Effect of Advance Organizer Model (AOM) on Pupil's Academic Achievement in Geography - A Study

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Abstract: *The present paper is an attempt to study the effect of Advance organizer Model on achievement of students in geography at school level. For this study 280 students of IXth standard from Four West Bengal Govt. Aided Bengali medium Schools were selected by random method. For this purpose R.B. Cattle Culture Fair Intelligence Test 'A' and achievement test in Geography was given to collect date. From this study it was found that Advance organizer Model (AOM) is more effective than traditional lecture method on pupils' Academic achievement in geography at school level.*

Keyword: Advance organizer Model (AOM), Traditional lecture Method, Academic Achievement

1. Introduction

Teaching is the form of interpersonal influence aimed at changing the behavior of another person. In another words, teaching is a process in which learner, teacher, curriculum and other variables are organized in a systematic manner which is psychologically designed to attain few pre-determined instructional objectives. In the earlier days, teaching is an act of imparting instructions to the learners in the classroom situation in the traditional concept of the term. Now a days we are entering to the era of virtual learning in the forms of on line education through virtual universities.

The teaching activity is crucially important for the achievement of determined goals in terms of behavioral change of learners which are having individual differences i.e. intellectual, emotional, difference between learning abilities etc. To cope up with the existing situation a teacher is supposed to have effective teaching styles class-wise, subject-wise and area-wise to meet the situation. For this we should be aware about innovative teaching-learning strategies.

Model is a representation of some phenomenon of the real world made in order to facilitate an understanding of its workings. A model is a simplified and generalized version of real events. An iconic model represents reality on a smaller scale, an analogue model shows reality in maps and diagrams. Symbolic model uses mathematical expressions to portray reality.

Models of teaching (MOT) are designed to impart repositories while helping the students to learn information, ideas, academic skills, developing special skills, values and understand themselves and their environment. MOT are arriving on the horizon of the teacher education. As these are emerged at of the feeling that particular method / technique may not be appropriate for achieving the multi-dimensional objectives. Various models of teaching are used in geography which are as follows –

2. Information Processing Models

This model has especially been prepared for teacher education. Here, pupil teacher analyses learning problems and reaches the solution one by one. Information processing refers to the way people handle stimuli from environment, organize data, sense problems, generate concepts and solutions to problems and employ verbal and non-verbal symbols. Some information models are concerned with ability of the learner to solve problems and thus emphasize productive thinking; others are concerned with general intellectual ability.

Focus:
The model aims at developing social processes and making he principles understood by learners. In order to achieve these activities special emphasis is given on the comprehension of facts, events, laws and principles.

Types of information processing model:

1) Inductive thinking
2) Concept Attainment model
3) Synthetic model
4) Advance Organizer model
5) Scientific Inquiry Method

Advanced Organizer Model (Ausubel's Model)

Ausubel's primary concern is to help teachers organize and convey large amounts of information as meaningfully and efficiently as possible. This model is designed to strengthen student's cognitive structures, a term Ausubel uses for a person's knowledge of particular subject matter at any given time and how well organized, clear and stable it is. This model is taken from verbal learning principle, in which the main aim is to give the most possible to students. According to Ausubel, any subject is a chain of concepts and in our mind also, when we accept these facts that is also settled as a chain in our mind, if new concept is presented as related with the old one.

In this model, teacher first recalls the previous knowledge, then gives the new knowledge on the basis of previous one. It systemizes the subject in an order, and presents the topic in such a way that the student will grasp it easily. It is also called as expository model. Here teacher exposes the whole concepts among students. Teacher gives verbal instruction and students grasp it as a whole and a chain is made in student's mind.

The aim of teaching geography to the pupils of secondary level are to help them to know their own state and people in the first instance and gradually to widen their geographical knowledge of the other lands and people so that they could eventually conceive entire world as the home to mankind and be able to develop national and international understanding of people living under different natural environments. The major purpose of introducing geography on all level of education especially secondary level is to develop the knowledge of geographical facts, principles and terms, the ability to recognize the effects of climate and topography on human activities, the ability to use space and time concepts in solving problems, the ability to prepare and interpret maps, sketches, charts, diagrams and models and understanding about environments and its relationship with human activities. The Subject of geography also aims at developing awareness among learners about the natural processes operative in physical environment and also to make them conscious about the danger of unwanted human interference inflicted on the nature. Various models of teaching are being used today in teaching geography. Mostly conventional method of teaching (lecture method) is adopted for teaching at school. Due to use of this traditional method, students could not understand the concepts, ideas, rules, methods, techniques, etc of geography properly. Therefore aims and objectives of geography are meaningless to the learner. But the effect of advance organizer Model (AOM) is rarely taken into account in geography teaching at secondary level. Various aspects of geography cab be learned meaning fully if this model is used for teaching geography, This model of teaching nurtures an interest in a inquiry and precise habits of thinking. So the researcher has decided to determine the effect of Advance organizer Model (AOM) on achievement of Students in geography at IXth Standard. But the effect of Advance organizer Model (AOM) is rarely taken into account in geographical studies. Mostly lecture method is adopted as the traditional teaching for the teaching at school. Due to the use of the traditional teaching of different concepts, ideas, rules, techniques, methods, etc. Of geography subject many a times students cannot understand of it properly. Various aspects of geography cab be learned meaningfully if advanced organizer model is used for teaching geography subject. As a result students get a habit of accurate and exact thinking and take interest in asking questions to get the information due to use of this model of teaching.

