A Comparative Study of Effect of Constructive Learning Approach on Achievement of Mathematics at Secondary Level

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Abstract

Constructivism is a paradigm shift towards learning in present scenario. The role of a teacher has shifted from transmitter of knowledge to investigator and explorer of knowledge. Role of student changes from knowledge acquisition to knowledge construction. Most importantly emphasis has been shifted from teaching to learning. The present study compare the effect of constructive learning approach on achievement of mathematics of IX class students at secondary level. Researcher has taken 80 students, out of those 40 male students and 40 female students. Sample was selected by stratified random sampling method. Data was collected by self made pretest and post-test. Here the investigator concludes that i)the performance of students in mathematics taught through constructive learning approach was significantly higher than that of traditional teaching approach. ii)The performance of male students have better when we taught through constructive learning approach than that of female students.

INTRODUCTION

The verb to construct comes from the Latin word “construere”, which means to arrange or give structure, on going structuring process are all the conceptual heart of constructivism. Constructivist believes that the process of actively engaging in building new knowledge structures is created. Constructivism is a paradigm shift towards learning in present scenario. The role of a teacher has shifted from transmitter of knowledge to investigator and explorer of knowledge. Role of student changes from knowledge acquisition to knowledge construction. Most importantly emphasis has been shifted from teaching to learning. The students can be facilitated to perform just beyond the limits of their abilities through constructivist approach.

Constructivism is a theory of learning where it is postulated that activities followed by a learner in a particular context helps him or her construct knowledge. Constructivism proposes that people create their own meaning and understanding by combining what they already know and believe to be true with new information and experiences that have confronted. Constructivism is basically a theory based on observation and scientific study about how people learn. It said that people construct their own understanding and knowledge of world, through experiencing things and reflecting those experiences. When we encounter something new , we have to reconcile it with our previous ideas and experiences, may be changing what we believe, or may be discarding the new information as irrelevant. In any case we are

active creatures of our own knowledge. Wide range of belief fall under general label of constructivism.

"Constructivism proposed that learning environments should support multiple perspectives or interpretations of reality, knowledge construction, and context-rich experience based activities." (David H. Jonassen)

PRINCIPLES OF CONSTRUCTIVISM

1) Learning is a search of meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning.
2) Meaning requires understanding whole as well as parts. And part must be understood in the context of whole. Therefore, the learning process focused on primary concepts, not isolated facts.
3) In order to teach well, we mut understand the mental models that students use to perceives the world and the assumption they make to support those models.
4) The purpose of learning for an individual is to construct his or her own meaning, not just memorize the right answers and regurgitate someone else meaning. Since education is inherently interdisciplinary, the only valuable way to measure learning is to make the assessment part of the learning process, ensuring the provided students with information on the equality of their learning

CONSTRUCTIVISM A NEW APPROACH IN EDUCATION

1) According to constructivist approach, learning is an interaction between the learner and the learning environment.
2) Prior knowledge is used as a basic to interpret and construct new understanding.
3) Knowledge is constructed through experience.
4) In constructivistclass room the teacher gives the child an opportunity to construct knowledge and skills through interaction and with adult support.
5) The highlights of this classroom is a free flow of thoughts that creates a healthy classroom atmosphere.

NEED AND SIGNIFICANCE OF THE STUDY

Mathematics is a science of numbers, magnitude, space, geometrical figures and algebraic expression. Achievement in mathematics simply means that excellent scores in mathematics.Achievement in mathematics shows that students have an capacity to deal with numbers, solve difficult mathematical problems and their constructions. A high achiever in mathematics has excellent computational ang interpretation skills.

The proper teaching strategies help teachers in solving learners problem and bringing remarkable improvement change in the behavior of students. Use of different teaching strategies gave positive results in comparison to traditional teaching technique. Conventional method is not much effective. Therefore researcher made an attempt to determine the effect of constructive learning approach on achievement in mathematics at secondary level.

STATEMENT OF THE PROBLEM

A Comparative Study of Effect of Constructive Learning Approach on Achievement of Mathematics at Secondary Level.

OBJECTIVES OF THE STUDY

1. To compare the achievement of group taught through constructive learning approach and traditional teaching approach.

2. To examine the achievement of male and female group in mathematics.

HYPOTHESIS OF THE STUDY

1. The achievement of group taught through constructive learning approach will be significantly higher than that of traditional teaching approach.
2. The achievement of male group will be significantly higher than that of female group in mathematics.

