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Effectiveness of Inquiry Training Model on the Development of Motivation and Achievement in Geography among Secondary School Students

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Abstract: *Education system of India has flowed since the ancient Gurukul system till the present smart classroom system. Tremendous changes have been taking place in the field of education from time to time. Education plays a vital role to change the learning style of the student. Students are always interested to learn new things, create new ideas and develop new concept especially in the subject of geography among the secondary school students. To solve this problem, an innovation of new models of teaching was developed with a new testament by Richard Suchman like Inquiry Training model, in 1961.In this model, a child enters through puzzling situation and follows one by one step upto his satisfaction. The Teacher only helps guides and motivates the students to show the path only. In this study, an attempt has been made to study the effectiveness of Inquiry Training Model on the development of motivation and achievement in geography among secondary school students. This study constituted with a sample of 164 students in different selected high schools in the district of Jajpur. It is found that the treatment of Inquiry Training Model is effective for the development of motivation and achievement in geography among secondary school students.*

Keyword: *Inquiry Training Model, Motivation and Achievement*

Introduction

The destiny of India is being shaped in her classroom. (Kothari Commission-1964-66).This statement signifies that it should be given to the classroom situation by which the objectives of education will be achieved, which will help in building a good nation. In a world based of science and technology, it is education that determines the level of prosperity welfare and security of the people. But quality education is necessary for the development of a country. Quality of education is a direct consequence and outcome of the quality of teachers and teacher education system. The task of bringing qualitative change in the institutional efficacy of teacher is a huge and challenging one. The last five decades have witnessed several attempts to change, modify and indigenize the inherited system of education. The system, however, continues to function more or less on the same principles, similar content and

approaches characterized by continuity and unwillingness to change. In this regard different types of teaching strategies are effective for adoptation and diffusion of innovations in education. It helps the students for the development of adjustment, motivation, values, problem solving ability, attitude and achievement etc. So there is a great need of Inquiry Training Model on the development motivation and achievement in geography among secondary school students.

Models of Teaching

A model of teaching consists of guidelines for designing educational activities & environments. Model of Teaching is a plan, which can be utilised to shape courses of studies, to design instructional material and to guide instruction. "Model of teaching can be defined as instructional design which describes the process of specifying & producing a particular environmental situation which causes the students to interact in such a way that a specific change occurs in their behaviour".

Types of Models of Teaching

Bruce Joyce and Marsha Weil (1985) organise these models into the following four families based on their chief emphasis – the way they approach educational goals and means. These are given below.

1. Behaviour Modification Models,
2. Information Processing Models,
3. Personal Models,
4. Social interaction Models,

Information Processing Models (IPM)

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, general concepts and solutions of problems and employ verbal and non-verbal symbols. Models are concurred with ability of the learner to solve problems and thus emphasize productive thinking; others are concerned with general intellectual's ability.

Types of Information Processing Model

1. Inductive Thinking,2- Concept Attainment Model, 3- Synthetic Model4. Advance Organizer Model, 5- Scientific Inquiry Method.

Inquiry Training Model

Out of four types of models of teaching Inquiry Training Model is one of Information processing Model which was developed by Richard Suchman, based on the premise that the intellectual strategies used by scientists to solve problems and inquire into the unknown can be taught to students. Using the natural curiosity of students, they can be trained and disciplined in the procedures of inquiry. The model was developed from analyzing the methods used in creative research personnel. The elements of their inquiry process were identified and these were built into an instructional model called inquiry training. Inquiry training is designed to bring students directly into the scientific process through exercises that compress the scientific process into small periods of time. The training has resulted in an increased understanding of geography, more creative thinking, and skills for obtaining and analyzing information as students establish facts, build concepts, and then generate and test explanations or theories. The students are active learners involved in exploration, questioning, problem solving, inductive reasoning, invention, labeling, and discovery.

Inquiry Training model was developed by Richard Suchman in 1961, which was intended to engage students in causal reasoning, become precise in asking questions, building hypothesis and testing them. It was also intended to teach students a process to investigate and explain unusual phenomenon and help develop their thinking abilities. It is most commonly used in science and social study.

The inquiry process will help the students

- to approach for future problems with confidence in their abilities to seek out the solution;

- to begin to consider success and failure as information rather than reward or punishment;
- to practice the process to develop the ability to sense the relevance of variables, make intuitive leaps, and put problems into forms with which they know how to work; and
- to improve their memory process because when they integrate material into their own cognitive structure, thus material is made more readily retrievable.

The inquiry training method requires active participation in scientific inquiry and capitalizes on the student's natural curiosity.

The general goals of inquiry training are

- to develop the intellectual discipline and skills necessary to raise questions and search out answers stemming from their natural curiosity;
- to acquire and process data logically;' and
- to develop intellectual strategies that they can use to find out why things are as they are.

