EFFECT OF GRAPHIC ORGANIZER MODEL ON ACHIEVEMENT AND RETENTION IN GEOGRAPHY

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Abstract

The present study compares the effectiveness of Graphic Organizer Model and traditional method of teaching in high school Geography. Ausubel (1963) was the one who advocated improvement in expository method of teaching. He viewed teaching learning and curriculum simultaneously in one gestalt. The man focus of his thinking is its on meaningful learning. He believes that the meaningful learning is acquiring new knowledge of a particular subject at any given time. The concept of meaningful learning lies in connecting the new learning material with existing ideas in the learner's cognitive structure. The sample consists of 100 students both boys and girls selected from Government high schools of Chandigarh affiliated to CBSE, New Delhi. The obtained data were analyzed with the help of mean, standard deviation and t-ratio techniques. The data revealed that: (i) The Graphic organizers model was found more effective than the traditional methods of teaching. Significant difference in gain means of overall scores was observed. After comparing their mean difference of post-test and pre-test, it was found that mean difference in scores of students is higher when taught with the help of Graphic organizers model. (ii) The Graphic organizers model was also found significant in case of retention scores. The students taught through Graphics organizers model of teaching did show higher retention as compared to the control group taught through traditional method of teaching, when student's performance was evaluated after one month. The result suggests that the Graphic organizers is more effective as compared to traditional method of teaching Geography at secondary school level.

Introduction

Teaching is an activity which is designed and performed for the attainment of some broad goals or a large number of specific objects in terms of change in pupil's cognitive structure and behavior. Teacher in an experimental situation may use a simple model. But in actual practice no teacher sticks to one model. There are various models of teaching. Eggen et.al. (1979) defined models as prescriptive teaching

strategies designed to accomplish particular instructional goals".

Teaching is a difficult task. It requires different types of method and teaching aids. The selection of these methods and techniques depends upon the nature of content, learning objectives, learner abilities and students entering behaviors. The main focus of teaching is to bring about a desirable change in the behavior of learner. It is brought about the teacher using teaching strategies to achieve his objective. But traditionally we have been using teaching method for content presentation. In order to increase the effectiveness of the presentation, the audio visual aids are also used.

Education encompasses teaching and learning specific skills and also something less tangible but more profound the imparting of knowledge, positive judgment and well developed system. It is through education that man develops his thinking and reasoning, problem solving and creativity, intelligence and aptitude, positive sentiments and skills, good values and attitude. In the field of education, teachers play active role. Teaching is considered as an integrated, professional activity concerned with bringing about desirable changes in learners (Dorasami, 1996). It is directly related with the attainment of teaching objectives and bringing modification in the individual behavior. Learner achievement of pre specified outcomes depends on the chosen instructional strategies. Teaching should be focused on the learner's retention level. Like in Geography, the learning which is retained by the learner's for the longer duration is more positive and productive.

Education is the process by which an individual is encouraged & enabled to develop fully his or her potentialities. It may also serve the purpose of equipping the individual, with what is necessary to be a productive member of the society. An individual acquires & develop knowledge & skill through teaching & learning. Traditionally, the teaching learning process comprised instructors, learners, content & learning resources. The text contained the content to be learned & it was the instructor's responsibility to teach that content to the learner. Teaching could be interpreted as getting content from the text into the minds of the learners in such a way that they could retrieve the information when & where necessary & apply it accurately. A more contemporary view of instruction is that it is a systematic process in which every component i.e. teacher, learner, learning material and learning environment is crucial for successful learning, which occurred when learners have incorporated new information into their memories that enable them to master new knowledge.

The models of teaching are grouped into four characteristics on the basis of sources of realty which the theorist has drawn as they focus on the learner and his environment. These four categories are social interaction sources, Information processing service, Personal sources and behavior modification as a source

The learner is the focus of instruction and good instruction is that which fulfill

the learners' expectations through goal oriented interesting instructional strategies. Whenever a teacher teaches something to his class teaching is intended to produce learning and bring permanent change in the behavior of the students of his class.

