

# APPROACHES TOWARDS LEARNING MATHEMATICS AMONG HIGHER SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR ACADEMIC ACHIEVEMENT

<sup>1</sup>S. Vijayalakshmi, Dr. S. Komalavalli

<sup>1</sup>Ph.D. Research Scholar, Lady Willingdon Institute of Advanced Studies in Education, [svijaya7206@gmail.com](mailto:svijaya7206@gmail.com)

<sup>2</sup>Assistant Professor of Tamil Education, Lady Willingdon Institute of Advanced Studies in Education, Chennai 600 005.

## Abstract

Education systems aim to enable students not just to acquire knowledge but also to become capable, confident and enthusiastic learners. At school, students who have positive approaches to learning, in terms of both attitudes and behaviors, tend to enjoy good learning outcomes. Beyond school, children and adults who have developed the ability and motivation to learn on their own initiative are well-placed to become lifelong learners. Thus, an overall assessment of the outcomes of schooling needs to consider not only students' knowledge and understanding but also their approaches to learning. This paper explains how learning study incorporates in its design and implementation the principles for a high quality of learning proposed by an Organization for Economic Co-operation and Development (OECD). The OECD Programme for International Student Assessment (PISA) provides a unique opportunity to look at how students approach learning, alongside how well they perform in key subject areas project entitled Innovative Learning Environments (ILE), and analyzes the critical conditions that supported its development in school organizations and the education system. It also describes how learning study could integrate the factors for building innovative learning environments and put them into practice in schools and in a professional learning network in the education system. The Programme for International Student Assessment (PISA 2000) aims to measure such wider outcomes of schooling, at the same time as assessing student performance in terms of reading, mathematical and scientific literacy. In this studies examine an approach to learning, especially in Mathematics among higher secondary school students plays a very important role in building Constructivist learning Ability which helps to achieve in Academic Achievement. For this purpose, A sample of Eleventh standard students were selected out of which there have been 300 girls and 300 boys belonging to the schools in Chennai.

**Keywords:** Enthusiastic, Attitudes, Assessment, Implementation, Literacy, Constructivist.

## INTRODUCTION

A variety of individual differences associated with students' approaches to learning have been identified, such as self-esteem, age, gender, coping strategies and personality traits.

Approaches to Learning focuses on how children learn. It refers to the skills and

behaviors that children use to engage in learning.

The Approaches to Learning domain incorporates emotional, behavioral, and cognitive self-regulation under a single umbrella to guide teaching practices that support the development of these skills. Supporting children's skills in this domain

helps children acquire knowledge, learn new skills, and set and achieve goals. They learn to successfully navigate learning experiences that are challenging, frustrating, or simply take time to accomplish. In terms of method, a systematic process of inquiry which involves planning, implementation and evaluating a research lesson is central to the learning study approach. The planning stage includes choosing the topic, defining the object of learning and identifying critical features of the object of learning. An important part of becoming a successful learner is developing the ability to self-regulate in a variety of situations.

Furthermore, the relationship between student's Achievement, and their Approaches to Learning is bidirectional with variations in student's Achievement. It has been found that persons having positive learning approach can solve the complex problems quickly. Achievement tests are useful aids for diagnosing a student's specific learning needs, for identifying his relative strengths and weakness, for studying his progress and predicting his success in a particular curriculum. Of all the different types of tests, achievement tests are used most frequently.

## Review of Related Literature

### STUDIES RELATED TO APPROACHES TO LEARNING

Puteh et al. (2018) studied the learning approaches and their impact on students' academic performance, i.e. their examination grades. Using Biggs' (1987a) Study Process Questionnaire, 208 completed questionnaires were obtained from final semester students of Diploma in Accountancy from Faculty of Accountancy, UiTM Perak Branch, Tapah Campus. Data pertaining to their previous semesters' grades were obtained from the online academic system and analyses were performed using SPSS. The result revealed a significant positive relationship between learning approaches and Cumulative Grade Point Average (CGPA) among the students.