METHODOLOGY OF THE STUDY

In this study the primary data required for the study will be directly collected from students of IX class with the help of factorial design pretest and post-test.This study will conduct by using experimental method. The experimental group was taught through constructive learning approach and control group was taught through traditional teaching approach.

SAMPLE OF THE STUDY

Stratified random sampling technique was used in the study. The present study was carried out on the representive sample of 80 students of IX class.Two sections of 40 student each , one for control group and one for experimental group were formed.

TOOLS OFDATA COLLECTION

Two tools were used for collection of Data.

i) Achievement test (pretest and post-test) in mathematics, prepared by researcher.

ii) Five selected concept based on constructive learning approach, prepared by investigator

STATISTICAL TECHNIQUE

The following statistical techniques were used for the analysis of the data in the present study.

1. Mean , 2. Mean Difference, , 3. Standard Deviation , 4. 't' Test

PROCEDURE

After the selection of sample and allocation of students in two groups, the experiment was conducted in three phases. Firstly, a pretest was administered to the students of both the experimental and control group. The answer-sheets were scored to obtained information regarding the previous knowledge of the students. Secondly, the experimental group was taught through constructive learning approach and control group was taught through traditional learning approach by researcher. Thirdly after the completion of course, the post test was administered to the students of both groups. The answer-sheets were scored with the help of scoring key. Time limit for the test was 45 minutes. The scores of the experimental group and control group was compared according to pretest and post-test scores. The difference was the gain achievement scores.

ANALYSIS AND INTERPRETATION OF RESULT

TABLE 1: Frequency based on Gender.

Groups	**No. of Students (N=80)**	**Percentage (%)**
MALE	40	50
FEMALE	40	50

TABLE 2:

To compare the achievement of group taught through constructive learning approach and traditional teaching approach.

Groups	**N**	**M**	**SD**	**D**	***D**	**df**	**t value**	**Level of Significance**
Experi-mental Group	**40**	**4.60**	**2.60**	**1.30**	**0.53**	**78**	**2.63**	**0.01**
Control Group	**40**	**3.30**	**2.08**					

Findings and Interpretation : A table 2 show that, the mean gain score of constructive learning approach is 4.60, which is higher than the mean gain score of 3.30 of traditional teaching approach. The t-value testing significance of mean difference of constructive learning approach and traditional teaching approach is 2.63, which is comparison to table value was found significant at 0.01 level. Hence the hypothesis, "The achievement of group taught through constructive learning approach will be significantly higher than that of traditional teaching approach", is accepted.

The result indicates that constructive learning approach is more effective than traditional teaching approach.

TABLE 3:

To examine the achievement of male and female group in mathematics.

Groups	N	M	SD	D	*D	df	t value	Level of Significance
Boys	40	4.91	2.38	1.30	0.50	78	2.61	0.01
Girls	40	3.61	2.11					

Findings and Interpretation : A table 3 show that, the mean gain score of male students is 4.91, which is higher than the mean gain score of 3.61 of female students. The t-value testing significance of mean difference male students and female students is 2.61, which is comparison to table value was found significant at 0.01 level. Hence the hypothesis, "The achievement of male group will be significantly higher than that of female group in mathematics", is accepted.

The result indicates that male students have better performance in mathematics than female students.

FINDINGS

1) The performance of students in mathematics taught through constructive learning approach was significantly higher than that of traditional teaching approach.
2) The performance of male students have better when we taught through constructive learning approach than that of female students.

CONCLUSION

A constructivist teacher can play role of guide, monitor, coach, tutor and facilitator. Activities, opportunities, tools and environment are provided to encourage metacognition, self-analysis-regulation, reflection and awareness within the students. The students plays

a central role in mediating and controlling learning and learning situation, environment, skill, content and tasks are relevant, realistic, authentic and represent the natural complexities of the real world. The learners previous knowledge constructions, beliefs and attitude are considered in the knowledge construction process and also problem solving higher order thinking skills and deep understanding are emphasized. Collaborative and cooperative learning are favored in order to expose the learner to alternative view points and also scaffolding is facilitatedto help students perform just beyond the limits of their ability. The constructivist propositions outlined above suggest a set of instructional principles that can guide the practice of teaching and the design learning environments. Constructivist theories are of great value of teachers in their efforts to help students grasp the substantive and syntactic components of the subjects they are teaching.

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