

## CHAPTER I

### INTRODUCTION

#### **A. Background of the Study**

Life is a never ending story, a fact that no one can change as long as he lives in this world. In his experiences through the past, as he walks in the present and as he journey to his future life, there would be this specific time that an individual would be engaged in situation and he puts himself into a trial that would test the length of his patience, his strength to overcome this, his wisdom for decision making, and at the end a blinding light enlightening him that he has gained something into his advantage out of the terrible situations. The best thing to know is when this person would encounter another problem, he has already figured out his capacity to overcome it in the easiest and most effective way.

According to Dr. Stoltz (2000), the Adversity Quotient® (AQ), is the science of human resilience. AQ® measures one's ability to prevail in the face of adversity. A person who uses AQ® successfully easily surpasses the big and small challenges that confront us every day. It is also proven that this kind of person does not only mean that they can easily cope up with these situations but it is better said that they can easily respond better and faster. Stoltz said that life is like mountain climbing and that people are born with a core human drive to ascend. Ascending means moving toward one's purpose no matter what the goals (Stoltz, 2000)

In present times, students in the College Level face this present challenges in school. They have to face the situation where Seat works, Assignments, Quizzes,

Midterm Examinations, Final Examinations are taken as a battlefield in a classroom. Student's AQ® is tested in the battlefield and unfortunate students fail in their achievement in school because they have been stunned and conquered by these beastly situations.

One of the courses students are having hard time to cope up with is mathematics. Students on the average don't perform well in this subject because they find the problems difficult to solve. Also, some of them, though they excel in math, find it hard to accept their mistakes because of their carelessness in solving problems. Thus, these will affect their achievement in the field. In college education, where students are required to take mathematics courses, the students may experience failure in the subject did not perform well.

This challenge which mathematics offers, gives the students the ability to be more logical and analytical in solving not only mathematical problems, but can be also applied real-life situations.

The Adversity Quotient® is the most robust test most companies use in identifying the profile of the applicant in terms of his human resiliency. Knowing the AQ® of a person will help him increase his potentials and his problem-solving skills to conquer the different challenges he may face. Since mathematics gives students an avenue to reinforce their logical and analytical skills, the researcher come up with his study as he believes that if achievement or failure in mathematics helps a student to strengthen or weaken his ability in problem solving, then it may also serve as a factor in the increase or decrease of his Adversity Quotient®. If AQ® will be fully understood and utilized, then it may create a better perspective for students in seriously taking up

mathematics courses to use their problem-solving abilities wisely and at their fullest potential towards resiliency.

## **B. Statement of the Problem**

The main purpose of this study is to determine the relationship between mathematics achievement and the Adversity Quotient® of the second year students of Pamantasan ng Lungsod ng Maynila- College of Engineering and Technology.

Specifically, it will attempt to seek answers for the following questions:

1. What is the profile of the respondents according to the following variables:
  - 1.1 Gender
  - 1.2 Course
  - 1.3 Type of High School where they graduated
  - 1.4 Scholastic Status
  - 1.5 Scholarship Program and
  - 1.6 Academic Status?
2. What is the level of Adversity Quotient® of the student respondents in this study?
3. What is the Weighted Average in Mathematics courses taken by the student respondents in the first and second semester of School Year 2009-2010 and in the first semester of School Year 2010-2011?
4. Is there a significant difference in the Adversity Quotient® among the respondents according to the following attributes:
  - 4.1 Gender

4.2 Course

4.3 Type of High School where they graduated

4.4 Scholastic Status

4.5 Scholarship Program and

4.6 Academic Status?

5. Is there a significant difference in the Weighted Average among the respondents in their Mathematics Courses according to the following attributes:

5.1 Gender

5.2 Course

5.3 Type of High School where they graduated

5.4 Scholastic Status

5.5 Scholarship Program and

5.6 Academic Status?

6. Is there a significant relationship between the Mathematics Achievement and the following dimensions of Adversity Quotient® of the respondents?