Hermann, McCuneb and Bager-Elsborga (2017) conducted a study on approaches to learning as predictors of academic achievement. The results of an analysis in which multilevel linear modelling was used to analyse data from 3,626 Danish university students. Controlling for the effects of age, gender, and progression, it was found that the students' end-of-semester grade point averages were related negatively to a surface approach and positively to organised effort. Interestingly, the effect of the surface approach on academic achievement varied across programmes. While there has been considerable interest in the ways in which academic programmes shape learning and teaching, the effects of these contexts on the relationship between approaches to learning and academic outcomes is under-researched.

Hasnor, Ahmad and Nordin (2013) examined the relationship between learning approaches and academic achievement among Intec Students, Uitm Shah Alam. The main aim of this study was to examine the influence of three different learning approaches which are Deep Approach, Surface Approach and Strategic Approach on students' academic achievement among the American Programme students of International Education College (INTEC), UiTM Shah Alam. The study also investigated the relationship between the variables involved and determined the predictors of academic achievement. The design of this research is descriptive in nature and questionnaires were used to obtain information on students' preferred learning approaches and their level of academic achievement. A total of 233 students responded to the questionnaire. The findings showed that students are more prone to use Deep Approach to studying. The findings also revealed that there was an inverse relationship between Surface Approach and academic achievement.

Kamath et al. (2018) determined the learning approach of second-year undergraduate medical students and whether a surface or deep approach to learning had any correlation with the pharmacology sessional and university examination marks obtained. A cross-sectional study was conducted among second-year medical students in their fifth semester. To

determine the students' learning approach, whether superficial or deep, we used the Revised Two Factor Study Process Questionnaire (R-SPQ-2F), which contains 20 items in the form of a five-point Likert scale and is suitable for use in higher education settings. Cronbach's alpha was calculated using the scores obtained from a sample of 20 students to determine the internal consistency. To determine the relationship between the learning approach and examination scores, the average of the individual sessional examination marks and the university examination scores obtained by the students were calculated. Of the 170 students who participated in the study, 87 (51.2%) were females. The Cronbach's alpha value was considered acceptable for both surface and deep approach. While the academic performance was significantly better in females, no difference was seen in the learning approach based on gender. Fifty students had a higher score for the surface approach. This group had lower examination scores compared with those with equal scores for surface and deep approach or higher scores for the deep approach. A weak negative correlation was seen between the examination marks and surface approach. The correlation was statistically significant only in females.

Cetin (2016) examined the approaches to learning and age in predicting college students' academic achievement. The aim of this study was to determine whether the approaches to learning and age are significantly correlated to grade point average (GPA) in early childhood education students. The sampling of the study consisted of 166 students in total (158 female and 8 males; 86 junior and 80 senior) who studied at Georgia Southern University in the United States of America College of Education, Teaching and Learning Department's Early Childhood Education program. The research model was a prediction study. The data in this study was collected using the Revised Two-Factor Study Process Questionnaire (R-SPQ2F) and a personal information form. The findings revealed that there was a positive relationship between students' GPAs and the deep approach. There was a negative relationship between GPAs and the surface approach. There was no

significant relationship between GPAs and approaches to the total score of learning. While there were no significant relationships between students' ages and deep motivation and surface motivation strategies, an association was found between age and approaches to total scores of learning total.

#### STUDIES RELATED TO ACADEMIC ACHIEVEMENT IN MATHEMATICS

Ryan et al. (2021) investigated student performance in mathematics after the transition from primary to secondary education in Ireland. Academic achievement in mathematics was measured using a standardized test at the end of the final year of primary school and the end of first year of secondary education. Progress in mathematics was measured over the transition by comparing these two test results for 249 students. On average, students' raw scores decreased by 7% from sixth class (final year of primary school) to the end of first year of secondary education despite an additional year of instruction and extensive overlap of both syllabi. The results showed statistically significant losses in each strand area and in each process skill.

