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Effectiveness Of Smart Classroom Teaching On Achievement In Science Among Secondary School Students

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Abstract

The study envisages the impact of smart classroom teaching of secondary school students. The sample comprised of each 40 for control and experimental groups from Madurai District by purposive sampling. The independent and dependent variable of the study are smart classroom teaching and academic achievement respectively. The investigator also manipulated gender, age and locality of the students as demographic variables. Experiment with double group design was followed for collecting data. t-test and Cohen's effect size has been used for analysis. The result shows as smart classroom teaching enhancing the students' achievement. The post-test mean scores of both control and experimental groups are significant too high and it may be occurred on the individual differences and both the mean scores are not too much varied. The effect size of post-test scores between control and experimental group indicates large effect is made by the smart classroom on achievement.

Keywords: *Smart Classroom, Experiment, Purposive Sampling, Secondary students*

Introduction:

Developing country like India has implementing innovative practices in teaching and learning process for sustainable development of education. But most the teacher offer in their classroom traditional method like lecture method with adding or introducing new teaching aids to improve lecturing. In the modern era, the students are digital learners and the traditional method is not fit for them. A new and innovative method can be adopted or applicable for the digital learners. Smart Classroom is a classroom which includes the internet facility with video conferencing things and it improves teachers' effectiveness and productivity of the classrooms. It is electronically enhanced lecture theaters and classrooms (Tiwari, 2017). It allows the teaching as well as learning is an enjoyable experience for both teachers and students. and it may lead to improve academic performance of students. Smart classroom offers teachers to assessing and valuing the learning which is achieved by their students at every class immediately. From the technology era, the technology has been used

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to enhance the quality of learning through teaching. However effective use of technology to enhance the quality of teaching is a very challenging one. Smart class can be used to improve the quality of teaching. For example it can be improve the interactions between the teacher and the students with respect to all teaching subjects at school levels as well as college levels.

Rational for the Study:

At present we are switching to modern technologies because the replacement of drawbacks of current teaching strategies. The current teaching strategies not make the students active position and acted be passive listener. Now it is started a new technology strategy is Smart classroom. Smart classroom is a smart concept for smart educators of smart schools and colleges. Tiwari (2017) summarized the smart classroom as Showing, Manageable, Accessible, Real-time Interactive and Testing, which nicknames "SMART". The smart classroom system has been designed to offer the teacher and students at different physical locations together in an interactive environment, using video conferencing and live broadcasting techniques. Smart classroom is one of the modern teaching strategies which being equipped with multimedia components and to facilitate instruction and learning positively. It is also helpful for contextual awareness, classroom layout and management (Tiwari, 20017). Smart classroom offers the complete transformation of the subject concept in the way that teachers bring the quality education in the classrooms. It may marked improvement in the students' outcome as well as longer retention on the memory part of the learners and so the author of the study has conduct a study on to find effectiveness of the Smart classroom teaching at secondary level.

1.3 Objectives of the Study

Objectives are the real staring point of the research. The following are the hypothesis of the present study.

- ✓ To find out the significance difference if any in in pre-test mean scores between control and experimental group.
- ✓ To find out the significance difference if any in pre-test mean score of control group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.

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- ✓ To find out the significance difference if any in pre-test mean score of experimental group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.
- ✓ To find out the significance difference if any in post-test mean score of control group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.
- ✓ To find out the significance difference if any in in post-test mean score of experimental group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.
- ✓ To find out the significance difference if any in between pre-test and post-test mean score of control group.
- ✓ To find out the significance difference if any in between pre-test and post-test mean score of experimental group.
- ✓ To find out the significance difference if any in post-test mean scores between control and experimental group.
- ✓ To find out the effect size of the post-test scores between control and experimental group.

1.4 Hypothesis of the Study

Hypothesis is a intelligent guess of the research which directs the researcher toward the finding of the research. 'Hypothesis is a tentative prediction or explanation of the relationship between two or more' (Mohan, 2014). The following are the hypothesis of the present study.

