



The Effect of using Interactive Whiteboard on the Achievement of Eleventh Grade Students in Computer Science Subject

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Abstract

The interactive whiteboard is present in the classroom setting to get better achievement in a computer science subject. The study was conducted on a sample of 56 eleventh standard student's selected using subjective sampling technique. The major objectives of the study were to find out the level of gain scores of control and experimental group students and to find out the significant difference in pretest and posttest achievement scores of the control and experimental group students. The investigator chooses the experimental method. The investigator divided by conducting intelligent test. The students of experimental group were taught using interactive white board, while the students of control group were taught through normal method of teaching. Pretest and posttest equivalent groups design was followed for in this study. Statistical techniques used were paired sample 't' test and percentile analysis. As a result, there is an improvement in students' academic achievement.

Keywords

Control group, Experimental group, Interactive whiteboard, Intelligent test, Normal Method of Teaching, Pretest, and Posttest

Introduction

Education plays an important role in student success. Any person getting a good education can become a good humanistic person. When a person does not get a good education, a person is incomplete. So, education makes a man a right thinker, a correct decision-maker and gives a positive effect on human life.

The use of technology tools has changed the way of technology in the classroom compared with traditional methods. When we use technology the teaching and learning process is simple. An interactive whiteboard is an effective tool in the teaching process. As Zandbergen and Lehrman suggest, the interactive whiteboard is "an innovation that is gaining considerable presence in many contemporary classrooms" (2008, p. 107). An interactive whiteboard has been recently gaining popularity among the classrooms because they enable teachers to teach in an enjoyable and motivating manner.

Need and significance of the study

The importance of the study stems from the importance of smart board as a modern method of teaching which is consistent with global and local principles in the adoption of the principle of the use of technology in teaching (NCTM, 2000).

Today different forms of technology have entered the classroom. One of the technology tools is an interactive whiteboard. An interactive whiteboard used in the classroom could support this need further as it has increased interaction between students and teachers and also allowing equal opportunities for both participants to learn in collaboration with other and it is an effective tool to increase students subject matter and knowledge because of motivation and attention created by an interactive whiteboard. So it is necessary to enrich the student knowledge. Hence the investigator has decided to conduct a study on the effectiveness of interactive whiteboard among the higher secondary students.

Review of related literature

Nuri and Muharrem (2015) studied on attitudes of students and teachers towards the use of interactive whiteboards initial elementary and secondary school classrooms. The main objective of the study to understand teachers and students attitudes toward interactive whiteboard. Two parallel survey methods adopted for the present study. The data

collected from 255 students and 23 teachers from three private schools by using simple random sampling technique.

Students from sixth to twelfth grades and teachers from 15 different branches participated in this research study. The result of the study should that interactive whiteboards are highly rated by both teachers and students. This study was statistically not significance of difference between teachers and students. This study has some educational implications for policy makers, educator and researchers. The entire samples of the students and teachers have been favorable attitude towards the use of interactive whiteboard.

Amani and Yousif (2015) studied on teacher's attitudes towards using interactive whiteboards in English language classrooms. The objective of the study was explored the attitudes and insights of Saudi female teachers regarding the use of interactive whiteboards in English classroom. Data was collected from questionnaires from forty three teachers at different girl's schools in Riyadh by using simple random sampling technique. The result of the study was positive attitudes toward using the interactive whiteboard in the English as a foreign language classroom. The finding was there is a significant difference between student teachers having internet facility at home and not having internet facility at home. The study was recommended that English classroom should be equipped with all supplicants of the interactive whiteboards. This study suggested that training is important for teachers to deal with the technological devices.

Marzano and Haystead (2009) conducted a study aimed to determine the effect of white board on the academic achievement of students where it included 85 teachers and 170 classrooms the teachers used white board to teach a series of lessons, which have been taught later to a different group of students without the use of technology where the results indicated that the use of white board was accompanied by an increase of 16% in student achievement scores, there was statistically significant differences in favor of the use of white board.

Statement of the problem

The problem is entitled as "the effect of using an interactive whiteboard on the achievement of eleventh-grade students in computer science subject".

Objectives of the study

1. To find out the level of gain scores of Control and Experimental Group Students.

2. To find out the level of gain scores of Control and Experimental Group Boys and Girls.

Hypothesis Framed

H₀₁: There is no sign of the difference in achievement gain scores between control and experimental groups

H₀₂: There is no significant difference between pretest achievement scores of students in control and experimental groups.

H₀₃: There is no significant difference between posttest achievement scores of students in control and experimental groups.

H₀₄: There is no significant difference between pretest and posttest achievement scores of students in control and experimental groups.

Method of the study

The investigator adopted an experimental method to analyze the result.

Sample

The sample for the present study consists of 56 students of class XI from a higher secondary level of Sankarankovil area. A class with 28 students was considered as a control group and another group with 28 students was treated as the experimental group. The control group is taught with the traditional method on the topic 'Introduction to computer'. The experimental group is taught with an interactive whiteboard method on the same topic.

Tool used

In the present study, the investigator has used the "interactive whiteboard acceptance scale" developed by S.Karuppasamy and S.Lenin (2019) for collecting the data.

The interactive whiteboard acceptance scale consists of 35 items under five dimensions namely, remembering, understanding, applying, analyzing and evaluating. The content validity of IWBAS was established with the help of 5 judges. The reliability of these tools was established by the split-half method and reliability coefficients were found to be 0.8675.