Villa and Sebestian (2021) examined achievement motivation, locus of control and study habits as predictors of mathematics achievement of freshman students taking non-board examination programs at a certain state university in Southern Luzon, Philippines. In this descriptive-correlation research design, purposive sampling technique was used to select 258 participants enrolled in the subject mathematics in the Modern World. Four sets of research instruments were used for the data collection: namely, mathematics Achievement Motivation Scale, Locus of Control Scale, mathematics Study Habits Inventory and the teacher-made mathematics Achievement Test. The results showed that most students have average achievement motivation, internal locus of control, desirable study habits and average mathematics achievement. The results also revealed that there was a significant relationship between achievement motivation and mathematics achievement and achievement

motivation was found to be the only predictor of mathematics achievement.

Brezavšček et al. (2020) investigated the main factors influencing the mathematics achievement of social sciences university students in Slovenia. A conceptual model was derived where three categories of variables were taken into account: attitude towards mathematics and math anxiety, engagement in learning activities, and attitude towards involving technology in learning mathematics. Data were collected for seven consecutive academic years and analysed using Structural Equation Modelling (SEM). The results showed a very high coefficient of determination for mathematics achievement, indicating that variables “Perceived Level of Math Anxiety”, “Self-Engagement in Mathematics Course at University”, and “Perceived Usefulness of Technology in Learning Mathematics”, together, explain 80.1% of the total variance.

#### NEED AND IMPORTANCE OF THE STUDY

Mathematics enables a child to think and communicate quantitatively, solve problems, recognize situations where their aptitude can be applied and use appropriate technology to support their cause. It gives the child an instrument through which it may measure, analyze and explain a wide range of phenomena, make trend projections, or solve problems of personal interest in general. Despite the importance of Mathematics Education, it has increasingly been observed in recent times that the Achievement of students in Mathematics in all tiers of education is far from satisfactory. Learning outcomes have become a phenomenon of interest to all and this accounts for the reason why scholars have been working hard to unravel factors that militate against good academic performance (Aremu & Soka, 2003). Hence it is necessary to study all the possible factors that influence Achievement in Mathematics.

Mathematics, as a language, is a way of communicating. The Mathematics Educators teach the symbolism they use which is globally recognized. In this way, Mathematics can be

thought of as a universal language. The National Council of Teachers of Mathematics (2000), in its principles and standards for school Mathematics, includes “Mathematics as communication” as one of its major principles for Mathematics Education.

The medium through which the attainment of individuals and the nations’ educational goals can be achieved is through learning. Learning outcomes have become a phenomenon of interest to all and this accounts for the reason why scholars have been working hard to unravel factors that militate against good academic performance (Aremu & Soka, 2003).

Academic Achievement of students especially at the higher secondary school level is a major determinant of the future of youth in particular and the nation in general. Even when they go for higher education like Engineering, Medicine, etc., their marks in Mathematics is considered not only for getting admission into these courses, but also to obtain better job opportunities during campus interviews and to enter into prospective companies. Hence, Academic Achievement in Mathematics has been taken as a criterion variable for the present study by the investigator along with certain relevant educational factors that is responsible for the Mathematics achievement at the higher secondary level. As India is a developing country, and most of the students are still studying in Government schools and Government-aided schools, the investigator sensed the importance to analyze the standards of students’ Mathematics Achievement and to investigate the influencing factors such as Approaches to Learning of the students on Mathematics performance. This is an honest attempt to study the research inquiry on educational factors of Mathematics Achievement among higher secondary students studying in Chennai district.

