

# Effectiveness of Learning Styles and Academic Achievements among Secondary School Students in Mathematics Subject

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**Abstract:** *This study was aimed to determine the effect of learning styles on academic achievement of school students in mathematics subject. Learning style refers to the ability of learners to perceive and process information in learning situations. The learners learning style based on instructional strategy will improve the academic performances. In mathematics it improves the problem solving ability of the students in the areas of Arithmetic reasoning, Numerical ability and Non-verbal problems quickly and correctly within the prescribed time. Three of the most popular learning styles are visual, auditory, and kinesthetic in which students take in information. This study has found statistically significant difference between the result of pre and the post test achievements in mathematics. Findings of the study reveal that, kinesthetic learning style found to be more prevalent than visual and auditory learning styles among secondary school students. There exist variables – visual, auditory and kinesthetic are significant on academic achievement.*

**Keywords:** Learning, Learning Styles, Secondary School Students, Academic Achievement

## 1. Introduction

Learning is defined as modification of behavior through experience. It is also defined as the acquisition of a desirable behavioral pattern. In other words learning is the modification and co-ordination of the response of the organisms. This study focus on the important psychological variables like learning style and academic achievement. Educational and psychological theorists have identified several major types and categories of learning styles. Researchers have observed and recorded the effect of these various styles on student achievement in school (Reiff, 1992). Dunn et al. (2009) asserted that valid and reliable instruments are available for assessing the learning styles of students of all ages; additionally, they claimed educators can effectively utilize results gathered from such assessments to develop instructional lessons that are responsive to student needs. Meeting the needs of students is essential if educators are to make substantial progress toward the goal of developing lifelong learners.

### Need and significance of the study

Some psychologist has found differences in student's cognitive style. Students learn in many ways, like hearing and experiencing things first hand. But for most students one of their methods stands out. Although basically there are other factors that can influence students' academic achievement, this study specifically seek to discover the students' learning styles in Mathematics streams. The information is vital in helping teachers, students and parents to employ these learning styles effectively.

### Statement of the Problem

The Study taken by the Investigator stated as “**Effectiveness of Learning Styles and Academic Achievements of Secondary School Students in Mathematics Subject**”.

## Objectives

The following objectives were set for this study.

- To find the types of learning style prevalent among the Secondary School Students (Auditory, Visual and Kinesthetic) towards their Academic Achievement in Mathematics.
- To study the relationship between learning styles and academic achievement of secondary school students in Mathematics.
- To compare the effect of different learning styles on the academic achievement of secondary school students in Mathematics.

## Hypothesis

Following hypotheses has been formulated for this study.

- There will be no significant effect of learning style on the academic achievement of Secondary School students in Mathematics.
- There will be no significant difference between the learning styles (Auditory, Visual and Kinesthetic) on the academic achievement of Secondary School students in Mathematics.
- There will be no significant relationship between the learning styles and the academic achievement of Secondary School students in Mathematics.

## 2. Review of Related Literature

### 2.1 Review Study Abroad

JilardiDamavandi, & Shabani,et.al 2011 conducted investigative study on the impact of learning styles on the academic achievement of secondary school students in Iran has also contributed to the learning styles discourse. The results of the analyses of variance showed that there is a statistically significant difference in the academic achievement of the Iranian students that correspond to the

four learning styles; in particular, the mean scores for the converging and assimilating groups are significantly higher than for the diverging and accommodating groups.

**Vaishnav and Chirayu (2012)** conducted study on the analysis of learning styles prevalent among secondary school students also tried to find out the relationship and effect of different learning styles on academic achievements of students. It was conducted on three learning styles-visual, auditory and kinesthetic (VAK). Findings of the study revealed that, kinesthetic learning style was more prevalent than visual and auditory learning styles among secondary school students.

**Gokalp, M. (2013)** conducted study to evaluated the learning styles of education faculty students and determined the effect of their success and relationship between their learning styles and academic success. The study found out that statistically significant differences existed between the results of the first and final applications of the subtests on learning styles and academic success.

## 2.2 Review Study in India

**Ayodhya .P (2007)** in his study it was concluded that there is a substantial correlation between problem solving skills and achievement of the students in mathematics.

**Manoj,T.I. (2010)** made a study focused to find out the effectiveness of Selected learning strategies viz. Scientific inquiry based learning, Cooperative learning and Problem based learning on Achievement of students studying in standard IX and showed that intervention of Selected learning strategies significantly enhances Achievement of the students.

**Shakila J. (2011)** found her study that there is a significant positive relation between the learning of mathematical concepts and problem solving skills of secondary school pupils.

