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IMPACT OF TECHNOLOGY ON TEACHING METHODS- A FORWARD LOOK

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ABSTRACT

Teaching is a purposeful process which influences learning. Teaching and learning are closely related. In the modern age teaching-learning are accepted as one concept. Both teaching and learning in the instructional technology aim towards the same goal i.e. to bring desirable changes in the behaviour of the learner. Teaching learning task can be performed at three different levels, ranging from least thoughtful to most thoughtful behaviour or mode of action. The set of things of operations help in achieving the objectives from 'knowledge to evaluation' and in creating the conditions of learning from "stimulus-response to problem solving." Models of teaching have been developed to help a teacher to improve his capacity to teach and create a richer and more diverse environment for them. The biological science inquiry model which belongs to the information processing family of models is designed to teach the process of research in biology to affect the ways that student process information and to nurture open mindedness and an ability to suspend judgement and balance alternatives. The investigator feel that student taught with traditional method and Biological Science Inquiry Model based teaching method, have differences in their achievement level. Therefore to assess the achievement level of students the investigator has taken up this problem.

INTRODUCTION

Science is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe. In an older and closely related meaning,

"science" also refers to a body of knowledge itself, of the type that can be rationally explained and reliably applied. A practitioner of science is known as a scientist.

Biology is a natural science concerned with the study of life and living organisms, including their structure, function, growth, evolution, distribution, and taxonomy. Modern biology is a vast and eclectic field, composed of many branches and sub disciplines. However, despite the broad scope of biology, there are certain general and unifying concepts within it that govern all study and research, consolidating it into single, coherent fields.

Technology is often equated to applied science and its domain is generally thought to include mechanical, electrical, optical and electronic devices and instruments, the household and commercial gadgets, applications of chemical, biological, nuclear sciences and computer and telecommunication technologies. These various sub-domains of technology are, of course, interrelated. Much of technology that we see around is indeed informed by the basic principles of science. However, technology as a discipline has its own autonomy and should not be regarded as a mere extension of science. Basically science is an open-ended exploration; its end results are not fixed in advance. Technology, on the other hand, is also an exploration but usually with a definite goal in mind. Of course, technology is as much a creative process as science, since there are, in principle, infinite ways to reach the given goal.

About 40 years ago science education came to be recognized around the world as an independent field of research. The concerns of this research are distinct from the concerns of science and those of general education. Its methods and techniques were initially borrowed from the sciences but new methods are being developed suited to the research questions. Studies in the 1970s typically compared experimental classrooms with controls. New teaching aids were tried out, lecture methods were compared with activity-based teaching, and so on. These studies gave useful results in particular contexts but it was hard to replicate them. Conditions in classrooms are varied; teacher and student characteristics too vary widely. Teaching and learning are complex, context-dependent processes and one needs to first describe this complexity in order to understand it, before eventually aiming to control it.

Teaching is a purposeful process which influences learning. Teaching and learning are closely related. In the modern age teaching-learning are accepted as one concept. Both teaching

and learning in the instructional technology aim towards the same goal i.e. to bring desirable changes in the behaviour of the learner. Teaching learning task can be performed at three different levels, ranging fron least thoughtful to most thoughtful behaviour or mode of action. The set of things of operations help in achieving the objectives from 'knowledge to evaluation' and in creating the conditions of learning from "stimulus-response to problem solving."

Models of teaching have been developed to help a teacher to improve his capacity to teach and create a richer and more diverse environment for them.

The biological science inquiry model which belongs to the information processing family of models is designed to teach the process of research in biology to affect the ways that student process information and to nurture open mindedness and an ability to suspend judgement and balance alternatives. Though its emphasis on the community of scholars it also nurtures a spirit of cooperation and an ability to work with others in scientific inquiry. The biological science inquiry model was developed to achieve objectives of science teaching.

Biological Science Inquiry Model is one of the learner centered approach by (J. Schwab 1965) to teach scientific inquiry. Not only nature of science but process of research in biology can also be introduced to students. They can also learn planning and execution of projects and self learning involving acquisition of knowledge through observation of phenomena creative thinking and activities. BSIM is based on Science curriculum study. This approach emphasis the need to teach students to process information using techniques similar to those of research biologists (Joyce and Weil 1980).

EMERGENCE OF THE PROBLEM

Today in the changing educational scenario, there is explosion of knowledge in every field. In these changing conditions traditional methods could not keep pace with the changes in the pupils need and aspirations and most of these changes are affected directly or indirectly by science and technology. The traditional methods are just imparting the knowledge of the content, deep thinking is not involved. Biological Science Inquiry Model can be used for giving the students scientific knowledge, process of research in biology, commitment to scientific inquiry, open mindedness ability balance and alternatives, cooperative spirit and skill.

The educational institutions are failing to produce the quality researchers which is today's need. The level of research in biology and many other fields is not upto the mark. The interest in research should be developed from very early age. Biology is the basis for many other fields, so there is need to teach biology through models of teaching in order to make biology teaching effective. The investigator feel that student taught with traditional method and Biological Science Inquiry Model based teaching method, have differences in their achievement level. Therefore to assess the achievement level of students the investigator has taken up this problem.

STATEMENT OF THE PROBLEM

EFFECT OF BIOLOGICAL SCIENCE INQUIRY MODEL ON THE ACHIEVEMENT IN BIOLOGY AMONG VIII CLASS STUDENTS.

