



A Study Of Mathematical Interest Of High School Students In Relation To Their Gender And Problem-Solving Ability

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Abstract: The main purpose of the present study was to investigate the Mathematical Interest of High School Students in Relation to their Gender and Problem-Solving Ability. The sample used for the study consisted of 206 students of govt. high school 103 male and 103 female students made up the total sample. Data were gathered by using the Mathematical Interest Inventory developed and standardized by L.N. Dubey and Problem-Solving Ability test developed and standardized by Dr. Rooprekha Garg. The data interpretation involved the use of analysis of variance (ANOVA). Results showed that govt high school students do not differ in Mathematical interest for their Gender and Problem-solving ability. Gender and Problem-solving ability do not have an interactional influence on the Mathematical Interest of high school students at a 0.05 level of significance.

Index Terms - Mathematical Interest, Gender and Problem-Solving Ability.

INTRODUCTION

Mathematics education is a critical component of the academic curriculum, providing students with essential skills and knowledge applicable to various fields. However, concerns have arisen regarding students' declining interest and engagement in mathematics, particularly during the high school years. Understanding the factors that influence mathematical interest among high school students is vital for educators and policymakers to develop effective strategies that promote engagement and improve learning outcomes.

Gender has been a topic of significant interest and debate in the field of mathematics education. Historically, there have been stereotypes and biases suggesting that males possess higher mathematical ability and interest compared to females. These perceptions can impact students' self-perception, confidence, and motivation, potentially leading to disparities in mathematical interest levels. However, it is crucial to examine and challenge these assumptions to foster a more inclusive and equitable learning environment for all students.

Moreover, problem-solving ability is a crucial aspect of mathematics education and is closely linked to students' interest and achievement in the subject. Problem-solving skills enable students to apply mathematical concepts to real-life situations, fostering critical thinking, creativity, and analytical reasoning. Exploring the relationship between problem-solving ability and mathematical interest can provide insights into how these factors interact and influence students' engagement, motivation, and performance in mathematics.

This study aims to investigate the mathematical interest levels among high school students in relation to their gender and problem-solving ability. By examining potential gender differences in mathematical interest, the research seeks to challenge stereotypes and biases and contribute to creating a more inclusive and equitable mathematics learning environment. Additionally, exploring the relationship between problem-solving ability and mathematical interest can inform instructional practices and interventions that promote critical thinking and problem-solving skills among high school students. The findings will provide valuable insights for

educators, policymakers, and educational institutions to develop targeted interventions and strategies that enhance students' mathematical interest and foster a positive and engaging mathematics learning experience.

Ultimately, the research aims to promote a more comprehensive understanding of the factors influencing mathematical interest among high school students, paving the way for effective educational practices and interventions that can support students' motivation, perseverance, and achievement in mathematics. By cultivating a strong mathematical interest among high school students, educators can contribute to the development of a competent and mathematically literate generation prepared for the challenges and opportunities of the future.

Significance Of the study:

The research paper titled "A Study of Mathematical Interest of High School Students in Relation to their Gender and Problem-Solving Ability" aims to investigate the significance of mathematical interest and problem-solving ability among high school students, with a specific focus on gender differences. The paper seeks to understand the factors that influence students' engagement with mathematics and their capacity to solve complex mathematical problems.

Mathematical interest plays a vital role in learning, as it enhances student engagement, motivation, and overall learning outcomes. Moreover, problem-solving is a fundamental aspect of mathematics education, with its applicability extending beyond the subject itself to real-life situations. Developing strong problem-solving skills is essential for students' success not only in mathematics but also in various other domains.

By exploring the relationship between mathematical interest, gender, and problem-solving ability, this research aims to provide valuable insights into how these factors interrelate. Understanding the influence of gender and problem-solving ability on mathematical interest can help to identify any gender-based disparities or stereotypes that may exist. This research has the potential to contribute to the development of inclusive and equitable mathematics education practices by addressing and mitigating any gender-related gaps.

