# IMPACT OF INQUIRY BASED INSTRUCTIONS ON LEARNING OF SCHOOL STUDENTS

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## ABSTRACT

*The present study has been designed to study the effect of Inquiry Based Instructions on Learning of secondary school students. A pre-test and post-test design was administered in order to analyze and interpret the data on the mean gain Learning Satisfaction scores in science of experimental and control groups. The total sample of 50 students of senior secondary school situated in south west district of New Delhi was drawn. In order to obtain two matched group of students, Dr. Jalota's general Intelligence Test was used. Two groups were formed consisting of 25 students each. The findings of the study revealed that the Inquiry Based Instruction was more effective than the traditional teaching approach. Furthermore, it also exhibits that mean gain score of high intelligence students of experimental group was significantly higher than the control group.*

***Key Words:*** *Inquiry Based Instructions, Learning Satisfaction*

## INTRODUCTION

Inquiry based Instructions is seeking information and knowledge by questioning. It starts by questions, problems or scenarios, rather than simply presenting established facts or portraying a smooth path to knowledge. The term Inquiry based Instruction is interchangeable with a numerous synonyms such as Inquiry based learning, guided inquiry, research-based teaching, problem based learning and discovery learning. It is very closely related to the development and practice of thinking skill. The teacher is a facilitator and helps the students to move in the right direction. An old adage states: "Tell me and I forget, show me and I remember, involve me and I understand." The last part of this statement is an essence of Inquiry based Instruction. The student who plays the role of an inquirer will be put in a situation where he questions to develop his knowledge and understanding of the concepts.

Inquiry based Instruction is a pedagogy which enables the students to acquire knowledge and the key attributes is the learning stimulated by inquiry. It is a child-centred approach where a child moves to self directed learning and an active approach to learning. Inquiry learning involves developing questions, making observations, selecting methods for experimentation collecting, analysing, interpreting data and finally outlining possible explanations. It is an approach to teaching and learning that places the students' questions, ideas and observations at the centre of the learning experience. Educators play an active role throughout the process by establishing a culture where ideas are respectfully challenged, tested, redefined and viewed as improvable, moving children from a position of wondering to a position of enacted understanding and further questioning (Scardamalia, 2002).

Learning Satisfaction is the major criteria used to evaluate the personal satisfaction towards his academic environment (Lee, 2008). Learning Satisfaction plays a major role in shaping a student to become successful in pursuing their education. Students are viewed as customers of education market and as such their satisfaction is invaluable. Understanding the students learning satisfaction is to be able to provide improvements that may contribute to quality (Ansari, 2011). Learning satisfaction is the pleasure or contentment that a student feels when he has achieved something. Teachers who show care or appreciation for their students influenced the student's satisfaction of learning (Teven & Croskey, 1997). The factors that affect students learning satisfaction are the instructor, technology, course management, Instruction and interactivity. Satisfaction can be manifested in student feelings and attitude towards learning activities; a cheerful mood or positive outlook shows satisfaction, while an unhappy mood or negative outlook shows dissatisfaction.

Arbaugh (2000) states that learning satisfaction includes the individual's feelings and attitudes towards the education process and the perceived level of fulfilment connected to the individual's desire to learn. In the learning environment because of frequent experiences learning satisfaction is a constantly changing construction in the world of higher education. A primary objective of higher education should be to build more happy clients, whether they are students, parents of students, graduates, or industry employers. Focusing on improving customer satisfaction at colleges and universities is therefore essential for the growth of customer value..Students have gradually started to see themselves as clients or customers of a service company, and the high quality requirements and performance of the educational institutions are related with this. As a result, student satisfaction is becoming more and more significant. Mamun and Das (1999) completed a study and highlighted several variables that would attract students. The authors have diverse views on the idea of satisfaction with learning. Each author has his or her own viewpoint on the needs of university students. This included library facilities, laboratory facilities and internship support as some of the key factors for satisfying the students. A Haque et al. ( 2011) study identified independent variables that may influence student satisfaction based on university services. These include teaching quality, student study facilities, library book collections and services, campus amenities, canteen facilities , group discussions room, sport programmes, ICT facilities (PC and Internet) etc. Student satisfaction is a major factor in persevering in a course of action, as students who are satisfied with their campus experiences appear to make an effort to graduate (Edens ,2012).

