

SELF-REGULATION OF HIGHER SECONDARY STUDENTS IN RELATION TO ACHIEVEMENT IN MATHEMATICS

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ABSTRACT

This survey study aims to find out the self-regulation of higher secondary students in relation to achievement in mathematics. A sample of 300 first year higher secondary students studying during the academic year 2018-19 was selected by using simple random sampling technique from Tirunelveli district, Tamil Nadu. Data were collected with the help of Self-Regulation Scale constructed by Saileela (2013). The five point Likert scale consisting of 42 (38 positive and 4 negative) items was designed to assess students' Self-Regulation in learning mathematics. The research tools were distributed to the students with proper instructions as to get the exact data for this study. For analyzing the data, percentile analysis, mean, standard deviation, t-test, F-test and Pearson's product moment correlation were employed and the analyzed data were interpreted accordingly. The finding shows that there is a positive relationship between self-regulation and achievement in mathematics of higher secondary students.

KEYWORDS: Self-Regulation, Higher Secondary Students, Achievement In Mathematics, Relationship, Academic Achievement.

Introduction

In this techno era, we are advanced in scientific things and using latest technological gadgets such as computers, smart phones, iPods, tablets, etc. There is no doubt that these technological gadgets make our life easy and assist our daily routine and have become a dominant role in our life. On other hand, these gadgets make us to blank out certain skills like interpersonal skills, arithmetic skills including memorization of tables, and mobile numbers etc. And also these gadgets have exerted significant pressure in our life. When students are using these gadgets for the purpose of their educational activities, they are distracted constantly. Most of the students are struggling and facing every day conflicts that arise due to the distractions and they are unable to self-regulate their learning. Self-regulation is the ability to develop, implement, and flexibly maintain planned behaviour in order to

achieve one's goals. According to Pintrich (2000), Self-regulation is an active constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment. They have to understand the strategies to develop themselves and apply the strategies purposefully in their life for betterment of their life. So, self-regulation is very essential for the present day students to cope up with the rapidly changing scenario of the present world.

Need for the Study

Subramanian, et al. (2016) stated in the report of the committee for evolution of the new education policy as below:

“Teachers have to gradually become facilitators and encourage self-learning by students so that their natural curiosity receives impetus. Internet has removed all barriers to learning and made knowledge easily available. Education can no longer be confined to textbooks; and the examination system has to be revamped to test knowledge and understanding, and not the ability to regurgitate by rote. ICT can no longer be treated as a school subject; it has to become a part of the learning process”.

With this guidance, government of Tamil Nadu has introduced changes by blending ICT with school education syllabi for the 6th, 9th and 11th classes from the academic year 2018-19 onwards. By incorporating ICT with school education, we can prepare our students for the next generation research fields like automation, Internet of Things (IoT), Blockchain where there will be a smooth transfer of learning. In order to cope up with the changes in the school education syllabi and the incorporation of ICT along with the syllabi, the students are struggling and facing every day conflicts that arise due to the distractions. Additionally the students who are studying first year after the incorporation of ICT blended syllabi get stress than others easily. Therefore, self-regulation is vital for them to cope up with. Self-regulated learning emphasizes autonomy and control by the individual who monitors, directs, and regulates actions toward goals of information acquisition, expanding expertise, and self-improvement. In particular, self-regulated learners are cognizant of their academic strengths and weaknesses, and they have a repertoire of strategies they appropriately apply to tackle the day-to-day challenges of academic tasks (Dweck & Leggett, 1988). Mathematics is the science that deals with the logic of shape, quantity and arrangement. Math is all around us, in everything we do. It is the building block for everything in our daily lives, including mobile devices, architecture (ancient and modern), art, money, engineering, and even sports (Hom, 2013). As the mathematics is necessary for all the day-to-day activities of the basic human being, the students have to understand clearly about its concepts. While the mathematics syllabus is also enriched with the blended ICT, the students have to self-regulate themselves for adopting them. Hence, the investigators planned to find out the relationship between the self-regulation and the achievement in mathematics.