REVIEW OF RELATED LITERATURE

Sarmah and Hazarika (2012) explored the elements that influence students' interest in mathematics based on gender and type of school. A stratified random sampling technique was used to select the sample. The researcher collected data from 384 students of the 8th class from 13 different schools in Guwahati, Assam, India, using a standardised tool. The collected data were analysed by using statistical approaches such as mean, measure of dispersion, and t-test. The findings revealed a considerable difference in interest in mathematics between boys and girls, particularly boys showing more interest than girls. The findings also demonstrated that gender had no effect on students' interest in mathematics in both public (SEBA) and private (CBSE) schools.

Gupta and Pasrija (2015) evaluated the effect of problem-solving ability on high school students' academic achievement. The data was gathered using the descriptive method. The study included 250 students (118 rural and 132 urban) enrolled in 10th-grade CBSE-affiliated private schools in Haryana's Rohtak district, who were chosen at random. The data were statistically evaluated using ANOVA and t-test. The study's findings demonstrated that problem-solving abilities had a substantial effect on the academic achievement of students. ANOVA and t-test were used to analyze the data. Furthermore, female pupils outperformed male students.

Senthamarai et al. (2016) studied the problem-solving ability in mathematics of IX standard students in the Dindigul district. In this study, the researcher aims to investigate the problem-solving ability in mathematics of 10th-grade students in the Dindigul district of Tamilnadu. The sample consists of 80 students in the tenth grade from two types of institutes: government and private secondary schools. The sample was chosen using a random sampling technique. The data were gathered using a problem-solving ability test in mathematics. The survey method was used by the researcher. The findings indicated that IX standard students have an average level of problem-solving ability in mathematics.

Rimma (2017) examined a study on Interest and Engagement: Perspectives on Mathematics in the Classroom. The findings suggested that students showed the least interest in mathematics as a result of teachers' incorrect methods of teaching, and few reported that interest is reflected through positive involvement in mathematics classes. The results also revealed teachers had improved students' interest and engagement during classroom interaction.

Salifu and Bakari (2022) performed a study exploring the relationship between students' perception, interest, and mathematics achievement. The descriptive survey method was utilized to collect data. The researcher employed simple random and purposive sampling techniques to select a sample of 232 students from Bole Senior High School in Ghana for this investigation. Descriptive and inferential statistics were used

to analyze the data. The findings demonstrated that pupils had a poor perception of mathematics nevertheless a good interest in it. Furthermore, the findings demonstrated that students' interest and perception substantially affected their mathematical achievement. Again, a positive, moderate and significant connection was found between students' mathematical interest and achievement.

OBJECTIVES OF THE STUDY

1. To study the influence of Gender on the Mathematical Interest of High School Students.
2. To study the influence of problem-solving ability on the Mathematical Interest of High School Students.
3. To study the influence of interaction between Gender and Problem-Solving ability on the Mathematical Interest of High School Students.

HYPOTHESES OF THE STUDY

1. There will be no significant influence of Gender on the Mathematical Interest of High School Students.
2. There will be no significant influence of problem-solving ability on the Mathematical Interest of High School Students.
3. There will be no significant influence of interaction between Gender and Problem-Solving ability on the Mathematical Interest of High School Students.

DELIMITATIONS OF THE STUDY:

1. The study was delimited to 206 students of the 10th class only.
2. The study was delimited to government schools affiliated with the Himachal Pradesh Board of School Education.
3. The study was delimited to the Mandi district of Himachal Pradesh only.

METHODOLOGY:

The method used for conducting this study was the Descriptive Survey method.

Sample used

The present study involved 206 (103 male and 103 female) students currently enrolled in the 10th grade at a government high school in the Mandi district of Himachal Pradesh. The school was affiliated with the Himachal Pradesh Board of School Education, Dharamshala. The selection of participants was done randomly to ensure a representative sample.

Variables

Mathematical Interest was regarded as a dependent variable whereas Problem-Solving Ability and Gender were regarded as independent variables.

