



ADVANCE ORGANIZER MODEL FOR TEACHING MATHEMATICS

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Abstract

In India, the failure of the student in Mathematics is more at the school Board level Examinations. Along with many reasons, this could be due to the teaching methods used by mathematics teachers. There is an urgent need for teachers to use teaching methods that can enhance achievement of students in mathematics. Models of teaching will be useful for enhancing the achievement. Advance Organizer Model is to support the teacher and creating a proper interactive environment for learning. Development of models of teaching is the recent innovation in teaching. Teaching by using models is one of ways to improve teaching of Mathematics.

The objectives of this study were, to develop an Advance organiser model for Mathematics of VIII Standard, to develop traditional teaching lesson note for the same and to evaluate the effectiveness of Advance Organiser Model. Experimental method with two equivalent post-test design was used for this work. The null Hypothesis formulated was, there is no significant difference between the means of achievement test scores of the students from control group and Experimental group. The population for this study was the VIII standard students from the schools in Pune city. The sample for experimental method was 120 students. (60 in control group and 60 in experimental group) They were selected from one school in Pune city by purposive and incidental sampling. The tool used for data collection was achievement test in Mathematics, which was developed by the researcher. The Mean, Standard Deviation and t-test were the statistical tools used for data analysis.

The conclusions of this study are, the students' achievement in Mathematics average, by using the Traditional Method of teaching Mathematics and It is Good, by using Advance organiser Model and Mathematics teaching by using Advance organiser Model is effective than the traditional method of Mathematics teaching.

Keywords: *Advance Organizer Model, Teaching Mathematics*



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1. Introduction

The main goal of Mathematics Education in schools is the mathematisation of the child's thinking. Clarity of thought and pursuing assumptions to logical conclusions is central to the mathematical enterprise. There are many ways of thinking, and the kind of thinking one learns in mathematics is an ability to handle abstractions and an approach to problem solving. Universalisation of schooling has important implications for mathematics curriculum. Mathematics being a compulsory subject of study, access to quality mathematics education is

every child's right. We want Mathematics Education that is affordable to every child, and at the same time, enjoyable. With many children exiting the system after Class VIII, Mathematics Education at the elementary stage should help children prepare for the challenges they face further in life. (NCERT (2006).

Mathematics should be visualized as the vehicle to train a child to think, reason, analyse and to articulate logically. Apart from being a specific subject, it should be treated as a concomitant to any subject involving analysis and reasoning (National Policy on Education, 1986). The issues of mathematics education in Indian schools are around the following four problems in teaching and learning Mathematics.

1. A sense of fear and failure regarding mathematics among a majority of children,
2. A curriculum that disappoints both a talented minority as well as the non-participating majority at the same time,
3. Crude methods of assessment that encourage perception of mathematics as mechanical computation, and
4. Lack of teacher preparation and support in the teaching of mathematics.

The students have fear and anxiety in Mathematics therefore; Mathematics anxiety and 'Math phobia' are terms that are used in popular literature. Failure in Mathematics is a common problem in the school education in India. Students may leave school due to failure in this subject. Teacher can solve the problems of teaching learning of Mathematics by using various teaching methods, strategies, techniques and models of teaching so that students will learn mathematics easily and enjoy the learning of Mathematics.

Development of models of teaching is the recent approach in teaching. One can use these models for effective teaching of Mathematics. An important purpose of discussing models of teaching is to assist the teacher to have a wide range of approaches for creating a proper interactive environment for learning. An intelligent use of these approaches enables the teacher to adopt him to the learning needs of the students. In India, the first National project on models of teaching was planned, designed and executed during 1985-86. In this context, the researcher decided to use Models of Teaching for Mathematics subject.

2. Models of Teaching

Teaching of model is a pattern or plan, which can be a curriculum or courses to select instructional materials and to guide a teacher's action. (Joyce and Weil - 1972)

A model of teaching consists of guidelines for designing educational activities and environments. Model of teaching is a plan that can also be utilized to shape courses of studies, to design instructional material and to guide instruction. (Passi Singh and Sansanwal - 1991)

Educators and psychologist have design several types of teaching models which provides suitable guidelines to the teachers for modifying the behaviour of the learners.