Ausubel (1963) was the one who advocated improvement in expository method of teaching. He viewed teaching learning and curriculum simultaneously in one gestalt. The main focus of his thinking is on meaningful learning. He believes that the meaningful learning is acquiring new knowledge of a particular subject at any given time. His concept of meaningful learning lies in connecting the new learning material with existing ideas in the learner's cognitive structure

Joyce and Weil (1985) have identified the given two types of advance organizers: one is expository organizer and other is comparative organizer. The former provides a general model of class relationships as broader rules relate themselves with sub-rules and specifics. Varying kinds of forests are first distinguished from one another before the component sub forests and trees are differentiated. The later is used for relatively familiar material and are designed to integrate new concepts with parallel concepts existing in the cognitive structure on the one hand and on the other, to discriminate between old and new concepts to prevent confusion caused by similarity.

In the laymen languages, "Model of teaching" is a blue print of teaching activities which is needed to generate educative environment within the frame work of task in hand. Model of teaching try to describe teaching as it ought to be. Psychologists are of the view that the best substitute for a theory of teaching is a model of teaching which explains various teaching learning conditions and their relationship. When we teach well, we help students learn well. A model of teaching helps learning. Powerful learners have repertoires of powerful strategies for acquiring education. Model of teaching are designed to impart repertoires while helping students learn information, ideas, academic skills, developing social skills, values and under-themselves and their environment (Joyce &Weil, 1990).

A Graphic Organizers is simply a graphical or spatial representation of text concepts. It is an instructional tool that can help students to organize, structured the information and concepts to relate with the other concepts. In addition, the spatial arrangement of Graphic Organizers allows the students to identify the missing information or absent connections in one's strategic thinking (Ellis, 2004). Graphic Organizers has many names including visual maps, mind mapping and visual organizers. As an instructional tool, Graphic Organizers used to illustrate students' prior knowledge about a topic or section of text that have been highly recommended to be used in classrooms.

A graphic organizer can be defined as a visual and graphic display that depicts the relationships between facts, terms, and ideas within a learning task. Graphic

organizers are also referred to as knowledge maps, concept maps, story maps, cognitive organizers, advance organizers, or concept diagrams (Strangman, Hall, & Meyer, 2003). Graphic organizers have multiple benefits. These benefits include helping learners grasp the material by assisting in seeing the relationships between ideas, concepts, or authors. Graphic organizers also assist in memory recall. Finally, graphic organizers encourage the use of developing higher-level thinking skills by assisting students to synthesize and integrate information, ideas, and concepts. Ellis and Howard (2007) stated that graphic organizers are effective across subject areas because they provide visual cues designed to assist students in their understanding of information by organizing information.

Graphic organizers are representations, pictures or models used for processing visual information. They facilitate understanding of knowledge when there is a large amount of information to work with, in a given limited time. In essence, the functions of graphic organizers in the learning process are: (i) Clarifying knowledge and reasoning. The function of graphic organizers is to explain the relations between concepts. There are graphic organizers that organize information into categories, facilitating in this way the definition of different concepts. Also, the visual organization of knowledge represents an efficient support for the process of thinking. (ii) Strengthening the learning process. Filling in a graphic organizer is a complex process which requires taking the decision on which graphic organizer is the most suitable for the given type of knowledge and cognitive processes. This decision involves the selection of the necessary knowledge and also the evaluation of the approach and of the intermediary and final results. This type of work with knowledge contributes to the increase of learning comprehension and critical thinking in education. (iii) Integrationing the new knowledge in the prior knowledge system. This association of the new knowledge with the previous knowledge leads to a superior learning process. (iv) Identificating the conceptual errors (and missconceptions). Filling in a graphic organizer shows the teacher and the student the conceptual and perceptual errors. Therefore, both teacher and student can proceed with the required revisions (Ciascai, 2009).

