

Does Gender Play a Part in High School Students' Interest and their Application of Cognitive Strategies in Learning Mathematics?

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Manuscript ID:
EDU-2021-09033919

Volume: 9

Issue: 3

Month: June

Year: 2021

P-ISSN: 2320-2653

E-ISSN: 2582-1334

Received: 24.03.2021

Accepted: 14.05.2021

Published: 01.06.2021

Citation:
Subrahmanyam, Jeyanthi.
"Does Gender Play a
Part in High School
Students' Interest and Their
Application of Cognitive
Strategies in Learning
Mathematics?" *Shanlax
International Journal of
Education*, vol. 9, no. 3,
2021, pp. 242-245.

DOI:
[https://doi.org/10.34293/
education.v9i3.3919](https://doi.org/10.34293/education.v9i3.3919)



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Abstract

Mathematics is an important component of school education. It teaches us to think logically. But learning this subject is not easy due to its abstract nature. Students find it difficult to learn mathematics due to a lack of interest in the subject. Nowadays schools give importance to grades and marks rather than teaching the subject interestingly. The present study was conducted to determine high school student's interest in mathematics and their cognitive strategies concerning gender. The sample consisted of 738 students studying in 9th standard and they are selected from 18 schools of Thanjavur educational district using the purposive sampling technique. Data were analyzed using t-test. The findings showed that a significant difference could be seen in showing interest in learning the subject and applying cognitive strategies based on gender. Females showed more interest in the subject and their cognitive strategies are better than males.

Keywords: Interest, Gender, Learning mathematics, Application, Cognitive strategies, High school students

Introduction

Polish mathematician Stefan Banach said, "Mathematics is the most beautiful and most powerful creation of human mind". The influence of mathematics could be seen in all fields. The routine of daily life demands the mastery of the subject. Mathematics helps us to analyze a situation, to be accurate, be systematic and to make a proper decision. Interest is the most important aspect of learning. Unless the students develop a proper attitude towards the subject, they cannot become a good achievers. Interest is defined in Collins Dictionary as "something that interests you and attracts your attention so that you want to learn or hear more about it or continue doing it". The very basic thing to excel in a subject is to have an interest in learning it.

Need and Significance of the Study

Learning different concepts at the high school level paves the way to a better understanding at higher studies. There remains a gender gap when it comes to professional degrees. This made the investigator to explore how much difference exists in learning mathematics with interest and the application of cognitive strategies in learning the subject based on gender.

Review of Related Literature

Hogheim and Reber (2019) planned a study about "Interesting, but Less Interested: Gender Differences and Similarities in Mathematics Interest". The study examined the existence of gender differences related to the interest in the subject of math. A sample of 366 middle school students was taken for this particular study. The variables like competence, performance and effort

during learning were analyzed. The findings showed the existence of gender difference in showing interest towards the subject. There was no difference in the performance. But girls put more effort than boys in learning mathematics.

Yorganci (2018) conducted a study on the mathematics learning styles of vocational college students. The researcher started a study with 94 vocational college students during 2017 and 2018. A questionnaire, "How do I actually learn?" developed by Foster in 1999 was given. The scale had questions related to four learning styles namely reflective, inquisitive, diligent, and user. It was concluded that the most preferred learning was user learning style. Most students preferred to take notes during their math class and study them later. There existed a significant difference in learning styles and student's academic achievement. Moreover, students with higher academic achievement had high inquisitive nature than the students with lower level. A student achieves more if he uses his own convenient style to study.

Saraswathy, R. (2019) conducted a research on relationship between learning strategies in mathematics and learning styles among IX standard students. For this study the researcher took a sample of 88 students studying in standard IX from Salem district of Tamil Nadu. The sampling technique applied was random sampling technique. Normative survey method was adopted to collect the sample. Learning strategies scale was standardized with 68 statements with four strategies, cognitive, meta-cognitive, non-informational resources management and informational resources management. The second tool was Honey and Mumford's Learning Style questionnaire, with 80 items on four styles namely, Activist, Reflector, Theorist and Pragmatist. The study included categorical variables, gender and medium of instruction. Samples were collected from government, government aided and private schools. The findings showed that information resources strategy is the most followed strategy and reflector style is the most preferred style. There existed a positive correlation relationship between learning strategies in mathematics and learning styles of 9th standard students.

Jena, et al., (2017) conducted a study on YouTube and Skype modes of virtual learning performance about cognitive styles of students. The objective of the study was to find out the relationship between cognitive styles, YouTube learning and Skype learning performance of secondary school students. For this purpose, 20 students were selected randomly from the 9th standard of two English medium schools, Silchar town, Assam. The methodology used was a quasi-experimental design assessing the effect of the independent variable, virtual learning on the dependent variable, learning performance. Out of 25 schools and 5,000 students, only 20 students were selected randomly. A cognitive Style questionnaire was used for this study. It was concluded that virtual learning should be incorporated better in Indian schools and students should use technology for their improvement of knowledge.

Objectives of the Study

- To find out difference in interest in mathematics of high school students based on gender.
- To determine the difference in applying cognitive strategy in learning mathematics by high school students based on gender.

Hypotheses

- There would be no significant difference in interest in the mathematics of high school students in terms of gender.
- There would be no significant difference in applying cognitive strategy in learning mathematics by high school students in terms of gender.

Methodology

A normative study is used for the present study. A sample of 738 students studying in 9th standard is drawn from 18 schools of Thanjavur educational district. The number of male and female students are 436 and 302, respectively. The interest in mathematics scale was developed by the investigator and it consisted of 41 questions. A questionnaire consisting of 21 questions about measuring the cognitive strategies used by the students to learn the subject was devised by the investigator. The data analysis was done using t-test.

Analysis and Interpretation

Table 1 reveals that the mean values of male and female students are found to be 24.46 and 26.62, respectively. The obtained 't' value of 4.608 is greater

than the table value at 0.01 level of significance. It is concluded that there is a significant difference in Interest in Mathematics among high school students concerning gender.

Table 1: Mean, SD and t-value of Interest in Mathematics among High School Students based on Gender

Interest in Mathematics	Gender	N	Mean	SD	t-value	Level of Significance
	Male	436	24.46	6.42	4.608	Significant at 0.01 level
	Female	302	26.62	6.04		

Degrees of freedom = 736

From Table 2, The cognitive strategies mean values of male and female students are 36.92 and 39.49, respectively. The obtained 't' value 4.163 is greater than the table value at 0.01 level of

significance. It is concluded that there is a significant difference in applying cognitive strategies in learning mathematics by high school students in terms of gender.

Table 2: Mean, SD and t-value of Cognitive Strategies Applied in Learning Mathematics by High School Students based on Gender

Variable	Gender	N	Mean	SD	't' value	Level of Significance
Cognitive Strategies	Male	436	36.92	8.08	4.163	Significant at 0.01 level
	Female	302	39.49	8.47		

Degrees of freedom = 736

Findings of the Study

- There is significant difference in the interest shown by high school students based on gender in learning mathematics. Female students show more interest in learning the subject than male students.
- There is a significant difference in applying cognitive strategies by high school students based on gender in learning mathematics. When it comes to the application of cognitive strategies, female students are better than male students.

Conclusion

The study shows that the high school students' interest level is not the same in learning mathematics concerning gender. Interest and learning strategy are correlated. If the interest is more, learning becomes better. Cognition is nothing but understanding. This is more in female students. It is a teacher's job to see the level of cognition in a student and help him/her accordingly. The application of cognitive strategy helps a student to achieve better.

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