

## Effectiveness of Computer Assisted and Activity Oriented Instructional Strategies on Achievement in Science

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### Abstract

This paper highlighted the effectiveness of computer assisted and activity oriented instructional strategies on achievement in science. The design of the study was experimental. The data was collected and the findings revealed that there is significant difference in the level of academic achievement among students taught through computer assisted, activity oriented and conventional instructional strategies in teaching of science.

**KEYWORDS** : computer assisted and activity oriented instruction, achievement in science

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**Introduction:**The Progress and prosperity of any nation is determined by its standard in science and technology, which is an outcome of science education provided to its youngsters. The advancement of the developed countries provides ample evidence for this fact. The destiny of the Country is shaped in the classrooms. This shape depends upon what teacher teaches and how it goes on moulding it. In other words destiny of our youngsters falls on the shoulders of teachers. "A teacher affects eternity, he can never tell where his influence stops." So observed the historian philosopher- *Henry Adams (1838)*. In the last two decades, the universalization of elementary education has emerged as a National goal. Education for all children up to Class X now seems a realistic target rather than a distant dream. It is therefore worthwhile to ask what the main aim of teaching science in schools is.

### INSTRUCTIONAL STRATEGY

Instructional strategy is something a teacher arranges that is designed to establish interaction between the teacher, student and the subject matter or any combination of these three dimensions. It is the total plan with carefully selected tools, techniques etc to be used in the classroom for optimum outcome.

*The following four main types of instructional strategies these are:*

- Direct Instructional strategy i.e :- Drill and Practice, Mastery lecture, Demonstration
- Indirect Instructional strategy i.e :- Problem solving, concept mapping
- Interactive Instructional strategy i.e :-Co-operative learning, Brainstorming
- Experimental Instructional strategy i.e:- Activity-oriented, Field Trips, Games etc
- Independent Instructional strategy i.e:- Computer Assisted Instruction, Learning and Activity Package etc.

Classrooms are places where teachers and students interact within a highly interdependent environment. For instance, lecturing or conventional learning creates a tightly structured learning environment where students are expected to listen, observe, and take notes. On the other hand, if the teacher divides students into cooperative learning groups, an environment is created where students are actively engaged and in charge of their own interactions is suitable for better learning. So environment should be such which promotes better learning conditions.

## **COMPUTER-ASSISTED INSTRUCTIONAL STRATEGY**

Computer Assisted Instruction is a method of learning in which there is purposeful interaction between a learner and teacher with the help of computer device for helping the learner to achieve the desired learning objectives with his own pace. It helps in achieving educational outcomes through internet blog, e-mail source like e-learning. Teacher may use the CD's, video clips, virtual field-trips, virtual science museum.

### **STATEMENT OF THE PROBLEM**

## **EFFECTIVENESS OF COMPUTER ASSISTED AND ACTIVITY ORIENTED INSTRUCTIONAL STRATEGIES ON ACHIEVEMENT IN SCIENCE**

### **Objectives of the Study:**

1. To study the effect of computer assisted, activity oriented and conventional instructional strategies on academic achievement in science teaching.

### **Hypotheses:**

1. There will be no significant difference in the level of academic achievement in science among students taught through computer assisted, activity oriented and conventional instructional strategies in science.

### **SAMPLE**

A random cluster sampling technique was used to select the secondary school students. The study was conducted on the sample of 300 students of class VIII of Government and Private secondary schools of P.S.E.B from urban locality of Faridkot District of Punjab. Group was equated on the bases of Mean & S.D. 300 Students were divided into two groups each having 150 students from Government and 150 students from private schools. Each group of 150 students were again be randomly furcated into 75 students for four schools. Each school contained 25 students in each of three groups.

### **DESIGN OF THE STUDY**

Non-randomized control group pre-test and post-test design and two group randomized subject. Three groups of students were equated on the basis their science achievement exam taken by the school. Instructional strategies were applied on students belonging to three different equated groups. Pre- test was used to test the achievement level, scientific attitude and creativity of equated sample for pre-test and post-test design. After

treatments post-test was applied. The effect of strategies was measured by differences in pre-test scores and post- test scores of both experimental groups and control group.

### COLLECTION OF DATA

After finalizing the sample and tool used, investigator met the Principals of the school and fixed the time for collection of the data, most of the teachers allotted the whole afternoon periods for administration of the tools. Uniform procedure was followed in all schools in collection of data. The steps followed by investigator during collection of data:

- Distribution of answer sheets to the subjects with instructions for filling them up.
- Distribution of test booklets together with printed instructions regarding the test.
- Explaining the general instructions in the booklet.
- Familiarizing the subjects with answer sheets, method of entering responses etc.
- Clearing the doubt of the subjects, giving instructions regarding time- limit.
- Strict adherence to the time limit prescribed in the test booklet.
- Giving instructions not to disfigure the test booklets.
- Giving interval between tests.
- Collecting back the test booklets and answer sheets.
- After collection, data was analyzed.

