AN INVESTIGATION IN TO THE CORRELATION BETWEEN MATHEMATICAL REASONING ABILITY OF HIGHER SECONDARY STUDENTS AND THEIR SELF-REGULATED LEARNING

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Abstract

The present study is an investigation in to the correlation between mathematical reasoning ability of higher secondary students and their self-regulated learning. For this purpose, a sample of 600 higher secondary students was selected through simple random sampling technique and normative survey method. For the present study Mathematical Reasoning Ability Test (MRAT) constructed and validated by the investigator and Self-Regulated Learning Scale (SRLS) developed by Dr. S. Kadhiravan (1999). Results found that the higher secondary students level of mathematical reasoning ability is high and self-regulated learning is average. It is concluded that the gender and type of school management of higher secondary students is differ significantly in their mathematical reasoning ability and self-regulated learning. Finding also indicated that there is significant and positive relationship between mathematical reasoning ability and self-regulated learning of higher secondary students.

Key Words: Mathematical Reasoning Ability, Self-regulated learning, Gender, Type of School Management and Higher secondary students

1. Introduction

Present age is the age of science and information. Whatever technological and physical progress being made, shall be corresponding to the role of mathematics. Kothari commission has explained about placing mathematics as a compulsory subject up to high school or ninth standard and has said "Mathematics should be made a compulsory subject for the standards of I to IX, as part of general education".

The importance of mathematics can be expressed in the form of values. It helps in attaining and developing various values among the children. The values give meaning and strength to a person's character by occupying a central place in life. The famous mathematician Hogben has remarked that "Mathematics is the mirror of civilization". In fact mathematical knowledge is indispensable and changes the way of one's living. Mathematics is essential and more important in one form or the other. Engineering, Banking and others business are directly linked with mathematics. For them mathematics work like foundation brick and the business which are indirectly related to mathematics, also depends totally on it. Besides these in our daily routine, also we need a general mathematics knowledge.

2. Need for the Study

Mathematics is a science that is important for all students to learn, from elementary school to high school even in college. Many reasons for the need for students to learn mathematics, among others, because mathematics is a means of logical and mathematical thinking, a means of developing creativity, a means of

recognizing patterns of relationships and generalization of experience and a means of solving problems in everyday life. Among the district of Tamilnadu, achievement in mathematics of the higher secondary students lags behind than the other districts. Hence, it was felt by the investigators to study the mathematical reasoning ability and self-regulated learning of higher secondary students in Cuddalore district of Tamilnadu, India.

3. Objectives of the Study

1. To find out the level of the Mathematical Reasoning Ability of higher secondary students.
2. To find out the level of the Self-Regulated Learning of higher secondary students.
3. To find out whether there is any significant difference in the Mathematical Reasoning Ability of higher secondary students with regard to a) Gender and b) Type of school management.
4. To find out whether there is any significant difference in the Self-Regulated Learning of higher secondary students with regard to a) Gender and b) Type of school management.
5. To find out whether there is any significant relationship between Mathematical Reasoning Ability and Self-Regulated Learning of higher secondary students.

4. Hypotheses of the Study

1. The level of the Mathematical Reasoning Ability of higher secondary students is average.
2. The level of the Self-Regulated Learning of higher secondary students is average.
3. There is no significant difference in the Mathematical Reasoning Ability of higher secondary students with regard to a) Gender and b) Type of school management.
4. There is no significant difference in the Self-Regulated Learning of higher secondary students with regard to a) Gender and b) Type of school management.
5. There is no significant relationship between Mathematical Reasoning Ability and Self-Regulated Learning of higher secondary students.

5. Method and Sample of the Study

In the present study the investigator followed normative survey method. The present study consists of 600 higher secondary students studying in Cuddalore District, Tamilnadu State, India. The samples were selected by using simple random sampling technique.

6. Statistical Techniques Used

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

1. Descriptive Analyses (Mean and Standard Deviation)
2. Differential Analyses ('t' test and 'F' test)
3. Correlation Analyses (Karl Pearson Product Moment Correlation)

7. Tools Used for the Study

The present study Mathematical Reasoning Ability Test (MRAT) constructed and validated by the investigator and Self-Regulated Learning Scale (SRLS) developed by Dr. S. Kadhiravan (1999).

8. Analysis and Interpretation of Data

Hypothesis 1

The level of the Mathematical Reasoning Ability of higher secondary students is average.

