

# Intrapersonal and Stress Management Dimensions of Emotional Intelligence as Determinants of Mathematics Performance

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## ABSTRACT

Students' success in mathematics instruction is determined by some school and personal measures and most likely, quality emotions and feelings that could also help students. The descriptive-correlational research ascertained the students' level of emotional intelligence and its association to mathematics performance. Using Sta. Maria's (2007) Emotional Intelligence Inventory, data were gathered from the 222 college students of Capiz State University, Philippines selected through simple random sampling. Data were analyzed using the mean, Pearson's Product Moment of Correlation and ANOVA. The results of the study showed that college students had an average level of emotional intelligence. The students' mathematics performance was good. The study also revealed that sibling rank shows significant relationship with emotional intelligence. Intrapersonal and stress management measures were strongly associated with students' performance in the mathematics. Class size and time of class significantly influenced the mathematics performance of students. The need to stress management on emotional intelligence is, therefore, vital to promote classroom learning.

**Keywords** – Emotional Intelligence, mathematics performance, EI dimensions, descriptive-correlational research, Capiz, Philippines

## INTRODUCTION

There is a significant increase on the study regarding the interest on the role of affective factors in the learning of mathematics (Leder & Forgasz, 2006; Schuck & Grootenberg, 2004). The implication of mathematical beliefs and attitudes was highlighted by Wilkins (2004) stating that a person's mathematical disposition is related to his beliefs and attitudes towards Mathematics, which could be as important as content knowledge for making the informed decision regarding the willingness to use his knowledge in everyday life.

Over the past several years, the term emotional intelligence has been the subject of various studies as a factor that is useful in understanding and predicting individual's performance at work, at home, at school, among others (Katyal & Swasthi, 2005).

A number of studies have concluded that emotional intelligence and related non-traditional measures of intelligence and human performance may indicate academic and career success than intelligence quotient (IQ) test and other measures of scholastic aptitude and achievement (Low, D. Nelson & K. Nelson, 2006). Research findings emphasized the necessity of including emotional skills development programs designed to improve student achievement and academic success.

Elias (1999) pointed out that social emotional skills can be taught to students and their presence in the classroom and schools can improve academic learning. Block (2005) likewise, believes that social and emotional skills create higher achievements and Boyle (2003) Elkin and Low (2003) consistently indicated that constructive thinking, assertive communication, time management, good achievement commitment and stress management are significant predictors of academic success and tested performance.

Academic and social emotional learning are two key ingredients for a balanced and optimum learning. As Elias (1999) puts it, "when both academic and social learning become a balance part of schooling, students are more likely to remember what they are taught". In this way, learning becomes an experience that touches both the "head" and the "heart" and the results are students who are inspired.

In any college curricula, Mathematics is one basic subject which educators have identified that can provide strong scientific basis for developing continuing education. It provides a strong foundation for learning and understanding higher concepts in the major field of study (Gellecanao, 1991). Mathematics can make

a unique contribution to the understanding and functioning of the society in which human resources are increasingly important for resolving environmental, economic and other issues that dominate modern life (Roberts, 1991).

However, Mathematics teachers found students as weak and unprepared for tertiary Mathematics. Most complaints of teachers were those on students' poor background, high rate of failure in Mathematics courses, physical adjustment and attitudinal problems.

There is an assumption that mathematical beliefs, attitudes, and feelings will lead to increased mathematical achievement. Hence, a reasonable proposition that motivated the researcher to undertake an investigation to determine if a relationship exists between emotional intelligence and mathematics performance of students in Capiz State University, Philippines.

## **FRAMEWORK**

The study supports Bar-On's (2000) Theory of Emotional Intelligence. Its premise requires effective awareness, control and management of one's own emotions, and those of other people. It also anchored on Fennema and Sherman's Theory (1978) that explains that mathematics has utility in life and that the teacher's belief that students should be active participants in learning and doing Mathematics are key components in building affinity in the subject.

The study is guided by the conceptual framework showing that the Mathematics Performance of the college students is influenced by the four dimensions of emotional intelligence, namely, intrapersonal, interpersonal, adaptability and stress management; the personal, family and school-related variables such as gender, sibling order, educational attainment of parents, class size and time of class.