**Mehraj Ahmad Bhat (2014)** in his study concluded that the problem solving ability is the best predictor of achievement in mathematics of high school students. It is clear that there exist a relationship between learning style and academic achievement. This research has attempted to develop an in-depth understanding or explanation as to how the learning styles of the learner influence the academic achievement in their Mathematics Subject.

## 3. Methods

For the present study the researcher utilized the Index of Learning Style Questionnaire Prepared by Barbara A.Soloman and Richard M. Felder. For the academic achievement, Pre-test and Post Test Scores were considered to find out the academic achievement of students in mathematics subject. This study was conducted on the sample of 300 secondary school students from Erode District in Tamilnadu following Tamilnadu state syllabus.

## Statistical techniques adopted

Karl Pearson's product-moment method of correlation Test and for significance difference between means of large independent sample (t test and f test) has been adopted for this research. Measures Mean, Standard deviation, t-test, ANOVA and Correlation Techniques were used to analysis and verification of the hypothesis. The results are summarized below.

## 4. Analysis and Interpretations of Data

**Table 1:** Percentage of Visual, Auditory and Kinesthetic Learning Style

S.No.	Learning Style	Sample	No. of Learners	Percentage
1.	Visual	300	104	34.6
2.	Auditory	300	87	29
3.	Kinesthetic	300	109	36.33

Table 1. Result shows that, kinesthetic learners are more than visual and auditory. It means kinesthetic learning style is more prevalent among students.

**Table 2:** Effect of different learning style on the academic achievement of secondary school students

Sources	df	Sum of Squares	Mean square	'F'	S.L.
Between Mean	2	4743.06	2331.42	4.71	0.01
Within Mean	297	51397.23	246.40		

Table 2 shows that different learning styles are more effective on academic achievement of secondary school students in mathematics subject. The learning style is significant on 0.01 level. It means there exists a significant effect of different learning styles on academic achievements.

**Table 3:** Correlation between different learning styles and the academic achievement of secondary school students

Learning Style	Total No. of Students	M.D.	Sum of S.D.	'r'
Visual	104	2.6	564.23	0.126
Academic Achievement	104	34.81	2584.01	
Auditory	87	5.4	846.36	0.232
Academic Achievement	87	65.32	2445.43	
Kinesthetic	107	9.3	236.23	0.418
Academic Achievement	107	62.64	4786.84	

Table 3 shows that the calculated 'r' value for visual learners is 0.126 are a negligible correlation between visual learners and academic achievements. The value of 'r' is 0.232 shows positive low correlation between auditory learners and academic achievements. The value of 'r' of kinesthetic learner is 0.418 shows positive high correlation between kinesthetic learning style and academic achievements.

## 5. Results and Findings

Kinesthetic Learning Style is found to be more prevalent than Visual and Auditory Learning Style. There exists positive high correlation between kinesthetic Learning Style and Academic Achievement of Secondary School Students in Mathematics Subject. Very low correlation was found in visual and auditory Learning styles and Academic achievement. Therefore, Kinesthetic Learners are more benefited in Traditional Classroom at Secondary Level in their mathematics Subject. There exists significant effect of

Different Learning Styles and academic achievement of students in their Mathematics Subject.

### **Educational Implications and suggestions**

This study has been done in a normal government and non government schools. Therefore, it is suggested that further research be done in other types of schools such as cluster schools, boarding schools or schools where the academic achievements are excellent. With this suggested study, Teachers can see clearly which learning styles they can employ for their Secondary School students in their academic achievement in various subjects. Compare the learning styles between high achievers and low achievers. Visual Learners may draw scientific process, watch videos, use highlights, take note make list. Auditory learners may use word association, record lectures, listen videos, group discussion, may be participated in video conference lecturing etc. Kinesthetic Learners may study in short blocks, attend lab, classes, field trips, visits museum etc. students may improve their academic achievements and strengthen the weaken areas of studies.

### **6. Conclusion**

Each and every individual acquires some sort of education, even if he has never spent a day in a school, because all his acquired characteristics are the products of experiences and activities which are educational in nature. Education, thus, includes all influences in life. Learning style and academic achievement plays a significant role for cognitive affective and psycho motor development of children. The curriculum and syllabus should therefore be framed according to the interest, abilities, attitudes, needs and desires of individuals. It is expected that the findings of the study would help the authorities to plan curricular and activities for secondary school students. Teachers may find out own preferred learning style which often becomes predominant learning style. Teacher may find out students learning style for better learning. Parents should be made aware about different kind of approaches help their child learn best.

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