6.1 Control

6.2 Ownership

6.3 Reach

6.4 Endurance?

7. Is there a significant relationship between the Adversity Quotient® and the Weighted Average in Mathematics courses of the respondents?

### C. Hypotheses

The following null hypotheses have been formulated using 0.05 level of significance for the present study:

1. There is no difference in the Adversity Quotient® among the respondents according to the following attributes:
  - 1.1 Gender;
  - 1.2 Course;
  - 1.3 Type of High School where they graduated;
  - 1.4 Scholastic Status;
  - 1.5 Scholarship Program; and
  - 1.6 Academic Status.
2. There is no difference in the Weighted Average in Mathematics Courses among the respondents according to the following attributes:
  - 2.1 Gender;
  - 2.2 Course;
  - 2.3 Type of High School where they graduated;
  - 2.4 Scholastic Status;
  - 2.5 Scholarship Program; and
  - 2.6 Academic Status.
3. There is no significant relationship between the Mathematics Achievement and the following dimensions of Adversity Quotient® of the respondents:
  - 3.1 Control

3.2 Ownership

3.3 Reach

3.4 Endurance

4. There is no significant relationship between the Adversity Quotient® and the Weighted Average in Mathematics courses of the respondents.

#### **D. Significance of the Study**

This study is deemed to benefit the following:

1. Students. This study can help the students in knowing their level of Adversity Quotient® and letting them know what this AQ® could do to change their lifestyle for its improvement. This study can also help them to know the relationship of Adversity Quotient® to their Math Performance with the realization that the skills in mathematics will help to increase their resiliency in solving problems, not just in school but may also in actual situations..
2. Teachers. The study can help the teachers in making new approaches in their way of teaching primarily, the approach of developing the student's Adversity Quotient® that could guide the students in their future challenges.
3. School Administration. The study can give the administration an idea of what is the real meaning of Adversity Quotient® and how it could help us in our daily life. This may give the initiative for the administration to give appropriate priority in developing the student's AQ® and their staffs as well. They may also create different seminars and workshops on how to increase students' Adversity Quotient® as they grab different job

opportunities in the future. Linking these activities to the students may change their outlook in studying their lessons, as they will face challenges with better perception towards success and failures.

4. Researchers. The study can also help the researchers to correlate Adversity Quotient® with other forms of achievement in different fields. The idea can be widened into the constraints that everything associated to Adversity Quotient® will be studied and be proved of advantages in increasing their score. This could also give the initiative for them to study deeper of what higher score in Adversity Quotient® could give the people in their daily activities.

5. Readers. The study may give the readers the initiative to take the Adversity Quotient® test and develop it for themselves to make it as an advantage in their lives in any workplace they will be.

6. Writers. The study could give them a hint to write more articles for the people to read. These articles that are about to be published should give different points of view that could give the people the enlightenment and an easier understanding of Adversity Quotient®.

### **E. Scope and Limitations**

This study covered the second year students of Pamantasan ng Lungsod ng Maynila under the College of Engineering and Technology who are officially enrolled in the second semester of School Year 2010-2011. They were chosen for they had the most number of mathematics courses taken in the past two years.

## Chapter II

### **THEORETICAL FRAMEWORK**

#### **A. Review of Related Literature and Studies**

Presented in this chapter is foreign and local literature and studies which are relevant to the present undertaking. Literature and studies cited enables the researcher to have a better understanding and a wider perspective of this investigation.

#### **Conceptual Literature**

The world would have been struggling to survive if people cannot overcome weakness. What would a country look like if the president does not have enough strength to face problems? How can a school handle students and have a good image if they cannot surpass the negative feedbacks? “Turning everyday struggles into everyday” a nice phrase to give you an inspiration. A president is elected because he is known for his power to rule over a country. A school administrator is hired to lead the school in taking effective actions. An obstacle is just meant to test your strength and not to overcome you. It’s not about the odds. It’s about believing in your capabilities.