Title of the Study

Self-regulation of higher secondary students in relation to achievement in mathematics.

Operational Definitions

- **Self-Regulation** refers to the ability to regulate one's cognitive activities in learning of mathematics.
- **Achievement** measures student's performance in mathematics in the quarterly examinations during the year 2018-19.

Objectives of the Study

1. To find out whether there is any significant difference in the self-regulation of higher secondary students in terms of gender, locality, and type of school.
2. To find out whether there is any significant difference in the higher secondary students' achievement in mathematics in terms of gender, locality, and type of school.
3. To find out whether there is any significant relationship between self-regulation and achievement in mathematics of the higher secondary students.

Hypotheses of the Study

1. There is no significant difference between higher secondary boys and girls in their self-regulation.
2. There is no significant difference between rural and urban higher secondary students in their self-regulation.
3. There is no significant difference among government, government-aided and private higher secondary students in their self-regulation.
4. There is no significant difference between higher secondary boys and girls in their achievement in mathematics.
5. There is no significant difference between rural and urban higher secondary students in their achievement in mathematics.
6. There is no significant difference among government, government-aided and private higher secondary students in their achievement in mathematics.
7. There is no significant relationship between self-regulation and achievement in mathematics of higher secondary students.

Methods and Procedures

This study adopted survey method. A sample of 300 first year higher secondary students studying during the academic year 2018-19 was selected by using simple random sampling technique from Tirunelveli district, Tamil Nadu. Data were collected with the help of Self-Regulation Scale constructed by Saileela (2013). The five point Likert scale consisting of 42 (38 positive and 4 negative) items was designed to assess students' Self-Regulation in learning mathematics. The research tools were distributed to the students with proper instructions as to get the exact data for this study. For analyzing the data, percentile analysis, mean, standard deviation, t-test, F-test and Pearson's product moment correlation were employed and the analyzed data were interpreted accordingly.

Analysis of Data

H₀₁: There is no significant difference between higher secondary boys and girls in their self-regulation.

Table-1: Difference in the self-regulation of higher secondary students in terms of gender

Gender	N	Mean	SD	't' value	LoS at 0.05
Boys	198	156.76	18.97	4.431	S
Girls	102	166.82	18.44		

It is inferred from the above table that the calculated t-value (4.431) is greater than the table t-value (1.96) at 5% level of significance. Therefore the null hypothesis is rejected and it is concluded that there is a significant difference between higher secondary boys and girls in their self-regulation.

H₀₂: There is no significant difference between rural and urban higher secondary students in their self-regulation.

Table-2: Difference in the self-regulation of higher secondary students in terms of locality

Gender	N	Mean	SD	't' value	LoS at 0.05
Rural	200	162.62	18.41	3.031	S
Urban	100	155.30	20.36		

It is inferred from the above table that the calculated t-value (3.031) is greater than the table t-value (1.96) at 5% level of significance. Therefore the null hypothesis is rejected and it is concluded that there is a significant difference between rural and urban higher secondary students in their self-regulation.

H₀₃: There is no significant difference among government, government-aided and private higher secondary students in their self-regulation.

Table-3: Difference in the self-regulation of higher secondary students in terms of type of school

Type of School	Sum of Squares	df	Mean Square	'F' value	LoS at 0.05
Between Groups	11730.687	2	5865.343	17.358	S
Within Groups	100356.230	297	337.900		
Total	112086.917	299			

It is inferred from the above table that the calculated F-value (17.358) is greater than the table F-value (3.09) at 5% level of significance. Therefore the null hypothesis is rejected and it is concluded that there is a significant difference among government, government-aided and private higher secondary students in their self-regulation.

H₀₄: There is no significant difference between higher secondary boys and girls in their achievement in mathematics.