Achievement can also be defined as the product of learning aptitude and interest because they are learned, retained and forgotten just as knowledge. It may means to be a person level of skill or range or breadth of information and what he has accomplished in designed area of learning or behavior. These are the indicators of the extent of academic achievement and are considered to be the unique responsibility of educational institutions. Knowledge of level of correlation between different factors and academic achievement is therefore necessary for a teacher in ascertaining what contributes to high and low achievements of students. According to Crow and Crow (1956), achievement means me extent to which a learner is profiting from instructions in a given area of learning. According to Torres (1993) defined achievement as the attained ability or the degree of competences in school task usually as measured by

standardized achievement tests. It is the learning outcomes of general and specific learning experiences.

Retention is an active state of the learned performance. What is retained during the inactive state must be something in the form of ft structure activity as left behind it some modified brain structure of the organism, mostly modified brain structure. This modified structure is often called the memory trace. Hence, retention is very difficult to improve by practice. The capacity of retention is native and cannot be improved by training.

Methods of Measuring Retention: Four methods are used for measuring the amount of retention such as: (i) the recall method is very often used in schools. Frequent examinations after every month give pupil an opportunity for active recall. It requires a person to reproduce correctly what previously learned. The recall method is very simple to measure, you show list of words to the students and after an exposure for a specified time ask them to recall as many items as possible, (ii) The subject is shown the material which he learned together with other items, which he has not known before, and he is expected to identify the items which occurred in the original material. The police use this method in identification parades when the subject is mixed in a small crowd of strategies and witnesses are asked to identify him. (iii) When this method is used, the number of trials a person requires to reach learning objective is recorded. After an interval in which forgetting occurs, subjects reach the same objective and number of trials required for relearning is compared with the number required for the first time. The difference represents the effect of retention. (iv) When material has been learned in a serial order the learner is given the original items in a mixed up form and is asked to re-arrange them in an original order that is, to reconstruct the original order. The spelling of words may be presented in a different order and pupils may be asked to correct giving the proper order of letters. Obviously, this method can be used to measure only one phase of the learning process when the material to be learned has a serial order.

Remembering plays an important role in our daily life. Our life becomes richer if we are able to remember past experience which makes living pleasant and enjoyable. This ability to remember plays an important role in the process of learning which is essential for our intellectual life. With the help of thinking, we attempt to do new things and solve the numerous problems that we face in our daily life. But all thinking is based on remembering. Thus, remembering is an important aid for progress in learning and constructive thinking.

Need and Significance

The purpose of the study was to conduct research regarding the perception of students working in a graphical organizer model to solve problems in geography. Graphic organizers model promotes learning because these collaborative experiences engage students in an interactive approach to processing information, resulting in greater retention of subject matter, improved attitudes toward Geography, and

enhanced interpersonal relation among group members. The students are likely to attain higher levels of achievements, to build life-long interaction and communication skills, and to master the habits of mind (critical, creative and self-regulated) need to function as productive members of society. Adopting proper teaching strategies help teachers in solving learners' problems and bring remarkable improvement in their overall behavior. Review of literature shows that the use of various teaching strategies gave quite positive in comparison to traditional teaching strategy. While teaching 7th class geography student investigator found graphical organizer model strategy is much more effective. The investigator taught through graphical organizer model for teaching experimental and conventional group and find whether the use of graphical organizer model is effective or not. If teaching of geography is to be effective there is a need for well planned, well executed and carefully analyzed research into the field which brings forth the efficacy of model's teaching over traditional teaching for achieving various academic objectives. Thus, the present study will give wide range of knowledge regarding the Geography students. The findings of the present study will also be helpful assist the students to improve their learning skill in Geography. Therefore, the investigator made and attempt to inquire into the effectiveness of Graphic Organizers model on achievement and retention with in geography..