#### CONCEPTUAL FRAMEWORK OF THE STUDY

Numerous studies have been undertaken on predicting mathematics achievement is students’ approaches to learning (McInerney,

Cheng, Mok, & Lam, 2012; Murayama et al., 2013). Approaches to learning are characterized as the methods used by an individual to focus on and retain new information (Sengodan & Zanaton, 2012). Students' approaches to learning vary because of the relationship between students' motivation to learn, intentions, and learning context. However, these various students' approaches to learning can be generally classified into deep and surface approaches (Marton & Säljö, 2005). Maciejewski and Merchant (2016), in an empirical cross-sectional study, show that there is a strong correlation between a deep approach to learning and students' first-year grades on mathematics tasks. Studies conducted by Puteh et al. (2018), Hermann, McCuneb and Bager-Elsborga (2017) and Ladan et al. (2014) revealed a significant positive relationship between learning approaches and academic achievement in Mathematics. Hasnor, Ahmad and Nordin (2013) and Cetin (2016) found an inverse relationship between Surface Approach and academic achievement.

Only a few researches have been conducted to examine the Approaches to Learning Mathematics of the higher secondary students in Indian contexts. Researches have revealed that Learning Approaches in mathematics provides some advantages for students' learning such as increasing their perception ability, creating different contexts, improving higher order thinking skills and generalizing concepts. This research was proposed to present these deficiencies, improve students' Positive Approaching Ability with new research studies and changes in curriculum, and develop some activities to fill the lacunae found in the literature on Approaching method particularly in Indian context.

Considering the relationships among Approaches to Learning and Mathematics Achievement, the researcher tried to focus on these variables in the Indian context. Hence, this study investigates the influence of students' approaches to learning, on academic achievement in mathematics of higher secondary students. The conceptual framework of the study has been presented below.

## STATEMENT OF THE PROBLEM

Academic achievement is important because it is strongly linked to the positive outcomes. Adults who are academically successful and with high levels of education are more likely to be employed, have stable employment, have more employment opportunities than those with less education and earn higher salaries. Academic success is important because working people will need higher levels of education to tackle the technologically demanding occupations of the future. Individuals, who are better organized, better prepared and have an organizational plan and planner did better in school and will continue to be like that in their career. A nation's development depends on the educated citizens and hence academic performance plays a significant role in deciding the students' future.

Learning approaches play an important role in determining students' academic performance (Shakurnia et al., 2012). Recent research has also emphasized the importance of students' learning approach as a determinant of academic performance. On the other hand, if necessary, measures are taken to change students' learning approaches during the codified educational programs, and their approach may change.

Therefore, this study is an honest attempt to investigate the approaches to learning, school environment, spatial ability and academic achievement in Mathematics among higher secondary students. Hence, the statement of the problem can be stated as

**"APPROACHES TOWARDS LEARNING MATHEMATICS AMONG SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR ACADEMIC ACHIEVEMENT"**

## OPERATIONAL DEFINITION OF THE VARIABLES

**Approaches to learning:** Approaches to learning refers to the combination of motivation and learning strategies that higher secondary school students use to address learning Mathematics.

**Academic Achievement:** Achievement means knowledge attained or skill developed by pupil usually in the school subjects measured by test scores or marks assigned by teacher or by both in Mathematics. In this investigation, marks secured by the students in their half yearly examination has been taken as academic achievement.

**Higher Secondary students:** Operationally the term higher secondary level students refer to those who have chosen Mathematics as one of the subjects studying in class eleven and twelve of the selected schools situated in Chennai district.

## HYPOTHESIS

### MAJOR OBJECTIVES OF THE STUDY

The following objectives were framed to guide this study.

1. To assess the level of Approaches to Learning, and Academic Achievement in Mathematics of higher secondary students.
2. To ascertain the relationship among the variables namely Approaches to Learning and Academic Achievement in Mathematics among higher secondary students.
3. To investigate the relative contribution of Approaches to Learning, Academic Achievement in Mathematics among higher secondary students.
4. To investigate whether there is any significant difference in Approaches to Learning, and Academic Achievement in Mathematics with respect to gender, type of institution, medium of instruction,

### HYPOTHESES WITH REGARD TO RELATIONSHIP

1. There is significant relationship among Approaches to Learning towards Academic Achievement in Mathematics among higher secondary students.
2. There is significant contribution of the independent variables namely Approaches to Learning, and Demographic variables namely

Gender, Medium of Instruction towards Academic Achievement in Mathematics among higher secondary students.

