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Relationship between Academic Procrastination and Mathematics Anxiety among Secondary School Students

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Abstract: In this technological age mathematical knowledge are not only needed in scientific and technical fields but increasingly important in business, social sciences and even humanities, one cannot afford to procrastinate in the learning of mathematics. Investigation into the reasons for academic procrastination and the importance of mathematics anxiety in the teaching learning of mathematics makes it necessary to study the relationship between academic procrastination among secondary school students. The participants of the study are 352 secondary school students of Kerala. This is an investigation into the relationship between academic procrastination and mathematics anxiety and it also explores the gender difference in the relationship. The study reveals a significant relationship between academic procrastination and mathematics for total sample and subsamples based on gender.

Keywords: academic procrastination, mathematics anxiety, mathematics education, secondary education

I. Introduction

We are living in a fast growing technological age and education in this era has become not preparation for future life but life itself as for being successful in life one has to update knowledge and has to acquire new skills keeping in pace with growth of technology. Students develop an in depth understanding of various school subjects as well as high expectations for success is the ultimate goal of schooling. For this to accomplish up to date learning and continuous hard work from the part of students is necessary and one cannot afford to procrastinate especially in the case of mathematics. In this technological age mathematical knowledge are not only needed in scientific and technical fields but increasingly important in business, social sciences and even humanities.

Procrastination refers to the act of putting off actions or tasks to a later time. Solomon and Rothblum (1984) defined Academic Procrastination behaviour as doing homework, preparing for exams at the end of the term at the last minute. Research on academic procrastination shows that majority of secondary school students procrastinate (Asikhia, 2010) especially in the learning of mathematics. But Education at secondary level is supposed to be the bedrock and the foundation towards higher education (Asikhia, 2010). So the Attitude towards and Achievement in Mathematics at this level of schooling is of much importance. So it is necessary to know why students procrastinate.

Task avoidance and fear of failure are the primary excuses given by students who avoid starting their work (Solomon & Rothblum, 1984). Task avoidance is particularly likely if the task involves a heavy cognitive demand and is subject to evaluation. Fear of failure on the other hand, causes delaying for fear that performance will be substandard and not reach the expectations set by others (Brownlow & Reasinger, 2000). Research on procrastination also shows that 'Procrastination often results when a task seems difficult unpleasant or overpowering (Akinsola, Tella and Tella, 2007). We know that many mathematics students consider mathematics as a difficult subject. So it will of benefit to know whether academic procrastination has any relationship with mathematics

anxiety of students of secondary school students, as mathematics anxiety is a phenomenon which is often considered when examining students' problems in mathematics.

Ashcraft (2002) defines Mathematics Anxiety as "a feeling of tension, apprehension or fear that interferes with math performance". Mathematics anxiety can be characterized in a number of ways such as uneasiness when asked to perform mathematically, avoidance of mathematics classes until the last possible moment, feeling of physical illness, faintness, dread or panic and inability to perform on a test (Ko and Yi, 2011).

Many researchers had reported consequences of being math anxious including the inability to do mathematics, the decline in Mathematics achievement, low math grades, the avoidance of mathematics courses, the limitation in selecting college majors and future careers, poor mathematics achievement in selection exams and the negative feelings of guilt and shame (eg: Erden & akgul 2010; Ma, 1999). Mathematics Anxiety hinders the learners in common mathematics tasks.

Further, academic procrastination is found to be related to anxiety, fear of being unsuccessful in a person's actins owing to negative perceptions. It also been found to be related to stress, statistical anxiety, low mathematics achievement etc. and the relationship between academic procrastination and mathematics anxiety is yet to be explored.

In the above context the present study envisages to examine the relationship between Academic Procrastination and Mathematics Anxiety among secondary school students. The study also tries to explore the gender difference in Mathematics Anxiety, Academic Procrastination as well as the relationship between Academic Procrastination and Mathematics Anxiety.

II. Aims

The major research objectives intended in the present investigation are, to identify the gender difference in Academic Procrastination and Mathematics Anxiety, to identify the relationship between Academic Procrastination and Mathematics Anxiety for Total sample and subsample based on Gender and to identify the gender difference in the relationship between Academic Procrastination and Mathematics Anxiety.

III. Methods and Materials

Participants

The present study was carried out on a representative sample of 352 secondary school students of Kerala. The sample was drawn by simple random sampling method.

Instruments

The Scale of Academic Procrastination for Secondary School Students (Musthafa & Fouzia, 2010) was adapted to collect data on Academic Procrastination. The original scale consists of 46 items, in a Likert type response format ranging from Strongly Agree to Strongly Disagree. High Scores indicate high Academic Procrastination. The scale used for this study consists of 28 items with a minimum score of 28 and a maximum score of 140. The reliability coefficient of the original scale was 0.82. The reliability of the present scale was established by split half method with reliability coefficient of 0.74. The scale has content validity.

Mathematics Anxiety of students was measured using Scale of Mathematics Anxiety developed by Musthafa and Sunitha (2012). The Scale is of Likert type and consists of 27 items with 5 response categories, viz., Always, Frequently, Often, Rarely and Never. Scores can range from 27 to 135. A high score indicates high Mathematics Anxiety. The reliability of the scale was established by using test-retest method. The reliability coefficient was 0.73. The validity of the test was established by correlating the Mathematics Anxiety Scores with Achievement Scores in Mathematics. The coefficient of correlation was -0.52.

