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A Study on Learning Style and Achievement of Mathematics among Higher Secondary Students

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ABSTRACT

The purpose of this study is to ascertain upper secondary students' level of mathematical competency and preferred method of learning. There were only 300 samples used in the study. Descriptive statistics, the t-test, and Pearson's Product Moment Correlation Coefficient are used to assess the data. The following were the study's conclusions: 1. The gender, location, school type, instruction medium, and quantity of time spent with children all have a substantial impact on the learning styles of higher secondary pupils. 2. 3. Students in higher secondary school do not significantly differ in their mathematical proficiency by gender or type of school, but they do differ significantly in their proficiency by location and teaching medium.

Keywords: *learning style, Higher secondary students, achievement of mathematics Descriptive statistics, t-test, Pearson's Product Moment Correlation Coefficient.*

INTRODUCTION

Learning is an experience that everyone has. Close learning, behavioral changes, and the ability to make these changes consistently throughout one's life are all necessary in response to new situations. Learning in a given classroom can vary not just in the students' knowledge and abilities but also in the way they approach and manage a given activity. The common and distinctive patterns of a student's academic path are known as learning styles. Schmeek defines a learning style as a learner's propensity to select a certain learning strategy notwithstanding the demands of the learning tasks. Learning styles are preferred approaches to learning. The four learning modes that learning style explains are active exploration, abstract conceptualization, reflective observation, and concrete experience. Students are divided into four categories of preferred learning styles based on this. accommodators, assimilators, and those who converge and diverge. Kolb's theory states that learning is a cognitive process that requires four stages and concrete experiences. Concrete experience is a responsive experience-based approach that primarily relies on emotional judgments. Reflective observation is a hesitant, objective, and introspective method of learning. Abstract conceptualization is a conceptual, analytical approach to teaching that primarily relies on rational judgment and logical reasoning. An approach to learning that heavily emphasizes experimentation is called "active experimentation." Mathematics is one of the subjects that seeks to promote creativity. Mathematics can be seen as a tool for encouraging students' creativity because of its flexible deductive structure, which permits different subject organization strategies—from the whole to the part or from the part to the whole. There are several mathematical problems and circumstances that can motivate students to develop unique answers. Students who study mathematics also learn how to objectively assess situations.

NEED AND SIGNIFICANCE OF THE STUDY

Every pupil must understand the problems and situations that exist at home. They should be aware of the significance of protecting the environment. Education is the best outcome for the environment. The house is essentially a location where parents and children live together. The family's principal role depends on the different tasks and responsibilities that each member of the household does in order to keep the others safe and take care of them.

The parents should sincerely worry about the future of their child. Both the public and private sectors employ some parents. They don't care about their kids. As a result, their children are less future-oriented. Thus, the researcher decided to focus on this topic for the study. The purpose of this study is to ascertain upper secondary school students' preferred methods of learning and level of mathematical competency.

STATEMENT OF THE PROBLEM

The proposed study entitled as **"**A STUDY ON LEARNING STYLE AND ACHIEVEMENTOFMATHEMATICS AMONG HIGHER SECONDARY STUDENTS"

OPERATIONAL DEFINITIONS OF KEY TERMS

Learning Style

The phrase "learning style" refers to personal traits that influence a student's ability to learn, interact with classmates and teachers, and participate in other educational activities.

Achievement in Mathematics

Students' accomplishment in academic courses is referred to as achievement. The outcomes of the accomplishment test were used to calculate the index of mathematical achievement. **Higher Secondary Students**

The students who are class eleventh standard opted mathematics in various higher secondary students of Thanjavur Educational District.

OBJECTIVES OF THE STUDY

1. To ascertain the level of learning style of the upper secondary students.

2. To assess upper secondary students' level of mathematical competency.

3. To ascertain whether the learning preferences and mathematical competency of upper secondary students are substantially impacted by gender, location, school type, and medium of instruction.

4. To ascertain the relationship between the learning methods and mathematical proficiency of upper secondary students

HYPOTHESES OF THE STUDY

1. The learning styles of upper secondary students do not appear to differ significantly by gender.

2. The learning styles of higher secondary students are not significantly influenced by their geographic location.

3. There is no discernible difference in the learning styles of higher secondary students according to the type of school they attend.

4. Based on the teaching medium, there are no appreciable differences in the learning styles of higher secondary students.