According to Armstrong et al (1997) educational leaders today are challenged to educate a growing and diverse student population; to be responsive to the needs of an expanding underclass; to address broader needs of students and their families; to

implement teaching and learning strategies that will prove effective both for students and taxpayers; and to engage in sound, data driven practices. The effectiveness of a school depends primarily on the personal and professional characteristics of the principal. Although New Era leadership is about the team, not the leader, those schools that have experienced dramatic improvements in student achievement, professional commitment, learning environment, and public engagement have done so because of an effective building principal. It is worth examining common attributes as they reflect leadership in all arenas of engagement. The profile of an effective leader is composed of critical attributes, values, skills, and strategies. The critical attributes are knowledgeable, organized, honest, dependable, efficient, flexible, creative, imaginative, hopeful, open-minded, independent, trusting, with a sense of humor, focused worker, visionary, conscientious, approachable and open, insightful, self-assured, compassionate, tactful, reflective, responsible, attentive, enthusiastic, concerned and caring. Values consist of self-discipline, mutual respect, and trustworthiness, student-centered, collegial, community-minded, people-oriented, self-motivated, goal-directed and idea-based. The skills are analytical, provocative, synthesizer, manages crises, develops cohesion, works productively, thinks holistically, tolerates ambiguity, models expectations, confronts dissent and works to resolve it, politically astute, advocates for change, agent for change, functions well in loose situation, advocates for coalition building, and technologically aware. And the strategies of an effective leader are collaborator, risk-taker, encourager, nurturer, motivator, listener, evaluator, team builder, communicator, implementer, consensus builder, and mentor. To be able to exhibit these traits while making sense of a very ambiguous and complex system such as school is quite a big challenge.

According to Paul Stoltz (1997), the way you respond to frustration, bad luck, and people and things that go wrong comprises your Adversity Quotient® . He groups AQ® into four dimensions: control, ownership, reach and endurance. People with high AQ® s perceive themselves as having more control and influence in adverse situations than those with lower AQ® s. Even in situations that seem overwhelming or out of their hands, high AQ® s invariably find or interpret some part of the situation to be under their control. Low AQ® s usually give up. Ownership involves the extent to which you hold yourself responsible for improving a situation. High AQ® s, as you would imagine, hold themselves accountable for dealing with situations regardless of the cause, while lower AQ® s lapse into victimization and helplessness. Reach involves putting setbacks into their place, and not letting them undermine the healthy areas of work and the rest of one's life. For example, a low AQ® worker does poorly on a project and starts thinking he or she is stupid and will be a failure. A high AQ® worker tries to learn from the mistake and believes the next project will be better. Endurance is the ability to see beyond even enormous difficulties and maintain hope. Higher AQ® people have the ability to feel "this too shall pass," and go on. Lower AQ® s see adversity as dragging on indefinitely. Stoltz believes that most people are "Campers," the 80 percent of the population who have middle-range AQ® s. They aren't what he calls Quitters, who give up, catastrophize and blow up even minor difficulties. Campers have some capacity for challenge and change, but they tend to get overwhelmed when adversity piles up and resort to blame when tired or tense. Stoltz calls high AQ® types Climbers, and he believes we can mold ourselves into having their successful outlook by carefully analyzing our internal dialogs and editing what we tell ourselves. Low AQ® s, Stoltz observes, have negative, usually

irrational, dialogs going on in their heads that don't permit them to break out of the mental boxes they've unknowingly created for themselves. This negative thinking pattern prevents them from taking steps to make things better. Like the old song says, when things go wrong you've got to "pick yourself up, dust yourself off, and start all over again." If we follow Stoltz's advice and re-educate that inner voice that's telling us "aw, what's the use," we'll be well on our way to a high AQ® .

