

CHAPTER II

REVIEW OF RELATED LITERATURE

The review of related literature of this study identifies how fear and interest, together with the students' study habits can affect their performance in various subject matters, specifically, mathematics.

To begin this chapter, the researchers will define the variables involved in the study, namely, fear and its types, interest, study habits and mathematics. The researchers will also examine other research studies and articles that show how these variables are related. This chapter ends with the summary of literature review.

Mathematics as defined yourdictionary.com, is "the group of sciences (including arithmetic, geometry, algebra, calculus, etc. dealing with quantities, magnitudes, and forms and their relationships, attributes, etc., by the use of numbers and symbols." Ernest (1989) mentioned that learning mathematics involves more than basic knowledge of facts, skills and procedures. He added that it has a crucial involvement of conceptual structures, the general strategies in solving problems, attitudes towards the subject and appreciation of mathematics.

According to the latest Gallup youth survey conducted in 2004 (as cited by Saad, 2005), the subject that the teenagers find most difficult in school is mathematics. Thus,

Saad(2005) said that it is not surprising how the subject has the lowest performance rate. The reasons were not mentioned, however, Stites (1993) said that people have the tendency to blame the educators of the poor performance of the students in math. However, Temple professor and mathematician John Allen Paulos (as cited in Stites, 1993) directed these problems to a number of factors. Paulos (as cited in Stites, 1993) attributed this problem to the educational system that "emphasizes practice without incorporating the concept." In addition to this, he mentioned that this is also partly because of the mentality that math is not for everyone. According to Paulos (as cited in Stites, 1993), people think that math is only for a selected few or the left-brained ones. However, Paulos (as cited in Stites, 1993) disagreed with this as everyone has the ability to do mathematics and problem solving as long as they know the basics. Another problem pointed out by Paulos (as cited in Stites, 1993), is the hierarchical way math is taught where teachers teach algebra and geometry instead of more applicable ones such as probability and statistics for their students to have a high percentage in passing standardized exams.

In the Philippine concept, as cited in a research conducted by Cabahug and Ladot (2005), the University of the Philippines' greatest failure is in mathematics. It is also said that repetition in mathematics is common among UP students that almost one out of three repeat a mathematics course. Cabahug and Ladot (2005) also said that the faculty of the UP Cebu Natural Science and Mathematics Division or NSMD have felt the declining performance of students in basic mathematics. It is also stated that the attitude towards mathematics and achievement in mathematics have always been a

great concern.

Fullarton (1993) as cited in Cabahug and Ladot (2005), stated that poor attitude towards mathematics is often being said as one of the contributing factors to lower participation and less success in the courses. Neale(1969) still cited in Cabahug and Ladot (2005), said that the attitude towards mathematics affects performance as performance in turn affects attitudes.

In the study conducted by Cabahug and Ladot(2005), there were 941 students in four school years excluding transferees and those who withdrew from Math 11 and Math 17 were the subjects of the study. The dependent variable was the students' performance in Math 11 or Math 17 measured by a dichotomous criterion of "pass" or "fail". The researchers stated that the UPCAT mathematics ability, University predicted grade, attitude towards the subject, degree program and type of high school the students graduated from are the factors of success and failure of students. The results of the study showed that the students who took up Math 11 and Math 17 got a passing rate of 73.3% and 73.2% respectively. The highest failure rate is 36% for math 11 and 31.2% for math 17. The researchers stated that these results showed that the training of the incoming freshmen is deficient.

Furthermore, Cabahug and Ladot(2005) said that for students who were required to take math 11, their only significant factor is the attitude of students towards the subject. The results of their study also showed that for students enrolled in degree programs requiring Math 17 in addition to UPCAT mathematical ability and attitude

towards mathematics, the type of school is also a significant factor.

Davidson and Levitov (1993), on the other hand, point these difficulties to the condition that fears mathematics.

Overstreet (1951), believed that fear is the most deceitful emotional force that has the greatest impact on our behaviour. He said that fear "makes us do what we ought not to do and leave undone what we ought to do (p.3)." The author stated reasons on why the "fear-problem (p.4)" remains unsolved despite its length of occurrence in human history. Part of this, Overstreet (1951) mentioned, is our lack of ability to recognize fear as it is. He added that fear disguises itself in a wide range of emotions which are, more often than not, an opposite of fear such that of courage, ambition, humility, sacrifices or loyalty.

Ficarra (1990), on another hand, described fear as a "basic emotional response (p.11)" to a certain situation. He classified fear into four types: anxiety, panic, paranoia, and phobia. According to him, the distinction between these four types of fear lies in the intensity and how long these fear lingers. Ficcara (1990) said that the first two fears, anxiety and panic, stays on for just a fleeting moment or a short while, the only difference between the two is that while anxiety is a vague feeling in which a person fears what may happen, panic is just a sudden unreasonable fear. On another hand, he described the two remaining fear as lasting and is not just a cause of a single event - paranoia is a fear in which a person believes he/she is being followed (this could happen every time) and phobia is a intense fear on something that others find normal

(this could happen when an environmental stimuli presents itself).

