Mathematical Achievement of Senior Secondary School Students in Relation to Academic Anxiety

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Abstract: The present study was carried out to investigate the significance of relationship between mathematical achievement and academic anxiety of senior secondary school students. The investigator selected a sample of 200 students of 11th (Non-Medical) class from Government/Government aided Senior secondary schools of Ludhiana district from the state of Punjab. Marks of 10th class board examination were taken as achievement in Mathematics and for the academic anxiety scale for children (2009) developed by Singh and Gupta was used to collect the data. Mean, median, S.D., Skewness and Kurtosis were calculated to check the normality of the data. The product moment correlation ‘r’ was employed for the analysis of data. The results of the study revealed that an inverse relationship was found between the mathematical achievement and academic anxiety of senior secondary school students. More specifically, as the level of academic anxiety increases, mathematical achievement decreases and vice-versa.

Keywords: Anxiety, academic anxiety, Mathematical achievement, senior secondary school students

I. Introduction

Education is the most powerful instrument of human development and empowerment for the achievement of a better and high quality of life. A sound and effective system of education results in the enfoldment of potentials, values and attitudes. It stands for all those changes and modifications in the behavior of individual, which he/she undergoes during his/her lifetime. Education aims at tapping the potentialities of an individual to the maximum efforts. Thus to make the teaching-learning process most effective education must develop abilities and capacities which make child competent enough to deal with various challenges of life. To achieve this aim mathematics also plays a vital role as mathematics is a backbone of the students to achieve and developed the skill in reasoning and thinking level. But, all over the globe, mathematics has been viewed as a challenging subject by a significant portion of learners. Since the beginning of recorded history, mathematics discovery has been at the forefront of every civilized society, and in even the most primitive of cultures. The need of math arose based on the wants of society. The more complex a society, the more complex the mathematics needs, primitives tribes needed little more than the ability to count, but also replied on math to calculate the position of the sun and physics of hunting. In elementary stages, the base of the mathematics should be imposed to develop for mental observation and creativity of innovations. Due to lack of proper knowledge on mathematics the student suffers in all spheres of life. So, In their grassroots level the teaching of mathematics should be effective and scientific. In there stepping stones and the process of learning the students should involved in the respected area with more interesting.

II. Mathematical Achievement

Mathematics is regarded as the mother of all sciences. Mathematics is a sort of mental jogging to build up mind. There is a disciplinary value in the study of mathematics, in the development of sound work habits, capacity to do work habits, capacity to do work independently and acquire problem solving skills and strategies. It is self-discipline, which help in the analysis of a problem, the identification of what is given and what is to be solved: the selection of strategy to solve the problem and interpretation of the obtained results. The Educationalists believes that study of mathematics helps in the mental and intellectual development, disciplines, simplicity, accuracy, certain and verification of results, originality and reasoning. It is very easy that mathematics is a gateway of all sciences. Mathematics achievement refers to not only to obtaining excellent marks in the greater level final examination but it also refers to the attainment of the mathematical ability and skills. Mathematics achievement of the pupils refers to the attainment and skill development through school subjects which are assessed by school authorities with the help if the achievement test.

According to Kulkarni (1970), “Mathematical achievement refers to understanding of mathematical concepts,
application of knowledge to new situations and logical reasoning as involved in interpretation of data, interpretation of missing links, etc.” Good (1959) defined Achievement in mathematics as “knowledge attained or skills developed in the school subjects usually test scores or by marks assigned by teachers” Grounlund (1971) defined achievement as, “A systematic procedure for determining the learnt through instruction.” The academicians are majorly concerned due to the issue of student’s poor performance in mathematics and its downfall at a higher level of education. According to (Pisa, 2009) report two Indian states bagged 72nd and 73rd position out of 74 in both reading and math. The poor performance of Indian students in PISA was acknowledged with disappointment by the Indian media (Anubhuti, 2012). For 2015 PISA cycle, India backed out, as the government officials felt that Indian students were not yet well prepared for such a test (Chappia, 2013).

Children’s poor performance and maths avoidance has remained a significant challenge for the education community since several decades. There are numerous personal and environmental factors that can influence students’ achievement in mathematics. Student’s math anxiety poses to be a crucial variable, affecting their performance and mathematics achievement. Math anxious individuals respond to the maths curriculum with boredom and discouragement by developing the perception that success in math depends on innate ability, which they simply do not possess. This divorces their entire lives and career away from the discipline of mathematics, bringing their future potential at crossroads. It has been observed that both parental and children math anxiety play an important role in children math achievement. Math anxious individuals respond to the math curriculum with boredom and discouragement by developing the perception that success in math depends on innate ability, which they simply do not process. This divorces their entries lives and career away from the discipline of mathematics, bringing their future potential at crossroads. It has been observed that students’ math anxiety plays an important role in mathematical achievement.