According to Boocock (1980) "Test scores indicate that on all measures there is considerable overlap between the distribution of scores for the two sexes; and that on tests of total or composite abilities, the sexes do not differ consistently, and superior or highly developed ability is more or less equally distributed among boys and girls". Nevertheless, males do consistently score higher than females in mathematics, while females score higher on tests of verbal skill. The gap between males and females in math achievement has narrowed, though, as the number of females enrolling in math courses has risen. Girls have an initial academic advantage over males, in elementary school they consistently outperform males in grades, and maintain this grade advantage into high school, even in math and science (Sadker et, al...1989). At the elementary level males are six times more likely to have learning disabilities or to be emotionally disturbed. However, from the beginning of school boys tend to express more interest than females in mathematics and science. This difference increases with age. Studies of students who are extremely gifted in mathematics found that gifted boys outnumbered gifted girls by a substantial ratio (Benbow and Stanley, 1980).

Dweck (1976) from the University of Illinois, is one of the world's leading researchers on emotional development. Dweck showed that girls responded much differently than boys to the criticism they received from their teachers and peers. Girls were more likely to receive criticism that was both permanent and pervasive such as "You're not good at math." Boys' criticism was more temporary, such as "You weren't paying attention." Girls, therefore, learned to attribute their failures to permanent traits, whereas boys learned to attribute their failures to more temporary sources, such as lack of motivation. Dweck revealed an important difference between how men and women respond to adversity. Females are more likely to explain the adversity as their fault and due to an enduring characteristic, such as stupidity. Males on the other hand, are more likely to attribute failure to something temporary, such as "I didn't try hard enough."

According to Lukey and Tepe (2008) in the military service, military's interest to optimize the resilience of its fighting force, and one means of doing so is to improve and implement psychological screening methods that can identify resilient characteristics and behavior. Resilience is a complex phenomenon that involves multiple factors of psychosocial, experiential, behavioral and psychological influence. In order to identify, measure, and screen for resilience, we need to develop a clear and useful understanding of what makes some individuals more resilient than others to particular type of stress, and why the same individual might more or less resilient to different type of stress. To that end, we can consider specific factors that have already been linked to stress-related outcomes such as first-term attrition, PTSD (Post Traumatic Stress Disorder) and violent or criminal behavior. One of the factors to consider is demographic variables.

These factors have been elaborated further by Brewin, Andrews, & Valentine (2000) who explained that specific demographic variables have been associated with first-term attrition as well as with PTSD. Although these experiences are correlative in nature, they are of unique interest for their consistency with stress-related outcome. Basic demographic variables such as gender, age, and race have demonstrated statistically significant relationships to attritions and oftentimes to PTSD as well. Although the relationships among demographic variables and PTSD are small in magnitude ( $r$  ranging from 0.05 to 0.14; Brewin et al., 2000), they are consistent with stronger correlations that point to higher attrition rates for females (versus males), black males (versus black females), and Native Americans (versus other recruits). Other findings are also important here. Significantly lower attrition rates are found among Asia/Pacific Islanders and among individuals 19-22 years of age (versus 17-18 years old and those over the age of 23). Some of these demographic findings may have broad implications for resilience and vulnerability to stress. For example, it is also the case that when compared with general U.S. population, Native Americans have the highest rate of suicide and Asian/Pacific Islanders have the lowest rate of suicide (Gould, Greenberg, Velting & Shaffer, 2003). Interestingly, level of education also appears to be related to both early attrition and PTSD according to Brewin et al., (2000). Attrition is dramatically higher among recruits who have not finished high school (50% attrition versus 25% overall attrition), even when comparison groups are controlled for aptitude. The relation between education and PTSD is consistent, though certainly less dramatic ( $r = 0.10$ ), with poorly educated military personnel being more likely to develop PTSD. These results suggest that for

whatever reason(s) not yet understood, there exist some relationship between education and resilience.

According to Joshi (1995), failing math achievement in schools is an important question needed to be answer as the international markets become more competitive and technologies are changing rapidly. Even though educationists are making efforts to improve the state of affairs, any time, we are unable to notice the trend of events in mathematics education.

Together with the National Center of Educational Statistics (NCES), they have devised a special system for assessing mathematics performance of students. Different levels were given tests at different proficiency levels and they collected valuable information about the state of math achievement throughout the school years and in different regions, and for different socio-economic factors.

