

MATHEMATIC'S ANXIETY LEVEL AND DEMOGRAPHICS ENVIRONMENTS AMONG STUDENTS IN THREE DIFFERENT UNIVERSITI TEKNOLOGI MARA (UiTM) CAMPUSES IN MALAYSIA

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ABSTRACT

Students in university especially Universiti Teknologi MARA(UiTM) are required to subjugate Mathematics' subject during their first semester such as Business Mathematics and Calculus. However, different intakes of UiTM students show different performance during final examination. A quick observation by most of the lecturers shows that some students had a problem with Mathematics since their secondary school. This problem is getting worse as they are in university level. This phenomenon is identified as Mathematics' anxiety. Students with Mathematics anxiety tend to have a negative affective reaction to a situation involving numbers and Mathematics calculation (Richardson & Suinn, 1972). Students with Math's anxiety had different reactions from mild to severe. On the other hand, a university student mostly shows mild reactions such as minor frustration to overwhelming emotional and psychological disruptions (Mark H. A & Alex M., 2009). In this research, we want to compare students' Maths anxiety level between three campuses of UiTM which are UiTM Tapah, UiTM Seremban 3, and UiTM Alor Gajah and relate it with the campuses' demographic environments. Findings from this research will help lecturers to identify the best teaching approach to their students.

Field of Research: *Mathematics, Mathematics' Anxiety, UiTM, Demographic Environment*

1. Introduction

Murat Tezer, (2015) stated that Mathematics is defined as a very important and beneficial science of which admired by all people and also needed by all other sciences. That's why in this an era of rapid development of science and technology, we can't get away from dealing with the use of mathematics in our daily lives. Mathematics becomes a language of technology (Hulya et al., 2014). Learning and gaining skills of Mathematics now are inevitable. Mathematics education is not only beginning at school, but it's started in pre-school level at the age of four to five years old. Though mathematics is very important, students always regard mathematics as very hard to learn. Most people tend to express that they are afraid of mathematics as they think it is difficult.

This phenomenon is known as anxiety toward mathematics or mathematics anxiety. Anxiety involved several disorder affect such as feeling, behavior and other real physical symptoms. It also can be explained as a feeling of worry, nervousness, or unease about an imminent event or something with uncertain outcome (Dorothy et al., 2015). According to Sarah, (2006), mathematics anxiety happens when students participate in mathematics class, listening to lecture, working through a mathematics problem and discussing mathematics. The symptoms of low attainments in mathematics can be identified at kindergarten level especially when students apparently only had a poor achievement in mathematics but not in other subjects (David, 1988).

Some students take their childhood education at modest. They came to school, have fun with their friends, listening lightly to their teachers and when they are at home they didn't try to look back at what they have learned through the whole day at school. In the end their basic knowledge especially in mathematics becomes very weak. Students who cannot conquer three basics knowledge (reading, writing and calculating) will not do well during their higher level of education that will increase the anxiety level (Nur Azlina et al., 2005).

Mathematic involve a multi-tasking job (Sahin & Ahmet, 2010). Mathematics consists of problem solving skills and also computational skills in order master it. A student with all area skills are needed to master mathematics or else the mathematics anxiety level will develop. Laura, (2007) state that mathematics anxiety can be measured using a scale called the Mathematics Anxiety Rating Scale (MARS) proposed by Richardson & Suinn, (1972). This MARS model is based on the Likert scale for example 1 to 5 where 1 represent "Do not worry at all" and 5 represent "Very worry". Lorelei, (1978) in her research on the validation of MARS model based on four hypothesis which are MARS score were inversely related to intensity of participation by students in mathematics, females exhibits greater level of MARS, the higher the MARS the more negative reactions to study mathematics and MARS scores were positively correlated with scores on measure of test anxiety. Her research supports this research on how MARS can be a good scale in measuring the mathematics anxiety among students. Tina, (2010) proposed that mathematics anxiety can be determine by qualitative and quantitative study. Quantitative data obtained from the questionnaire distributed to the respondents considering the MARS model while qualitative data were obtained from the interviews of the respondents. The respondents statements about mathematics are taking into considerations and then the mathematics anxiety level were determine based on the respondents' statements.