The Inquiry Training Model is based on Suchman's theory that:

- The students inquire naturally when they are puzzled;
- They can become conscious of and learn to analyze their thinking strategies;
- New strategies can be taught directly and added to the students' existing ones; and
- The cooperative inquiry enriches thinking and helps students to learn about the tentative, emergent nature of knowledge and to appreciate alternative explanations.

This model differs from other inquiry models in the way the data are presented. Students gather data in a simulated process through questioning rather than actual manipulation of data. Thus, the method is more process oriented as the primary goal is to improve students' ability to relate data to the inferences they have formed.

Presentation of the model

A. Preparation for the Inquiry

1. Identify a problem requiring an explanation. In selecting the problem or event, these criteria need to be considered:
    a) The event must pose a problem which requires a discoverable explanation, as opposed to teaching a fact, concept, or generalization. The problem must be genuinely interesting and stimulating to the learner.
    b) The level of the problem must be approximately matched with the level of the learner.
    c) The curiosity and motivation of the student are enhanced if the problem is prepared a way which makes it appear discrepant.
2. The event focuses the student on a particular problem rather than on a set of in general.
3. In selecting the medium for presenting the problem/event, design experiences which will bring students into contact with a problem-evoking situation. Discrepant events, demonstrations, films, audio tapes, graphs, tables, problems and case studies can be used to start the inquiry process. It must be a puzzling situation to the students and conflict with the idea of reality. The model can be presented in a variety of ways. To help the students improve their thinking skills, have them work in groups and follow the format on the worksheet.
4. Student collects data surrounding the new situation and gives its wanted shape. He organizes his knowledge within the contest of new framework.

Phases of Inquiry Training Models

Phase one: Area of investigation is posted to students.

Phase Two: Students structure the problem.

Phase Three: Students identity the problem in the investigation.

Phase four: Students speculate on ways to clear up the difficulty.

Advantages of Inquiry Training Model:-

- Inquiry Training Model makes the students opportunity to think.
- It gives the students opportunity to think carefully about ideas, problem & questions being considered valid by class.
- It creates curiosity among students.
- It makes the students to develop the spirit of personal initiative.

Rationale of the study

The study of geography influences our life in its entire field. It is quite useful in economic research and the relationship of resources and human activities. Geography teaching provides to the pupil knowledge of the different people of the world and the contributions made by them for the development of world culture.

It is a compulsory subject and most vital subject at secondary stage. It is also closely related with our daily life. At the secondary stage, geography gives emphasis on the acquisition of knowledge and the ability to observe specifically, to draw conclusions and to make decision as like as science. But it has been realised that our secondary school students are unable to do expected result in geography. Several factors may be responsible for low achievement of students in geography. One of the important factors is the application of inductive teaching strategies by the teachers. Hence, in order to improve the teaching standard of geography and, there is the requirement of adoptation of new, effective and efficient teaching strategies by the geography teachers.

For the present research investigation, the investigator has selected Inquiry Training Model of teaching for the development of motivation and achievement in geography among secondary school students.

Review of Related Literature

Major outcomes of different Researchers of the study

The study revealed that social Inquiry Model has increased the achievement and self concept of students. Effect of Memory Model is higher on self – concept than conventional Method. Effect of Inquiry Model is higher on self- concept than Memory Model. (Kumar, S - 2005). It was found that Inquiry Training Model improved the achievement of students. It provided opportunity for the development of Reasoning Ability in a mixed Ability Class. (Rupsinh, S. - 2006). It was studied that there were more benefits from ITM than traditional methods teaching.(Raja and Bency - 2010) The study found that there was a significant difference in the spirit of inquiry of prospective teachers based on number of siblings.(Bency and Raja - 2011). In an intriguing study, successful carried out the model with deaf children which suggest that the method can be powerful with students who have severe sensory handicaps.(VOSS - 1982). Single-sex schools deliver specific advantages to their students, especially female students in matters concerning academic achievement, education aspiration, sex role stereotyping or attitudes and behaviours related to academics. This will enable the girls develop their attitudes to science and thus improve their achievement in biology.(Lee and Bryk, 1986). The study conducted a study to compare the effectiveness of teaching science through ITM and traditional method on the achievement in science.(Likhia - 1996). It was showed that the changes in the teachers' practice helped them to promote scientific Inquiry in laboratory lesson. (Christensen & Joseph - 2005). The study identified that the scientific inquiry style of teaching makes a significant impact in improving students' attitude and understanding about the nature of science.(Jirnenez (2005).

Objectives of the study

The study has the following objectives

1. To study the effectiveness of Inquiry Training Model on the development of motivation in geography.
2. To study the effectiveness of Inquiry Training Model in the achievement in geography.
3. To find out the differences between boys and girls in the development of motivation in geography.
4. To find out the differences among boys and girls in achievement in geography.