Since fear of mathematics happens only at moments when a person has to answer mathematical problems, Smith (1997) referred the condition as math anxiety. He defined it as a condition when a person feels helpless and frustrated in doing mathematics. He stated that not only “normal people” are prone to math anxiety but even those who are well-acquainted with math. Aside from other biological reasons such as mental retardation, the author mentioned that the causes of math anxiety can also be pointed towards the social context and learning strategies. Smith (1997) explained that labelling math enthusiasts as “geeks or nerds” causes a destroyed image of math in the society. This concept of math as only for “certain people,” he stated, provides a reason for the students for not being able to do math. Smith added that the strategies practiced by the educators which he called as “learning-by-rote (memorization and repetition)” is “dull and unrewarding” making the students loathe the subject even more.

Davidson and Levitov (1993) also considered that bad experiences regarding math may also lead to math anxiety. The shame when one can’t answer math problems, the teacher’s frustration when students can’t understand what they teach and unsupportive parents are some examples of bad experiences with math that were stated by the authors. Additions to those above are childhood experiences (change of schools, divorced parents and bullying), unmatched teaching and learning styles and society’s beliefs that math is for men and not for women.

In another study, the researchers Bilbase and Shashidar (2010) in a study entitled “Images, Anxieties and Attitudes Toward Mathematics” said that there could be various reasons for fear of the subject mathematics. 'Strawderman, (as cited in Bilbase and Shashidar, 2010) proposed three domains to study mathematics anxiety: social/motivational domain, intellectual/educational domain, and psychological/emotional domain. Bilbase and Shashidar (2010) clarified that the social/motivational domain includes those forces that act upon a person through the agencies of family, friends, and society as a whole. The authors described that the intellectual/educational domain is comprised of those influences that are cognitive in nature. According to them, these cognitive influences include but are not limited to, the knowledge and skills an individual has and or is expected to acquire and his or her perception of success or failure in them. The authors explained that the psychological/emotional domain is formed by the faculties that are affective in nature. They continued that it is largely comprised of the individual's emotional history, reactions to stimuli, and arousal states. Hence, the researchers said that the continuum associated with this domain is feelings wherein at either end of the feelings continuum lie anxiety and confidence.

Bilbase and Shashidar (2010) continued that the images in the classrooms and the means of teaching may have a significant impact on shaping the attitude towards mathematics. They proposed that another thing that may affect a child's perception of mathematics is the attitude of the parents toward the subject. They said that most likely, parents that show negativity towards mathematics will give the child a negative attitude

of it - this shows how much parental encouragement is important in a child's learning. They also added that anxieties and attitudes play significant role in learning mathematics.

Part of these attitudes is a child's interest in mathematics, which is fear's counterpart.

According to an article written by Jay Prakash(2011) that was published in preservearticles.com, interest, in Latin, means, "it matters" or "it concerns." He said that interest may refer to the motivating force that drives the individual to attend to a person, an object or an activity. He added that interest might be the cause of an activity and the result of participation in the activity. According to him, people "tend to attend to such objects that interest them."

Prakash(2011) continued that interest might not be the same for everybody. He said that our interests are governed by our drives, motives and emotions, but mostly our instincts. An example he offered was the instinctive interest of teenagers in clothes or appearance may be due to their drive to attract members of the opposite sex.

Hidi (2011) in a study entitled "*Interest and Its Contribution as a Mental Resource in Learning*" stated that our preference in processing certain types of information is determined by our interest most of the time. She continued that our interests can also affect our cognitive functions and learning. She proposed that there is a huge difference in psychological and physiological processes when the information received is interesting or not. She further said that there are unique aspects not present when

processing uninteresting information.

In another article entitled “Creating an Interest in Learning Science”, Paris and Turner (as cited in Keiff, 2005), said that interest plays an important role in motivating students to study. If the learner has an interest in the subject matter, it is more likely that the learner will engage into a good study habit that will help the student expand the knowledge at hand.

According to Kizlik (2012), study habits are different for everybody. A studying strategy may be effective for one but entirely of no use to another student. However the study habit fit for one can help the student in different ways. To name one, with continuous study habits, study skills develop and they create a more effective understanding about the topic. Study habits can also improve the learning and understanding about the subject, and thus, the grades.

In the study *“Connections Between Learning Experience, Study Behavior and Academic Performance: A Longitudal Study”* conducted by Ning and Downing(2010), the relationship between learning experience and study behaviour on the students’ performance was studied. The researchers tested their hypothesis by a survey given to 396 students from a university in Hongkong. They tested the students’ study habits in terms of Concentration, Time Management, Self-testing, Study Aids, Information Processing, Selecting Main Ideas, Test Strategies, Anxiety, Attitude and Motivation. From the information obtained, Ning and Downing (2010), discovered a positive relationship between the variables. Aspects like motivation and study strategies in study

behavior were also discovered to be of importance to the current academic performance. Despite the wide range of psychological area being studied, the research, however, is limited in scope as it just studies students from a single university.

From the different studies and articles presented, the researchers hypothesized that anxiety and interest may affect the performance of the First Year Biology, Mass Communication and Management students of the University of the Philippines - Cebu who took up Mathematics 11(College Algebra) classes during the first semester of school year 2011-2012. However, their attitude toward the subject cannot be the only basis of their performance as their study habits can also affect it.

The researchers are keen to find out the effects of fear and interest in the performance of the students academically.

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