2. Objective of Study

- i) To determine the level of mathematics anxiety among students in three different campuses of UiTM.
- ii) To identify whether the demographic environments affect the students' level of mathematic anxiety.

3. Methodology

3.1 Sample and Data Collection Method

A total of 149 students are selected randomly from three different campus of UiTM which are UiTM Tapah, UiTM Alor Gajah and UiTM Seremban 3. All students selected are students who are taking Mathematic during their current semester. All respondent are diploma and pre-diploma students who are taking Diploma in Accounting, Diploma in Statistics, Diploma in Office Management, Diploma in Public Administration, Diploma in Corporate Administration and Pre-Diploma Commerce. Questionnaires are design based on Mathematics Anxiety Rating Scale proposed by Richardson & Suinn, (1972) which involves Likert scale measuring from number one to five where one represent "Do not worry at all" and five represent "Very worry". Students were gathered during class and asked to answer the questionnaire monitored by the respected lecturers.

3.2 Instrumentation

All the instruments applied in this questionnaire were adopted from Richardson & Suinn, (1972), Diana (2009), Rosenberg M., (1965), Nur Azlina et al., (2005), Rachel. R, (2010), Spybrook J., (2009), and Hulya et al., (2014). Questionnaires were divided into two different areas which are demographic information and mathematics anxiety.

4. Finding & Discussion

4.1 Reliability analysis

All three campuses showed reliable Cronbach alpha values which are 0.984 for Seremban 3 campus, 0.831 for Tapah campus and 0.817 for Alor Gajah campus. Overall Cronbach alpha values show a reliable value of 0.853. This shows a good respond by all respondents in questionnaire.

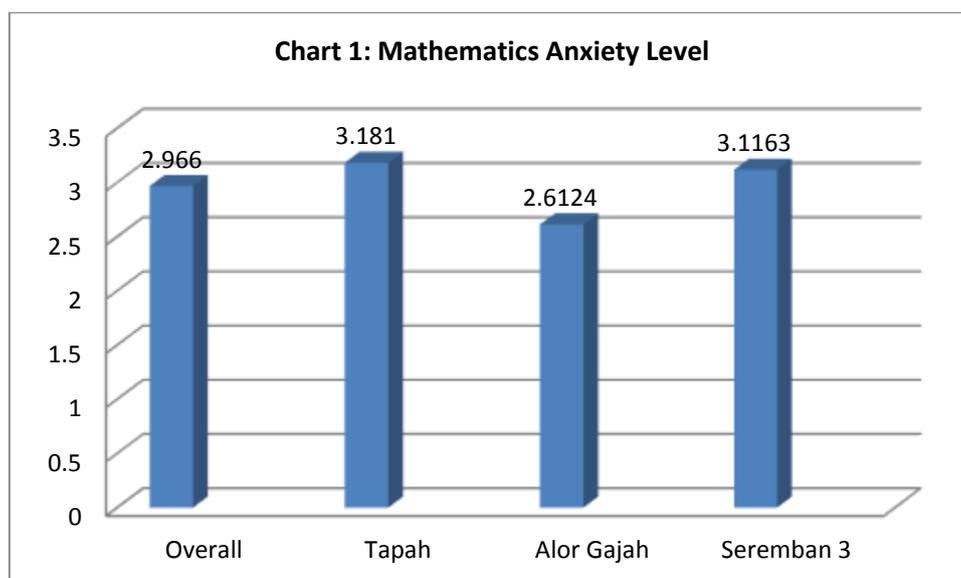
4.2 Descriptive statistics & analysis

Table 1 shows total of respondents from three different campuses of UiTM which are UiTM Tapah, UiTM Seremban 3 and UiTM Alor Gajah. 149 respondents where 51 form Tapah and Alor Gajah, and 47 from Seremban 3. The number of respondents shows a balance for all three different campuses.

