

A STUDY ON ATTITUDE TOWARDS MATHEMATICAL RESPONSIVENESS IN MANAGEMENT EDUCATION: AN EMPIRICAL STUDY

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Abstract: The unique state of mind and responsiveness assume a vital part in adapting any ability including mathematics. Scientific aptitudes are basic so as to finish a postgraduate program of business studies, especially, students who are having major marketing, accounting and finance subjects. There is growing concern of the universities and business schools to realize the cause of disappointment and lower slant toward mathematics because of little accomplishments and the insufficient introduction of this subject

The reason for this investigation is to check the criteria that thought about critical in measuring students' mentality about mathematics. This empirical study is done through 13 items of disposition for quantitative systems and statistic data of respondents and review data is gathered from 110 students of various colleges of Berhampur, Odisha. The Factor analysis was carried out to identify the groups among criterion. All the respondents have already passed out quantitative techniques course. Finding shows that there were 3 criteria that influenced students' responsiveness toward mathematics, namely curiosity in mathematics, concern toward the mathematics and self-initiative. From the analysis, it shows that the total percentage of variance explained is 65.24%.

Index Terms - *Responsiveness, factor analysis, attitude*

I. INTRODUCTION

Responsiveness plays an important role in determining individual reaction to a particular entity. Responsiveness shapes the behavior, positive responsiveness leads towards favorable response and negative responsiveness develops an unfavorable response. Responsiveness is one of the most pivotal determinants of achievement in an academic career (Ma and Kishore, 1997). Responsiveness is all about someone's perception of the particular object.

Responsiveness towards Quantitative techniques measure the level of affect and emotions, students have for this subject (Di Martino and Zan, 2001). According to Ayub et al (2005), when studying mathematics, affect means optimistic or pessimistic feeling towards mathematics. Comprehensive responsiveness means that how the student perceives to mathematics, their responsiveness is regarding the usefulness of mathematics in daily lives and practical implications in businesses, while behaviour or intention deals with the reaction of the student towards mathematics.

This research intended to examine the impact of responsiveness on students' performance in quantitative techniques.

Grades in this subject may determine success. Those students, who are more anxious and less affection for mathematics, are likely to exhibit unconstructive responsiveness and will feel discomfort to teach and learn it (Ho., et al, 2000). Responsiveness of students regarding mathematics and quantitative subjects become positive, as they pass through different semesters and curriculum. Similarly, students feel that mathematics little a bit more hard than any other quantitative subjects. Moreover, some talented students also detract other and themselves by showing some negative responsiveness for this course. Negative responsiveness towards quantitative techniques become even more depressing if students have not studied mathematics at secondary education level.

The Different colleges of Odisha located in Berhampur were taken for the study where the department of management educations is an integral part of these colleges. Most of the students of these departments come from government schools and colleges, who face serious deficiencies in quantitative subjects. Similarly, Most of the students who take admissions at postgraduate level program come without a mathematical background. Therefore, it is general to possess negative responsiveness for quantitative techniques. But, this study tries to find out responsiveness of those students who have studied quantitative techniques and also passed out it.

Literature Review

There are many factors which have a direct influence on achievements and performance of quantitative techniques, these are attitude, anxiety, ability and mathematical background. Attitudes towards mathematics can be referred to a positive or negative emotional disposition towards mathematics (McLeod, 1992; Haladyna, Shaughnessy & Shaughnessy, 1983). According to Odell,

& Schumacher, (1998), significant gender differences were found in several areas, and attitudes variables were found to be useful in predicting grades. From the previous study, students' achievement in mathematics is affected by several factors such as the environment of the school where it must be favorable (Creemers & Reezigt, 2005), teaching and learning process (Baumert et. Al., 2005; Opdenakker & Van Damme, 2005; Van de Grift & Houtveen, 2006; Wilms, 1992) and so forth. According to Papanastasiou, 2008, teaching methodology has a direct effect on achievements in mathematics and also on the students' attitudes toward mathematics, on class climates, on students' mathematics and self – attitude. In other words, if it is delivered properly, the students can have a better learning environment. In addition, students who are benefited more from high-quality instruction are self-regulated, have strong mathematics backgrounds and had low levels of frustration (Jones & Byrnes, 2006).

