimental group with teacher's support	35	23.34	1.696			

S-Significant

In the above table, the calculated value of t (3.65) is greater than the table value (2.00) for df 68, at 0.05 level of significance. Hence the null hypothesis is rejected. It shows that there is a significant difference in the scores between the control group and experimental group with teacher's support.

The mean scores shows that the mean value of experimental group with teacher support is greater than that of control group.

H₀: 04) There is no significant difference between the gain scores of achievement of experimental group without teacher support and experimental group with teacher support.

Table - 4

t-test for the gain scores of experimental group with teacher's support and experimental group without teacher's support

Group	N	Mean	SD	t-value		Remarks (5% level of significance)
				Calculated Value	Table Value	
Experimental group with teacher's support	35	23.34	1.696	2.358	2.00	S
Experimental group without teacher's support	35	22.20	2.311			

S-Significant

In the above table, the calculated value of t (2.358) is greater than the table value (2.00) for df 68, at 0.05 level of significance. Hence, the null hypothesis is rejected. It shows that there is a significant difference in the gain scores between the experimental group with teacher's support and experimental group without teacher's support.

The mean scores shows that the mean value of experimental group with teacher support is greater than that of experimental group without teacher's support

FINDINGS OF THE DESCRIPTIVE ANALYSIS

The mean value of the gain scores of achievement in Science of control group, experimental group with teacher's support and experimental group without teacher's support are 21.65, 23.34 and 22.20 respectively.

In the present study, the achievement of the students had increased when they are taught through smart classroom. It is also found that the achievement of the students had increased when they are taught through smart classroom with the support of teacher.

FINDINGS OF THE INFERENTIAL ANALYSIS

1. There is a significant difference among the gain scores of achievement in Science of the control group, experimental group with teacher's support and experimental group without teacher's support.
2. There is a significant difference between the gain scores of achievement in Science of control group and experimental group with teacher's support.
3. There is a significant difference between the gain scores of achievement in Science of control group and experimental group without teacher's support.
4. There is a significant difference between the gain scores of achievement in Science of experimental group with teacher's support and experimental group without teacher's support.

EDUCATIONAL IMPLICATIONS OF THE STUDY

Based on the findings and conclusions of the study the following educational implications are put forward to Science teachers and instructional designers in using smart classroom, as the student may prefer it to the conventional method of teaching.

In order to improve the educational system, it is essential to adopt new technologies in the classroom. Novel methods will create a new scenario in the field of education by encouraging the students as well as the teachers. With the help of modern techniques teachers can make the classroom livelier and create curiosity and interest among the students. As a result, the teacher-student relationship is strengthened.

This study expresses the significance of teaching of Science through smart classroom for high school students. Teaching through smart classroom is not only a need of the hour but also order of the day. It is the right time to realize the value of smart classroom in order to meet the expectations of the learners. It is helpful in developing the desired outcome of the student. No educational institution can escape from the influence of smart classroom. An educational institution that fails to install smart classroom cannot fulfill the need of students.

SUGGESTIONS FOR FUTURE RESEARCH

By virtue of the experience of this study the researcher would like to put forward the following suggestions for the future study.

1. The same study may be conducted with different experimental design.
2. The same study may be conducted by comparing the achievements with respect to educational objectives.
3. The same study may be conducted by comparing the levels of achievement such as high, average and low.
4. A similar study may be carried at primary and higher secondary level.

CONCLUSIONS OF THE STUDY

In the light of the important research findings of the study, the researcher has arrived at the following conclusions.

1. There is a significant difference between the gain scores of achievement in Science of control group and experimental group with teacher's support. The mean value of Experimental group with teacher's support is greater than that of control group. It is concluded that teaching through smart classroom is effective than the conventional method of teaching.
2. There is a significant difference between the gain scores of achievement in Science of experimental group with teacher's support and experimental group without teacher's support. The mean value of experimental group with teacher's support is greater than that of experimental group without teacher's

support. It is concluded that teaching through smart classroom with the support of teacher is more effective.

3. The teacher acts as a catalyst in the system of education and so the achievement of students has improved significantly with the support of teacher. Even though, technology is a powerful tool in the field of education, the role of teacher is also an important one. While the students are taught through smart classroom, mere supervision alone is not sufficient. It is concluded that to improve the achievement of students, active participation of the teacher is essential. Therefore, Support of teacher is a major component that can be neither denied nor eliminated in the system of education.
4. The mean gain scores of achievement of experimental groups are greater than that of control group. It is concluded that the teaching of Science through smart classroom is effective.
5. This study reveals that the students who are the main clients of the educational system had accepted the innovative method of teaching Science through smart classroom. This conclusion is strengthened by the improvement in the achievement of the students of experimental groups. This proves the effectiveness of smart classroom.

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