- ✓ There exists no significance difference in pre-test mean scores between control and experimental group.
- ✓ There exists no significance difference in pre-test mean score of control group with regard to the demographic variables such as,
    - Gender,

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- Age, and
- Locality of the student.

✓ There exists no significance difference in pre-test mean score of experimental group with regard to the demographic variables such as,

- Gender,
- Age, and
- Locality of the student.

✓ There exists no significance difference in post-test mean score of control group with regard to the demographic variables such as,

- Gender,
- Age, and
- Locality of the student.

✓ There exists no significance difference in post-test mean score of experimental group with regard to the demographic variables such as,

- Gender,
- Age, and
- Locality of the student.

✓ There exists no significance difference in between pre-test and post-test mean score of control group.

✓ There exists no significance difference in between pre-test and post-test mean score of experimental group.

✓ There exists no significance difference in post-test mean scores between control and experimental group.

✓ The effect size of the post-test scores between control and experimental group is medium.

1.5 Research Methodology of the Study

Research methodology is heart of the research which includes method to be adopted, Sample and Sampling technique, tools and statistics. The following are the methodology of the study.

1.5.1 Method of the Study

Experimental study is adopted for finding effectiveness of the smart classroom teaching. The investigator of the study has adopted Experimental method with double group design for experimentation.

1.5.2 Variables of the Study

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Ones it varies its values is called as variable (Suresh, 2012). The investigator has manipulated the following variables for the study.

- ✓ Smart classroom teaching is a independent variable
- ✓ Achievement test scores is dependent variable and
- ✓ Gender, Age, and locality of the student are demographic variables.

1.5.3 Sample and Sampling Technique

The investigator has selected 80 IX standard students from Madurai district, Tamilnadu. In that, 40 from Government Higher Secondary School, Sengapadai for control group and another 40 from Government Higher Secondary School, Sedapatti for experimental group. Purposive sampling technique has been adopted for sample selection.

1.5.4Tools of the Study

Achieving test was constructed and validated by the investigator. It primarily contains 53 statements and it is reduced by item analysis to 40. Face and content validity were found.

Table-1 t-table for Pre-Test of Control and Experimental Groups

Group	N	Mean	Standard Deviation	Standard Error (Mean)	t-Value	Significance
Control	40	30.1634	1.8973	0.3863	0.3103	Not Significant
Experimental	40	30.3124	2.3717			

Significance with the Critical Value of 1.99 to the degrees of freedom 78 at 0.05 levels

Table-2 t-table for Pre-Test of Control and Experimental Group

Group	Demographic Variable		N	Mean	Standard Deviation	Standard Error (Mean)	t-Value	Significance
Control	Gender	Male	20	30.0339	1.0352	0.4377	0.3930	Not Significant
		Female	20	30.2929	2.7594			
	Age	12 – 14 Years	29	30.0021	1.2534	0.5340	0.4029	
		Above 14 Years	11	30.3247	2.5412			
	Locality	Rural	23	29.9235	1.0254	0.4567	0.6807	
		Urban	17	30.4033	2.7692			
Experimental	Gender	Male	20	29.6338	1.1245	0.4941	1.6017	
		Female	20	30.9910	3.6189			
	Age	12 – 14 Years	31	31.1132	1.8832	0.6574	1.5832	
		Above 14 Years	9	29.5116	2.8602			
	Locality	Rural	25	29.9010	0.9923	0.5380	0.8322	
		Urban	15	30.7238	3.7511			

Significance with the Critical Value of 2.02 to the degrees of freedom 38 at 0.05 levels