Scholastic aptitude test (SAT) examinations are conducted throughout the USA, and as the center analyzed these scores from the students, it was revealed that a clear correlation may be found between the former and parental education. On similar lines, the SAT scores are also significantly related with the family's annual income. On problem solving skills, out of the three problems (Raymond, trapezoid and radio reception), only a few of them gave satisfactory answers considering these problems are not difficult, and are based on basic concepts and simple procedures. It just shows that students have little grasp of how to integrate and sequence information to solve a problem and that many students are weak in the basic concepts, implying low student achievement. Because of these, it is clear that students and parents must know the importance of availing of the timely help that may be offered to the students. These helps

may be in the form of periodic programs to enable the low achievers in the middle and high schools to review and strengthen basic skills that they were supposed to have learned before, but in most cases, continue to remain weak and self-learning booklets or computer software to help middle-aged students who are weak in their basics. Finally, they have seen that misbehavioral tendencies among students end up in low achievement, but if a low achiever does not get timely help and encouragement, he perpetuates as a low achiever, develops apathy for mathematics, and is driven towards misbehavioral tendencies. Timely and effective help to the low achiever will not only enhance academic achievement but will also help in curbing the misbehavioral tendencies among students. It will be a double boon. Such timely help is the only hope of mitigating the heavy social costs otherwise incurred.

Bessoondyal (2008) analyzed the performance of students in Mauritius at the School Certificate examination from 1995 to 2004 and has revealed that boys were outperforming girls in mathematics at that level. This trend was confirmed through a Mathematics Questionnaire specially designed for this study. Through classroom observations and interviews of different stakeholders, factors affecting Mathematics achievement of secondary school students were identified. To ensure gender equity and social justice, strategies have been identified in view of enhancing the teaching and learning of Mathematics at the secondary level in Mauritius. A teaching and learning package has also been designed to promote student-centered practices and proper use of collaborative learning. It has been found that this package helps in motivating students towards the learning of Mathematics and in developing conceptual understanding in the subject.

Martin (2000) analyzed the level of success and failure in mathematics of African-American students. With the findings that most African-American lack the necessary knowledge and problems solving skills, experience differential treatment by teachers and officials, given poor access to educational resources and experience socioeconomic difficulties, he made a leverage to increase the achievement of these youth. He suggested that prior studies of mathematics achievement and persistence among African Americans have failed to link sociohistorical, community, school, and intrapersonal forces in sufficiently meaningful ways, and that they suffer from theoretical and methodological limitations that hinder the ability of mathematics educators to reverse the negative achievement and persistence trends that continue to afflict African-American students. A big part of increasing mathematics ability is through mathematics socialization where he interviewed different students regarding their confidence in solving problems. He further motivated these students that by knowing mathematics can make a big impact in their overall achievement. The fear that the students can't actually do a simple arithmetic really affects the pursuit of learning higher mathematics and instead will just want to drop out of school. But then, after what he did to the students, they had achieved in mathematics even of the different factors that are present in the society.

## Research Literature

The researches conducted abroad on Adversity Quotient® are presented below. Studies of adversity and resiliency have provided baseline data that bring the Adversity Quotient® phenomenon into the heart of the study.

In a study made by Ferrer (2009) entitled, *“Relationship of Personal Characteristics, Leadership Styles, and Job Satisfaction to Adversity Quotient® of Academic Heads of Selected Colleges and Universities in the National Capital Region”* The researcher utilized the descriptive method using the Adversity Response Profile® (ARP) by Dr. Paul Stoltz, Leadership Style Survey by Dan Clark, and Job Satisfaction Questionnaire by Alita Roxas. These questionnaires were distributed to 121 academic heads during school year 2008-2009 in the selected State Colleges and Universities in the National Capital Region. The percentages and weighted mean were computed for the profile of the respondents in terms of personal characteristics (age, civil status, gender, educational attainment, and number of years of service), leadership style (participative, delegative, and autocratic) and job satisfaction level. In testing the hypothesis, the chi-square was used. She then recommends that there is a need to improve more on the present level of Adversity Quotient® among academic head respondents since the study revealed that they have the tendency to suffer from larger setbacks and accumulated burden of life’s frustrations and challenges. By improving the AQ® and the CORE skills, the optimism and resiliency of the academic heads will also increase which will lead to increased capacity to accept challenges, bounce back and thrive in adversity. This will also result into developing their full potentials and encouraging them to put their best

effort and to maximize their performances that will eventually result to better organizations.

