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RELATIONSHIP BETWEEN ACHIEVEMENT IN MATHEMATICS AND SELF-CONFIDENCE OF HIGHER SECONDARY STUDENTS IN THIRUVANNAMALAI DISTRICT

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Abstract

In this study, an attempt has been made to study the relationship between achievement in mathematics and self-confidence of higher secondary students in Thiruvannamalai District. The Achievement in Mathematics Test constructed and validated by the investigator and Self-Confidence Scale (SCS) developed by Madhu Gupta and Bindiya Lakhani and validated by the Researcher (2022), were used to collect the data from a sample of 772 higher secondary students studying in Thiruvannamalai District, Tamilnadu State in India. The Normative survey method has been followed and simple random sampling technique was used in administration of the research tools. The result of the analysis reveals that the average level of achievement in mathematics and self-confidence of higher secondary students, there are significant differences in the gender and type of school of higher secondary students with respect to their achievement in mathematics and self-confidence of higher secondary students, there is a significant contribution of self-confidence and dependent variables on the achievement in mathematics of higher secondary students i.e. 34.9% of the total variance in achievement in mathematics is attributed by self-confidence.

Key Words: Achievement in Mathematics, Self-confidence and Higher Secondary Students

1. Introduction

Mathematics Achievement may be defined as "a product which can be measured by means of achievement test" (Van den Aardweg, 1988). Chaman (2014) in a study 'Factors influencing mathematics achievement among secondary school students: In a review it was found that mathematics achievement is influenced by a range of factors including mathematics self-concept, mathematics anxiety, attitude towards mathematics, mathematics self-efficacy, parental involvement, teachers, peers and gender.

There are several studies to show a strong relationship between self-confidence and achievement or positive mental health (Atherton, et al, 2016; Clark and Gakuru, 2014; Skenderis, 2015; Stankov and Lee, 2014). The successful individuals with high self-confidence are likely to have the following SIX attributes.

- A greater sense of self worth
- Greater enjoyment in life and in activities
- Freedom from self doubt
- Freedom from fear and anxiety, freedom from social anxiety and less stress
- More energy and motivation to act
- Have a more enjoyable time interacting with other people at social gatherings

2. Need and Importance of the Study

Mathematics as an academic discipline includes numbers, principles, abstract manipulations and varieties of formulae. Most people have a stereo-type thinking about Mathematics that it is a tough subject and initiate negative thinking about it.

By perusing studies related to students' mathematics achievement, the Researcher has noted that the following important factor self-confidence is affecting achievement in mathematics.

It is believed that research findings are beneficial for Mathematics Teachers, Students and School Administrators. Mathematics Teachers can be helped in determining the level of achievement in mathematics and self-confidence of students. By knowing it, they can design specific teaching methods and strategies to lessen and even eliminate the anxiety of students towards the subject.

3. Review of Literature

Nandhini and Subramanian (2021) found out the relationship between Mathematics Anxiety and Achievement in Mathematics of Higher Secondary School Students. The Sample of the study was selected by using Simple Random Sampling technique which includes 1050 Higher Secondary School Students in Chennai. Normative Survey Method was used to collect data. Results shows that higher the Mathematics Anxiety, lower the Achievement in Mathematics. Based on the results, it was recommended that, Mathematics Teachers should be trained periodically in order to have ideas of innovative approaches of Teaching Mathematics to avoid Anxiety.

Komalavalli (2019) examined the relationship between mathematics self-efficacy and achievement in mathematics of higher secondary students. A total sample of 800 higher secondary XI students (400 boys and 400 girls) were randomly selected for the study. Normative survey method was employed for data collection. Results revealed that there was a significant relationship between Mathematics Self-efficacy and achievement in Mathematics. Also, there was asignificant difference between boys and girls in Mathematics self-efficacy and achievement Aided school students were high in Mathematics self-efficacy and achievement in Mathematics where girls excelled boys. Findings showed that Government Aided school students were high in Mathematics self-efficacy and achievement in Mathematics whencompared to Government school students.

4. Operational Definitions of the Study

Achievement in Mathematics

Achievement in Mathematics is the competency shown by the student in mathematics. It is the result of acquired knowledge or information, understanding, skills and techniques developed in the subject of mathematics in a particular stage. Its measure is the score on the achievement test in mathematics.

Self-Confidence

The psychological dictionary online defines self-confidence as an individual's trust in his or her own abilities, capacities, and judgments or belief that he or she can successfully face day to day challenges and demands. In the present context, 'self-confidence' represents one's activities pertaining to academic works.

Therefore, operationally the Researcher means Self-Confidence as Academic self- confidence, and it is the score obtained on the 'Self-Confidence Scale' standardized by Madhu Gupta and Bindiya Lakhani and validated by the Researcher (2022).