In simple language a models of teaching may be defined as a blueprint designed in advance for providing necessary structure and direction to the teacher for realizing the stipulated objectives.

Characteristics of Teaching Model

1. Specification of learning outcomes: A models of teaching specify what the students should perform after completing an instructional sequence.
2. Specification on environment: A models of teaching specifies in definite terms the environmental condition under which a student's response should be observed.
3. Specification of criterion of performance: A models of teaching specifies the criterion for performance which is expected from the students.
4. Specification of operation: A model of teaching specifies the mechanism that provides for the reaction of students and interaction with the environment
5. Scientific procedure: A models of teaching is based on a systematic procedure to modify the behavior of the learner. It is not a random combination of facts.

Fundamental elements of a Teaching Model

A teaching model has six fundamental elements:

1. **Focus:** Focus is the central aspects of a teaching model. Objectives of teaching and aspects of environment generally constitute the focus of the model.
2. **Syntax:** Syntax includes the sequences of steps involved in the organization of the complete programmed of teaching.

3. **Principles of Teaching:** This element is concerned with the way a teacher should regard and aspects respond to the activities of the students. These responses should be appropriate and selective.
4. **Social System:** It is related to the description of the interactive roles and relationship between the teacher and the students as well as the kinds of norms that are observed and student behavior which is rewarded
5. **Support System:** The supportive system relates to the additional requirements other than the usual human skills or capacities of the teacher and the facilities usually available in the ordinary classroom. Teacher requirements refer to special skills, special knowledge of the teacher and special audio-visual material like films, self-instructional material, visit to special place etc.
6. **Application Context:** Several types of teaching modes are available. Each model attempts to desirable the feasibility of its use in varying contexts-goal achievements-cognitive, conative-effective.

Families of Models of Teaching

All the models of teaching are classified in to four families according to their sources like information, social, personal or behavioural sources.

- I. **Information processing models:** Information processing models refer to the way people handle stimuli from the environment, organize data, sense problem, generate concepts and solution to problems and use verbal and nonverbal symbols.
- II. **Social interaction models:** Social interaction models stress the relationship of the individual to other person and to society.
- III. **Personal models:** Personal development models assist the individual in the development of selfhood, they focus on the emotional life an individual,.
- IV. **Behaviour modification models:** Behaviour modification models stress changing the external behaviour of the learners and describe them in them of visible behaviour rather than underlying behaviour.

3. Advance Organizer Model

Advance Organizer Model (AOM) is an Information Processing Model of teaching. It is widely used model for Mathematics. Therefore, the researcher decided to use this model for this study.

Advance organizer as a cognitive instructional strategy used to promote the learning and retention of new information. (David Asubel, 1960)

A method of bridging and linking old information with something new is advance organiser. (Anderson 2004)

An advance organizer is information that is presented prior to learning that can be used by the learner to organize and interpret new incoming information (Mayer, 2003).

An educational technological term for short introductory texts presented to a student at the beginning of course to enable him/her to structure the course material and put in perspective.

The model in which advanced organizer is presented with explanation, integrative reconciliation and critical study and in which also idea is cleared is an advanced organizer model. Advance organizers are helpful in the way that they help the process of learning when difficult and complex materials are introduce.

The syntax of Advance organiser Model includes following Phases:

Phase I: Presentations of Advance Organiser- The teacher tells aims, objectives of lessons. Present Advance organizer model, give examples.

Phase II: Presentation of learning material - The Teacher presents learning material to students; make logical order of learning material.

Phase III: Strengthening cognitive organization- Advance organiser model provides support for learning process. It gives framework to enable student learn new ideas knowledge through meaningful learning.

As the Advance Organiser Model is more suitable for teaching Mathematics, the researcher decided to use of advance organiser model for teaching mathematics and study its effectiveness.

4. Statement of Problem

Use of Advance Organiser Model for teaching mathematics and study its effectiveness.

5. Objectives of the study

1. To develop lesson note by using Advance Organiser Model and by Traditional method on one unit in Mathematics for VIII Standard.
2. To evaluate the effectiveness of Advance Organiser Model

6. Hypothesis of the study

The researcher decided two types of hypothesis for this research work. They are as follows:

Research Hypothesis

There is difference between the means of achievement test scores of the students from control group and Experimental group.