Table 1: Campus

| | | Frequency |
|-------|------------|-----------|
| Valid | Tapah | 51 |
| | Seremban 3 | 47 |
| | Alor Gajah | 51 |
| | Total | 149 |

Chart 1 represent mathematics anxiety level based on MARS proposed by Richardson & Suinn, (1972). Though it is an old rating scale, it is valid since this phenomenon are never ended. From Chart 1 we can see that, overall score for all three campuses are 2.996 or approximately about 3.00. It's means that overall, UiTM students had a fair amount of mathematics anxiety. Alor Gajah however show a lowest level of mathematics anxiety compare to Seremban 3 and Tapah campus. This support by Nur Azlina et al., (2009) where she stated that different intakes of UiTM students will show a different quality of students.



Question for Table 2 is “Did either of your parents graduate from college”. The answer given by 0 for no, 1 for mother only, 2 for father only and 3 for both. As we can see here on Table 2, mostly for UiTM students in this three campuses, only their mothers are graduated from college. However for the next question “Do you like Mathematics?”, most of them like mathematics. This is contrary from findings by Sticht T.G., (2010) who suggest that poorly educated children are the source of adult functional illiteracy, and functionally illiterate adults are the source of poorly educated children.

Table 2: Parent’s Education and Do You Like Mathematics?

| Campus | | Did either of your parents graduate from college? | Do you like Mathematics? |
|------------|----------------|---|--------------------------|
| Tapah | Mean | 1.14 | .06 |
| | Std. Deviation | 1.312 | .238 |
| Seremban 3 | Mean | 1.06 | .30 |
| | Std. Deviation | 1.325 | .462 |
| Alor Gajah | Mean | .67 | .25 |
| | Std. Deviation | 1.143 | .440 |
| Total | Mean | .95 | .20 |
| | Std. Deviation | 1.270 | .402 |

In Table 3, four questions being asked about the demographic environment of three different campuses which are:

Table 3: Questions on Demographic Environment

| | | | |
|--|------------------------------------|---|---------------------------------------|
| Did the infrastructure provided in the campus enough? | | How do you like your campus? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> Just nice | <input type="checkbox"/> Very much | <input type="checkbox"/> A little bit |
| <input type="checkbox"/> Not sure | <input type="checkbox"/> No | <input type="checkbox"/> Hate | <input type="checkbox"/> Neutral |
| Do you like the location of your campus? | | Which do you prefer (location of campus) | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> City | <input type="checkbox"/> Rural |
| <input type="checkbox"/> Neutral | | <input type="checkbox"/> Other: _____ | |

The results however as shown in Table 4. For the first question, the mean score is 0.92 shows that students from all three different campuses think that all the facilities provided in their campuses are “Just Nice” for them in this education live. This stated by John E. W., (2017) in his research that learning environment will influence students performance. Next question on the other hand shows

that students prefer their campuses to be in the city. It is obvious with generation-Y students who prefer a city life than rural life (Black A., 2012). This support by the next question where most of the students didn't like the location of their campuses. UiTM Tapah, Alor Gajah and Seremban 3 far away from the main city at a new place where the development are taking in slowly. For the last questions, everybody at least likes their campus with a mean score of 1.46 and standard deviation 1.26.

Table 4: Demographic

| Campus | | Did the infrastructure provided in the campus enough for you? | Which do you prefer (location of campus) | Do you like the location of your campus? | How do you like your campus? |
|------------|----------------|---|--|--|------------------------------|
| Tapah | Mean | .82 | .14 | 1.10 | 1.39 |
| | N | 51 | 51 | 51 | 51 |
| | Std. Deviation | .684 | .348 | .855 | 1.234 |
| Seremban 3 | Mean | .89 | .19 | .91 | 1.60 |
| | N | 47 | 47 | 47 | 47 |
| | Std. Deviation | .729 | .398 | .974 | 1.296 |
| Alor Gajah | Mean | 1.04 | .18 | .94 | 1.41 |
| | N | 51 | 51 | 51 | 51 |
| | Std. Deviation | .799 | .555 | .904 | 1.219 |
| Total | Mean | .92 | .17 | .99 | 1.46 |
| | N | 149 | 149 | 149 | 149 |
| | Std. Deviation | .740 | .441 | .908 | 1.244 |

There are thirty questions as shown on Table 4 which were given to selective respondent about the situation which can cause mathematics anxiety. The development of the questionnaire was based on Richardson & Suinn, (1972) Mathematics Anxiety Rating Scale (MARS) but with some modification. Likert scale was used to show level of anxiety with 1- Not at all, 2- A little, 3-A fair amount, 4-Much and 5-Very much.