5. Objectives of the Study

- 1. To find out the level of achievement in mathematics of higher secondary students.
- 2. To find out the level of self-confidence of higher secondary students.
- 3. To find out whether there is any significant difference in the achievement in mathematics of higher secondary students with respect to their gender.
- 4. To find out whether there is any significant difference in the achievement in mathematics of higher secondary students with respect to their type of school.
- 5. To find out whether there is any significant difference in the self-confidence of higher secondary students with respect to their gender.

7

8

- 6. To find out whether there is any significant difference in the self-confidence of higher secondary students with respect to their type of school.
- 7. To find out whether there is any significant relationship between achievement in mathematics and self-confidence of higher secondary students.
- 8. To find out whether there is any significant contribution in the self-confidence on achievement in mathematics of higher secondary students.

6. Hypotheses of the Study

- 1. The level of achievement in mathematics of higher secondary students is low.
- 2. The level of self-confidence of higher secondary students is low.
- 3. There is no significant difference in the achievement in mathematics of higher secondary students with respect to their gender.
- 4. There is no significant difference in the achievement in mathematics of higher secondary students with respect to their type of school.
- 5. There is no significant difference in the self-confidence of higher secondary students with respect to their gender.
- 6. There is no significant difference in the self-confidence of higher secondary students with respect to their type of school.
- 7. There is no significant relationship between achievement in mathematics and self- confidence of higher secondary students.
- 8. There is no significant contribution in the self-confidence on achievement in mathematics of higher secondary students.

7. Method of the Study

The normative survey method was adopted in the present study.

8. Sample Used

In order to collect the required data, Achievement in Mathematics Test Score of higher secondary students and Self-Confidence Scale (SCS) developed by Madhu Gupta and Bindiya Lakhani and validated by the Researcher (2022). Simple random sampling technique has been employed to collect the data from 772 higher secondary students studying in Thiruvannamalai District, Tamilnadu State in India.

9. Analysis of Data and Interpretation

The data collected were descriptively analyzed by employing the following statistical techniques:

- 1. Descriptive Analyses
- i. Measures of central tendency (Mean)
- ii. Measures of variability (Standard Deviation)
- 2. Differential Analyses ('t' test and 'F' test) and
- 3. Co-relational Analyses (Karl Pearson Product Moment Correlation)
- 4. Regression Analysis (Linear)

Descriptive Analysis

Hypothesis No.1

The level of achievement in mathematics of higher secondary students is low.

Table 1

Mean and Standard Deviation in respect of Achievement in Mathematics of Higher Secondary Students

Variable	Ν	Mean	SD
Achievement in Mathematics	772	31.43	8.21

9

From table-1, the calculated mean and standard deviation for achievement in mathematics scores of the entire sample is found to be 31.43 and 8.21 respectively. The mean score lay in between $(M\pm\sigma)$ value i.e., 24 to 39, Hence, the framed hypothesis (1) is rejected and it is concluded that the achievement in mathematics of higher secondary students is average.

Hypothesis No.2

The level of self confidence of higher secondary students is low.

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Mean and Standard Deviation in respect of Self-Confidence of Higher Secondary Students

Variable	Ν	Mean	SD
Self Confidence	772	185.60	32.49

From table-2, the calculated mean and standard deviation for self-confidence scores of the entire sample is found to be 185.60 and 32.49 respectively, this mean score is average value between 177-200. Hence, the framed hypothesis (2) is rejected and it is concluded that the self-confidence of higher secondary students is average.

Differential Analysis

Null Hypothesis No. 3

There is no significant difference in the achievement in mathematics of higher secondary students with respect to their gender.

Mean Difference of Achievement in Mathematics Scores of Higher Secondary Students with regard to Gender

Variable	Gender	N	Mean	SD	ʻt' Value	Level of Significance at 0.05 Level
Achievement in	Male	464	30.76	7.44	6.91	Significant
Mathematics	Female	308	35.23	8.52	0.64	Significant

Table-3

It is seen from the above Table-3 that the 't' value calculated is 6.84, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the Hypothesis No.3 is rejected and it is concluded that there is significant difference in the achievement in mathematics of higher secondary students with respect to their gender. It is also inferred that female students are having high achievement in mathematics than the male students.

Null Hypothesis No.4

There is no significant difference in the achievement in mathematics of higher secondary students with respect to their type of school.

Mean Difference of Achievement in Mathematics Scores of Higher Secondary Students with regard to Type of School

Table-4	
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Variable	Type of School	Ν	Mean	SD	ʻt' Value	Level of Significance at 0.05 Level
Achievement in	Tribal	320	28.31	8.78	6 01	Cignificant
Mathematics	Non-tribal	452	32.13	7.87	6.21	Significant

It is seen from the above table that the 't' value calculated is 6.21, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the hypothesis 4 is rejected and it is concluded that there is significant difference in the achievement in mathematics of higher secondary students with respect to their type of school. It is also inferred that non-tribal school students are having high achievement in mathematics than the tribal school students.