III. Academic Anxiety

In the present study academic is a kind of anxiety which is related to the impending danger from the environment often academic institutions including teacher in certain subjects like Mathematics, English and Chemistry etc. Academic anxiety, is a kind of anxiety which related to the imminent danger from the environment of the educational institutions together with teacher. certain subjects, co-curricular activities, etc. It is a mental Sensitivity of uneasiness or distress in response to school or college circumstances that is perceived negatively. They feel anxious in academic field in the form of panic, helpless, hypertension and mental disorganization. Academic anxiety leads to academic difficulties through irrelevant thoughts, preoccupation and reduce attention and concentration (Eysenck, 2009).

It is a mental felling of uneasiness or distress in reaction to a school situation that is perceived negatively. Researchers generally agreed that academic anxiety is not always bad. An average level of anxiety is useful in keeping people motivated and responsible and helpful for people in helping a more sustainable and prosperous life (Kahan, 2008), Donnelly, (2009), Hakimi, Ashouri, Dehghani, Zeinali, Daghighi, & Bahami, (2011). Without any anxiety most of the people would lack the motivation to do anything in life. Therefore, moderate level of academic anxiety is essential to motivate students to study for examination and may incline them for better achievement. It has been observed that a high level of anxiety interferes with concentration power and also affects memory. In this way high academic anxiety may be one of the obstacles to academic achievement. Academic anxiety cannot be ignored at any cost, if we are concerned about students’ performance. If it is not properly addressed it can have serious and long lasting consequences such as causing a student to procrastinate, perform poorly in school work, and withdraw from socializing with peers or from other situation (Mattoo & Nabi, 2012), Modi (2005), Deb, Chatterjee and Walsh, (2010), Atri and Neelam, (2013), Mathur (2015) found math anxiety in students of government and government aided schools and low level of math anxiety in students of AMU and missionary schools. Hemamalini, (2010), found significant relationship between anxiety and English achievement among the high school students of Ramanagaram city. Yousefi et al (2010) found significant difference between test anxiety and mathematics achievement. It can be concluded that there is significant negative relationship between anxiety and achievement (Singh & Thukral, 2009; Khatoon & Mahmood, 2010; Rana & Mahmood, 2010; Vitasari, 2010; Yousefi et al, 2010; Vahid & Kashani, 2011; Ali, 2012; Das et al, 2014 Shakir, 2014 and Dawood et al, 2016). Ndirangu et al (2009) and Meetei (2012) found no significant relationship between test and academic performance. Singaravelu (2009), Mattoo and Nabi (2012) found that is no significant difference between the academic (test and Mathematics) anxiety scores between male and female respondents.

IV. Objectives

1. To investigate the significance of relationship between mathematical achievement and academic anxiety of senior secondary school students.  
   1a. To investigate the significance of relationship between mathematical achievement and academic anxiety of senior secondary school boys.
   
1b. To investigate the significance of relationship between mathematical achievement and academic anxiety of
The present study is to investigate the relationship of mathematical achievement and academic anxiety of Senior secondary school students. The present investigation is of survey type and descriptive in nature. In the present study investigator selected sample of 200 students (100 Boys and 100 Girls) of 11th (Non-Medical) class from Government/Government aided Senior secondary schools of Ludhiana district only. The schools were randomly selected but availability of students, favorable attitude of the principal, teachers and convenience of the investigator were also taken in consideration while selecting schools. For the collection of data, marks of 10th class board examination were taken as achievement in Mathematics and an academic anxiety scale for children (2009) developed by Singh and Gupta were used. Scoring of the scale was done with help of manual of the scale and scoring guide. Descriptive statistics – mean, median, mode, standard deviation, skewness and kurtosis calculated to examine the nature of distribution of scores. For inferential purpose, product moment correlation ‘r’ was employed.

VI. Analysis and Interpretation of data
For the sake of convenience and keeping in view the nature and objectives of the study, the results have been presented into three sections.

Section I: has been dealing with normality of data.
Section II: has been dealing with relationship between mathematical achievement and academic anxiety of senior secondary school students and relationship between mathematical achievement and academic anxiety of boys and girls.