Statistical Techniques used

The investigator used the following statistical techniques for the study: percentage analysis and pair t-test for the large groups were used to analyze the data.

Data Analysis

1. Percentage analysis

Objective 1: To find out the level of gain scores of control and experimental group students

Table 1

Level of Gain Scores of Control and Experimental Group Students

Group	Low		Moderate		High	
	N	%	N	%	N	%
Control	18	64.29	4	14.29	6	21.43
Experimental	11	39.29	12	42.86	5	17.86

It is inferred from the above table that 64.29% of control group students have a low level, 14.29% of moderate level, and 21.43% of the high level of gain scores. Among the experimental group, 39.29% of the students have a low level, 42.29% of the moderate level and 17.86% of them have a high level of gain scores.

Objective 2: To find out the level of gain scores of control and experimental group concerning boys and girls

Table 2

Level of Gain Scores of control and Experimental Group Boys and Girls

Group	Boys						Girls					
	L		M		H		L		M		H	
	N	%	N	%	N	%	N	%	N	%	N	%
Control	16	57.14	0	0	2	7.14	2	7.14	4	14.29	4	14.29
Experimental	9	32.14	5	14.86	2	7.14	2	7.14	7	25.00	3	10.71

It is inferred from the above table, control group boys have 57.14,% of students have a low level, 0% of them have moderate level, 7.14% of the high level of gain scores. Regarding the control group girls, 7.14% of students have a low level, 14.29% of them have moderate level, 7.24% of the high level of gain scores

It can be observed from the above table, experimental group 32.14% of the students have a low level, 14.86% of the moderate level and 7.14% of them have a high level of gain scores. Regarding the experimental group girls, 7.14% of students have a low level, 25.00% of them have a moderate level, 10.71% of the high level of gain scores.

2. Differential Analysis

Ho1: There is no significance of the difference in achievement gain scores between control and experimental groups

Table 3***Significance of Difference in Achievement Gain Scores between Control and Experimental Groups.***

Group	N	Mean	SD	T value	P-value
Control	28	15.84	13.56	2.439	.022*
Experimental	28	24.68	14.46		

*- Significant at 0.05 level

In the above table, since the P-value is less than 0.05, the null hypothesis is not ACCEPTED at a 5% level of significance. Hence it is concluded that there is a significant difference between the gain scores of control and treatment groups. The mean scores show that the experimental group performed better than the control group.

H₀₂: There is no significance of the difference between pretest achievement scores of students in control and experimental groups

Table 4***Significance of Difference between Pretest Achievement Scores of Students in Control and Experimental Groups***

Group	N	Mean	SD	Value	p-value
Control	28	33.23	14.97	0.561	0.579 ^{NS}
Experimental	28	35.71	16.85		

NS- Not Significant

In the above table, since the p-value is greater than 0.05, the null hypothesis is ACCEPTED at a 5% level of significance. Hence it is concluded that there is no significance of the difference between pretest achievement scores of students in the control and experimental group.

H₀₃: There is no significance of the difference between posttest achievement scores of students in control and experimental groups

Table 5

Significance of Difference between Posttest Achievement Scores of Students in Control and Experimental Groups

Group	N	Mean	SD	t value	p-value
Control	28	49.07	19.746	2.319	.028*
Experimental	28	60.39	12.662		

*Significant at 0.05 level

In the above table, since the P-value is less than 0.05, the null hypothesis is not ACCEPTED at a 5% level of significance. Hence there is a significant difference between posttest scores of control and experimental groups. The mean scores show that the post-test achievement scores of the experimental group high when compared to the control group scores.

H₀₄: There is no significance of the difference between pretest and posttest achievement scores of students in control and experimental groups

Table 6

Significance of Difference between Pretest and Posttest Achievement Scores of the Control Group and Experimental Groups

Group	Test	Mean	SD	t value	p-value
Control	Pretest	33.23	14.968	6.121	0.000**
	Posttest	49.07	19.746		
Experimental	Pretest	35.71	16.85	9.034	0.000**
	Posttest	60.39	12.66		

** - Significant at 0.01 level

In the above table, since the P-value is less than 0.01, the null hypothesis is not ACCEPTED at a 1% level of significance. Hence there is a significant difference between pretest and posttest achievement scores of the control group. The mean scores show that posttest achievement scores in computer science in control and experimental groups posttest higher when compared to control and experimental groups pretest scores.

Findings

1. 64.29% of the control group higher secondary students have a low level of gain scores.
2. There is no significant difference between pretest achievement scores of students in the control and experimental group.
3. There is a significant difference between the posttest scores of the student in control and experimental groups.

4. There is a significant difference between the pretest and posttest of the student in control and experimental groups.

Recommendations

1. Teachers should acquire basic ICT skills
2. Teachers should have a clear idea of how a traditional classroom is different from classroom equipped with SmartBoard
3. The syllabus should be transformed into software programs
4. Teachers should be aware of learner's needs and their different learning styles. They should accommodate computer science classes.

Conclusion

It is observed that the pretest result shows no significant difference in all the samples concerning the method of teaching while considering the posttest significantly is observed in the method of teaching. As a whole, on comparing the pretest and posttest results, the posttest results show a significant difference in the method of teaching. It is found that the traditional method of teaching is a better method than other methods followed by conventional methods. This method is effective for teaching computer science subjects.

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