Table-1
Showing the Mean and Standard Deviation Scores of Mathematical Reasoning Ability of Higher Secondary Students

Variable	N	M	SD
Mathematical Reasoning Ability	600	26.32	5.47

It is evident from the Table 1, that the calculated mean score is found to be 26.32 and the standard deviation value is 5.47 respectively, which indicates that the mean score lies between than the average value (21-30). Therefore hypothesis 1 is accepted and it is concluded that the mathematical reasoning ability of higher secondary students is average.

Hypothesis 2

The level of the Self-regulated learning of higher secondary students is average.

Table-2
Showing the Mean and Standard Deviation Scores of Self-Regulated Learning of Higher Secondary Students

Variable	N	M	SD
Self-Regulated Learning	600	79.71	28.80

It is evident from the Table 2, that the calculated mean score is found to be 79.71 and the standard deviation value is 28.80 respectively, the calculated mean score is higher than the mid score 70. Therefore hypothesis 2 is rejected and it is concluded that the self-regulated learning of higher secondary students is high.

Hypothesis 3

There is no significant difference in the Mathematical Reasoning Ability of higher secondary students with regard to a) Gender and b) Type of school management.

Table-3
't' value of Mathematical Reasoning Ability Scores of Higher Secondary Students with regard to Sub-Samples

Variable	Sub-Samples	N	Mean	SD	't' Value	Level of Significance at 0.05 Level
Mathematical Reasoning Ability	Male	308	29.03	7.27	2.47	Significant
	Female	292	25.10	5.29		
	Government	300	28.86	6.23	2.10	Significant
	Private	300	24.49	5.40		

It is evident from the table 3, the calculated 't' value is found to be 2.47 and it is higher than the table value of 1.96. It reveals that there is significance difference between the male and female students with respect to their mathematical reasoning ability. Hence the stated hypothesis is rejected.

It is evident from the table 3, the calculated 't' value is found to be 2.10 and it is higher than the table value of 1.96. It reveals that there is significance difference between the government and private school higher secondary students with respect to their mathematical reasoning ability. Hence the stated hypothesis is rejected.

Hypothesis 4

There is no significant difference in the Self-regulated learning of higher secondary students with regard to a) Gender and b) Type of school management.

Table-4
't' value of Self-Regulated Learning Scores of Higher Secondary Students with regard to Sub-Samples

Variable	Sub-Samples	N	Mean	SD	't' Value	Level of Significance at 0.05 Level
Self-Regulated Learning	Male	308	82.18	29.64	2.06	Significant
	Female	292	76.82	27.89		
	Government	300	83.37	29.58	3.14	Significant
	Private	300	75.66	27.98		

It is evident from the table 4, the calculated 't' value is found to be 2.06 and it is higher than the table value of 1.96. It reveals that there is significance difference between the male and female students with respect to their self-regulated learning. Hence the stated hypothesis is rejected.

It is evident from the table 3, the calculated 't' value is found to be 3.14 and it is higher than the table value of 1.96. It reveals that there is significance difference between the government and private school higher secondary students with respect to their self-regulated learning. Hence the stated hypothesis is rejected.

Hypothesis 5

There is no significant relationship between Mathematical Reasoning Ability and Self-regulated learning of higher secondary students.

Table-5
Showing the Correlation Values between Mathematical Reasoning Ability and Self-Regulated Learning of Higher Secondary Students

Variable	N	'r' Value	Level of Significance at 0.01 level
Mathematical Reasoning Ability and Self-Regulated Learning	600	0.321	Significant

From the above table the 'r' value found to be 0.321. From this there is significant relationship between mathematical reasoning ability and self-regulated learning. Hence it is concluded that there is significant and positive relationship between the mathematical reasoning ability and self-regulated learning of higher secondary students.

9. Findings of the Study

- The level of mathematical reasoning ability of higher secondary students is average.
- The level of self-regulated learning of higher secondary students is high.
- There is significance difference between the male and female higher secondary students with respect to their mathematical reasoning ability.
- There is significance difference between the government and private school higher secondary students with respect to their mathematical reasoning ability.
- There is significance difference between the male and female higher secondary students with respect to their self-regulated learning.

➢ There is significance difference between the government and private school higher secondary students with respect to their self-regulated learning.

➢ There is significant and positive relationship between the mathematical reasoning ability and self-regulated learning of higher secondary students.

10. Conclusion

In the present study an investigation in to the correlation between mathematical reasoning ability of higher secondary students and their self-regulated learning. Results found that the higher secondary students' level of mathematical reasoning ability is average and self-regulated learning is high and it is inferred that there is significant and positive relationship between mathematical reasoning ability and self-regulated learning of higher secondary students.

11. References

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