RESEARCH ARTICLE

BIOLOGICAL SCIENCE INQUIRY MODEL AND BIOLOGY TEACHING

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ABSTRACT

Education is considered essential for the development of an individual, a society and a country. Hence, the quality of education has to be improved for faster all round development of the individual. It is acknowledged universally that any attempt towards the improvement in the quality of education ultimately depends on the quality of instruction imparted in the class. Variety of experimentation spread over the whole world which changed the face of teaching learning process and has put forth a number of teaching strategies, CAL, computer and various models of teaching. Models of teaching help the learner to learn the information, ideas, developing social skills, values (Joyce and Weil 1997) A teaching Model includes patterns for designing educational environment through specified ways of teaching and learning, to achieve specific goals.

Keywords : Effectiveness, Biological Science Inquiry Model, Technique.

1. INTRODUCTION

Education is considered essential for the development of an individual, a society and a country. Hence, the quality of education has to be improved for faster all round development of the individual. It is acknowledged universally that any attempt towards the improvement in the quality of education ultimately depends on the quality of instruction imparted in the class. Variety of experimentation spread over the whole world which changed the face of teaching learning process and has put forth a number of teaching strategies, CAL, computer and various models of teaching. Models of teaching help the learner to learn the information, ideas, developing social skills, values (Joyce and Weil 1997) A teaching Model includes patterns for designing educational environment through specified ways of teaching and learning, to achieve specific goals.

As we know that foundation of learning is laid down as soon as the child comes in contact with the environment. The learning of concepts is much more important for human beings as they think, learn and communicate with the concepts. Knowledge explosion, population explosion also change the scenario of Biological Science manifold and so its concepts. Therefore a convenient and suitable method of teaching learning is needed, hence, the study in hand endeavors to measure the efficacy of Biological Science Inquiry Model.

Biological Science Inquiry Model is developed on the findings of BSCS (Biological Science Curriculum Study) that produced curricular and instructional material in America. The main objectives of the BSCS are to inculcate scientific values and scientific skills among students so that they take interest in science. To achieve these objectives nine themes were selected. Keeping in mind the nine themes three versions of BSCS were developed- Green, Yellow and Blue to develop scientific values and scientific skills among learners was designed on the basis of the work of Joseph J. Schwab. It is meant for teaching different levels and types of concepts.

2. OBJECTIVES OF BIOLOGICAL SCIENCE INQUIRY MODEL

The BSIM produces two types of effects, the instructional effects and nurturing effects. The major instructional objectives of BSIM are :

- To understand the process of research in Biology
- To provide practice in inductive reasoning.

Certain nurturing effects are also produced by the model. These are :

- An awareness of scientific knowledge
- To create commitment to scientific inquiry
- To develop the ability to balance alternatives
- To develop cooperative spirit and skill

3. SYNTAX OF BIOLOGICAL SCIENCE INQUIRY MODEL

The syntax of this model describes the model in action, it describes the sequence of the activities (phases) which teachers have to do by using the model.

Phase one – Pose Area of Investigation to Students : It involves presenting problem to the learner. They are expected to find out answers to those unanswered questions and curiosities.

Phase two – Students identify and structure the problem: The students identify the problem mentioned in the situation. They frame the problem themselves. It is
believed that they understand the various dimensions’ of the problem.

**Phase three – Students conduct experiments and collect data**: Students search ways to find out the solution of the problem. They arrange the necessary material for experimentation and conduct a series of experiments. While planning and setting the experiment, they may alter one variable or another. Students may restructure the experiment depending on the nature of the problem. As a result of these, data is collected by them.

**Phase four – Students draw conclusions and solve problem**: Students arrange data in a systemic order and draw conclusion(s) on the basis of the data.