Table-4: Difference in the higher secondary students' achievement in mathematics in terms of gender

Gender	N	Mean	SD	't' value	LoS at 0.05
Boys	198	132.12	37.50	4.033	S
Girls	102	151.67	40.83		

It is inferred from the above table that the calculated t-value (4.033) is greater than the table t-value (1.96) at 5% level of significance. Therefore the null hypothesis is rejected and it is concluded that there is a significant difference between higher secondary boys and girls in their achievement in mathematics.

H₀₅: There is no significant difference between rural and urban higher secondary students in their achievement in mathematics.

Table-5: Difference in the higher secondary students' achievement in mathematics in terms of locality

Gender	N	Mean	SD	't' value	LoS at 0.05
Rural	200	150.82	37.41	8.631	S
Urban	100	114.49	32.56		

It is inferred from the above table that the calculated t-value (8.631) is greater than the table t-value (1.96) at 5% level of significance. Therefore the null hypothesis is rejected and it is concluded that there is a significant difference between rural and urban higher secondary students in their achievement in mathematics.

H₀₆: There is no significant difference among government, government-aided and private higher secondary students in their achievement in mathematics.

Table-6: Difference in the higher secondary students' achievement in mathematics in terms of type of school

Type of School	Sum of Squares	df	Mean Square	'F' value	LoS at 0.05
Between Groups	183495.948	2	91747.974	94.865	S
Within Groups	286273.777	296	967.141		
Total	469769.726	298			

It is inferred from the above table that the calculated F-value (94.865) is greater than the table F-value (3.09) at 5% level of significance. Therefore the null hypothesis is rejected and it is concluded that there is a significant difference among government, government-aided and private higher secondary students in their achievement in mathematics.

H₀7: There is no significant relationship between self-regulation and achievement in mathematics of higher secondary students.

Table-7: Relationship between self-regulation and achievement in mathematics of the higher secondary students

Self-Regulation Vs. Achievement In Mathematics	' γ ' value	LoS at 0.01
	0.30	S

It is inferred from the above table that the calculated γ -value (0.30) is greater than the table γ -value (0.095) at 1% level of significance. Therefore the null hypothesis is rejected and it is concluded that there is a significant relationship between self-regulation and achievement in mathematics of higher secondary students.

Findings and Interpretations

From the t-test it is inferred that there is a significant difference in the self-regulation of higher secondary students in terms of gender and locality. While comparing the mean scores, girls (166.82) are better than boys (156.76) in their self-regulation. This may be due to the fact that from cultural perspective, females are found to be obedient and receptive to the instructions given to them by their elders. As a result of this, girls have a natural tendency to obey the teachers' instruction without inclination towards the worth of the instruction. While comparing the mean scores, rural students (162.62) are better than urban students (155.30) in their self-regulation. This may be due to the fact that culturally the rural students show more regulation in maintaining discipline and they have less distraction when compared to urban students.

From the t-test it is inferred that there is a significant difference in the higher secondary students' achievement in mathematics in terms of gender and locality. While comparing the mean scores, girls (151.67) are better than boys (132.12) in their achievement in mathematics. This may be due to the fact that the females are more reflective and adaptable to the changes than males. Further, the females perceive the academic regulation from the teachers as a motivation factor to perform well in academic activities. While comparing the mean scores, rural students (150.82) are better than urban students (114.49) in their self-regulation. This may be due to the fact that rural school students are always having a conducive environment for their studies and they are less prone to distraction.

From the F-test it is inferred that there is a significant difference in the self-regulation of higher secondary students in terms of type of school. And also there is a significant difference in the higher secondary students' achievement in mathematics in terms of type of school.

From the correlation analysis, it is concluded that there is a positive relationship between self-regulation and achievement in mathematics of higher secondary students. This finding confirms the findings of Fauzi & Widjajanti (2018), Alotaibi et al. (2017), Safdari &

Maftoon (2016), Shaine (2015), Medina (2011), Dewitz, et al. (2009), Haron et al. (2007), Haziah (2004), Gandhi and Varma (2004), Hwange and Konstantinous (2002), Dembo and Eaton (2000), Pintrich & De Groot (1990), Zimmerman and Ringle (1981).

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