Table 4 shows the answers given by all 149 respondents with the highest value is 3.92 while the lowest is 2.44. The range value are between one to five which mean that the overall mathematics anxiety among students is either not at all, a fair amount or very much based on the respected situation. Studying mathematics for the upcoming exam shows the highest anxiety level with the mean score of 3.71 and mode 4.00. This show that mathematics anxiety among students increase at the end of semester especially when the final exam just around the corner. Jolyn et al., (2007) in their research support this findings that people tends to stimulate a negative feelings about evaluation especially at the presence of an examination. Questions that are related to the same situation of anxiety during test such as "thinking about math test one week, a day and 10 minutes before", "getting a pop quiz" and "waiting for the math test returned" with anxiety values between 2.44 to 3.23 means a little and a fair amount of anxiety.

Another situation which shows an interesting finding is "Waiting to get the math test returned to you where you expect to do well". The mean value of 3.92 with a mode score 5.00 shows how the mathematics anxiety reaction in their mind. Low self confidence and maybe lack of basic skills at mathematics makes them feel very nervous with themself on a paper where the are

expected to excel. Some subjects need a previous knowledge in certain subject to solve current one. This made students always think mathematics consists of lessons that poison life, exams that feel anxiety, and nightmares which they will get rid of as soon as they finish examination or school (Melihan U., 2013). Having a vicious lecturer for your mathematics class shows the lowest anxiety with the score of 2.46. These mean that lecturer's attitude doesn't really affect the level of mathematics anxiety among students in all three campuses. It is in contrast with the findings by Gan et al., (2003) where he clarifies that lecturers with a positive and open-minded can help to increase the academic performance of students.

There is also some question about the experience when completing mathematical operations such as "adding some negative and positive numbers", "working with questions involving lots of fractions and power", "dividing number", and "solving mathematical equation involving logarithm and exponents" with the anxiety values between 2.64 to 3.07 means a fair amount of anxiety. Allan & Judith, (1988) in their research also identify some features in mathematics such as precision, logic and emphasis on problem solving make it particularly anxiety provoking for some individuals. Some of the questions are based on real life situations such as "totaling up dinner bills", "memorizing some figures", and "figuring out the sales tax on purchase". Overall answer was in the range between one and two means that respondents are having only a little or a fair amount of mathematics anxiety when using mathematics in their real life situation.

Table 4: Mathematics Anxiety

| | N | | Mean | Mode | Std. Deviation |
|---|-------|---------|------|------|----------------|
| | Valid | Missing | | | |
| Realizing that in your program there are certain math class to be attend as the requirement | 149 | 0 | 3.11 | 3 | 1.260 |
| Thinking about the upcoming math test one week before | 149 | 0 | 3.17 | 3 | 1.137 |
| Thinking about the upcoming math test one day before. | 149 | 0 | 3.23 | 5 | 1.426 |
| Thinking about the upcoming math test one hour before. | 149 | 0 | 2.89 | 1 | 1.630 |
| Thinking about the upcoming math test less than 10 minutes before. | 149 | 0 | 2.69 | 1 | 1.648 |
| Getting a "pop quiz" in a math class. | 149 | 0 | 2.44 | 1 | 1.397 |
| Waiting to get the math test returned to you where you expect to do well. | 149 | 0 | 3.92 | 5 | 1.081 |
| Studying math alone. | 149 | 0 | 3.05 | 3 | 1.144 |
| Studying math with your study group. | 149 | 0 | 3.05 | 3 | 1.150 |
| Studying math for the upcoming final exam. | 149 | 0 | 3.71 | 4 | 1.048 |