Section- I
Table 1.1.Normality of data: Before statistical of the data needs to be checked for its normality.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Median</th>
<th>S.D</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical Achievement</td>
<td>11.35</td>
<td>11</td>
<td>3.33</td>
<td>0.20</td>
<td>-0.63</td>
</tr>
<tr>
<td>Academic Anxiety</td>
<td>81.21</td>
<td>82</td>
<td>11.32</td>
<td>-0.29</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Table 1.1 reveals that values of mean, median for achievement in mathematics are 11.35 and 11 respectively. Both these measures of central tendency are in close proximity to each other which shows that the distribution is quite near to normal. The values of skewness and kurtosis are 0.20 and -0.63 respectively. Both these values are within the range of chance fluctuation. The values of mean, median for academic anxiety are 11 and 82 respectively. Both these measures of central tendency is in close proximity to each other which shows that the distribution is quiet near to normal. The values of skewness and kurtosis are -0.29 and 0.09 respectively. Both these values are within range of change fluctuation of skewness and kurtosis for N=200.

Section - II
A. Mathematical Achievement and academic anxiety of Senior secondary school students.
Pearson’s correlation was worked out to find the relation of mathematical achievement and academic anxiety of Senior secondary school students.

Table 1.2

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical Achievement and Anxiety</td>
<td>-0.172*</td>
</tr>
</tbody>
</table>

Significant at 0.05 level of significance (table attached in Appendix -II)

Table 1.2 reveals that the value of correlation between Mathematical Achievement and Academic Anxiety is -0.172 which is negative and significant at 0.05 level. This means there is a significant relationship between the mathematical achievement and the academic anxiety. Therefore, H01 is rejected. Negative correlation indicates that as the level of academic anxiety increases, mathematical achievement decreases and vice-versa. This finding is consistent with the findings of previous researchers. (Singh & Thukral, 2009; Khatoon & Mahmood, 2010; Rana & Mahmood, 2010; Vitasari, 2010; Yousefi et al, 2010; Vahid & Kashani, 2011; Ali, 2012; Das et al, 2014; Shakir, 2014 and Dawood et al, 2016).

Table 1.3

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical Achievement and Academic Anxiety of Senior secondary schools boys</td>
<td>-0.22</td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of significance (table attached in Appendix -II)

Table 1.3 reveals that the value of correlation between Mathematical Achievement and Academic Anxiety of Senior secondary schools boys is -0.22 which is negative and significant at 0.01 level. Therefore, H01 is rejected. Negative correlation indicates that as the level of academic anxiety of boys’ increases, mathematical achievement decreases and vice-versa.
Table 1.4

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical Achievement and Academic Anxiety of Senior Secondary Schools Girls</td>
<td>-0.05</td>
</tr>
</tbody>
</table>

Not Significant at 0.05 level (table attached in Appendix -II)

Table 1.4 reveals that the value of correlation between Mathematical Achievement and Academic Anxiety of Senior secondary schools girls is at 0.05 level. Which is negative and not significant at 0.05 level. Therefore H(1b) accepted.

Figure 1 (Correlation between Mathematical achievement and academic anxiety)

The Figure 1 is prepared after the analysis of Table 1.2, Table 1.3, Table 1.4.

Here, A belongs to senior secondary school students.
B belongs to senior secondary school boys.
C belongs to senior secondary school girls.

VII. Findings of the study

1. An inverse relationship was found between the mathematical achievement and academic anxiety of senior secondary school students. More specifically, as the level of academic anxiety increases, mathematical achievement decreases and vice-versa.
2. An inverse relationship was found between the mathematical achievement and academic anxiety of boys’ students. As the level of academic anxiety increases, mathematical achievement of boys also decreases and vice-versa.
3. An inverse relationship was found between the mathematical achievement and academic anxiety of girls’ students but not significant.

VIII. Suggestions for further research

1. This research study was conducted on the students of senior secondary schools. It is suggested that the same research may be conducted from primary level up to secondary and as well as at university level.
2. In future research, qualitative research methods may also be included to check the validity of quantitative research methods.
3. For the enhancement of the validity, this research may also be expanded in the whole country.
4. Mathematical achievement of the students can be related with mathematical anxiety.
5. The academic anxiety can be considered in two high and low levels.
6. T-test can be employed to test the significance of difference in different levels of anxiety with achievement.
7. The research may be conducted in different subjects other than mathematics.
8. Population may be of different states and the same research may be conducted on large sample.

References