Many studies have been taken up on Inquiry based Teaching in teaching learning process. Arthur (2005) found that Inquiry based Instruction brings in a sense of satisfaction in the students as to the knowledge and understanding of the concepts. It emerged during the interviews that corresponded with the theme of science as a subject the students enjoyed the lesson. Nuangchalerm and Thammasena (2009) revealed that Inquiry based instructions also enhances student's

cognitive and analytical thinking, when the learner is fully satisfied. Hwang et. al(2015) found that the educational computer game based on Inquiry based Instructions improves students performance, motivation and learning styles. Eltanahy and Forawi (2019) found positive perception and satisfaction in students when taught through Inquiry based Instructions.

## SIGNIFICANCE OF THE STUDY

In the present Indian Education system, we still follow the traditional method of teaching without considering the need of the child and the society. Besides the fact that our educators are aware of the different approaches and strategies to be adapted inside a classroom but it is really unfortunate that our teachers follow the traditional lecture method and all other methods do not have their applicability.

Science is fundamentally concerned with exploring and interpreting the physical world through the three fundamental areas of Physics, Chemistry and Biology. Thus this study will help students to approach the topic from the point of inquiry, thus leading them to more information, views and providing them with the raw material needed to construct knowledge and understanding. It will lead to Learning Satisfaction among students due to which they will develop interest in science and develop understanding on how the different scientific processes are carried out.

## OBJECTIVES:

1. To compare the mean gain scores of Learning Satisfaction of $7^{th}$ class students of experimental and control group.
2. To compare the mean gain scores of Learning Satisfaction of $7^{th}$ class students with respect to their high and average intelligence.

## HYPOTHESES:

1. There is no significant difference in the mean gain scores of Learning Satisfaction of $7^{th}$ class students of experimental and control group.
2. There is no significant difference in the mean gain scores of Learning Satisfaction of $7^{th}$ class students with respect to their high and average intelligence.

## SAMPLE:

The sample of the study was comprised of 60 students of $7^{th}$ class of R.D.Rajpal Public School, New Delhi, affiliated to Central Board of Secondary Education, New Delhi. In order to obtain two matched group of students, Dr. Jalota's general Intelligence Test was administered on 100 students of class $7^{th}$. On the basis of intelligence test 60 school students were selected and divided into two different groups i.e. experimental and control group of 30 students each. Both experimental and control groups will be further divided into two groups i.e. 15 in high intelligence, 15 in average level respectively.

## DESIGN:

The study was experimental in nature. A pre-test post-test design was employed. The experimental group was taught through Inquiry based Instruction and control group was taught through traditional approach. In the present study, Inquiry based Instruction was an independent variable and Learning Satisfaction was a dependent variable.

**TOOLS USED:**

The tools used in the study were:

1. Group Test of General Mental Ability by Dr. S.S. Jalota was used for matching the groups on the basis of intelligence.
2. Learning Satisfaction Tool in Science was developed by the investigator.
3. Twenty lesson plans based on Inquiry based Instruction prepared by the investigator.

**PROCEDURE:**

After the sample was selected and the students were allocated in the groups for different instructional approaches, the experiment was conducted in three phase as following:

**Phase I: Pre- Experimental Stage:** A pre-test of Learning Satisfaction was administered to the students of both the experimental and control group. The answer sheets were scored to acquire the information regarding the previous knowledge of the students.

**Phase II: Experimental Stage:** The treatment was given to the experimental groups in this stage. The experimental groups were taught through Inquiry based instruction. 20 lessons based on Inquiry based instruction in science were taught to students. On the other hand, the control group was exposed to conventional teaching. The content was selected from prescribed C.B.S.E. science text book for class $7^{th}$. Same topics were taught to all groups by same teacher.

**Phase III: Post-Experimental Stage:** After the completion of the course, post-test (same Learning Satisfaction tool) was administered to the students of both groups. The answer sheets were scored with the help of scoring key. The scores of experimental and control group were correlated in accordance with their pre-test and post-test scores. The difference between pre-test and post-test scores was the gain achievement scores.

**ANALYSIS AND INTERPRETATION OF THE REULTS:**

The analysis of the data was subjected to statistics such as, mean, standard deviation and t-ratio techniques.

**RESULTS:**

The results are presented in Table1 and 2.

