

Students' Different Study Approaches and Its Effect on the Under Achievement in Mathematics

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ABSTRACT: The large number of dropout and failure in secondary mathematics has been a matter of grave concern in national and international level. Under this perspective the study deals with the different study approaches of the students in mathematics and the causes of under achievement in mathematics. The study is based on primary information collected from 280 random samples in class-X, XI & XII standard. Attempt was made to identify the causes of under achievement (CUA) and different approaches to study mathematics; and to verify the relationship between them. Findings of the study revealed that the CUA is positively correlated with the different study approaches in mathematics.

Keywords: *The three types of study approaches: Dull, Moderate & Excellent. CUA: Causes of under achievement.*

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I. INTRODUCTION

The basic knowledge and skill in mathematics is out most required in every field of learning and in every field of endeavor in everyday life. Poor performance and underachievement in mathematics has adverse effect in the scientific and socio-economic development of a country. In Indian context dissatisfactory scenario is still continuing with the large number of dropout and failure in mathematics in school leaving certificate examinations conducted by the different Boards of the country¹. The achievement level in mathematics of the students of class X in Assam as per the National Achievement Survey (NAS) 2014-15 conducted by NCERT revealed that 39% students scored in the range of 0-35% marks, 42% students scored in the range of 36-50% marks, 18% students scored in the 1 R. Banerjee (2012), "Innovation and initiatives in mathematics education in India", *Mathematics Education in India: Status and Outlook*, HBCSE, TIFR, 2012, P-183 range of 51-75% marks and only 1% students reached above 75% marks.² The importance of mathematics in the changing scenario of the society and the ongoing gloomy situation necessitates undertaking the present study on under achievement in mathematics. Students' study habits, self-concept, attitude and interest toward mathematics have influential effect in the achievement in mathematics (Marsh et.al, 1985, Singh et.al, 2002, Suan, 2014) and become a deciding factor in the choice of mathematics related career (Marsh et.al, 1985). The research study revealed that there are individual differences in the student's perception in mathematics class and it influences self-concept and interest in mathematics (Lazarides, et.al, 2012). Students' study habits also differ depending on their individual perception. In this study attempt was made to identify the different study approaches of the students in mathematics. The study tried to identify the causes of under achievement in secondary mathematics. There are many causes of under achievement in mathematics but the individual causes are cited in many literatures (C. Hui-Ling, 2001, Aremu et.al, 2003, Wachira, 2005, Kitsantaset.al, 2010, P. K. Sodhi 2016). Therefore, in this study attempt was made to identify the attributes of the individual factor that are caused for under achievement in mathematics. It included the students' study habits, lack of basic knowledge and other personal problems affecting the achievement in mathematic. Further the study also tried to verify there relationship between the causes of under achievement and the different study approaches of the students in mathematics.

II. AIM AND OBJECTIVES OF THE STUDY:

The study set the following three objectives

- 2.1. To identify the different study approaches of the students in mathematics.
- 2.2. To identify the attributes of the individual factor those are caused for under achievement in mathematics.
- 2.3. To verify the relationship between the causes of under achievement (CUA) and different approaches to study mathematics.

III. NULL HYPOTHESIS

There is no relationship between CUA and different approaches to study mathematics”

IV. METHODOLOGY

For the Present study the causes of under achievement in mathematics and the different approaches toward study of mathematics were determined by the investigator2 Appraisal Report-Assam (2016-17, P-4), PAB Minutes-RMSA, India, www.mhrd.gov.in>school Education through unstructured face-to face open interview of the students of class- X, XI and XII. The views of the students associated with more frequencies were selected for the questionnaire of the pilot survey and others were discarded. The final questionnaire remained only twelve (12) questions. This questionnaire was prepared for identifying the causes of poor performance and the different approaches of the students toward study of mathematics. Responses of the students were collected using ten-point scale in the questionnaire. The study is delimited to Goalpara District of Assam. It is based on the responses of 280 numbers of random samples collected by the investigator from the students in Class-X, XI and XII in the district. The questionnaire was administered in a very free-frank friendly way by the investigator in a classroom situation so that they don't hesitate to give accurate answer. The collected data were analyzed by the statistical tools- Mean, SD, Correlation, Multiple regression and ANOVA with the help of SPSS.

