

THE EFFECT OF CONSTRUCTIVIST 7E MODEL OF TEACHING ALGEBRA ON ACADEMIC ACHIEVEMENT OF CLASS-IX STUDENTS OF GEORGE HIGH SCHOOL, BARGARH, ODISHA

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Abstract:

The teaching-learning process takes a vital role in the system of education. Learning is intercommunication within the learner and learning experience. In learner-centred learner role is essential. Constructivism theory emphasised learner construct his/her knowledge. For this purpose, the 7E model of learning is one of the vital learning models of constructivism. In this study, the researcher understands the effectiveness of 7E learning model of teaching in classroom learning. The experimental method of research adopted for this study and 7E model lesson plan and achievement test, mental ability test this used for this study. Also, the researcher used one and two-way Ancora test for analysis of the data. At last, the researcher found the 7E model algebra at the secondary level.

Introduction

Every one the largely depends on education has to enhance for fostering all-round development of the individual. To achieve the educational objectives through the constructivist teaching-learning process is more significant. The basic idea of constructive is that the learner must construct knowledge; the teacher cannot supply it (Bringuier,1980). The Constructivist model supported by Jean Piaget(1981)and Burner (1990), whatever has to the individual into knowledge development.

Accordingto constructivist approach ,learningis an instruction between the learner and the learning environment. During this interaction, prior knowledge is used as a basic to interpret and construct new understanding. In a Constructivist setting, the students have autonomy for their own learning, opportunities for peer collaboration and support, occasion for learner– generated problems that derive the curriculum, time for self-observations and evaluation and outlets for reflections. One of the important model for Constructivist learning is7-E Learning model. The Constructivist classroom for studying Mathematics at Secondary school level presents the learner to train and develop good citizens who are able to solve various social, economic and political problems of the country.

SIGNIFICANCE OF THE STUDY

Today's modern world built on science and technology demands further mathematical knowledge, and the world of tomorrow demands a person to well educated in society. Everyone should have minimum literacy on LSRW, mainly in the name of Reasoning or mathematical literacy. The mathematical plays' vital role in discovery and intervention from the last few centuries.

In civilized societies, mathematics plays a vital role, and in particular, mathematics knowledge is essential for secondary school students. At the secondary level, the teaching and learning of mathematics play a crucial role in education is difficult for children also. The Mathematics curriculum is vast because it is the basis of all sorts of daily life.

Nowadays, the number of children in India failures in mathematics in a secondary school level examination because mathematics is an abstract subject. The students have a positive attitude towards mathematics, and their achievement is very well otherwise meager. Therefore teaching and learning mathematics need different techniques and methods.

Learning is an interaction between the learner and the learning experiences. In learner-centered methods, students are very active in education. And the constructivism model features that learners develop their understanding capabilities. Therefore various Constructivist models have proposed and present the 7E Learning model; an attempt has made to teaching mathematics to understand effective teaching in classroom learning.

The present study measures the influence between the Constructivist 7E model and the traditional models of teaching Mathematics at Secondary School level. Therefore the researcher had planned the 'Effect of Constructivist 7E Model of teaching Algebra on Academic Achievement of class-IX students of George high school, Bargarh, Odisha'.

Operational definition of the terms used

Effect -The result of a particular influence (Cambridge Dictionary).In education, the term effect typically refers to the ultimate result or outcome to the learning experiences that are either directly applicable to the personal aspirations, interests or cultural backgrounds of the students or that connected in the same way to real-world issues, problems and context.

Constructivism – Formalization of the theory of Constructivism generally attributed to Jean Piaget, who articulated mechanisms by which learners internalise knowledge. This theory describes how learning happens, regardless of whether learners are using their experiences to understand a lecture or following instructions. Constructivism implies that real learning occurs when the student investigates a concept, find information, discuss it and create something with it. It is an approach in which the learner is building an internal illustration of knowledge, a personal interpretation of experience. It is active, constructive, cumulative, goal-directed, diagnostic and reflective (Simons,1993). The theory of Constructivism states that learning is nonlinear, recursive, continuous, complex and relational. It focuses on the learner and each learner's perceptions and motivation.

Fundamentally, constructivism says that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences.

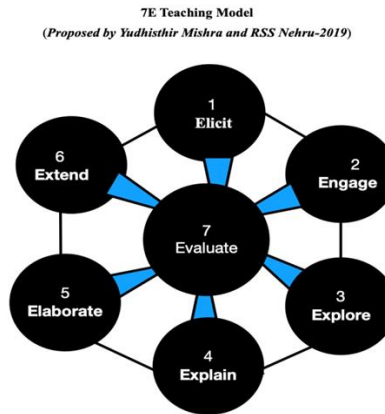
According to Brader (2002) – Constructivism can be defined as the idea that development of understanding requires the learner to actively engage in meaning-making.

We invent our own concept & ideas, linked to what we already know. this meaning making theory is known as constructivism. Constructivist approach of teaching emphasized

- Construct knowledge
- Develop thinking skill
- Develop communication & social skill
- Encourage alternative method of assessment
- Helps student to transfer skill to the real world
- Promotes intrinsic motivation to learn

Proposed 7E Model

The learning cycle is a methodology that provides students with experiences in generating both declarative and procedural knowledge and is grounded in Piaget's theory of Cognitive development (Lawson, 1988). The learning cycle rests on constructivism as its theoretical foundation. Atkins and Karpus developed a three-stage model. The Biological Science Curriculum Study programme uses a five step learning cycle called 5-E model. The modified version of 5-E model is 7E learning cycle is a template for planning and getting the most out of the inquiry activities. The phases in the 7-E learning are Elicit, Engage, Explore, Explain, Elaborate, Evaluate and Extend



The purpose of the first phase, elicit, is to assess student's knowledge of the content. The engage phase is intended to motivate students and to capture their interest in the topic. The third phase is exploration phase where teacher provides students with opportunities for experience to construct their own understanding of the concept. The purpose of the explain phase is to allow opportunities for students to verbalize the concept. The fifth phase is elaboration phase where the students can apply the content to other situations. The sixth phase is evaluation phase. The purpose of this phase is to assess student's understanding of the content. The last phase is extend phase. This phase challenges student understands to apply what they have learned.