Sushma (1987) studied the effect of the BSIM, Concept Attainment Model and Traditional teaching on pupil’s achievement as well as their attitude towards BSIM and CAM was also determined. She found that BSIM and CAM were more effective than traditional teaching. Tabbasum Raina (1993) compared the effectiveness of BSIM in terms of pupil’s achievement in biology, pupil’s interest in inquiry activities and pupil’s reactions towards the model. Pre-test Equivalent Group Design (Campbell and Stanley, 1963) was used for the study. Purposive sample of girl students was taken from two government schools of the same locality. The sample was divided into two experimental groups which were equated on mental ability, socio-economic status and previous knowledge of biology. Findings indicated that Advance Organizer Model is more effective as compared to Biological Science Inquiry Model in terms of pupil’s scholastic achievement. However, when pupil’s interest in inquiry activities was taken into account Biological Science Inquiry Model has proved significantly more effective than the Advance Organizer Model. Pupils reacted more favorably towards the biological Science Inquiry Model than the Advance Organizer Model.

The analysis of above studies reveals that BSIM acts as a useful tool for enhancing the performance of students. Hence it was felt necessary that an investigation of present type would throw light on the BSIM based on which recommendations could be made. The findings of the study will offer suggestions for changing the method of teaching from traditional method to new method like BSIM.

**4. RESEARCH METHODOLOGY**

**Objective of the Study**: To study the effect of Biological Science Inquiry Model on scholastic achievement as compared to conventional method of teaching in teaching of Biology to IX grade students

**Hypothesis**: Null hypothesis was formulated. There is no significant difference in the efficacy of Biological Science Inquiry Model and conventional method of teaching for learning of concepts in Biology of IX grade students

**Method and Procedure**: Method and procedure of the study has been discussed under the following headings –

**Population and Sample**: In the present study students of ninth grade is considered as the population and the students enrolled in two different schools of NOIDA were taken as the sample and they are divided into two groups. One control group (n= 85), one experimental group (n=90).

**Design and Tools Used**: Pre-test, treatment, Post –test design was employed. ‘t’ test was used for finding out the effect of teaching strategy on scholastic achievement in Biology of ninth grade students. In order to collect the required data for the study, the tools used were – Shrivastava’s SESS, Tandon’s group test of intelligence, Lesson plans and an achievement test in Biology.

**Procedure**: The experiment was conducted in three stages – pre-test, treatment, post-test in the two groups. Pre-test stage – The groups were matched on the basis of socio-economic status and intelligence of the students. Treatment stage – Experimental group was treated by using the lesson plans prepared in accordance with the Biological Science Inquiry Model and the control group was treated by using the lesson plan prepared in accordance with conventional method of teaching. Post –test stage - This was the terminal stage in which achievement test in Biology (post test) was administered on experimental group and control group. In this way the terminal behavior of the sample was evaluated.

**Technique used**: ‘t’ test was used for analyzing the data in the present study.

**5. DATA ANALYSIS AND RESULT**

**Findings**: There exists significant difference with respect to learning of concepts in Biology. ‘t’ test was applied to test the significance of difference between means of gain scores of subject on achievement test in Biology.

**TABLE 1**: ‘t’ Value Of Control & Experimental Group

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>MEAN</th>
<th>S.D.</th>
<th>DEGREE OF FREEDOM</th>
<th>t VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>8</td>
<td>5</td>
<td>24.645</td>
<td>11.4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(90 + 85) - 2</td>
<td>173</td>
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<td></td>
<td></td>
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<td></td>
<td>= 15.91</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Significant at .01 or .05 level</td>
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<tr>
<td>Experimental</td>
<td>9</td>
<td>0</td>
<td>52.017</td>
<td>11.2</td>
<td>6</td>
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<td></td>
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<td></td>
<td>(90 + 85) - 2</td>
<td>173</td>
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<td>Significant at .01 or .05 level</td>
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**6. CONCLUSION**

It may be concluded that for learning of concepts in Biology of ninth class students Biological Science Inquiry Model was more effective than conventional method of teaching. This means it has very important implications for
day-to-day classroom teaching and also for the benefit of the students. It also makes the teaching process interactive, lively and interesting.

7. REFERENCES