DELIMITATIONS OF THE PROBLEM

1. The study was confined to biology subject only.
2. The population chosen was restricted to boys and girls of class VIII.

OBJECTIVES

1. To study the achievement of students of Conventional Method group and Biological Science Inquiry Model group in Biology.
2. To study the achievement of boys of Conventional Method group and Biological Science Inquiry Model group in Biology.
3. To study the achievement of girls of Conventional Method group and Biological Science Inquiry Model group in Biology.

HYPOTHESES

1. There will be no significant difference between the effectiveness of Biological Science Inquiry Model over Conventional Method in Biology of 8^{th} class students.

2. There will be no significant difference between achievement of boys of Conventional Method group and Biological Science Inquiry Model group in Biology of 8th class students.
3. There will be no significant difference between achievement of girls of Conventional Method group and Biological Science Inquiry Model group in Biology of 8th class students.

SAMPLE

Sample of the study was restricted upto 240 students of 8th class.

DESIGN OF THE STUDY

In the present study, experimental control group design was followed.

TOOLS

For the collection of data in the present investigation following tools were used

1. Lesson plans based on the principle of Biological Science Inquiry Model.
2. Achievement test prepared by the investigator
3. Test of general Mental Ability prepared by S.S.Jalota.

STATISTICAL TECHNIQUES USED

In this study following statistical techniques were used.

1. **Descriptive Statistics:** Descriptive statistics such as Mean, Standard deviation were used to analyze the data. The skewness and kurtosis were also calculated to find the normality of the sample.
2. **Inferential Statistics:** "t" test was applied to compare the results obtained through descriptive statistics.
3. **Graphic Statistics:** To have a pictorial view of the scores of different variables; graphic statistics was used.

HYPOTHESIS I:

In order to test that "There will be no significant difference between the effectiveness of Biological Science Inquiry Model over Conventional Method in Biology of VIII class students."

The first hypothesis was framed to analyze the difference between the achievement scores of the students taught with Conventional method and students taught with Biological Science Inquiry Model. For this mean and standard deviation of the whole group were calculated. After finding these measures, the significance difference between two means was calculated and the t value was calculated. The results of the analysis are shown in table 1.

TABLE- 1

Showing Achievement Gain Scores

Method	**N**	**Mean**	**S.D.**	**S.ED**	**'t'**	**Interpretation**
Conventional Method	40	8.2	1.19	0.295	34.23	Significant at 0.01 level
Biological Science Inquiry Model	40	18.3	1.452			

It is clear from the table that as calculated value of 't' is more than the table value of 't'. so our hypothesis that, "There will be no significant difference between the effectiveness of Biological Science Inquiry Model over Conventional Method in Biology of VIII class students" stands rejected. So it shows that Biological Science Inquiry Model has positive effect on the achievement of the students over conventional method.

HYPOTHESIS II :

In order to test that "There will be no significant difference between achievement of boys of Conventional Method group and Biological Science Inquiry Model group in Biology of VIII class students."

This hypothesis was tested by calculating mean and standard deviation of test scores of boys taught through Conventional method and Biological Science Inquiry Model students. The hypothesis was further examined by applying 't' test. The result of the analysis is being shown in table 2.

TABLE-2

Showing Mean Scores of boys

Method	N	Mean	S.D.	S.ED	't'	Interpretation
Conventional Method	20	8.3	1.19	0.172	58.139	Significant at 0.01 level
Biological Science Inquiry Model	20	18.3	1.435			

It is clear from the table that as calculated value of 't' is more than the table value of 't'. so our hypothesis that, "There will be no significant difference between achievement of boys of Conventional Method group and Biological Science Inquiry Model group in Biology of VIII class students" stands rejected. It shows that the Biological Science Inquiry Model causes higher achievement in boys than the conventional method.

HYPOTHESIS III :

In order to test that "There will be no significant difference between achievement of girls of Conventional Method group and Biological Science Inquiry Model group in Biology of VIII class students."

This hypothesis was tested by calculating mean and standard deviation of test scores of girls taught through Conventional Method and Biological Science Inquiry Model. The hypothesis was further examined by applying 't' test. The result of the analysis is being shown in table 3.

TABLE- 3

Showing Mean Scores of Girls

Method	N	Mean	S.D.	S.ED	't'	Interpretation
Conventional Method	40	8.2	1.16	0.173	58.38	Significant at 0.01 level
Biological Science Inquiry Model	40	18.3	1.46			

It is clear from the table that as calculated value of 't' is more than the table value of 't'. so our hypothesis that, "There will be no significant difference between achievement of girls of Conventional Method group and Biological Science Inquiry Model group in Biology of VIII class students" stands rejected. It shows that the Biological Science Inquiry Model causes higher achievement in girls than the conventional method.

FINDINGS

It shows that Biological Science Inquiry Model has positive effect on the achievement of the students over conventional method. It shows that the Biological Science Inquiry Model causes higher achievement in boys than the conventional method. It shows that the Biological Science Inquiry Model causes higher achievement in girls than the conventional method.

CONCLUSION

The findings of the study have got lasting implications for practicing teachers as it is established that if students are taught through Biological Science Inquiry Model through this method there is significant improvement in student's achievement. Moreover, it has got implications for textbook writers who could use the principles of Biological Science Inquiry Model while writing the textbooks for science.

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