Table-3 t-table for Post-Test of Control and Experimental Group

Group	Demographic	N	Mean	Standard	Standard	t-Value	Significance

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	Variable				Deviation	Error (Mean)		
Control	Gender	Male	20	32.7432	2.0124	0.5100	2.3074	Significant
		Female	20	33.9390	1.1498			
	Age	12 – 14 Years	29	32.7027	1.8903	0.4887	2.4559	
		Above 14 Years	11	33.9795	1.2719			
	Locality	Rural	23	32.5043	1.3226	0.4292	3.1907	
		Urban	17	34.1779	1.8396			
Experimental	Gender	Male	20	35.9901	2.0132	0.6089	2.6304	
		Female	20	38.2953	3.3626			
	Age	12 – 14 Years	31	35.3307	2.5490	0.7237	3.4593	
		Above 14 Years	9	38.9547	2.8268			
	Locality	Rural	25	36.1002	1.625	0.5964	2.0411	
		Urban	15	38.1852	3.7508			

Significance with the Critical Value of 2.02 to the degrees of freedom 38 at 0.05 levels

Table-4 t-table for Pre-Test and Post-test scores of Control and Experimental Groups

Group	Type of Test	N	Mean	Standard Deviation	Standard Error (Mean)	t-Value	Significance
Control	Pre-Test	40	30.1634	1.8973	0.4994	5.7014	Significant
	Post-Test	40	33.3411	1.5811			
Experimental	Pre-Test	40	30.3124	2.3717	0.6358	8.1252	Significant
	Post-Test	40	37.1427	2.6879			

Significance with the Critical Value of 1.99 to the degrees of freedom 78 at 0.05 levels

Table-5 t-table for Post-test scores between Control and Experimental Groups

Group	N	Mean	Standard Deviation	Standard Error (Mean)	t-Value	Significance
Control	40	33.3411	1.5811	0.3274	8.0936	Significant
Experimental	40	37.1427	2.6879			

Significance with the Critical Value of 1.99 to the degrees of freedom 78 at 0.05 levels

Table-6 t-table for Effect Size of Post-Test between Control and Experimental Groups

Group	N	Mean	Standard Deviation	Effect Size (Cohen's d Formula)	Interpretation
Control	40	33.3411	1.5811	1.7240	Large Effect
Experimental	40	37.1427	2.6879		

Significance with the Critical Value of 1.99 to the degrees of freedom 78 at 0.05 levels

1.6 Findings of the Study

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Findings are the results of the research and conclusion is a justification about the findings of the result. In here, the investigators of the study have presented the justification against the findings as conclusions and they are given below.

- ✓ There exists no significance difference in pre-test mean scores between control and experimental group.
- ✓ There exists no significance difference in pre-test mean score of control group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.
- ✓ There exists no significance difference in pre-test mean score of experimental group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.
- ✓ There exists a significance difference in post-test mean score of control group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.
- ✓ There exists a significance difference in post-test mean score of experimental group with regard to the demographic variables such as,
    - Gender,
    - Age, and
    - Locality of the student.
- ✓ There exists a significance difference in between pre-test and post-test mean score of control group.
- ✓ There exists a significance difference in between pre-test and post-test mean score of experimental group.
- ✓ There exists a significance difference in post-test mean scores between control and experimental group.
- ✓ The effect size of the post-test scores between control and experimental group is large.

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1.7 Conclusion of the Study

Based on the findings, the investigator identified that there is no significance difference in pre-test mean scores of control and experimental group and this indicates both control and experimental groups are in same knowledge level. In addition to that the pre-test scores of both control and experimental group are not significant with the demographic variable and it proves the groups are identical based on achievement test. There is a greater difference in pre-test and post-test mean scores of experimental group than difference pre-test and post-test mean score of control group. This is an evident that smart classroom teahing enhancing the students achievement. The post-test mean scores of both control and experimental groups are significant too high and it may be occurred on the individual differences and both the mean scores are not too much varied. The effect size of post-test scores between control and experimental group indicates large effect is made by the smart classroom on achievement. Finally, based on the conclusion, the investigator concluded that the increase of achievement is occurred by the smart classroom teaching.

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