### HYPOTHESES WITH REGARD TO VARIANCE

3. There will be no significant difference between boys and girls with respect to

- Approaches to Learning Mathematics
- Academic Achievement in Mathematics.

4. There will be no significant difference between the students studying in English and Tamil medium with respect to

- Approaches to Learning Mathematics
- Academic Achievement in Mathematics

### VARIABLES OF THE STUDY

The variables included in the present investigation have been classified into dependent and independent variables which are presented below:

Independent Variables - Educational variables:

- ☐ Approaches to Learning Mathematics

Dependent variable:

- ☐ Academic Achievement in Mathematics

Demographic variables

Demographic variables refer to the variables identified by the researcher to describe the nature of the sample chosen. The demographic variables included in the present study are:

- ☐ Gender – Boys and Girls
- ☐ Medium of Instruction – Tamil/English
- ☐ Type of Institution - Private and Government School students.

Thus, the independent, dependent and were identified and systematically treated in the present study.

## TOOLS USED FOR THE STUDY

## Tools Used

The selected tools for this research investigation along with the reliability and validity of the tools were presented below.

Variables	Tools	Reliability	Validity
Approaches to learning	Students' Approaches to Learning questionnaire was adopted from Learners Life, Results from PISA 2000 report by Cordula Artelt, Jürgen Baumert, Nele Julius-McElvany, Jules Peschar, Organization For Economic Co-operation And Development (2003)	0.914	0.892
Academic achievement in Mathematics	Marks scored by the students in half-yearly examination have been taken from the register.		

## METHODOLOGY

In the present study, descriptive method is used to assess the academic achievement in Mathematics with other selected independent and demographic variables. The investigator took utmost care to establish a sound research methodology, designing the psychometric properties and executing the same to select the sample of the study. Survey method has been employed by selecting samples from large number representing a specific population collected

through a highly structured and detailed questionnaire. Data have been collected, tabulated, classified, interpreted, compared, evaluated and then generalizations were made. It involves some types of comparison or contrast analysis and attempts to discover relationship between existing dependent and independent variables of the study. Thus, normative survey method has been adopted in the present research study

## SAMPLE DISTRIBUTION

In the sample of 600 students

SAMPLE DISTRIBUTION OF 600 STUDENTS					
GENDER		MEDIUM		TYPE OF INSTITUTION (SCHOOL)	
Boys	Girls	English	Tamil	Private	Government
300	300	300	300	300	300

1. The Likert Type Approaches Scale is used for Approaches to Learning under 5 point scale.
2. For Academic Achievement, Eleventh standard half- yearly examination marks is used as scoring key.

## TESTING OF HYPOTHESIS

## TABLE-1 SHOWING CORRELATION RELATION BETWEEN APPROACHES TO LEARNING IN MATHEMATICS AND ACADEMIC ACHIEVEMENT

Hypothesis-1 There is no significant relationship between Approaches to Learning Mathematics and Academic Achievement.

Pearson Correlation	r-value	Level of Significance
Approaches to Learning	<b>.726**</b>	<b>0.01</b>
Academic Achievement		

Inference: The hypothesis shows that there is significant relationship between Approaches to Learning and Academic Achievement in Mathematics at 0.01 level. Hence the Hypothesis is rejected.

Variables	Medium	N	Mean	S.D.	S.E.M	t	Level of Significance
Approaches to Learning	Tamil	300	108.2467	5.7518	.3321	70.292	0.01
	English	300	155.1200	10.0160	.5783		

Inference: There is significant difference between Tamil and English Medium students in their Approaches to Learning Mathematics at 0.01 level. The Mean Value of English Medium students are high when compared to Tamil Medium students. Hence the above hypothesis is rejected.