## **OBJECTIVES OF THE STUDY**

The study aimed to determine the students' level of emotional intelligence and its association to mathematics performance. Specifically, to determine: 1) The level of emotional intelligence of the respondents as a whole and in terms of the following dimensions: intrapersonal, interpersonal, adaptability and stress management; 2) The level of Mathematics performance of the respondents; 3) Significant relationship between the respondents level of emotional intelligence and their Mathematics performance; 4) Significant difference in the level of

emotional intelligence of the respondents when they are grouped according to personal and family related variables such as gender, sibling order, educational attainment of parents and school factors such as class size and time of class; and 5) Significant difference in the Mathematics performance of the respondents when they are grouped according to personal and family-related variables such as gender, sibling order, educational attainment of parents and school factors such as class size and time of class.

## METHODOLOGY

The study utilized the descriptive-correlational method of research. It employed a questionnaire to collect data from the respondents. The questionnaire used in the study was adapted from Bar-On on his emotional-social intelligence model. Part I of the questionnaire contains data on the personal, family and school-related characteristics of the learners. Part II is the emotional intelligence inventory consisting of 40 item statements with responses used to measure the EI level of the learners. The study involved 222 college students from the three campuses of Capiz State University, Philippines chosen through simple random sampling technique. Employing the SPSS, the descriptive and inferential statistics were utilized to analyze the results namely: frequency count, percentage, mean, t-test independent sample, analysis of variance (ANOVA), and Pearson Product Moment Coefficient Correlation. The researcher sought permission from the respondents before the survey was conducted.

## RESULTS AND DISCUSSION

As a whole, the emotional intelligence of the respondents was on the average ( $M=3.33$ ). Their overall mathematics performance was “good” ( $M=2.34$ ). The computed Pearson’s  $r$  of 0.145 revealed a significant relationship between the respondents’ level of emotional intelligence and their mathematics performance. The finding affirms the Bar-On model of emotional intelligence. The principle states that those individuals with higher than average EQ are in general more successful in meeting environmental demands and pressures (Bar-On, 2000). EI and cognitive intelligence are considered contributory to a person’s general intelligence. There was a significant relationship between the respondents’ intrapersonal ( $r= -0.180$ ;  $p = .007$ ) and stress management ( $r= 0.187$ ;  $p = .005$ ) dimensions of EI, respectively and their mathematics performance. This indicates

that students who have good intrapersonal dimensions and are less stressed are more likely to perform better in mathematics. These results are in support of Sulaiman (2013) who claimed that that students' who are not depressed have averages that are significantly higher on problem solving scales than depressed students. Furthermore, Parker, *et al.* (2004 ), found a strong association of stress management abilities to the academic success of a student. With this, it is necessary that school heads and teachers better ensure that the school environment is conducive enough to promote emotional stability and nurture the students' intrapersonal skills.

The result further showed that there was a significant difference in the level of mathematics performance when respondents are classified according to class size ( $F(3,217) = 2.932; p < 0.05$ ) and according to the class schedule,  $F(3,217) = 4.854; p < 0.05$  ). The study affirms the idea expounded by Ehrenberg, Brewer, Gamoran and Willms (2001) that the number of student in a class determines the level of social interaction, which may in turn affect how the teacher plans the classroom activities. This implies that classes with the ideal number of students and a well-planned class schedule can steer students to learn better in Mathematics. School heads and teachers should thoroughly plan a class schedule that would not be too taxing for students. Likewise, the problem of classroom size, which more often than not exceeds the ideal, should be addressed. The need for additional classrooms should be given emphasis.

Only adaptability dimension of Emotional Intelligence was found to be significantly different among birth orders registering an F-value of 3.711 at 0.05 significant level with 3 and 217 degrees of freedom. In the study, respondents who belonged to the only child category appeared to have higher EI mean rating in comparison with other birth order categories, hence, more adaptable to situations. Thus, birth order significantly affected the respondents' emotional adaptability level implying that the higher the Emotional Intelligence level of the respondents, the better or more effective they are in decision-making and show more willingness to go for positive changes in the current situation.

Table 1. Correlation matrix on the relationship between emotional intelligence (taken as whole) and college students' Mathematics performance.

