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Research Paper Education

Effect of Smart Class Instruction on Achievement in Chemistry in Relation to Academic Anxiety

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ABSTRACT

The present study investigates the smart class instruction on achievement and retention in Chemistry in relation to academic anxiety. The sample consisted of class 9th students selected from two different schools of Chandigarh. Instructional materials based on smart class instruction were prepared and utilized to teach the experimental group after pre-testing and gain scores were computed after implementing post and retention-test on all the students. The academic anxiety test was also administered. Analysis of variance (2×2) was used to arrive at conclusions: (i) The smart class instruction group was found significantly higher achievement scores as compared to the control group (ii) Performance of students with different academic anxiety group through smart class instruction was found significant at immediate level, (iii) Significant interaction effect was found to exist between the two variables at immediate performance level.

KEYWORDS : Smart Class Instruction , Conventional Techniques, Achievement, Academic Anxiety

INTRODUCTION

Students learn well from using technology and from doing hands-on activities. Since students with disabilities have trouble learning abstract concepts, guided practice and a variety of teaching tools are needed to help students in the mathematics classroom.

The tools must be motivating and interesting. Hands-on, interactive activities are useful tools for students who are struggling learners. An interactive whiteboard that is analog resistive if offered by Smart technologies (Weiser, 2001). Smart offers a pen tray with styluses programmed for a certain color. None of them are finger-touch sensitive. Smart technologies have the feature of allowing students to touch items and move them about the interactive whiteboard whereas other companies only have the electronic capability.

Academic anxiety only becomes a problem that needs a solution when the amount experienced grows so excessive that a student is no longer able to function productively. It is true that a high level of anxiety interferes with concentration and memory, which are critical for academic success. Without any anxiety, however, most of us would lack the motivation to study for exams, write papers, or do daily homework. A moderate amount of anxiety actually helps academic performance by creating motivation.

OBJECTIVES

1. To compare the performance of a group of students taught through smart class instruction and conventional technique of teaching at immediate and retention level.
2. To study the performance of students with different academic anxiety at immediate and retention level.
3. To examine the interaction effect between smart class instruction and academic anxiety at immediate and retention level.

HYPOTHESES

The study was designed to test the following hypotheses in respect of immediate performance and retention scores:

H_1: The performance of students of smart class instruction groups of students in English will be higher than the conventional group at immediate and retention level.

H2: The performance of high academic anxiety will be higher than that of low academic anxiety groups at immediate and retention level.

H3: The Performance through the smart class instruction of teaching will interact with different academic anxiety groups at immediate and retention level.

METHODOLOGY

It is necessary to adopt a systematic procedure to collect the necessary data which helps to test the hypotheses of the study under investigation. The various steps of research methodology followed in the present study are as follows:

Sample

The study was conducted on a random sample of 100 students in 9 th class, both boys and girls chemistry students of experimental and control group including 50 students from the Government Model School, Sec-38, Chandigarh and 50 students from the Government Model School, Sec-43, Chandigarh. It was a random sample.

Design

For the purpose of present investigation a pre-test and post-test factorial design was employed. In order to analyze the data a 2×2 analysis of variance was used for the two independent variables viz. instructional treatment and academic anxiety.

Tools used

The following tools were used for data collection:

1. Academic Anxiety Test was developed by investigators.
2. Achievement Test in Chemistry was prepared and used by the investigators.
3. Five Lessons in Chemistry based on smart class instruction and conventional technique was prepared by the investigators.

ANALYSIS AND INTERPRETATIONS

- **Analysis of Descriptive Statistics on Achievement Scores**
  The data were analyzed to determine the nature of the distribution of scores by employing mean and standard deviation. The two way analysis of variance was used to test the hypotheses related to strategies of teaching and academic anxiety. The mean and standard deviation of different subgroups have been presented in Table- 1.

Table- 1: Means and SD of Gain Achievement Scores of different subgroups

Variables	Teaching						Total		
	Smart Class Instruction			Conventional Teaching Model					
	N	Mean	SD	N	Mean	SD	N	Mean	SD
High Acd. Anxiety	14	11.78	2.23	14	3.64	1.63	28	7.72	4.61
Low Acd. Anxiety	14	7.29	1.75	14	3.11	0.69	28	5.22	2.49
Total	28	9.54	3.17	28	3.39	1.34	N= 56		

Source: Field Study, 2013

Table-1 that the gain mean scores of smart class instruction group (M=9.54) is higher than the conventional technique of teaching (M=3.39). This table shows that the gains mean of high and low academic anxiety students with smart class instruction and conventional technique is different from each other.

