



SELF-EFFICACY OF HIGH AND LOW ACHIEVERS IN MATHEMATICS OF SENIOR SECONDARY SCHOOL STUDENTS

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ABSTRACT

The present study was conducted to compare the self-efficacy of high and low achiever of achievement in mathematics of senior secondary school students. The sample of 300 senior secondary school students was taken from 3 districts of Punjab. Senior secondary school students was divided into two groups viz. high achievers and low achievers on the basis of achievement in mathematics which was taken as their marks in Mathematics in previous class and assessed their self-efficacy by using the hindi version of Self-Efficacy scale developed by Sud, Schwarzer and Jerusalem (1998). Result of the study revealed that the high achievers of mathematics had better self-efficacy as compared to low achievers of mathematics. The positive correlation between self-efficacy and achievement in mathematics of senior secondary school students was also found.

KEYWORDS : Self-Efficacy, Achievement in Mathematics, Senior Secondary School Students.

Introduction

Mathematics plays vital role in the development of child as critical reasoning is enhanced due to complex puzzles of questions in this subject. In globalization world, technology and industry gives more value to mathematics as it imparts participation in progress of every profession. Mathematics' basic elements are analysis, logic intuition and construction, generality and individuality. Kothari Education Commission (1964-1966) stated that, "mathematics and science should teach on compulsory basis for all students as a part of general education in quality form during up to ten standards for rational outlook, clear and logical thought formation with positive attitude". Some students may understand faster than others but almost students need practice time to reach sufficient proficiency level.

Student's mathematical achievements influenced on performance of pupils at school and college level which further help students to develop sophisticated perspectives and offer more career opportunities. Educators and politicians also consider its value. Teachers and parents start to recognize the factors influencing their student's mathematics achievements but they are unable to help them to make substantial academic performance. There are many factors responsible for academic achievement of the students like intelligence, motivation, study habits, self-regulation, self-efficacy, attitude towards teacher, attitude towards education, home and institution background, self-confidence, mental conflicts, level of aspiration, examination fear etc. Self-efficacy is very important factors which affect academic achievement of the students in mathematics.

The word Self-efficacy is developed by the psychologist Albert Bandura, who well defined the word self-efficacy, which plays a major role in how one approaches goals, tasks and challenges.

According to Albert Bandura, Self-efficacy defined as "individual's confidence in their ability to organize and execute a given course of action to solve a problem or accomplish a task". Self-efficacy means individual's belief about own capability to perform behavior at certain level in specific situation (Bandura, 1997 and Schunk, 1991). Bandura (1977) first introduced the concept of self-efficacy by publishing theory of behavioral change and defined self-efficacy expectations as a belief about one's ability to behave successfully for desired consequences. While Schunk (1991) states that self-efficacy is personal judgment to assess capabilities to perform in specific domain of activity that may contain novel, unpredictable situation and stressful event.

In positive psychology, it is central idea to focus on the factors to enhance creativity in individuals. Self-efficacy is not transformed from one to other but it is a generative capability that is acquired through the life experiences. Self-efficacy's basic aim is not to achieve a particular goal while it's intention is what I say, I will probably do; and research has shown that intentions are influenced by a number of factors, including, but not limited to, efficacy beliefs.

Self-efficacy is characterized as the capacity to exert control over one's behaviour, passion and social environment. The belief in one's own ability to perform or learn at an undeniable level is described as self-

efficacy. People's behaviours are effected by how they see the results of their efforts and their abilities. One's belief in the likelihood of goal completion can be motivating in itself. Self-efficacy states to the people judgments about their competence to perform particular tasks. Tasks-related self-efficacy enhance the effort and continuance toward challenging tasks, and therefore increases the probabilities that they will be completed.

Academic achievement was found to be related to self-efficacy and found positive and significant relationship between self-efficacy and academic achievement of mathematical student's. While few studies found no significant relationship between self-efficacy and academic achievement of mathematics.

Significance of the Study

School education is important for student's life. In school they study different subjects such as English, Punjabi, Science, Mathematics, Social studies, Hindi, etc. Mathematics plays vital role in school curriculum and in student's daily life. It is a pure science and its knowledge is important for everybody because mathematics is a methodical application of matter. Certain qualities that are nurtured by mathematics are power of reasoning, creativity, critical thinking, problem solving ability and even effective communication skills. It is fact well explained by psychologist that individuals differ in their abilities and potential and they differ in achievement in mathematics as well. Academic achievement of the students in the subject of mathematics at variance with the other subjects as per table 1.3 chapter 1. The table shows that although there is increase pass percentage or achievement scores of mathematics were still students are not achieving as desired by parents and the school. From the results of tenth class it is seen that large number of students who pass the subject have obtained marks ranging from 33 to 55 marks. Only small percent is obtaining above 60% marks in this subject. There are different factors which affect the mathematics achievement i.e. psychological, and environment factors. The psychological factors –Self regulation, self-directed learning, motivation, learning strategies, self-efficacy, concentration, etc. Environmental factors-SES, Parental education, etc. There is more impact of self-efficacy on the mathematics achievement. It describes that with an increase in self-efficacy, the mathematics achievement also increases which is evidenced in the case of urban area. The related literature is silent about the status of rural area. Thus, the present study is an attempt to locate the impact of self-efficacy on academic achievement in mathematics in rural area.

Objectives of the Study

1. To identify the high and low group of senior secondary school students on academic achievement in mathematics.
2. To compare the self-efficacy of high and low group of senior secondary school students on academic achievement in mathematics.
3. To study correlation between self-efficacy and academic achievement in mathematics of senior secondary school students.