Algebra

Mathematics as compulsory subject in secondary stage. This consist 100 mark in the examination and pass mark is 30. Mathematics has the four fundamental operations of addition, subtraction, multiplication and division. At secondary level Mathematics consists of two part one is Algebra and another is Geometry.

Secondary level

The Secondary level consists of IX and X standard in the Odisha educational system. It was followed by Board of Secondary Education Odisha Syllabus. The present study only selected IX standard students.

Variables in the Study

Independent variables

Constructivist Method of Teaching (7E Model of teaching)

Traditional Method of Teaching

Dependent Variable

Achievement in Algebra

Objectives of the Study

1. To prepare and validate lesson transcripts based on Constructivist 7E Learning model
2. To compare the relevance of teaching through the Constructivist model and Traditional Method
3. To find whether there is significant difference in the means of scores of pre-test and post-test in Mathematics.

Hypothesis of the Study

1. There is a significant difference between the means of scores on achievement test in Mathematics taught by Constructivist 7E Learning model and Traditional Method among the students of experimental and control group
2. There is a significant difference between the means of scores of pre-test and post-test of experimental group in Mathematics.

Delimitation of the study

- This study is only cover the secondary school.
- This study is only cover the 30 student of class IX.
- This study is only cover the Bargarh District of Odisha.

Methodology of the Study

The Experimental method of research was adopted for the present study. The design selected for the study was pre-test and post-test non equivalent two group design. The methodology of the present study was described under the following heads: Tools, Sample and Statistical Technique.

Tools to be used

1. Lesson Transcript based on Constructivist 7E Learning Model of teaching and Traditional method of teaching
2. Pre-test and post-test in Mathematics
3. Socio-Economic Status Scale

Sample of the Study

The present study conducted on two sections of standard IX at George High School, Bargarh, Odisha. One group selected as the experimental group and the other as the control group.

Statistical Technique

Descriptive Statistics: Mean and Standard Deviation were computed for bringing out various characteristics of the data and for summarizing and interpreting the salient features of data. The correlation coefficient used for finding the relationship between scores on the test.

Inferential Statistics: The two-tailed test was employed to test the significant difference between the scores of the two groups.

Analysis of Data

Table-1: Analysis of data with respect to Achievement in Algebra by Constructivist 7E Learning model and the traditional Method

| Groups | No of Students | Mean | SD | rxy | CR | Level of Significance |
|--------------------|----------------|-------|-----|------|------|----------------------------|
| Experimental Group | 30 | 34.12 | 556 | 0.47 | 7.19 | Significance at 0.01 level |
| Control Group | 30 | 24.12 | | | | |

From the above table-1, it is observed that the critical ratio of 7.19 is significant at 0.01 levels. Therefore it can be interpreted that there is significant difference between the means of scores of achievement test in Algebra taught by Constructivist 7E Learning model and the traditional Method.

Table-2 : Comparison of the pre-test and post test Achievement Algebra scores in Algebra

| Groups | No of Students | Mean | SD | rxy | CR | Level of Significance |
|-----------|----------------|-------|-------|------|-------|----------------------------|
| Pre-Test | 30 | 17.42 | 6.754 | 0.54 | 10.94 | Significance at 0.01 level |
| Post Test | 30 | 34.13 | 3.623 | | | |

From the table-2, it observed that the critical ratio of 10.93 is significant at 0.01 and 0.05 level. Therefore it can be interpreted that there are substantial differences between the means of scores of pre-test and post-test scores in Algebra among the experimental and control group. Analysis of Data concerning Achievement in Mathematics. Scores obtained by administering the post-test subjected to a test of significance of the difference between correlated means of groups matched for mean and Standard Deviation using a two-tailed test. The investigator equated the two groups about the pre-test scores and the Socio-Economic Status Score (SES). The result of the analysis and interpretation has presented after conducting the study Comparison of the effectiveness of teaching through the Constructivist 7E Learning

Model and the Traditional Method. In the study, one group shown through using the Constructivist 7E Learning Model of education and the other using the Traditional Method. The scores obtained by administering an achievement test immediately after the experiment subjected to the analysis of the significance of the difference between correlated means of groups, which matched for mean and standard deviation using a two-tailed test.

Comparison of the Pre-test and post-test scores in Algebra. The scores obtained by administering an achievement test immediately after the experiment subjected to the analysis of the significance of the difference between correlated means. Correlation between initial and final test scores.

Findings of the Study

1. The researcher state that the experimental group is in an advantageous position concerning achievement in Algebra as a whole.
2. Constructivist Method of teaching is more effective than the Traditional Method of teaching Algebra.

Conclusion

The significant findings of the study reveal that the Constructivist Method of teaching is more effective than the traditional method of teaching. This method developed a reciprocal relationship between education and learning and also resulted in an intrinsic self-development, competence, collective, and individual development of students through collaboration. Suggestion for the improvement of the classroom learning is that it provides an opportunity to implement the Constructivist Method of teaching in classroom instruction.

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