So the researcher decided to determine the effect of advance organizer model on achievement of pupils in geography at Secondary Level.

Statement of the Problem

Effect of Advance Organizer Model (AOM) on academic Achievement of IXth Class Students in Geography.

A Brief Review of Related Literature

Several researches have studied the effect of Advance organizers on the various measures of achievements of Students Hudson Shihusa and Fred. N. Kerazo (2009) investigated the effect of using AOM on student's motivation to learn biology in their study. O.I. Oloyede (2011) studied the effects of pictorial and written AOM on the achievement and retention of Senior Secondary School in Chemistry. Jadav Vandana studied the effect of AOM on the achievement of students in Physics in her study. Narendra Girdhar Pachpande (2012) studied the effect of AOM on achievement of students in Mathematics teaching at School Level. So in this study the researcher tried to study the effect of AOM on the achievement of students in Geography at High School Level.

Objectives of the Study

The following objectives were formulated for the study.
1. To study the impact of AOM on Pupil's achievement in Geography at Secondary Level.
2. To prepare Lesson Plan for teaching by AOM.

Hypothesis

The following hypothesis are formulated to empirical validate the above objectives –
- There will be no significant difference in the mean scores between experimental group taught through AOM and control group taught through Conventional Method of teaching.

Assumptions
1. When teaching of teacher is effective learning is also effective.
2. Concentration power of students increases because of the meaningful learning due to effective teaching of teacher.

Operational Definitions of the Terms:

- **Advance Organizer model:** AOM is a plan or pattern of teaching designed by (AOM) David P. Ausubel, based on the theory of meaningful learning.
- **Traditional / Conventional Teaching Method:** It refers to Lecture method used by the concerned subject teacher for teaching in the classroom.
- **Achievement:** It refers to academic achievement obtained by Students in researcher made achievement test.
- **Secondary School**: It refers to two year of schooling after VIIIth standard.

Delimitations of the Study
The study will be delimited to:
- The pupil of class IX of 4 W.B. Govt. – Aided Schools during the Academic Session (2013).

- Bengali Medium Students.
- Subject of Geography.

3. Research Methodology

Research Method – For the present study, posttest only experimental control design was adopted. The design used 10 conduct the study was "post-test only control equivalent group design" which according to Gay(1996), is a true experimental design. Teaching model namely Advance organizer Modal (AOM) was the independent variable and academic achievement was the dependent variable in this experimental study. This design was used because it controls for maximum number of internal and external sources of experimental validity. Moreover, due to small groups, pre-test is being used. Therefore, this design is able to determine the exact of amount of change attributable to the independent variable alone. Two groups were randomly formed through matching the subjects in terms of their pre-test scores.

The symbolization of the design is described as:

Table 2: Post – test only control equivalent Group design

Pre-test	Randomly assigned Equivalent Group	Independently variable	Post-test
T	Experimental	Teaching through New Method	T_2
	Control	Teaching through conventional Method	T_2

The Subjects, IXth class students, were administered a pretest of the dependent variable. The experimental group received the treatment of teaching model whereas the control group was taught as usual through traditional method. Two groups were post tested after the experiment.

Sample
In the present study, firstly, 4 W.B. Govt. – Aided Schools Were selected and then 70 students of IXth Standard were selected from each school. With the help of Standardized intelligence test, two equivalent groups were prepared. Each group have 35 students. From these two groups, one group was selected as an experimental group and other was selected as control group by random method. Total number of sample consists 280.

Variables
a) Independent Variable –
   1) Advance Organizer model (AOM)
   2) Traditional Teaching Method
b) Dependent Variable - Achievement of students
c) Control Variable - Intelligence of Student.