Delimitation

The study was delimited to 7th class Geography students from Government schools of Chandigarh affiliated to CBSE, New Delhi only.

Objectives

The study was designed to attain the following objectives;

1. To compare the achievement of groups taught through graphic organizers model and traditional method of teaching.
2. To compare the retention of groups taught through graphic organizers model and traditional method of teaching.

Hypotheses

H_1: The performance of group taught through graphic organizers model will be higher than that of traditional method of teaching in Geography.

H_2: The retention of group taught through graphic organizers model will be higher than that of traditional method of teaching in Geography.

Sample

The study was conducted on a random sample of 100 students (50 students in each group) of 7th class Geography students taken from Government schools of Chandigarh. The study was purposed to be conducted on two intact groups, one is experimental group and other is traditional group.

Design

For the purpose of the present investigation a pre- test post-test randomized group design was used.

Tools Used

The following tools were used for data collection:
1. Achievement Test in Geography was prepared by the investigator.
2. Five Lessons in Geography based on Graphic Organizers Model of teaching prepared by the investigator.

Procedure

After the selection of the sample and allocation of students to the two instructional strategies, the experiment was conducted in four phases: Firstly, a pre-test was administered to the students of both the treatment and control groups. The answer-sheets were scored to obtained information regarding the previous knowledge of the students. Secondly, one group was taught through Graphic organizers model and control group was taught through conventional method of teaching by the investigator. Thirdly, after the completion of the course, the post- test was administered to the students of both the groups. The answer-sheets were scored with the help of scoring key. Time limit for the test was half an hour. Fourthly, after one month, again the same achievement test was administered to the students of both the treatment and control groups to get a measure of their retention. The answer-sheets were scored with the help of scoring key. Time limit for the test was half an hour.

Analysis and Interpretation of Results

- *Analysis of Achievement and Retention Scores*

The analysis of the obtained data was done by statistics such as mean and standard deviation and t-ratio techniques were used. The results are presented in table -1 &2.

Table1: t-ratios for gain achievement scores of experimental and control group

Variable	Experimental Group			Control Group		SE_D	t-Value
	N	Mean	SD	N Mean SD			
Gain Achievement Scores	50	18.34	5.86	50 3.42	11.28	0.68	10.38**

** Significant at 0.01 level
(Critical Value 1.97 at 0.05 and 2.63 at 0.01 levels, df, 98)

Table- 1 shows that the mean score of Graphic organizer model is 18.34, which is higher than the corresponding mean scores of 11.28 for conventional method of teaching on the post test. This shows that Graphic organizer model is more effective on gain achievement score than the conventional method of teaching. The t-ratio for of teaching is 10.38, which in comparison to the table value is found significant at the 0.01 level of significance. Hence, the Hypothesis H_1: The performance of group taught through graphic organizer model will be higher than that of traditional method of teaching in Geography, is accepted at 0.01 levels of significance. The result

indicates that Graphic organizer model group was higher in performance than that of conventional teaching group.

Table-2: t-ratios for mean retention scores of experimental and control group

Variable	Experimental Group			Control Group			SE$_D$	t-Value
	N	Mean	SD	N	Mean	SD		
Retention Scores	50	7.28	3.46	50	6.12	2.12	0.54	2.15*

Significant at 0.05 level
(Critical Value 1.97 at 0.05 and 2.63 at 0.01 levels, df, 98)

Table- 2 reveals that the mean retention score on Graphic organizer model is 7.28, which is higher than the corresponding mean scores of 6.12 for conventional method of teaching on retention-test. This shows that Graphic organizer model was more effective on retention score than that of conventional method of teaching. The t-ratio for difference in mean retention scores of Graphic organizer model and conventional method of teaching is 2.15, which in comparison to the table value was found significant at 0.05 levels of significance. Hence, the Hypothesis H$_2$: The retention of group taught through graphic organizer model will be higher than that of traditional method of teaching in Geography, is accepted at 0.05 levels of significance. The result indicates that Graphic organizers model group was higher on retention scores than the conventional teaching group.