5. The math skills of upper secondary students do not significantly differ by gender.

6. The mathematical proficiency of higher secondary students does not appear to differ significantly by region.

7. The mathematical proficiency of higher secondary students does not appear to differ significantly by kind of school.

8. The medium of instruction has no discernible impact on the mathematical skills of higher secondary students.

9. The study preferences of upper secondary pupils and their proficiency in mathematics are unrelated.

METHODOLOGY

Methodology is the procedure or sequential order of executing the research. Research methodology is a systematic way to solve the research problem.

Sampling technique

The investigator used Random sampling technique.

Population

The population for the present study consisted of higher secondary students in Thanjavur Educational district.

Sample

In this proposed study simple random sampling is to be used. The proposed study was conducted on a representative sample 300 XII standard students.

Variables of the Study

The proposed study is to be designed with the following variables.

i. Learning style as independent variable.

ii. Achievement in mathematics as dependent variable.

Method

In this proposed study Normative survey method is to be used.

Tools to be used

1. Learning style inventory standardized by Joy Reid (2010-2011).
2. Achievement test in mathematics the investigator used the XI public examination marks in mathematics of higher secondary students in mathematics group.

Statistical Techniques Used

For the proposed study the following Statistical techniques was used. Arithmetic Mean, Standard Deviation, t- test and Pearson's Product Moment Correlation Coefficient.

ANALYSIS OF DATA INTERPRETATION

Table 1

Results of the test of significance of difference between mean scores of learning style of higher secondary students with respect to gender

Gender	Number	Mean	SD	SED	$\lvert m_1-m_2 \rvert$	t	Remarks at 0.05 level
Male	133	111.87	16.12	1.97	8.67	4.40	S
Female	167	120.54	17.88				

As shown in Table 1 above, the calculated t-value (t=4.40, table value >1.96) is obviously significant at the 0.05 level. Thus, the null hypothesis is refuted. Female students' average learning style score is 120.54, much higher than the average score of male students (111.87). Consequently, the learning style of female students was shown to be superior to that of male students.

Table 2

Results of the test of significance of difference between mean scores of learning style of higher secondary students with respect to locality

Locality	Number	Mean	SD	SED	$\lvert m_1-m_2 \rvert$	t	Remarks at 0.05 level
Rural	139	121.33	18.13	2.0	8.63	4.32	S
Urban	161	112.70	16.21				

As shown in Table 2 above, the calculated t-value (t=4.32, table value >1.96) is obviously significant at the 0.05 level. Thus, the null hypothesis is refuted. Students in rural areas had a much higher average learning style score (121.33) than students in urban areas (112.70). Consequently, it was found that kids in rural areas had a more sophisticated learning style than those in metropolitan areas.

Table 3

Mean, Standard Deviation and t value of learning style of higher secondary students with respect to type of school

Type of school	Number	Mean	SD	SED	$\lvert m_1-m_2 \rvert$	t	Remarks at 0.05 level
Government	138	124.14	17.25	1.90	13.77	7.24	S
Govt. Aided	162	110.36	15.38				

As can be seen in Table 3 above, the calculated t-value (t=7.24, table value >1.96) is obviously significant at the 0.05 level. As a result, the null hypothesis is not true. Compared to supported students, who have an average learning style score of 110.36, government students have a much higher average score of 124.14. Consequently, it was found that government students' learning styles were more sophisticated than those of children who received aid.

Table 4

Mean, Standard Deviation and t value of learning style of higher secondary students with respect to medium of instruction

Medium of Instruction	Number	Mean	SD	SED	$\lvert m_1-m_2 \rvert$	t	Remarks at 0.05 level
Tamil	191	121.23	15.72	2.07	12.47	6.02	S
English	109	108.76	18.05				

As shown in Table 4 above, the calculated t-value (t=6.02, table value >1.96) is obviously significant at the 0.05 level. As a result, the null hypothesis, "There is no significant difference in the mean scores of learning style of higher secondary students with respect to medium of instruction," is rejected. Since Tamil students' mean learning style scores (121.23) are much higher than English students' mean scores (108.76), it was determined that Tamil students had a greater acquisition learning style than English students.

Table 5

Results of the test of significance of difference between mean scores of achievement in mathematics of higher secondary students with respect to gender

Gender	Number	Mean	SD	SED	$\|m_1-m_2\|$	t	Remarks at 0.05 level
Male	133	65.13	18.64	2.15	1.80	0.83	NS
Female	167	63.33	18.41				

As indicated in Table 5 above, the calculated t-value (t=0.83, table value <1.96) is obviously not significant at the 0.05 level. Thus, "there is no significant difference in achievement in mathematics with respect to gender," as stated in the null hypothesis, is accepted. The fact that the mean math scores of male students are 65.13, much higher than those of female students (63.33), makes this clear. Consequently, it was found that male students did better in mathematics than female pupils.