This was supported by another study conducted by Huijuan (2009) with the title *“The Adversity Quotient® and Academic Performance among College Students at St. Joseph’s College, Quezon City”*. The main purpose of this study was to find the relationship between the Adversity Quotient® and academic performance of the selected respondents in the school year 2008-2009 of St. Joseph’s College, Quezon City. Two hundred and eighty (280) male and female college students from the College of Arts and Sciences and the Institute of Nursing were included in this study through randomized sampling technique. It was also the goal of the researcher to determine whether the profile variables or psychosocial correlates examined affect the Adversity Quotient® and academic performance of the selected student respondents. The researcher concluded that: (1.) Sex difference did not affect the selected respondents’ Adversity Quotient® ; however, course, and year level significantly affected the said respondents’ Adversity Quotient® . (2.) There is a significant relationship between Adversity Quotient® of the respondents as measured by the major instrument ARP Version 8.1 of the study and their academic performance as reflected in their GPA during the first semester of the school year 2008-2009.

Meanwhile, Enriquez (2009) made a study entitled *“The Effects of Mentoring Program on Adversity Quotient® of Selected Freshmen College Students of FAITH”*. The researchers employed the one group pre-test post test design. This design measures the dependent variable at a subsequent time. The dependent variable in this study is the Adversity Quotient® of the respondents and the independent variable is the mentoring

program. By using this design, the researchers were able to determine if the mentoring program has an effect on the respondents' Adversity Quotient®. The researchers conducted a pre-test on the dependent variable, which is the Adversity Quotient®, which was used as a basis of comparison with the post test results. The independent variable which is the mentoring program is expected to have an effect on the dependent variable. This design determines the effect of the independent variable on the dependent variable through providing a comparison of the respondents' condition before and after the test administration. This means that each respondent encounters the study's control level (pre-test measure) as well as experimental level (post test measure) (Dunn, 2001). The test which will be used in this research is the Adversity Quotient® Profile Version 8.1. He concluded that (1.) Most of the respondents' AQ® Score on the pre-test fell within the low range. (2.) Most of the respondents' AQ® Score have improved on the post test. (3.) The respondents were able to improve their Control, Ownership, Reach, and Endurance Scores as revealed by the results of their pre-test and post test. (4.) The mentoring program has a significant effect on the Adversity Quotient® of the respondents as revealed by the AQ® Profile® Version 8.1 of the pretest and post test. She also recommends that Mentoring program must also be given to graduating students who will then experience a heavy transition in life after graduation. She also suggested that the compatibility of mentor and mentee is a factor that should be taken into consideration when choosing pairs. Mentors and mentees may benefit from having similar backgrounds, interests and life experiences.

In a study entitled "*Mathematics Achievement of Chinese, Japanese and American Children*" made by Stevenson et. al. (1986), they compared the mathematics

achievement of American, Japanese and Chinese children and associated this achievement with different factors. The mathematics test constructed for elementary children contained 70 items derived from concepts and skills appearing in the mathematics curricula through grade six. Children in only one city in each country were studied. Some factors that were considered are economic, cultural and linguistic. Ten schools in each city were selected and they randomly chose two first-grade and two fifth-grade students. After administering the test and did statistical treatment, it was found out that first, Asian children performed better than American children, and when grouped into classrooms, similar results were obtained. Looking at the reading test helped clarify whether low levels of achievement generally characterized the academic performance of the children. There was a significant difference in their reading test, but it was less extreme as compared with mathematics. When related to life in school, the higher grades spent more time rather than in lower grade, but still, Asian children stayed in school longer than American children. In doing homework, Asian children spent more time in learning at home than in American children. Parental concern may be also attributed to that since parents in Asia evaluate their children more frequently rather than with in America. Teachers in the region are not significantly related with math achievement. As a conclusion, large majority of American children appeared to be falling behind their peers in other countries. But then, it was obvious that children's success in mathematics and other subjects would depend on greater awareness and an increased willingness by parents to be of direct assistance to their children. Further, reaching higher levels of achievement cannot be accomplished without more cooperation and communication between the school and the home.