**Table 1: Showing t-ratio of mean gain learning satisfaction scores between experimental and control group.**

| Group | N | Mean | S.D. | t-ratio | Significance Level |
|---|---|---|---|---|---|
| Experimental Group | 30 | 5.24 | 3.72 | 3.28** | 0.01 |
| Control Group | 30 | 2.78 | 1.85 | | |

**Significant at the 0.01 level of significance

(Critical Value 2.00 at 0.05 and 2.66 at 0.01 levels, df 58)

Table 1 exhibits that the experimental group has mean gain score 5.24, which is higher than the mean gain score of 2.78 of control group. The t-ratio for analyzing the significance of difference in mean gain achievement scores of experimental group and control group is 3.28, which is significant at the 0.01 level of significance, as compared to table value (t, 58). Consequently, the hypothesis H1: There will be no significant difference in the mean gain scores of Learning Satisfaction of 7$^{th}$ class students of experimental and control group, is rejected. Hence, the results point out that experimental group taught through inquiry based instructions outperformed control group taught through traditional methodology as indicated by the higher mean gain learning satisfaction scores of science of experimental group. The results were supported by the findings of Nuangchalerm and Thammasena (2009) revealed that the cognitive development, analytical thinking and learning satisfaction of students was high when taught through inquiry based instruction. Hwang et al. (2015) found significant difference in the scores showing increase in students' performance and learning satisfaction when taught through inquiry based instruction. Metwally et al. (2017) found a highly statistical significant difference in Inquiry based learning group and conventional group regarding students learning satisfaction. Eltanahy and Forawi (2019) revealed that teachers showed progress in applying inquiry instruction and students became more engaged in learning.

**Table 2: Showing t-ratio of mean gain learning satisfaction scores between high and average intelligence students.**

| Group | N | Mean | S.D. | t-ratio | Significance Level |
|---|---|---|---|---|---|
| High Intelligence | 30 | 5.61 | 1.73 | 2.96 | 0.01 |
| Average Intelligence | 30 | 3.86 | 2.79 | | |

**Significant at the 0.01 level of significance
(Critical Value 2.00 at 0.05 and 2.66 at 0.01 levels, df 58)

Table 2 exhibits that the high intelligence students has mean gain score 5.61, which is higher than the mean gain score of 3.86 of average intelligence students. The t-ratio for analyzing the significance of difference in mean gain learning satisfaction scores of high intelligence students and average intelligence students is 2.96, which is significant at the 0.01 level of significance, as compared to table value (t, 58). Consequently, the hypothesis H2: There will be no significant difference in the mean gain scores of learning satisfaction of 7$^{th}$ class students with respect to their high and average intelligence, is rejected. In that event, the results point out high intelligence students outperformed average intelligence students on mean gain Learning Satisfaction scores in science. The results are supported by Smallhorn et al. (2015) that through the inquiry based instructions, learning satisfaction scores improved drastically, especially of average intelligent students. Chang (2019) found that students with high intelligence taught through inquiry based instruction showed significant enhancement in learning satisfaction as

compared to the students with average intelligence.

**FINDINGS**

1. The mean gain Learning Satisfaction scores of experimental group taught through Inquiry based Instruction was significantly higher than the mean gain score of control group taught through traditional approach in science.
2. The mean gain Learning Satisfaction score of high intelligence, when taught through Inquiry based Instruction was significantly higher than the mean gain score of average intelligence students.

**EDUCATION IMPLICATIONS**

After completion of this experimental study some suggestions were given for teachers, teacher educators, administrators, curriculum developers, researchers and students as well.

- Inquiry based Instruction was found to be effective in enhancement of Learning Satisfaction of students in science as compared to traditional teaching approach. So, educators must integrate these instructions in their teaching learning process which will help students to acquire the concepts effectively and thus improve their comprehension power and thought process leading to fulfillment and pleasure in studying science.

- Faculty development programs, refresher and orientation courses should be conducted from time to time so that the in-service educators could be given knowledge how to carry out the Inquiry based lessons.

- Administrators should enrich their libraries and laboratories with latest instructional materials so that execution of Inquiry based instruction can be effective.

- Curriculum developers should develop instructional material in such a way that understanding of different concepts and principles can take place at faster rate in students.

- Government should take step forward to provide Inquiry based curriculum facilities to government as well as to private schools at low cost.

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