Null Hypothesis

There is no significant difference between the means of achievement test scores of the students from control group and Experimental group.

7. Research Methodology

The research methodology includes method of the research, Population, sample and sampling, tool for data collection and statistical techniques used for analysis of data.

Method of the research

As per the objectives of this study, the researcher was used **Experimental method** of research for this work. As the two equivalent posttest design was suitable for this work they used the same design.

Teaching with Advance Organiser Model and teaching with traditional method were the independent variables while the Mathematics achievement was the dependent variables in this work. Experimental group was taught by Advance Organiser Model and the control group was taught by traditional method.

Population and Sample

The population for this study was the VIII standard students from the schools in Pune city. The sample for experimental method was 120 students. (60 in control group and 60 in experimental group) They were selected from one school in Pune city by purposive and incidental sampling.

Tool for Data Collection:

The tool used for data collection was achievement test in Mathematics, which was developed by the researcher. This test includes twenty Multiple Type Questions based on the content of unit- Types of Quadrilaterals from the Mathematics syllabus of VIII standard.

Statistical Techniques:

The Mean, Standard Deviation and t-test were the statistical tools used for data analysis.

8. Scope, limitations and delimitations

Scope: This research work is related to the mathematics teaching for VIII standard students.

Limitations

The conclusions of this research study are based on the responses of the students to the achievement test in Mathematics based on the unit.

Delimitations

1. The present study is limited to the schools from Pune City only.
2. Only VIII standard students are included for this study.
3. It is delimited to the Mathematics subject only.
4. This study is delimited to the use of Advance Organizer Model and Traditional method for teaching Mathematics.
5. Only one unit is considered for this research.

9. Analysis and Interpretation of data

To study the effectiveness of Advance Organizer Model, the researcher conducted experiment i.e. they teach the unit by using Advance Organiser Model to Experimental group (60 VIII standard students). Same unit was taught by using traditional method to control group (60 VIII standard students). Then Posttest (Achievement test in Mathematics) was administered on both groups under supervised conditions. These achievement test of all students were corrected. The means of Experimental and Control group were calculated separately and these means were compared by using t- test.

Table No. 1 The Mean, Standard Deviation and Means of the Control and Experimental Group

Sr. No.	Group	N	S D	Mean	Achievement
1.	Control Group	60	2.121	8.1	Average
2.	Experimental Group	60	2.327	13.2	Good

The table No.1 shows that the Mean of achievement test in Mathematics of Control group is 8.1 (Average), while for Experimental group is 13.2 (Good). Thus the students' achievement in Mathematics is more by using Advance organiser Model than the Traditional Method.

10. Hypothesis Testing

The Null hypothesis formulated for this study was, *there is no significant difference between the means of achievement test scores of the students from control group and Experimental*

group. This hypothesis was tested by calculating means, standard deviation and t-test .The means, standard deviation and t-values are given in the table.

Table No.2 Mean, Standard Deviation and t-value of Control and Experimental group

Sr. No.	Group	N	Mean	S D	Calculated t- Value	Null Hypothesis
1	Control Group	60	8.1	2.121	2.852	Rejected
2	Experimental Group	60	13.2	2.327		

****t-value from t- table at 0.01 level of significance is 2.617***

The table No. 2 reveals that the calculated t- value is 2.852 is greater than the Table t- value of 2.617 at 0.01 level of significance. The calculated t- value is found to be significant. Therefore the null hypothesis, there is no significant difference between the means of achievement test scores of the students from control group and Experimental group is rejected, the rejection of null hypothesis made the researcher to formulate alternative hypothesis, i.e., there is significant difference between the means of achievement test scores of the students from control group and Experimental group. In this way the Mathematics teaching with Advance organiser Model is effective than the traditional method of Mathematics teaching.

11. Conclusions:

The conclusions of this study are-

1. The students' achievement in Mathematics average, by using the Traditional Method of teaching Mathematics and It is good, by using Advance organiser Model.
2. Mathematics teaching by using Advance organiser Model is effective than the traditional method of Mathematics teaching.

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