Variables	Medium	N	Mean	S.D.	S.E.M	t	Level of Significance
Academic Achievement	Tamil	300	54.1500	10.3119	.5954	22.743	0.01
	English	300	73.2833	10.2955	.5944		

Inference: There is significant difference between Tamil and English Medium students in their Academic Achievement at 0.01 level. The Mean Value of English Medium students are high when compared to Tamil Medium students. Hence the above hypothesis is rejected.

Variables	Gender	N	Mean	S.D.	S.E.M	t	Level of Significance
Approaches to Learning	Female	300	207.7200	22.8307	1.3181	.860	N.S
	Male	300	206.1133	22.9083	1.3226		

Inference: There is no significant difference between Female and Male students in their Approaches to Learning Mathematics. Hence the above hypothesis is accepted.

Variables	Medium	N	Mean	S.D.	S.E.M	T	Level of Significance
Academic Achievement	Female	300	18.8800	2.1790	.1258	1.127	N.S
	Male	300	19.4167	3.2204	.1859		

Inference: There is no significant difference between Female and Male students in their

TABLE-2 showing the difference between Tamil and English medium students in their Approaches to Learning Mathematics.

Hypothesis-2 There is no significant difference between Tamil and English Medium students in their Approaches to Learning Mathematics.

TABLE-3 showing the difference between Tamil and English medium students in their Academic Achievement

Hypothesis-3 There is no significant difference between Tamil and English Medium students in their Academic Achievement.

TABLE-4 showing the difference between Female and Male students in their Approaches to Learning Mathematics

Hypothesis-4 There is no significant difference between Female and Male students in their Approaches to Learning Mathematics

TABLE-5 showing the difference between Female and Male students in their Academic Achievement

Hypothesis-5 There is no significant difference between Female and Male students in their Academic Achievement

Academic Achievement. Hence the above hypothesis is accepted.



TABLE-6 showing the difference between Private and Government school students in their Approaches to Learning Mathematics

Variables	Institution	N	Mean	S.D.	S.E.M	t	Level of Significance
Approaches to Learning	Private	300	46.0833	5.0789	.2932	27.273	0.01
	Government	300	56.4767	4.4378	.2562		

Inference: There is significant difference between Private and Government school students in their Approaches to Learning Mathematics at 0.01 level.. The Mean Value of Private school students are high When compared to the Government school Students. Hence the above hypothesis is rejected.

Hypothesis-6 There is no significant difference between Private and Government school students in their Approaches to Learning mathematics.

TABLE-7 showing the difference between Private and Government students in their Academic Achievement.

Hypothesis-7 There is no significant difference between Private and Government school students in their Academic Achievement.

Variables	Institution	N	Mean	S.D.	S.E.M	T	Level of Significance
Academic Achievement	Private	300	46.6633	5.3521	.3090	26.470	0.01
	Government	300	57.0433	4.1817	.2414		

Inference: There is significant difference between Private and Government school students in their Academic Achievement at 0.01 level.. The Mean value of Private school students are high when compared to the Government school students Hence the above hypothesis is rejected.

□ In Gender wise there is no difference between Female and Male in Approaches to Learning Mathematics and Academic Achievement. Hence the hypothesis is accepted.

□ There is significant difference between Private and Government school students in their Approaches to Learning Mathematics and Academic Achievement at 0.01 level. The Mean Value of Private School Students are high when compared to Government school students.. Hence the hypothesis is rejected.

## MAJOR FINDINGS OF THE STUDY

Within the restricted realm of the present study, the following conclusions are drawn.

□ There is significant difference between Tamil and English Medium students in their Approaches to Learning Mathematics at 0.01 level. The Mean Value of English Medium students are high when compared to Tamil Medium students. Hence the above hypothesis is rejected.

□ There is significant difference between Tamil and English Medium students in their Academic Achievement at 0.01 level. The Mean Value of English Medium students are high when compared to Tamil Medium students. Hence hypothesis is rejected.