| | | | | | |
|---|-----|---|------|---|-------|
| Doing homework where your part is the most difficult one. | 149 | 0 | 3.38 | 3 | 1.082 |
| Preparation before studying math. | 149 | 0 | 3.25 | 3 | 1.144 |
| Working with questions involves lots of fraction and power. | 149 | 0 | 2.87 | 3 | 1.147 |
| Adding some negative and positive numbers. | 149 | 0 | 2.93 | 3 | 1.018 |
| Having someone looking at you when you are working on math problem. | 149 | 0 | 3.00 | 3 | 1.263 |
| Dividing a five digit number by a two digit number. | 149 | 0 | 2.67 | 3 | 1.130 |
| Using pen instead of pencil to solve mathematic problems. | 149 | 0 | 2.64 | 1 | 1.466 |
| Watching someone solving math problem using calculator. | 149 | 0 | 3.07 | 3 | 1.172 |
| Reading cash receipt after you purchase something. | 149 | 0 | 3.40 | 4 | 1.150 |
| Calculating your monthly budget | 149 | 0 | 3.08 | 3 | 1.233 |
| Trying to solve math problem that easily solve by your brother/sister | 149 | 0 | 2.85 | 3 | 1.277 |
| Solving mathematical equation involving logarithm and exponents. | 149 | 0 | 2.81 | 3 | 1.188 |
| Picking up math text book to begin working on assignments. | 149 | 0 | 3.01 | 3 | 1.191 |
| Being given a set of division problem to solve. | 149 | 0 | 2.64 | 3 | 1.158 |
| Being given a set of subtraction to solve. | 149 | 0 | 2.60 | 3 | 1.065 |
| Calculating you club monthly expenses for a year. | 149 | 0 | 2.38 | 1 | 1.426 |
| Totaling up dinner bill that you think overcharged to you. | 149 | 0 | 3.09 | 3 | 1.187 |
| Memorizing some figures such as your friend's phone number. | 149 | 0 | 2.72 | 2 | 1.169 |
| Figuring out the sales tax on purchase of some fast food restaurant. | 149 | 0 | 2.85 | 3 | 1.267 |

| | | | | | |
|--|-----|---|------|---|-------|
| Having a vicious lecturer for your math class. | 149 | 0 | 2.46 | 1 | 1.338 |
|--|-----|---|------|---|-------|

5. Discussion

In this research it's shown that there exists a mathematics anxiety among students in all three different campuses with a range from 2 to 4. Their anxiety can be just a little, a fair amount or much but still controllable. Most students begin to have an anxiety as they succeed in other subjects except in mathematics during their primary school. Four types of learning styles which are visual, read and write, kinesthetic and auditory makes students easy to get mathematics anxiety if their lecturer or teacher only apply one learning style. However, the most important is the student's attitude through learning beside all other factors. Demographic environment on the other hand, didn't really affect the students' mathematics anxiety level. It is proven in Table 4, even though most of students didn't like the location of their campuses and they prefer the location to be in city, their mathematics anxiety level still remains low. Most of them can adapt to a new environment. It shows that UiTM had provided good enough facilities in their campus for students to learn. If we refer back at table 2, despite the fact most of their parents are not graduated from college, they still love mathematics. It is in contrast with Sticht T. G., (2010) about parents who are not educated enough will influence their children performance in academic. Most parents nowadays understood really the important of academic performance in real life. Ministry of Higher Education (MOHE) has started so much strategic plans to improvise private and local education sectors in order for the students to have a good level of academic compared to other country in the world. As the conclusion, mathematics anxiety phenomenon also happens in UiTM Tapah, UiTM Seremban 3 and UiTM Alor Gajah but in a very controllable level. Demographic factors also didn't really affect students' performance in mathematics. For further study it is suggested that other factors can be focused such as parents' educational background, the teachers of lecturers' behavior or students learning styles. The scope of the study also can be widening to the whole UiTM for a bigger sample size with more accuracy and reliable finding.

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