- **Analysis of VARIANCE ON GAIN ACHIEVEMENT SCORES**

The mean of different sub-groups, sum of squares, degree of freedom, mean sum of squares and the F - ratio have been presented in table -2.

Table -2: Summary of Analysis of Variance (2×2) Factorial Designs

Source of Variance	Sum of Squares	df	Mean Sum of Squares	F- ratio
Treatment (A)	528.28	1	528.28	145.93**
Academic Anxiety (B)	87.50	1	87.50	24.17**
Interaction (A × B)	56.01	1	56.01	15.47**
Error Term	188.14	52	3.62	

**** Significant at 0.01 level**
(Critical Value 4.03 at 0.05 and 7.17 at 0.01 level, df 1/52)

MAIN EFFECTS

- **Treatment (A)**

It is observed from the table-2 that the F-ratio for difference in mean gain scores of smart class instruction and conventional teaching group is 145.93, which in comparison to the table value was found significant at 0.01 level of significance. Hence, the hypothesis H1 i.e. the performance of smart class instruction group of students on Chemistry will be higher than the conventional group, is accepted at 0.01 level of significance. The result indicates that the performance of smart class instruction group is more effective than that of the conventional teaching group.

• Academic Anxiety (B)

The table-2 shows that the F-ratio for difference in mean of the two groups of academic anxiety is 24.17, which in comparison to the table value was found to be significant at 0.01 level of significance. Hence, the hypothesis H2 i.e. the performance of high academic anxiety will be higher than that of low academic anxiety, is accepted. The result indicates that the performance of students in chemistry through smart class instruction has shown significant differences for high and low academic anxiety students.

Interaction Effect (A × B)

Table-2 reveals that the F- ratio for the interaction between treatment and academic anxiety groups is 15.47, which in comparison to the table value was found significant at 0.01 level of significance. It indicates that the two variables interact with each other. Thus, hypothesis H3 i.e. the performances through different teaching strategy will interact with academic anxiety is accepted at the both levels.

DISCUSSION

The result of the present investigation has lead to the conclusion that smart class instruction yields higher levels of attainment in Chemistry as compared to the conventional group. The hypothesis no. 1 was therefore, is accepted. The results are supported by the findings of Stratham and Torell (1996) concluded computer technology in classrooms stimulates increased teacher-student interaction. D'Angelo and Woosley (2007) show that students learned more observational words when using the smart board. Mali (2013) found that instruction through smart class results better as compared to traditional method.

The performance of students in Chemistry through smart class instruction has shown significant difference for high and low academic anxiety students lead to acceptance of hypothesis no.2. The results were consistent with the findings of Ashcraft and Faust (1994) reported that individuals with high math anxiety were significantly slower and less accurate on performing complex added addition problems than individuals without math anxiety. Oludipe (2009) concluded that low test anxious students performed better than high test-anxious students on both numerical and non-numerical tasks in Physics. Nadeem, Ali, Maqbool and Zaidi (2012) shows that when anxiety increases, academic achievement decreases both in male and female students.

The performance of smart class instruction was found to interact with each other at different academic anxiety groups. Hence the hypothesis no. 3 was accepted. The results were consistent with the findings of Tiffany (2007) found that anxiety and depression are being negatively associated with academic achievement. However, the results were contradicted by the studies of Thomas and Dowker (2000) did not find math ability to be correlated with math anxiety.

FINDINGS

On the basis of the analysis and interpretation of data, the following conclusions had been drawn:

1. A significant difference exists between gain scores of performance in chemistry of experimental and control group students. It may be concluded that smart class instruction has a significant effect on performance of students in Chemistry.
2. The mean gain score of high academic anxiety group was higher than low academic anxiety group. It may be concluded that the performance of high academic anxiety group was higher than low academic anxiety group.
3. The F-ratio for the interaction between smart class instruction and academic anxiety was found significant. Thus, it may be concluded that the performance through smart class instruction interacts with academic anxiety.

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