Table 6

Results of the test of significance of difference between mean scores of achievement in mathematics of higher secondary students with respect to locality

Locality	Number	Mean	SD	SED	$\|m_1-m_2\|$	t	Remarks at 0.05 level
Rural	139	60.39	19.29	2.12	6.96	3.28	S
Urban	161	67.35	17.21				

As can be seen in Table 6 above, the calculated t-value (t=3.28, table value >1.96) is obviously significant at the 0.05 level. Thus, the null hypothesis is refuted. The mean scores of urban students in mathematics are 67.35, much higher than the mean scores of rural students, which are 60.39. Consequently, it was found that urban students outperformed their rural counterparts in mathematics.

Table 7

Mean, Standard Deviation and t value of achievement in mathematics of higher secondary students with respect to type of school

Type of school	Number	Mean	SD	SED	$\|m_1-m_2\|$	t	Remarks at 0.05 level
Government	138	64.03	18.05	2.14	0.18	0.08	NS
Govt. Aided	162	64.21	18.94				

As shown in Table 7 above, the calculated t-value (t=0.08, table value <1.96) is obviously not significant at the 0.05 level. Therefore, the null hypothesis—that "there is no significant difference in the mean scores of achievement in mathematics of higher secondary students with respect to type of school"—is accepted. It is clear that aided students' average math achievement scores (64.21) are significantly higher than government students' (64.03). Consequently, it was found that children who received aid outperformed those who received government support in mathematics.

Table 8

Mean, Standard Deviation and t value of achievement in mathematics of higher secondary students with respect to medium of instruction

Medium of Instruction	Number	Mean	SD	SED	$\|m_1-m_2\|$	t	Remarks at 0.05 level
Tamil	191	66.01	16.78	2.34	5.17	2.21	S
English	109	60.83	20.86				

As shown in Table 8 above, the calculated t-value (t=2.21, table value >1.96) is obviously significant at the 0.05 level. As a result, the null hypothesis is not true. Tamil students' mean arithmetic achievement scores, at 121.23, are obviously much higher than English students' mean scores, which are 108.76. Consequently, it was found that Tamil students did better than English students in terms of their accomplishment in mathematics acquisition.

Table 9

Relationship between learning style and achievement in mathematics of higher secondary students

Variable Correlated	Sample	N	r- value	Verbal Interpretation
learning style and achievement in mathematics	Total sample	300	0.41	Moderate correlation

Table 9 above indicates that the overall mathematics achievement of higher secondary students and their learning style characteristics have a 0.41 coefficient of correlation. The linguistic interpretation indicates that the variables have a moderately favorable relationship with one another. The theory is thus refuted

FINDINGS

Following were the important findings in the present investigation.

1. There is significant difference between male and female higher secondary students in their learning style (t=4.40 >1.96 is significant at 0.05 level).
2. There is significant difference between rural and urban higher secondary students in their learning style (t=4.32 >1.96 is significant at 0.05 level).
3. There is significant difference between government and aided higher secondary students in their learning style (t=7.24 >1.96 is significant at 0.05 level).
4. There is significant difference between Tamil and English higher secondary students in their learning style (t=6.02 >1.96 is significant at 0.05 level).
5. There is no significant difference between male and female higher secondary students in their achievement in mathematics (t=0.83 <1.96 is not significant at 0.05 level).
6. There is significant difference between rural and urban higher secondary students in their achievement in mathematics (t=3.28 >1.96 is significant at 0.05 level).
7. There is no significant difference between government and aided higher secondary students in their achievement in mathematics (t=0.08 <1.96 is not significant at 0.05 level).
8. There is significant difference between Tamil and English higher secondary students in their achievement in mathematics (t=2.21 >1.96 is significant at 0.05 level).
9. There is relationship between learning style and achievement in mathematics of higher secondary students (r=0.41 Moderate correlation).

CONCLUSION

There is significant difference in learning style of higher secondary students with respect to gender, locality, Type of school, medium of instruction.

There is significant difference between achievement in mathematics of higher secondary students with respect to locality, medium of instruction.

There is no significant difference between achievement in mathematics of higher secondary students with respect to gender, type of school.

The study concluded that there is positive and moderate correlation between learning style and achievement in mathematics of higher secondary students.

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