Procedure

Using the collected data the gender difference in Academic Procrastination and Mathematics Anxiety was calculated using test of significance of difference between two means.

Correlation Coefficient of Academic Procrastination and Mathematics Anxiety for Total sample and subsample based on gender were calculated using Pearson's Product Moment Coefficient of Correlation and subjected to test of significance of correlation coefficient.

The correlation coefficients of the subsamples based on gender was subjected to test of significance of difference between two correlation coefficients to get the gender difference in the relationship between Academic Procrastination and Mathematics Anxiety.

Table 1

Test of significance of difference between mean scores of girls and boys on Academic Procrastination

Sl. No.	Sample	N	Mean	SD	t-value	Level of Significance
1.	Girls	152	79.63	12.330	4.245	0.01
2.	Boys	200	85.17	11.847		

The result of the analysis presented in Table 1 clearly indicates a statistically significant difference in the Academic Procrastination mean scores of Girls and Boys. i.e., Gender difference is found in Academic Procrastination of secondary school students, at 0.01 level of significance.

Table 2

Test of significance of difference between mean scores of girls and boys on Mathematics Anxiety

Sl. No.	Sample	N	Mean	SD	t-value	Level of Significance
1.	Girls	152	71.84	19.469	2.324	0.05
2.	Boys	200	66.84	20.677		

Result given in Table 2 depicts a statistically significant difference in the mean Mathematics Anxiety scores of Girls and Boys, at 0.05 level of significance. This indicates that there is gender difference in Mathematics Anxiety also.

Table 3

Test of significance of coefficients of correlation between Academic Procrastination and Mathematics Anxiety for total sample and subsample

Sample	Coefficient of Correlation	Degrees of Freedom (N-2)	Level of Significance
Girls	0.607	150	0.01
Boys	0.552	198	0.01
Total	0.529	350	0.01

Table 3 reveals that there is statistically significant relationship between Academic Procrastination and Mathematics Anxiety at 0.01 level of significance, for Total sample and subsamples based on Gender.

Table 4

Test of significance of difference in correlation coefficients between Academic Procrastination and Mathematics Anxiety for boys and girls

Sample	N	Correlation Coefficients	Critical Ratio	Level of Significance
Girls	152	0.607	0.838	NS
Boys	200	0.552		

NS: Not significant

The results given in Table 4 reveal that there is no significant gender difference in the correlation coefficients between Academic Procrastination and Mathematics Anxiety.

IV. Results and Discussion

The researchers through this investigation probe into the gender difference in Academic Procrastination and Mathematics Anxiety and also identified the relationship between Academic Procrastination and Mathematics Anxiety. Further it examined the gender difference in the relationship between Academic Procrastination and Mathematics Anxiety.

In this study it was found that there is significant gender difference in Academic Procrastination as well as Mathematics Anxiety. Boys are found to procrastinate academically more as compared to girls. This result is consistent with studies cited in Sirin (2011). The test of significance of difference between mean scores of Mathematics Anxiety reveals significant gender difference in Mathematics Anxiety also. But Mathematics Anxiety is high among girls as compared to boys. This result is consistent with the results given by Meece, Wigfield & Eccles (1990); Ayotola & Adedeji (2009), and Woodard (2001) which says that high school and college women generally rate themselves as more math anxious than men. The reasons for high Mathematics Anxiety among girls and high Academic Procrastination among boys need further investigation.

This study depicts a positive moderate correlation between Academic Procrastination and Mathematics Anxiety for total sample and subsamples based on gender. The study also found that there is no significant gender difference in the relationship between Academic Procrastination and Mathematics Anxiety. That means the relationship is similar for boys and girls. So the Academic Procrastination and Mathematics Anxiety of boys and girls and the factors influencing both the variables has to be studied in detail in the light of their Achievement in Mathematics to understand the Academic Procrastination- Mathematics Anxiety dynamics.

V. Conclusion

The study has significant implications to solve the problem of Academic Procrastination and Mathematics Anxiety of students. The study reveals that there is significant correlation between Mathematics Anxiety and Academic Procrastination. It means that as Academic Procrastination increases, Mathematics Anxiety also increases or vice versa. Both the variables are detrimental to students' achievement and performance in mathematics. So measures have to be taken to reduce both mathematics Anxiety and Academic Procrastination tendencies of secondary school students. Since there is gender difference in the two variables, gender has to be taken into consideration while planning the measures.

To reduce Mathematics Anxiety and Academic Procrastination of secondary school students, Mathematics has to be looked upon in a positive light. Non-threatening learning environment in the classroom, positive attitude of the teachers, parental support, methods of teaching that take into consideration individual differences among students, and their different learning styles etc. can help reduce Mathematics Anxiety and in addition counseling is needed to reduce Academic Procrastination in Mathematics. As mathematics is a high structured body of knowledge, there is an inherent difficult for many of the children to keep up to date with the learning of the subject. So efforts must be made to make teaching and learning of mathematics more effective.

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