



A Study of Mathematical Reasoning Ability of Science stream students in context to Certain Variables

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1. Introduction

Mathematics provides an effective way of building mental discipline and encourages logical reasoning and mental rigor. In addition, mathematical knowledge plays a crucial role in understanding the contents of other school subjects such as science, social studies, and even music and art. Mathematics is of central importance to modern society. It provides the vital underpinning of the knowledge of economy. It is essential in the physical sciences, technology, business, financial services and many areas of ICT. It is also of growing importance in biology, medicine and many of the social sciences.

Reasoning is a central and important thinking skill: thinkers need to be able to support conclusions with structured reasons and evidence, make informed, reasoned decisions and make valid inferences. ... These are creative thinking skills, enquiry skills, information processing skills and problem-solving skills. Mathematical Reasoning is a skill that allows students to employ critical thinking in mathematics. It involves the use of cognitive thinking, which has a logical approach. This skill enables students to solve a mathematical question using the fundamentals of the subject. Mathematical reasoning or the principle of mathematical reasoning is a part of mathematics where we determine the truth values of the given statements. These reasoning statements are common in most of the competitive exams like JEE and the questions are extremely easy and fun to solve.

2. Statement of Problem

A Study of Mathematical Reasoning Ability of Science stream students in context to Certain Variables

3. Importance of Research

Mathematical reasoning is important as it helps to develop critical thinking and understand Maths in a more meaningful way. The concepts of reasoning not only help the students to have a deeper understanding of the subject but also helps in having a wider perspective to logical statements.

4. Objective of Research

The objectives of present research are as follows

- 1.To know the mathematical reasoning of science stream students.
- 2.To know the mathematical reasoning of science stream students in relation to Gender.
- 3.To know the mathematical reasoning of science stream students in relation to Educational Achievements.

5. Variables of the Research

In present research there were two independent variables are there. In present research Gender and Educational Achievement are independent variable while Mathematical reasoning is dependent variable.

6. Hypothesis of Research

The hypothesis of present research is as under.

Ho₁ There is no significant difference between mean score of Boys and Girls students on Mathematical reasoning ability test.

Ho₂ There is no significant difference between mean score of students having higher and lower achievement on Mathematical reasoning ability test.

7. Population

In present research all the students studying in science stream A group students of Ahmedabad city are the population.

8. Sample

In present research the researcher has selected 100 students of A group science stream by random sampling method.

9. Research Method

In present research the researcher has to measure mathematical reasoning ability of science stream students therefore Survey method was used as a research method.

10. Research Tool

The researcher has used standardized mathematical reasoning ability test prepared and standardized by Dr. Satishprakash Shukla.

11. Data Collection

The researcher has taken prior permission of Principal of selected schools, then researcher has explained the students about research aims and gave the standardized test.

12. Data Analysis

The researcher has analyzed data by statistical techniques like mean, standard deviation and t value.

13. Testing of Hypothesis

The researcher has testing hypothesis are as under

Table 1

Group	Numbers	Mean	S.D.	t value	Significant level
Boys	58	29.35	8.35	0.53	NS
Girls	42	28.41	9.24		

From above table we can see that the mean value of boy's students is 29.35 and standard deviation is 8.35 while the mean value of girl's students is 28.41 and standard deviation is 9.24. the t value is 0.53 which is less than tabulated value 1.96 at 0.05 level therefore there is no significant difference and **Ho₁** **There is no significant difference between mean score of Boys and Girls students on Mathematical reasoning ability test** is accepted.

Table 2

Group	Numbers	Mean	S.D.	t value	Significant level
Higher Achievement	51	29.89	8.65	5.09	0.01
Lower Achievement	49	21.23	7.41		

From above table we can see that the mean value of students having higher achievement are 29.89 and standard deviation is 8.65 while the mean value of lower achievement is 21.23 and standard deviation

is 7.41. the t value is 5.09 which is high than tabulated value 2.58 at 0.01 level therefore there is significant difference and **H₀₂ There is no significant difference between mean score of students having higher and lower achievement on Mathematical reasoning ability test.** is rejected.

14. Findings

The findings of present research are as under

1. There is no significant difference between the mean score of boys and girls' students it means the mathematical ability are same. It means the mathematical reasoning ability of boys and girls are same.
2. There is significant difference between the mean score of students having higher and lower achievement. The students having higher achievement has higher mathematical reasoning ability than the students having lower achievement.

1. Educational Implications

The educational implications or suggestions to increase the mathematical reasoning ability in the students are as under.

1. Help students ask 'why?' The most important way to teach mathematical reasoning is to instruct students to justify their answers. ...
2. Teach proofs. Geometric proofs are a practical application of mathematical reasoning. ...
3. Have students work together.
4. Reasoning ability develops with proper teaching and training
5. Encourage students to think independently and develop their own ideas
6. Encourage students in discussions about a variety of topics, issues, and current events. answer of question.
7. Build confidence. ...
8. Encourage questioning and make space for curiosity
9. Emphasize conceptual understanding over procedure.
10. Provide authentic problems that increase students' drive to engage with math. ...
11. Share positive attitudes about math.

16 Conclusion

The current issue is a never quenching thirst. Efforts in the direction have been done by many scholars and experts, and are still undergoing by many. Such efforts will continue as long as there is innovation and creativity in the work method of teachers. From the present research we can conclude that many factors affect the mathematical reasoning ability which we have to think over it.

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