VARIABLE	MATHEMATICS PERFORMANCE		EMOTIONAL INTELLIGENCE	
	R	r prob	R	r prob
Mathematics Performance	1.000	1.0	0.145*	0.031
Emotional Intelligence	0.145*	0.031	1.000	1.0

\* Significant at 0.05 alpha

Table 2. Relationship between the four Emotional Intelligence dimensions and respondents' Mathematics performance.

EI DIMENSION	R	r prob	Interpretation
Intrapersonal	-0.180*	0.007	Significant
Stress Management	0.187**	0.005	Significant
Overall	0.145*	0.031	Significant

\* Significant at 0.05 alpha

ns = not significant

\* Significant at 0.1 alpha level

Table 3.0 ANOVA table on the differences in the emotional intelligence of the respondents when they were classified according to sibling rank.

DIMENSION	F	SIG	Interpretation
Adaptability	3.711*	0.012	Significant

\*Significant at 5%

ns= not significant

The study focused on the relationship between the level of emotional intelligence and mathematics performance of 222 college students. Emotional intelligence was measured only by the four components/dimensions namely: intrapersonal, interpersonal, stress management and adaptability.

Mathematics performance of the college students was delimited only to their

final grades in College Algebra during their first year of college in the previous year. Personal and family related variables and school factors were delimited only to: gender, sibling rank, parents' educational attainment, class size and time of class.

## CONCLUSIONS

Most of the respondents are aware of the emotional situations they are in, and through their experiences, they can manage their emotional self-awareness effectively. Despite the emotional conditions that the respondents are experiencing in their relationship with other people, they are capable of handling these relationships. As Elias (1997) posits: "Emotional intelligence is a set of abilities that help people to get along in life with other people in all kinds of life situations; the ability to express emotions, to detect emotions in others, to regulate strong feelings when experiencing it; the ability to focus energies on goal settings and problem solving; and finally, the ability to have the basic social skills that are needed to manage everyday relationships."

The respondents have adequate mathematics abilities: can reason, solve problems and apply their learning and carry out a mathematical procedure in daily life. The respondents who have higher EI also have higher performance in mathematics, but those with lower EI would likely obtain low performance or repeat a grade.

The intrapersonal dimension of emotional intelligence affects the respondents' mathematics performance. This implies that when the respondents intrapersonal Emotional Intelligence is high, the higher is their mathematics performance. The study supports Bar-On's Theory (2000) that individuals with higher than average EQ are in general, more successful in meeting environmental demands and pressures and that their emotional and cognitive development contribute equally to their general intelligence.

The result contradicted that of Sta. Maria's (2007) findings that no significant relationship existed between intrapersonal EI and respondents' academic achievements. The more respondents' understand their emotions and constructively express themselves, the higher would be their mathematics performance. Likewise, the more the respondents constructively manage and effectively control their emotions, the higher is their mathematics performance. The result denotes that respondents' mathematics performance is strongly associated with stress management, affirming the result of Hamdi, (1998) that

none-depressed students' averages were significantly higher on problem solving scales than depressed students. Likewise, Mounsey, Vandehey and Diekhoff (2013), supported the claim that students who are anxious and depressed earn lower grades.

In the study, respondents who belonged to the only child category appeared to have higher Emotional Intelligence mean rating in comparison with other birth order categories. Studies support the notion that a person's position in the family does not seem to affect their behavior at home and at school (Rodgers, Cleveland, van den Oord & Rowe, 2000; Belmont & Marolla, 1973).

Students' performance in Mathematics is high if the class is programmed in small group and scheduled in the late morning. The study is in agreement with Wasley (2002) who analyzed the relationship between class size and achievement and found out that small classes were associated with higher achievement at all grade levels, and concluded that the small classes were superior in terms of students' reaction, teacher's morale, and quality of instructional environment.

The study also implies that the students' mathematics performance was influenced by the time of class. The late morning have higher performance results in mathematics in comparison with the students' in other class schedules.

## **TRANSLATIONAL RESEARCH**

The findings of the study may be translated into print media such as teacher's guide on how to address the student's emotional intelligence. Moreover, the study can be translated into theatrical arts presentations so the audience, especially teachers can visualize the emotional needs of every learner, other than reading theoretical books. A brochure can also be created for information dissemination purposes. However, all these translational forms of media should be evaluated in order to measure its impact and efficacy.

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