Discussions

The present study revealed that the Graphic organizers model of teaching and conventional model of teaching were found more effective on achievement in geography. Hence, the Hypothesis **H$_1$** is accepted. The results are supported by the findings of Gonzales (1982) who reported that the subjects in treatment group A (technical instruction plus advance organizer) exceeded in their scores of subjects in treatment group B (technical instruction only). Cahall (1985) found that students in the experimental group receiving advance organizers scored significantly higher on the post-test. Hawk (1986) found that graphic organizers has shown to be significantly beneficial to student achievement. Budhhisagar (1987) found that the achievement gain mean scores of the experimental groups were significantly higher than that of the control group. Groller (1989) found that the experimental treatment produced a greater effect on students learning and retention on content material than did the control group. Jaimini (1990), Baggett (1993). Most of the empirical evidence leads to the conclusion that the advance organizer model and conventional method of teaching were found more effective in different subjects. Robinson and Kiewra (1995) revealed that when given enough time, students studying graphic organizers learned more hierarchical and coordinate relations, and as a result, they were more successful in applying that knowledge and in writing integrated essays than students studying outlines or text alone. Governale (1997) suggests that students will become more interested in social studies when graphic organizers are used before, during, and after

the lesson. DiCecco and Gleason (2002) found that using graphic organizers for students with learning disability helps to gain relational knowledge from expository textbooks. Kim, Vaughn, Wanzek, and Wei (2004) found in their study that graphic organizers (i.e., semantic organizers, framed outlines, cognitive maps with and without a mnemonic) improved reading comprehension overall for students with learning disability. Githua and Nyabwa (2008) indicated that students taught using advance organisers had significantly higher scores in mathematics than those taught in the conventional way and gender did not affect achievement. Lorenz, Green and Brown (2009) found that use of multimedia graphic organizer software can provide some benefits to writing and achievement for elementary school children. The study of Eissa (2012) advocated for the effectiveness of using advance graphic organizers on academic achievement, self efficacy, and motivation to learn social studies in learning disabled second year prep students. Iiter (2016) found that using different types of graphic organizers developed positive achievement emotions (i.e., enjoyment, hope and pride) more than contextual learning process in social studies.

The finding of the present study revealed that the students taught through Graphic organizers model of teaching in geography did retain different level of performance more than the group taught through conventional method of teaching. Hence, the Hypothesis H_2 is accepted. The results were consistent with findings of Darrow (1980), Skelly (1982) for learning and retention. Gonzales (1982) who reported that no difference between treatment group A (technical instruction plus advance organizer) and treatment group B (technical instruction only) both the retention-test scores. Richardson (1995) and Mize (1989) found that the graphic advance organizer did retain different level of performance. It appears that the effectiveness of the graphic organizers model varies with subjects. Spiegel and Barufaldi (1994) found that students who actively constructed graphic postorganizers of the test structure recalled significantly more content than did the control students who simply underlined, reread, or highlighted. On a 3-week retention posttest, those students in the study skills class retained significantly more of the material studied than did the control group of students. The study of Chalk (2006) indicated that the use of computer-based cognitive organizers increased the social studies comprehension and retention for students with disabilities. Jiang and Grabe (2007) argues that graphic organizers, which directly represent the discourse structures of a text, provide stronger evidence for the effectiveness of the technique, and graphic organizers should be adopted in comprehension instruction. Zaini, Mokhtar and Nawawi (2010) found that graphic organizers had effect on the improvement of students' retention, performance and motivation in learning. Hashemian, Jam and Naraki (2014) concluded that the use of graphic organizers had positive effects on the L2 learners' reading comprehension.

However, the findings suggest that graphic organizers model can prove to be a better strategy for geography at secondary school stage.

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