There are a lot of other factors affecting student's success in mathematics (Davut Köğçe et. al, 2009). According to (Githua & Mwangi (2003), mathematics self-idea is one of the factors that influence students' achievement in mathematics and this factor related to their motivation to learn mathematics. Walter and Hart (2009) noted that students' intellectual-mathematical motivations and social-personal motivations also influence the students' attitudes in learning mathematics. Besides these, mathematics anxiety research among elementary to high school populations showed that it is an influential variable in mathematics education (Birgin et. Al, 2010). Patterson et. Al (2003) examined that there are the statistically significant effect of gender, student attitude of parental opinions, and amount of study time on mathematics attitudes. On the other hand, Yilmaz et al, 2010, by using semi-structured interview have found that some other factors affecting students' attitudes towards mathematics are usage of different teaching materials, teachers' classroom management skills, teachers' content knowledge and personality, teaching topics with real-life enriched examples, and students' opinion about mathematics-related courses. The purpose of this study is to determine criterion that considered important in measuring student responsiveness towards mathematics.

In context of India, There are scare studies have been conducted on student attitude towards quantitative techniques. In many studies, it is indicated that student are witnessed about having positive attitude and mathematical achievements (Gallagher & De Lisi, 1994; Orhun, 2007). According to Shashaani (1995) attitude of student contributes a major part in determining attainment and partaking mathematics. Similarly, Thondike-Christ (1991) revealed that mathematics grades determine interest level and intention of the student to study quantitative subjects in future education.

According to Burstein (1992) student attitude towards mathematics and their performance and achievements are directly related to each other. Therefore, those students are having positive attitude perform better than bearing negative attitude regarding mathematics (Gibbons et al, 1997). To teach quantitative techniques, the attitude has to be assessed, as it is having high importance to teach this subject (Tapia and Marsh, 2004).

Linn and Hyde (1989) pointed out that stronger affection with mathematics has greater upshot on mathematics partaking than those students, who are showing higher cognition level. The learning of quantitative techniques depends upon attitude and affection level (Meyer & Koehler, 1990). Attitude is the most important determinant to create higher interest level of student for quantitative techniques. In the light of above literature, it is important for the instructor of quantitative techniques to make classroom environment where students possessing positive attitude (Steinback & Gwizdala, 1995; Ayub et al, 2005).

Lester et al (1989) and McLeod (1992) pointed out that teachers can easily predict the students' performance and results of quantitative techniques by analyzing their affection level with this subject. Similarly, by observing and students comments about this subject, whether they like it or not, make easier for teachers, how to teach this subject and provide more learning for students. Positive attitude for quantitative techniques is very important. Positive attitude increases student's learning of mathematics (Neale, 1969). Positive attitude associated with improved performance and achievements. Positive attitude regarding mathematics will encourage business students to choose finance and quantitative subjects (Haladyna et al., 1983).

From above discussion, it looks like that attitude is crucial variable for better performance and achievement in mathematics.

2. Research Methodology

This is a quantitative research conducted using survey method. A structured questionnaire was given to all business students taking Quantitative techniques course in In colleges with 13 items to be rated.

Participants

This research was conducted at various colleges and all of the MBA students (estimated around 200) taking Quantitative techniques have been chosen as the respondents. The respondents have been given a questionnaire through the lecturers, class by class. Out of 200, only 110 students or 55% submitted the completed questionnaire to their lecturer.

Data Collection

Data was collected using a set of demographic questions and agreement on statements of responsiveness toward mathematics questionnaire. A set of the questionnaire with thirteen items with responses gathered on a 5 point Likert scale (see Table 1). Scale 1 is for strongly disagree, scale 2 is for disagreeing, scale 3 is for neutral, scale 4 is for agreeing and scale 5 is for strongly agree.