Research Method

The study was conducted through descriptive method of research.

Research Tools Used

The devices that the researchers used for the purpose of data collection are called as the tools of research. In the present study, the following tools were selected and uses by the researcher.

Academic Achievement in Mathematics

Academic achievement in Mathematics was taken as the percentage of marks obtained in Mathematics of 10th class's final exam conducted by Punjab School Education Board, Sahibzada Ajit Singh Nagar.

Self-efficacy Scale by Sud, Schwarzer and Jerusalem (1998)

The Hindi version of Self-Efficacy Scale developed by Sud, Schwarzer and Jerusalem (1998) was used to assess the self-efficacy of the senior secondary school students. Self-efficacy scale is a 10 items likert scale on response 'exactly true', 'moderately true', 'hardly true' and 'not at all true'. The scores ranged from 10 to 40. High score showing the higher level of self-efficacy. The Cronbach's Alphas reliability of the tool was found to be ranged from 0.76 to 0.90.

Population of the Study and Sample

The government senior secondary schools of Punjab (both rural and urban) was the population of the study. All the districts of the Punjab state was categorized as high, moderate and low on the basis of literacy rate and one district from each group was selected for data collection. The sample of 300 (150 female and 150 male) senior secondary school students studying in class 11th was taken with the help of multi stage sampling technique.

Discussion of the results

The first objective of the present study was to identify the high and low group of senior secondary school students on the base of academic achievement in mathematics. In the present study, mathematical achievement of matriculation is assisted among 300 rural senior secondary school students. Q_1 and Q_3 was calculated to determine the high and low level of achievement in mathematics. Findings reveals that maximum students i.e. 160 were in average group while high and low had 70 senior secondary students in each as $Q_1 = 50.89$ (51) and $Q_3 = 65.26$ (65).

Table 1 Mean and Standard Deviation of High and Low Group of Senior Secondary School Students on Academic Achievement in Mathematics

| Academic Achievement in Mathematics | Group | N | Mean | Standard Deviation |
|-------------------------------------|-------|----|-------|--------------------|
| | High | 70 | 74.81 | 8.49 |
| | Low | 70 | 46.25 | 4.49 |

The table 1 shows that the mean of high and low academic achievement in mathematics among senior secondary school students came out to be 74.81 and 46.25 with standard deviation being 8.49 and 4.49 respectively.

Comparison of Self-Efficacy between High and Low Groups of Senior Secondary School Students on Academic Achievement in Mathematics.

The second objective of the present study was to investigate the mean differences in self-efficacy of high and low group of senior secondary school students on achievement in mathematics, the t-test was employed to find out the significant difference between self-efficacy among two groups (high and low) of senior secondary school students on academic achievement in mathematics and the results has been presented in table 2 as below.

Table 2 Comparison of Self-efficacy between High and Low groups of Senior Secondary School Students on Academic Achievement in Mathematics

| Group | Number of Students | Mean Scores of Self-Efficacy | SD | t-value | Sign |
|--|--------------------|------------------------------|------|---------|---------------------------|
| Higher Group on Mathematic Achievement | 70 | 31.79 | 5.41 | 3.39** | Significant at 0.01 Level |
| Low Group on Mathematic Achievement | 70 | 28.54 | 8.04 | | |

From the table 2 it can be seen that the 't' value for self-efficacy is 3.39 which is significant at 0.05 level at $df=138$. It reflects that mean scores

of self-efficacy of high and low achiever senior secondary school students in mathematics differ significantly. It may be concluded that high achiever students in mathematics is found better self-efficacy than low achiever students in mathematics of senior secondary school students. This result of the present study in line with the finding of previous researchs of Pajares and Kranzler (1995), Shkullaku (2013), Tenaw (2013) and Ochieng (2015).

Relationship Between Self-Efficacy and Achievement in Mathematics of Senior Secondary School Students.

The third objective of the study was to investigate the correlation between academic achievement in mathematics and self-efficacy of senior secondary school students the Pearson Product Moment Correlation was used and results and presented in table 3 as below.

Table 3 Coefficient of Correlation for Self-Efficacy and Academic Achievement in Mathematics

| Variable | N | R | Sign |
|----------------------------|-----|-------|---------------------|
| Self-efficacy | 300 | 0.11* | Significant at 0.05 |
| Achievement in Mathematics | | | |

The table 3 shows that coefficient of correlation between self-efficacy and academic achievement in mathematics of senior secondary students came out to be 0.11 which is significant at 0.05 level of significance. It may be revealed that there is positive relationship between self-efficacy and academic achievement in mathematics of senior secondary school students. This result of the present study is in line with the findings of previous researches of Li (2012), Tamannaefar and Lies (2014), Naz and Majoka (2016), Gupta and Kundu (2017), Woke et al., (2021) and Ariati et al., (2021).

Educational Implications

- Teachers should pay attention towards students to clear their concepts of mathematics at an early stage. Teachers should teach in an effective way in order to make learning process interesting. Extra time should be provided to slow learners so that they are not left behind academically.
- Parents of the students should pay attention to the students, they should try to motivate their child for improving their mathematics, problem solving skill and create interest of students in mathematics.
- Efforts should be made definitely to enhance the self-efficacy of the students. For this, inspiring the students to set and achieve their targets within time which will boost up their self-confidence and develop problem solving attitude in them.

School authorities should provide a variety of mathematics resources in their schools like Mathematics Laboratory, Mathematics Library Corner, Mathematics Club and Mathematics park etc. to increase Mathematics Achievement.

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