V. STUDENTS' DIFFERENT APPROACHES TOWARD STUDY OF MATHEMATICS:

The study approaches of the students were classified into three types-(i) Dull (ii) Moderate and (iii) Excellent Approaches. The dull approach refers to the study habits: trying to understand only by reading, repeatedly reading and Parrot type cramming. The moderate approach refers to the study habits: Practice the solved problems and homework is done for few problems other than classroom practice. The excellent approach refers to the study habits: homework is done trying to cover all the problems given in the exercise besides the theorem and classroom practice, keep the formula charts hanging in front of the study table besides writing.

Table-1: Descriptive Statistics for different approaches

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Different Approaches	N	Actual		Mean in Percent
		Mean	Std. Deviation	
	Statistic	Statistic	Statistic	Statistic
Dull	280	15.48	8.712	38.71
Moderate	278	25.09	8.922	62.73
Excellent	266	19.69	8.609	49.22

The findings presented in the table-1 revealed that the study approaches of the students were generally high for moderate (62.73%), medium for excellent (49.22%) and less for dull (38.71%) approaches. In decreasing order this can be represented as

$$\text{Moderate} > \text{Excellent} > \text{Dull}$$

The Individual Causes of Under Achievement (CUA) in Mathematics:

The study determined the five individual causes of under achievement in mathematics as (i) loss of memory in the examination hall, (ii) mistake occurs frequently in dealing with positive-negative sign, (iii) lack of algebraic knowledge and unable to apply formula, (iv) lack of geometric knowledge and (v) lack of arithmetical and computing knowledge. The finding of the study presented in table-2 revealed that the individual factor (Study habit, lack of Knowledge and personal Problems) are responsible for 43.22% underachievement in mathematics.

Table-2: Descriptive Statistics for the Causes of Under Achievement

TSCUA	N	Mean	Std.	S.D.	Mean
	Statistic	Statistic	Error	Statistic	Percent
Total Score for the Causes of Under Achievement	205	21.61	.690	9.879	43.22

Relationship between CUA and Different Approaches to Study Mathematics:

In this part of the study attempt was made to verify the null hypothesis, " H_0 : There is no relationship between CUA and different approaches to study mathematics". For this purpose the strength of linearity between causes of under achievement (CUA) and the three factors- dull, moderate and excellent approaches were measured by the correlation coefficients at 1% level of significance in 2-tailed test. The findings presented in the table-3revealed that causes of under achievement is highly correlated with the dull approaches (0.473**, p = 0.000) and Moderate approaches (0.397**, p = 0.000) to the study of mathematics. On the contrary the correlation between causes of under achievement and excellent approaches to the study math was not significant. It revealed that the strength of linearity measures of CUA were in decreasing order with dull, moderate and excellent approaches to the study of mathematics. Therefore, the study rejected the null hypothesis and indicated that the causes of under achievement can be minimized by changing the study approaches of the students in mathematics.

Table-3: Correlation between CUA and Three Factors of Study Approaches

Approaches →		Dull (Factor-1)	Moderate (Factor-2)	Excellent (Factor-3)
Causes of Under Achievement	Pearson Correlation	0.473**	0.397**	0.132
	Sig. (2-tailed)	0.000	0.000	0.067
	N	205	203	194

** . Correlation is significant at the 0.01 level (2-tailed).

Findings of the Study

The findings of the study revealed that the students generally practice moderate approaches to study mathematics. Both the dull and excellent approaches were less than moderate approaches. Another important finding of the study was that the attributes associated with individual factor are significantly responsible for under achievement of the students in mathematics. Moreover, the cause of under achievement was found correlated with the dull and moderate approaches. The dull approaches carried the heaviest weight 0.365 and then moderate approaches with the weight 0.223 for the causes of under achievement.9. Recommendation of the Study: The study forwarded the following recommendations

1. Remedial classes are necessary to identify the individual problems and the study approaches of the students in mathematics.
- 2 The teachers and guardians should try to motivate the students to practice excellent approaches in the study of mathematics.
3. Practice of conceptual understanding rather than rote learning.

VI. CONCLUSION

The study asserted that the under achievement of the students in mathematics can be minimized by changing the study habits of the students. The study was conducted taking limited number of samples in a small area (only one district). For the generalization of the findings further broad based study is required covering the state and whole nation. The findings of the study are expected to be helpful to the teachers and guardians in providing scientific guidelines to the students to study mathematics for batter achievement.

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