## SCOPE OF THE STUDY

Academic performance in mathematics of higher secondary education plays a crucial role and it decides the future of students to select the higher studies as well as their career. It is highly beneficial to enter into higher education but also to obtain employment in various reputed organizations. This study will hopefully facilitate the quest to improve the academic performance of higher secondary students particularly in mathematics.

This research study helps to provide some relevant insights on measurable aspects of major factors influencing higher secondary students' academic achievement in mathematics and such knowledge will help academics in designing strategies in mathematics teaching that can improve and enhance learners' interest towards mathematics learning.

Despite wide applicability and importance of achievement, particularly for a developing country like India, many students are still not finding their feet to perform better at the higher secondary level. Hence, there is a vital scope for the researcher to study the "Socio-Educational factors of Academic Achievement in Mathematics among higher secondary students."

### **EXPECTED OUTCOMES OF THE STUDY**

□ Factors that contribute to better performance in mathematics of students studying in Private and Government higher secondary schools will be identified and studied. The methods that will be used to achieve this aim are through the responses collected from the higher secondary school students by using suitable questionnaires.

□ Despite the fact that there exists an abundance of literature that describes the factors responsible for Mathematics achievement, very little research explains why some of the students succeed in mathematics and why they do so at levels comparable to those of their peers in other groups. Hence, by comparing mathematics teaching and learning in higher secondary schools with similar background, indication of why the school is achieving above or below expectation in higher secondary school mathematics can be determined. Furthermore, if this research could determine factors that facilitate achievement in mathematics, it could create opportunities for those who perceive mathematics as a dreadful subject. Findings from this study should also increase the knowledge and higher order thinking skills while adding understanding that

could lead to improvement to persuade more students and to develop their full potential in mathematics.

### **EDUCATIONAL IMPLICATION OF THE STUDY**

The Academic Achievement that has emerged from the study revealing the nature performance among the Eleventh standard student has got vital implications. The variable namely Approaches to Learning Mathematics, seem to contribute significantly to Academic Achievement. All educational Programmes have their essential ultimate. Approaches to Learning Mathematics enables the students to solve problem concerning and problems of life which they are likely for encounter. For slow learners various technique should be followed to stimulate the interest of the students which also promotes self-confidence and self-reliance and a sense of achievement among the students.

Active methods that require the learners to rediscover or reconstruct the truths to be learned should be used. The teacher also provides counter examples to the learner that lead to reflection of their often hasty solutions.

Learners must be permitted to make their own mistakes and to correct these errors themselves. Therefore, classroom instruction must be planned to facilitate the process of construction, assimilation and accommodation through which physical/empirical abstraction and reflective abstraction can occur. The classroom should provide situations to children in constructing their own knowledge so that the children can comprehend the world in new ways at different cognitive levels.

The implications of educational practice are important. First, a variety of activities games and experiences should be provided to that the learner can exercise his or her developing subsystems. One suggestion is to use individualized mathematics laboratories that utilize a variety of materials for measurement and experimentation.

## Conclusion

Academic performance in Mathematics of Higher Secondary Education plays a crucial role and it decides the future of students to select the higher studies as well as their career. This study will hopefully facilitate the quest to improve the Academic Performance of Higher Secondary Students particularly in Mathematics.

In this paper, we show how learning study can integrate all these factors to create an impact on student learning in real classroom situations and suggest some strategies to create a professional learning community in the school organization. As Stigler and Hiebert (1999) point out, the best way to avoid the theory-practice gap is to study actual lessons.

This research study helps to provide some relevant insights on measurable aspects of major factors influencing higher secondary students' academic achievement in mathematics and such knowledge will help academics in designing strategies in mathematics teaching that can improve and enhance learners' interest towards mathematics learning. Teacher should pay individual attention to the children in order to improve them in their studies and mould to become good citizens for the country. The student-teacher relationship should be improved in all aspect, so that the pupils may not leave fear in approaching the teacher to clear their doubts. This study may enrich the educators in the field of Mathematics education and may serve as a data for future.

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