### STATISTICS ACADEMIC ACHIEVEMENT IN SCIENCE, SCIENTIFIC ATTITUDE AND CREATIVITY SCORE AMONG ALL TEACHING STRATEGIES (CAIS, AOIS AND CIS)

This section deals Mean, median, mode, S.D, skewness, kurtosis on pre-test and post-test scores and only post-test scores of academic achievement, scientific attitude and creativity among all instructional strategies (CAIS, AOIS and CIS).

**Table:1**

#### PRE-TEST, POST-TEST AND MEAN GAIN SCORES OF ALL INSTRUCTIONAL STRATEGIES

		Academic Achievement score			Scientific Attitude score			Creativity Score		
		Pre-test	Post-test	Gain score	Pre-test	Post-test	Gain score	Pre-test	Post-test	Gain score
		<b>CAIS</b>	<b>Mean</b>	11.82	22.35	10.53	60.76	86.04	25.28	13.50

	<b>SD</b>	3.38	3.90	1.41	7.66	9.41	7.73	5.16	5.81	1.66
<b>AOIS</b>	<b>Mean</b>	11.90	20.84	8.94	58.23	77.85	19.62	13.39	22.72	9.33
	<b>SD</b>	3.51	3.80	1.25	6.11	9.71	6.09	4.96	5.26	1.43
<b>CIS</b>	<b>Mean</b>	12.03	16.71	4.68	56.93	60.52	3.59	13.25	17.45	4.20
	<b>SD</b>	3.41	3.48	1.03	6.56	6.64	1.22	5.08	5.16	1.25

Table 6.2.2 shows Mean score of Pre-test, Mean score of Post-test and gain mean score along with standard deviation for each variable i.e: Academic achievement in science, scientific attitude and creativity for each instructional strategy CAIS, AOIS & CIS are present perusal and for further investigation.

## INFERENCE STATISTICAL

### F & t- ratio

In this section an attempt has been made to compare the three instructional strategies and to find out the effect of these strategies on the three dependent variables i.e: academic achievement in science, scientific attitude and creativity. After introducing the experimental variable, the gain score (post over pre-test score) were calculated and significant difference among all three strategies with each variable was calculated. To find out the significant difference among three strategies F- ratio was used, t-ratio was used to compare the two instructional strategies to find out the significant difference if it exists.

**H<sub>1</sub>: There will be no significant difference in the level of academic achievement in science among students taught through computer assisted, activity oriented and conventional instructional strategies in science**

**Table 2**  
**Mean, SD and F ratio of gain scores among three instructional strategies (CAIS, AOIS and CIS) on academic achievement in science**

Methods	N	Mean of gain score	SD	Std. Error	F value	P value
Computer Instruction –Assisted	100	10.53	1.41	0.14	592.93	0.00**
Activity-oriented Instruction	100	8.94	1.25	0.13		

<b>Conventional Instruction</b>	100	4.68	1.03	0.10		
<b>Total</b>	300	8.05	2.77	0.16		

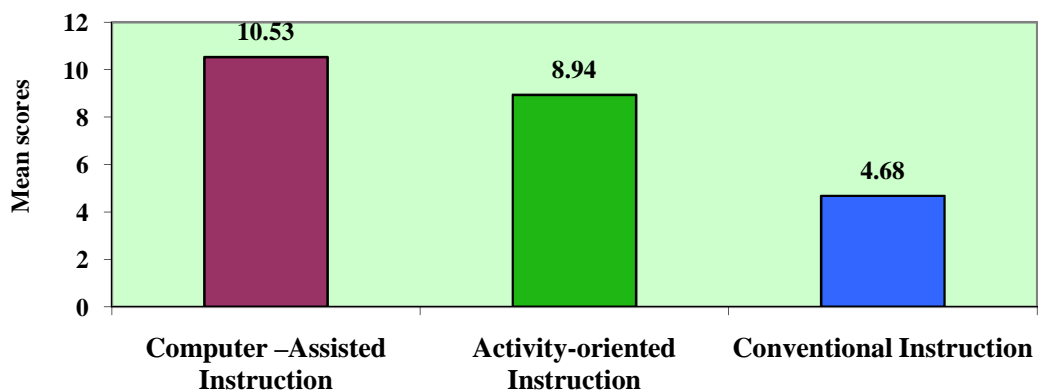
\*\* . Significant at the 0.01 level.

**Discussion:**

In Table 2 it is found that academic achievement in science scores has shown an increase of scores. The mean gain scores of CAIS 10.53, for AOIS 8.94 and for CIS 4.68 and F-ratio of comparison of means for CAIS, AOIS & CIS is 592.93 which is significant at 0.01 level.  $F=592.93$  &  $P < .05$  which is significant at .01 level.

It is clear that the mean of post test score of Computer –Assisted Instruction ( $M=22.35$ ) is more than the Activity-oriented Instruction ( $M=20.84$ ) and Conventional Instruction ( $M=16.71$ ) of the students of four schools. Hence mean of academic achievement in science scores of students were found to be more when taught through Computer – Assisted Instruction as compared to other strategies.

**Fig 1: Graphical representation of comparison of gain score of academic achievement in science in different strategies**



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