1. Studying mathematics make me feel worried

2. I am always under a terrible tension in a maths class
3. I am able to solve mathematics problem without too much trouble
4. I have usually enjoyed studying mathematics in school
5. Mathematics is dull and boring
6. I am happier in a maths class than in any other class
7. I would like to avoid using mathematics in college
8. I have usually been at ease during the math test
9. I have usually been at ease during math course
10. I get really uptight during math tests
11. I get a sinking feeling when I think of trying hard maths problems
12. My mind goes blank and I am unable to think clearly when working mathematics
13. Mathematics makes me feel uneasy and confused

The findings of this study were mainly based on the quantitative data gathered from the respondents using a developed set of questionnaires. Descriptive statistics procedures were adhered to in reporting the findings. All the data gathered were analysed using Statistical Package for Social Science (SPSS).

Table 2 shows the mean value for the Likert scale gathered from the respondent. Based on the table, mean value which is less than 3 has been eliminated from the list of criteria in this study. There is only one criterion that has

been eliminated. The mean value which is less than 3 shows that the criteria are not important and do not affect the respondents' responsiveness.

Table 1: Descriptive statistics of students' responsiveness toward mathematics

Criteria	N	Minimum	Maximum	Mean	Std. Deviation
Q1	110	0	5	3.25	1.148
Q2	110	0	5	3.21	1.037
Q3	110	0	5	3.10	0.890
Q4	110	0	5	4.11	0.970
Q5	110	1	5	4.27	0.918
Q6	110	0	5	3.79	1.044
Q7	110	0	5	3.93	1.084
Q8	110	1	6	3.44	1.042
Q9	110	0	5	3.70	1.090
Q10	110	0	5	3.13	0.910
Q11	110	0	5	3.27	0.967
Q12	110	0	5	3.46	1.042
Q13	110	0	5	3.58	1.078

Table 2 shows KMO and Bartlett's test. The KMO coefficient in this study is greater than 0.894 and greater than 0.5. This result shows that the factor analysis could be preceded. The Bartlett's test shows significant result too.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.794
Bartlett's Test of Sphericity	Approx. Chi-Square	5524.506
	Df	210
	Sig.	.000

Table :3 Criteria Analysis with VARIMAX Rotation towards Important Criteria and Reliability Coefficient

Important Criteria	Weight	Eigen Values	Percentage of Explanation of variation
Criterion 1 –curiosity in mathematics		6.609	34.471
Criterion 2 – concern toward mathematics	1.77	8.464	17.549
Criterion 5 – self initiative	1.005	4.784	13.224
Total percentage of variation explained i			65.244

The reliability of the instrument had been tested using Cronbach's alpha coefficient. The Cronbach alpha's reliability coefficient for twenty items is 0.863. Cronbach's alpha value for each criterion is 0.721, 0.745 and 0.798 for curiosity in mathematics, concern towards mathematics and self-initiative respectively.

From Table, there are 3 criteria that have been determined based on the respondent's response. The three identified criterion shows that the total percentage of variation explained is 65.244%.

4. Conclusion

As a conclusion, factor analysis can be used to determine the important criteria in students' responsiveness towards mathematics. The determined criterions are very useful for the teachers in order to measure students' responsiveness at the beginning of the semester. It can also help teachers to use a variety of techniques to deal with students with negative responsiveness.

As the study shows achievements in mathematics creates positive responsiveness, teachers should focus on to increase the level of achievements in order to foster optimistic responsiveness. There are a lot of students who are not having mathematical background and abilities. Therefore, universities should make different policies for these students. Further study can be conducted on how responsiveness toward mathematics affects students' achievement in the class and whether it can be used to predict students' performance in the course.

Moreover, there are some limitations of this research. The sample size was very small; it is also taken from one department of one city. Thus, results of this study cannot be generalized to other institutes. If the researcher wants to research again, there should be some adding up to be made for further research. The researcher would gain more permission to conduct the survey from other departments of the same university or from additional universities in order to attain more sample size and valid research. Students who have not got good marks or failed in the subject can also be included. Future research can be done with some mediating and moderating variables in order to develop a better relationship of responsiveness and performance in mathematics in management educations. This study can also be converted into a longitudinal study.

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