Null Hypothesis No.5

There is no significant difference in the self-confidence of higher secondary students with respect to their gender.

Mean Difference of Self-Confidence Scores of Higher Secondary Students with regard to Gender Table-5

Variable	Gender	Ν	Mean	SD	ʻt' Value	Level of Significance at 0.05 Level
Salf Confidence	Male	464	183.69	32.07	1 77	Significant
Self-Confidence	Female	308	195.54	30.07	4.//	Significant

It is seen from the above table that the 't' value calculated is 3.77, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the hypothesis 5 is rejected and it is concluded that there is significant difference in the self-confidence of higher secondary students with respect to their gender. It is also inferred that female students are having high self-confidence than the male students.

Null Hypothesis No.6

There is no significant difference in the self-confidence of higher secondary students with respect to their type of school.

Mean Difference of Self-Confidence Scores of Higher Secondary Students with regard to Type of School

Variable	Type of School	N	Mean	SD	ʻt' Value	Level of Significance at 0.05 Level
Salf Confidence	Tribal	320	177.58	34.04	5 1 /	Significant
Sen-Confidence	Non-tribal	452	189.91	30.91	3.14	Significant

Table-6

It is seen from the above table that the 't' value calculated is 5.14, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the Null hypothesis No.6 is rejected and it is concluded that there is significant difference in the self-confidence of higher secondary students with respect to their type of school. It is also inferred that non-tribal school students are having high self-confidence than the tribal school students.

Correlation Analysis

Null Hypothesis No.7

There is no significant relationship between achievement in mathematics and self-confidence of higher secondary students.

Co-Efficient of Correlation between Achievement in Mathematics and Self-Confidence of Higher Secondary Students based on Entire Sample

Table-7					
Variable	Ν	'r' Value			
Achievement in Mathematics and Self- Confidence	772	0.66**			

**. Correlation at 0.01 level (2-tailed)

Table-7 shows, the co-efficient of correlation between achievement in mathematics and selfconfidence of higher secondary students and it is found to be 0.66 at 0.01 level which indicates that there is correlation between achievement in mathematics and self- confidence of higher secondary students. Therefore the stated hypothesis is rejected and it is concluded that there is significant and positive relationship between achievement in mathematics and self-confidence of higher secondary students.

Regression Analysis

Null Hypothesis No.8

There is no significant contribution in the self-confidence on achievement in mathematics of higher secondary students.

The regression analysis has been carried out to find out whether there is any significant contribution in the self-confidence on achievement in mathematics of higher secondary students. The result of the analysis is presented in Table-8 and Table-9.

The Table shows a summary of the Results of the regression analysis Model Table-8

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.564(a)	0.349	0.229	52.261

Table-8 shows the R square value, which is found to be (0.349) and it is evident that only 34.9% of the total variance in achievement in mathematics is attributed by self- confidence of higher secondary students. The remaining percentage of variance 65.1 % (1-R Square) is to be accounted by other factors which is not included in this study.

ANOVA Test

Model	Sum of Squares	df	Mean Square	F	LS
Regression	5104.604	1	204.604		
Residual	39360.623	770	115.012	8.696	Significant
Total	44465.227	771			- C

It is evident from table-9, that the F value is found to be 8.696, which is significant at 0.01 level. It indicates that there is a significant contribution of self-confidence on achievement in mathematics of higher secondary students.

10. Findings of the Study

- > The level of achievement in mathematics of higher secondary students is average.
- > The level of self-confidence of higher secondary students is average.
- There is a significant difference in the achievement in mathematics of higher secondary students with respect to their gender.
- There is a significant difference in the achievement in mathematics of higher secondary students with respect to their type of school.
- There is a significant difference in the self-confidence of higher secondary students with respect to their gender.
- There is a significant difference in the self-confidence of higher secondary students with respect to their type of school.
- There is significant and positive relationship between achievement in mathematics and selfconfidence of higher secondary students.
- There is a significant contribution of self-confidence on the achievement in mathematics of higher secondary students i.e. 34.9% of the total variance in achievement in mathematics is attributed by self-confidence of higher secondary students.

11. Recommendations

The students need to be encouraged to develop their Mathematics self-confidence as they have a role in keeping the Mathematics Mark for various purposes.

Table-9

12

> For Strengthening the Mathematics self-confidence of Higher Secondary School Students, Teachers should pay individual attention. It can only be achieved if there will be ideal pupil teacher ratio in the class. There is a need to control the overcrowding of the students in the schools.

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12. Conclusion

This Study can provide awareness to everyone concerned especially the students about the Mathematics self-confidence in relation to achievement in mathematics on their academic lives.

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