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Understanding science through inquiry learning approach

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Abstract
The present research is an attempt of using Inquiry Learning Approach in Understanding Science. To study the effectiveness of Inquiry Learning Approach in context to achievement of F.Y. B.Sc. Students. The hypothesis of the study was 'There will be no significant difference between the mean achievement scores of Pre-test and Post-test'. The study was experimental in nature. The Single Group Pre-test Post-test design was used. The population of the study comprised of F.Y. B.Sc. students of Sardar Patel University. The sample of the present study comprised of 100 F.Y. B.Sc. students of J & J Patel Science College, Nadiad. The sample was selected using convenient sampling technique. The tools used to collect the data were Achievement Test and Reaction Scale. The data was analyzed using t – test. The major findings of the study reveal that understanding Science using Inquiry Learning Approach was found to be effective after the intervention programme.

Keywords: inquiry learning approach, science, inquiry tasks

Introduction

Education is a process in which and by which knowledge, character and behavior of the young are shaped and molded.

The Indian education system mainly focuses on theoretical knowledge rather than practical knowledge. In this skill oriented world theoretical knowledge is not sufficient to sharpen any individual's personality. The classroom teaching emphasizes merely on textbook / Reference books content. Students memorize the content and pen down in the examination. This will not provide enough learning experiences and exposure to the students. The teacher has to go beyond the textbook/ Reference books content and relate it with the daily life situations that provide a variety of experiences. The teacher has to create learning environment in which students think out of the box and learn to ask questions, discuss and solve problems, use innovative ideas, create new things, evaluate their own performance and sharpen their personality. Thus teaching learning process should be learner centric rather than teacher centric. Learner centric classrooms help students to actively engage in the learning process and understand the concepts rather than rote memorization of the concepts.

'Science' is an organized and systematized body of knowledge obtained by inquiry and investigation based upon careful and repeated experimental observations. Science is both a body of knowledge and the process of acquiring knowledge, Science did not need to be a process for identifying stable truths about the world that we live in, but rather science could be a flexible and multi-directional inquiry driven process of thinking and learning. Science in the classroom should more closely reflect the work of practicing scientists (Schwab J. 1989) Science is mainly taught using traditional methods. The learners are passive listeners and teachers are active. The nature of Science subject is investigative that demands the active participation of learners.

Teaching Science is not about preparing students for a world that is static and fixed, but it concerns getting students ready to cope with upcoming changes and challenges in this skillful era. Traditional direct instructions in the Science classroom generally focus on the mastery of content with less emphasis on the development of scientific skills and attitudes; students are the receivers while the teachers are the dispenser. Science teaching enhances essential skills and knowledge for success of students in their later life. Without science, modern society would not be where it is today in terms of technology, exploration, and innovation. Science teaches students to follow a logical process to solve a problem. From using a scientific method to investigate a solution of a problem, students learn to identify and solve problems in their daily life. These skills are related with other school subjects, real-world situations, and even family relationship. Harmonious development of Child's personality and social efficiency are the general aims of education. Science subject deals with the all above aspects of learning as a part of curriculum. The lack of various scientific skills such as observation, accuracy, perfectness, experimentation, demonstration, etc. will not develop scientific attitude and interest towards the subject. Inquiry is a process of understanding the characteristics of science through scientific experiments. It is through try outs, testing and discovering further information. Inquiry activities refer to the process of finding and getting information or understanding a concept, theory or a question and using it to carry out investigations of the problem.

The present research is an attempt of using Inquiry Learning Approach in Understanding Science.

Objectives of the Study

To study the effectiveness of Inquiry Learning Approach in context to achievement of F.Y. B.Sc. Students

Hypotheses
There will be no significant difference between the mean achievement scores of Pre-test and Post-test.

Research Type and Design
The study was experimental in nature. The Single Group Pre-test Post-test design was used.

Research Methodology of the Study
a. **Population of the study**
The population of the present study comprised of F.Y. B.Sc. students of Sardar Patel University.
b. **Sampling method**
The sample of the present study comprised of 100 F.Y. B.Sc. students of J & J Patel Science College, Nadiad. The sample was selected using convenient sampling technique.

Tools and Techniques
Following tools were used for the present study to collect the data.
a. **Achievement Test**
The researcher constructed achievement test namely Pre-test and Post-test. The aim of the achievement test was to obtain numerical scores regarding understanding of Science through Inquiry Learning Approach.
b. **Preparation of Reaction Scale**
The researcher constructed reaction scale. The aim of the reaction scale was to get reactions from the students learning Science using Inquiry Learning Approach.

Data Collection
The researcher selected one unit name Periodic elements. The Achievement test (Pre-test) was design and administered. The Inquiry tasks were prepared by the researcher on selected topic. The Tasks were administered on the group. The post-test was administered to know the effectiveness of Inquiry Learning Approach in both the groups. The researcher gave reaction scale to the students to know their responses about learning Science using Inquiry Learning Approach.

Data Analysis
To study the effect of Inquiry Learning Approach in terms of Achievement of Students, Achievement test (Pre-test and Post-test) in Science was used to obtain data and t-test was employed to analyze the data. Results of descriptive statistics and t - test are presented in the following table.

Table 1: Analysis of Post-test- Mean, SD, SEm, r, dfand 't' value

Group	No of Students	Mean	SD	SEM	R	DF	t-value & Significance Level
Control	50	15.82	6.20	0.78	0.99	49	27.58**
Experimental	50	19.68	6.26	0.79			

Interpretation
The computed t value 27.58 is greater than that of the table t value 2.68 at 0.01 levels for 49 degree of freedom. The calculated r value is 0.99; hence there is positive high correlation between the mean achievement scores of Pre-test & Post-test.
Therefore, the Null hypothesis that there will be no significant difference between the mean achievement scores of Pre-test & Post-test of is rejected. It means that, there is significant difference between the mean achievement scores of Pre-test & Post-test. Thus Inquiry Learning Approach was found effective in teaching of Science.

Analysis of Reaction Scale
1. 95% of students were of the opinion that they understand the topic using inquiry learning approach.
2. 90% of students were of the view that the inquiry tasks prepared were very interesting to do inquiry.
3. 88% of students said that such type of approach needs to be used in classroom teaching by the faculty members.
4. 75% of students were of the opinion that they learn skill of inquiry using this approach.

Findings of the Study
The major findings of the study reveal that understanding Science using Inquiry Learning Approach was found to be effective after the intervention programme.

Conclusion
Even though this study was limited in duration and scope, the results clearly support earlier research on Inquiry Learning Approach. It has enhanced learning of the students. This kind of teaching can in volved Students in discussion which makes learning participatory, joyful and interesting. It has also developed the critical and problem solving ability of the students. Overall there was a positive impact of Inquiry Learning Approach in the Science subject on the Students. The researcher would like to state that the study was a rich learning with insightful experience.

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