Tools of Data Collection
Achievement test of geography was developed by the researcher. Standardized test on intelligence (Cattle culture fair test "A") was used for the purpose. In order to measure and equalize the intelligence level of the Sample before the experiment, R.B. cattle culture Fair (or Free) test of "G" Scale 2, was adopted. It contained 46 multiple choice questions where Test I, Test 2, Test 3 and Test 4

contained 12, 14, 12 and 8 questions respectively (Appendix 'B'). All the questions of the test was related to general intelligence Level. The time duration was fixed as fifty minutes, which was considered to be appropriate for completing the test by all students well in time. In order to measure academic achievement of the Sample in the Subject of geography after the experiment, and achievement test was designed by the researcher. It contained twenty(20) multiple choice items. The content covered in the test was new Subject matter and that was taught during experiment. Hundred percent weight age was assigned to the topics to be learnt . The time duration of the test was fixed as 30 minutes, Which was considered to be appropriate for completing the test by all students well in time. The test was delimited to the topic 'Earthquake' of geography text book for class IX prescribed by West Bengal Board of Secondary Education, West Bengal(India). The test was also delimited to first three levels of Bloom's taxonomy (cognitive domain), from knowledge to application. Because these three levels are mostly taken into consideration while preparing the achievement test as Greenland (1990) focus on these three fundamental types of learning. The reliability of the test was found out thorough Kuder Richardson Formula (KR-21) is as follows:

$$R\ total\ test = \frac{(K)\ (SD^2) - X\ (K-X)}{(SD^2)\ (K-1)}$$

Where K = The number of items in the test
SD = The standard deviation of the Scores
X = The mean of Scores

For this purpose, the test was conducted on small samples (Remaining 30 out of selected 100 Samples) in two W.B. Govt aided Schools namely Srikrishnapur High School and C.K. High Madrasah. The reliability of the test was found to be 0.7 which seems to be quite reassemble for achievement tests. The content validity of the achievement test items was ensured by preparing a table of specifications as shown below:

Table 3: Table of Specifications
First Three level of cognitive Domain

Unit	Knowledge	Comprehension	Application	Total
Earthquake: its related terms, causes and consequences.	8	8	4	20
TOTAL	8	8	4	20
% in TOTAL	40%	40%	20%	100%

Figure in the table indicates number of questions.
The material in this study consisted of lesson plan that was prepared on the topic as per requirement of Advance Organizer Model (AOM). The topic 'Earthquake' was taught during the experiment. The researcher ensured the contents & lesson plan. To remain the same for teaching in each selected school.

4. Procedure of data Collection

Before experimentation is carried out, both experimental and control group were equated in terms of intelligence levels. The experimental group was taught through AOM

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of teaching and control group was taught through conventional method of teaching. A topic from the subject of geography of IX class standard was selected first and then it was taught to the selected students of each school. After completion of the teaching of the selected topic, a single researcher-made achievement test was administered to the both groups of each school. Data were collected from students on achievement test of the selected schools.

5. Method of Data Analysis

Data collected from students through administration of intelligence test, achievement test were analyzed with the help of Descriptive and inferential statistical techniques like mean, standard deviation, and 't' test and Critical Ratio or CR.

The following procedure was adopted for analyzing the data obtained through the above procedure. Five types of statistics were used for data analysis. These were descriptive statistics Such as mean, standard deviation and co-efficient of variation (CV). The inferential statistics used in the study were critical ratio and T. test.

The procedure used in analyzing the obtained information is described in the sequence given below:

1. In the present study, there were two groups, one of them was experimental and one was control group. The mean pretest and post-test scores of two groups were determined separately. The formula for the calculating mean score used in the study was

$$M = \frac{\Sigma X}{N}$$ (Garrett, 2000, P27)

Where M Stands for mean score
 N Stands for sample size
 X Stands for raw scores
 Σ Stands for sum of standard deviation scores of the above comparison groups,

2. Standard deviation scores were computed by using the following formula:

$$SD = \frac{\sqrt{\Sigma X^2}}{N}$$ (Garrett, 2000, P 50)

Where,
SD Stands for the standard deviation of the score
 X Stands for a deviation of raw score from mean score
 N Stands for number of measures

3. Critical Ratio (CR) is a ratio of difference between experimental and control means (numerator) and standard error of the difference between two means (denominator). CR is used when sizes of Samples is large (more than 30) for pre-test & post test scores. . CR was used to calculate the statistical significance of the differences between an experimental and control means if the experimental Sample group and control Sample group are randomly selected from same population. The formula used for calculating the critical Ratio was

$$CR = \frac{M_1 - M_2}{\sqrt{\dfrac{S_1^2}{N_1} + \dfrac{S_2^2}{N_2}}}$$

Where M_1 = Mean of first Sample
M_2 = Mean of Second Sample
S_1 = Standard deviation of first Sample
S_2 = Standard deviation of Second Sample
N_1 = Number of Cases in first Sample
N_2 = Number of cases in Second Sample

4. As the numbers of groups were two, t-test was used to compare the groups on their post test performance. The formulae used were:

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{S^2 \left[\dfrac{1}{n_1} + \dfrac{1}{n_2}\right]}}$$

$$\text{Where } S^2 = \frac{n_1 s_1^2 + n_2 s_2^2}{n_1 + n_2 - 2}$$

The above ratio 't' will be distributed as students t distribution with $(n_1 + n_2 - 2)$ degree of freedom .
Where X_1 = Mean of first Samples
 X_2 = Mean of Second Samples
 n_1 = Number of cases in first Samples
 n_2 = Number of cases in second samples
 s_1 = Standard deviation in First Samples
 s_2 = Standard deviation in Second Samples

6. Presentation and Analysis of Data

Table 4: Mean Standard deviation & Critical Ratio (CR) of experimental group and control group.