Hypothesis of the study

The following Hypotheses have been undertaken

1. There is no significant difference in the Mean Motivation Gain Scores of Experimental Group and Control Group.
2. There is no significant difference in the Mean Achievement Gain Scores of Experimental Group and Control Group.
3. There is no significant difference in the Mean Motivation Gain Scores of boys and girls taught through Inquiry Training Model.
4. There is no significant difference in the Mean Achievement Gain Scores of boys and girls taught through Inquiry Training Model.

Sample of the study

The present study consists of 164 students (103 boys and 61 girls) studying in Govt. school for both boys and girls. The sample has been selected from three high schools of district Jajpur of Odisha purposive sampling technique was used in this purpose.

Sl.N.	Name of the School	Total No. of Students	Sex		Treatment Group
			Boys	Girls	
1	Jajpur Zilla High School, Jajpur	57	31	26	Inquiry Training Model (ITM)
2	Biraja High School, Jajpur	53	42	11	Inquiry Training Model (ITM)
3	Harisamanta High School, Jajpur	54	30	24	Traditional Method (TM)
Total		**164**	**103**	**61**	

Tools used

The following schools were used to collect data.

1. Intelligence test developed by Dr. S.S. Jalota.
2. Motivation scale developed by Dr. D. Rao.
3. Achievement Test in Geography developed by Investigator.

Design of the study

The present study was experimental design. It was necessary to use a pre-test post test and parallel group design, so that difference in the performance of students due to treatment can be effectively measured and compared. For this purpose two schools were selected for study to conduct the experiment. 30 lesson plans were prepared separately for teaching. The lesson plans were taught through Inquiry Training Model to two experimental groups and traditional method was followed by one control group.

After planning, the students of three high schools were administrated with intelligence test, motivation test and achievement test.

Statistical Techniques used

After collection of the data mean, standard deviation were calculated to test the significant of difference of means of scores of different of means of scores of different groups as well as the same group at the pre-test and post- test were determined by ‘t’ test.

Analysis and Interpretation of Data

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Table 1: 't' test on Motivation Test Gain Scores of Experimental Group and Control Group

Group	Mean of MT gain scores	SD	N	't' value	Result
EX	49.84	9.73	57	9.79	Significant at 0.01 level
C	32.34	9.09	54		

From the table-1, it shows that the 't' value 9.79 is which is highly significant at 0.01 level. It reveals that Inquiry Training Model has a positive effect on the motivation of students in the geography.

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Table 2: 't' test on Achievement Test Gain Scores of Experimental Group and Control Group

Groups	Mean at gain scores	SD	N	't' value	Result
Ex	17.68	11.67	57	6.18	Significant at 0.01 level
C	6.92	5.87	54		

From the table-2, it shows that the 't' value is 6.18 which is significant at 0.01 level. It reveals that Inquiry Training Model has a positive effect on the achievement of student in geography.

Relative effectiveness of Inquiry Training Model on motivation of boys and girls

Table No.-3: 't' test among boys and girls of Inquiry Training Model on the Development of Motivation

Groups	Mean of MT gain scores	SD	N	't' value	Result
Boys	51.72	6.92	31	1.88	Not significant
Girls	46.5	12.67	26		

From the above table-3, it shows that the 't' value 1.88 is not significant. It reveals that the mean gain scores of motivation test between boys and girls of Inquiry Training Model do not differ significantly from each other. It does not produce any significant differential effect among boys and girls on motivation. Hence the null hypothesis is accepted. It is found that a significant effect among boys and girls in the subject of geography.

Relative effectiveness of Inquiry Training Model on achievement of boys and girls

Table No.-4: 't' test between boys & girls of Inquiry Training Model on the Achievement Test.

Groups	Mean	SD	N	't' value	Result
Boys	17.26	10.3	42	2.93	Significant at 0.01 level
Girls	11.3	4.2	11		

The above table No. 4 indicates that the 't' value is significant at 0.01 level. It shows that the mean gain scores of Achievement test between boys and girls of Inquiry Training Model differ significantly

from each other. So the null hypothesis is rejected. It is concluded that Inquiry Training Model Produced differential effect between boys and girls on the achievement of Inquiry Training Model.

Findings of the study

After careful analysis of the collected data is interpretation of results, the following findings were found.

1. Inquiry Training Model produced significant effect on the development of motivation of students.
2. Inquiry Training Model produced significant effect on the Achievement of Students.
3. Inquiry Training Model produced no significant differential effect between boys and girls on the development of motivation.
4. Inquiry Training Model produced no significant differential effect between boys and girls in the achievement test.

Conclusion

Geography is a compulsory subject for all the secondary school students. It should be studied in a unique method as like as Inquiry Training Model because it is more effective than traditional method. All the training college and teacher should adopt Inquiry Training Model in different level. More stress should be given through seminar and orientation programme to the teachers on Inquiry Training Model. It is also necessary to give emphasis on such model in different text books. Teachers should be trained on Inquiry Training Model to enhance the effectiveness of real education.

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