Tools Used

1. Mathematical Interest Inventory developed and standardized by L.N. Dubey.
2. Problem-Solving Ability test developed and standardized by Dr. Rooprekha Garg.

Research Design: 2X3 ANOVA

Statistical Techniques Used: Analysis of Variance (ANOVA) was employed as the statistical technique in this study.

ANALYSIS AND INTERPRETATION OF DATA

The statistical technique of analysis of variance (2x3) factorial design with two levels of Gender, namely male and female and three levels of Problem-Solving Ability namely High, Average and Low, was applied to study the main effects of Gender and Problem -Solving ability of sampled population on Mathematical Interest of High School Students.

TABLE 1.1**Summary of 2x3 factorial design ANOVA of mathematical interest of high school students**

Source of Variance	Df	SS	MSS	F-Value	Remarks at 0.05 level
Gender	1	.04	.04	.003	Non-significant
Problem-Solving Ability	2	11.75	5.87	0.453	Non-significant
Gender X Problem-Solving Ability	2	7.63	3.81	0.295	Non-significant
Error	200	2590.65	12.95		
Total	205				

Influence of Gender on Mathematical Interest of High School Students

Table 1.1 shows that the F-Value for Gender is 0.003 at df (1, 205) which is not significant at a 0.05 level of confidence. It indicates that the mean scores of mathematical interest of male students and female students did not differ significantly. There was no significant influence of gender on mathematical interest of high school students. Thus, the null hypothesis, "There will be no significant influence of gender on the mathematical interest of high school students" was not rejected. Thus, it is interpreted that male and female high school students were found to have mathematical interest to the same extent.

Influence of Problem-solving Ability on the mathematical interest of high school students

The F Value For problem-solving ability is 0.453 at df (2, 205) which is not significant at a 0.05 level of confidence (vide Table 1.1). It indicates that the mean scores of Mathematical interest of High, Average and low problem-solving ability did not differ significantly. That is, there was no significant influence of problem-solving ability on the mathematical interest of high school students. Thus, the null hypothesis, "There will be no significant influence of problem-solving ability on the mathematical interest of high school students" was not rejected. Thus, it is interpreted that high school students with high, average and low problem-solving abilities were found to have Mathematical interest to the same extent.

Influence of Interaction between Gender and Problem-solving Ability on the mathematical interest of high school students

From Table 1.1, it can be seen that the F value for interaction between gender and problem-solving ability of high school students is 0.295 which is not significant at 0.05 level of confidence. It indicates that the mean score of mathematical interest of male and female students with high, average and low problem-solving abilities in high school students did not differ significantly. That is, there was no significant influence of interaction between gender and problem-solving ability on the mathematical interest of high school students. Thus, the null hypothesis "There will be no significant influence of interaction between gender and problem-solving ability on the mathematical interest of high school students" was not rejected. Therefore, it may be said that mathematical interest was found to be independent of the influence of interaction between gender and the Problem-solving ability of high school students.

Summary:

Based on the analysis and interpretation of the data the researcher concluded that the major findings of the study are as follows:

1. There was no significant influence of gender on mathematical interest of high school students.
2. There was no significant influence of problem-solving ability on the mathematical interest of Mathematical Interest.
3. There was no significant influence of interaction between gender and problem-solving ability on the mathematical interest of high school students.

The findings showed that High School Students do not differ in Mathematical Interest for their Gender and Problem-solving ability. Gender and Problem-solving ability do not have an interactional influence on the Mathematical Interest of high school students at a 0.05 level of significance.

Educational Implications:

The following are educational implications that are drawn from the present study:

1. Government school teachers may be given training to make mathematics concepts more interesting.
2. In order to spark students' interest in mathematics, teachers should use a variety of relevant, real-world examples that relate to their experiences and passions.
3. Teachers should employ peer interactions, cooperative learning techniques and group work to allow pupils to talk about and work through mathematical difficulties with one another.
4. Boys and girls should give equal opportunities to solve mathematical problems without any discrimination.

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