Group	N	Mean	S.D	Critical Ratio(CR)	Level of Significance
Experimental	140	98.94	5.05		
Control	140	98.49	4.82	0.77	P>0.05

The table 4 indicates that mean pre-test Scores of comparison groups were 98.94 and 98.49 respectively Spread of individual scores around their respective means was from 5.05 to 4.82.

When their variability was tested through the coefficient of variation, variability of both the groups were least which means that the comparison groups were homogenous. The equality on. Pretest (Intelligence test) Score, between comparison groups were also statistically determined through critical Ratio (CR) .The critical ratio 0.77 is not significant. This shows the there is no significant difference between means of pre-test in (Intelligence test) Scores of students in experimental and control group . Therefore, null hypothesis is rejected. . It means that the two groups do not differ significantly in the initial academic ability of students. So it can be concluded that two groups are more or less of the same ability.

Table 5: Mean, standard deviation and t-value post test scores of experimental and control group

Group	N	Mean	S.D	t-value	Level of Significance
Experimental	140	15.721	2.067		
Control	140	12.092	1.635	16.35	P<0.0001

Df = 278

The table 5. shows that observed t-value is 16.35 which is much greater than table-t value at 0.0001 level of significance. The obtained t-value is therefore, statistically significant. Therefore, the null hypothesis No.- 2, That There is no significant difference between the mean post-test achievement Scores of the experimental groups taught through advance organizer Model and control group taught through conventional method is rejected which implies that there is real difference between the post test means of comparison groups. From this we can say that mean score of students taught by AOM is greater than the mean Score of student which are taught by traditional teaching method.

7. Major Findings of the Study

The main findings of the study were:

1) There was no significant difference between mean pretest scores of the experimental group and control group as tested through critical ratio (CR) at 0.05 level of confidence. Therefore, null hypothesis No.1 was retained (Table 4.)

2) There was Significant statistical difference between mean pot test scores of the experimental group taught through Advance organizer Model and control group taught through traditional method as tested through mean, Standard deviation and coefficient of variation. Therefore. The Null hypothesis No.2 was rejected (table 5.)

8. Discussion of Results

The present study was conducted to find out the effect of Advance Organizer Modal on academic achievement of 9th class students in four west Bengal Govt. Aided Schools. There were one experimental group and one control group. During experiment, experimental group was taught through Advance Organizer Model Where as control group was taught through conventional teaching . In this study, Advance organizer Model was found to be more effective than the conventional teaching method. The student of IXth class taught through Advance Organizer Model Showed Superior achievement in the Subject of geography.

During the instruction of Advance organizer model, the researcher used different types of material like models, pictures, charts and also the text book. The students performed different activities during the experiment, especially when they were taught through Advance organizer model. This might have influenced their understanding due to learning by doing, thus improving their academic achievement. The subject of geography is considered a less structured subject which is generally taught through dictation of text book reading and straight lecturing. This traditional approach is highly objectionable for teaching an important subject like social studies in order to prepare productive and motivated citizenry. Keeping in view its importance, it is necessary to teach the subject with greater zeal and devotion by using modern models of teaching like Advance organizer model. In the present study, though advance organizer model was found superior to conventional method. Advance organizer model improved student's performance better than conventional method. In fact, Advance organizer model is more logical and systematic in its approach than conventional teaching.

9. Recommendations

On the basis of findings, conclusions and the discussion, the following recommendations are made for action and further research:

1) Since the Advance organizer model was found be superior to traditional model the teachers of geography Studies be trained to use Advance organizer model because it was found to be more effective than conventional teaching in this study. Student curiosity be stimulated and interest through stimulating questions be fostered to promote deep thinking. The modes of inductive and deductive teaching may also be emphasized during teaching practice in Geography in teacher training programs.

2) For the subject f geography most of the time, lecture method is used. It is recommended especially at primary level that activity based teaching be adopted as it will help the learners to understand knowledge rather than just memorizing facts and concepts.

3) Advance organizer model is new mode of effective teaching that require thorough understanding and sufficient practice before using them during instruction. In future studies sufficient rigorous training in this model be provided to the teachers of the experimental group before conduction of the experiment.

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