A research was conducted by Ma and Xu (2004), with the title “*The Link Between Attitude Toward Math and Mathematics Achievement*” has explored the common belief that secondary-level students must have a positive attitude toward mathematics in order to succeed in a math course. They used a statistical tool known as structural equation modeling, and by that, they concluded that: (i) prior achievement significantly predicted later attitude across grades 7-12. Prior attitude, on the contrary, did not meaningfully predict later achievement. (ii) They found no significant difference in the causal relationship between attitude towards mathematics and mathematics achievement. (iii). They found an unbalanced reciprocal relationship between attitude and achievement across almost secondary school for nonelite students, with achievement showing causal predominance over attitude. For these students, when there was a causal relationship between attitude and achievement, achievement always claimed causal predominance over attitude. (iv). Late junior and early senior high school grades are the most effective periods to use achievement to promote attitude.

Another study was conducted by Affrassa and Keeves (1999) on “*Changes in Student’s Mathematics Achievement in Australian Lower Secondary Schools Over Time*”. It analyzed the mathematics achievement of students using the RASCH model and the changes in the student’s achievement over time in Australia. Different schools in Australia were involved targeting the lower secondary-level students. Five states were studied and for the fourteen-year period of comparison, only one state showed improvement in math achievement. But then, it was not statistically significant. It had actually declined as the years went by. It was also concluded that mathematics

achievement level of Year 8 declined in four states, but the one state that improved showed it was not significant. Further studies were suggested like the investigation of differences in conditions of learning and the quality of instruction presented in the different schools.

A study made by Kytt and Bjorn (2010) entitled “*Prior mathematics achievement, cognitive appraisals and anxiety as predictors of Finnish students' later mathematics performance and career orientation*” investigated the role and impact of mathematics performance, cognitive appraisals and mathematics-specific, affective anxiety in determining later mathematics achievement and future career orientation among Finnish adolescents. Using a longitudinal design to relate math anxiety and math achievement, the premise of this study was that control and value appraisals were significantly determinants of both activity and outcome achievement emotions. The results suggested that mathematics anxiety, a prospective outcome emotion, is determined by outcome expectancies (success or failure) and outcome value (the importance of performing well). They also suggest that anxiety as a negative affective emotion is a problem not only for those who perform poorly but probably also for certain pupils across all achievement levels. Compared with the performance level and with the boys, the girls exhibited inaccurately low outcome expectancies in mathematics. These low expectancies connected to the negative value of failure are a potential cause for their higher anxiety level.

Isiksal et. al. (2008), on their research on “*Gender differences regarding mathematics: achievement: the case of Turkish middle school students*” explored gender

differences in mathematics achievement as demonstrated by performance on the mathematics subsection of a nationwide high school entrance examination in Turkey. The cities in Turkey were separated into five groups according to their level of economic development. The analysis was based on 2647 students that were randomly selected from these five different groups of cities. Although results indicated a statistically significant difference in mathematics achievement in favor of cities with the highest economic status, the effect size was quite small, which indicates the difference was not practically significant. Results also showed the effect sizes for gender differences in mathematics achievement were very small in all groups of cities. It was concluded that socio-economic development of the regions was not a critical factor for gender differences in mathematics achievement.

## **B. Synthesis**

This chapter is focused on two major concerns: the first one is about adversity and how Adversity Quotient® is being applied (e.g. school climate, job satisfaction, student achievement, etc.) and used in every situation in human behavior; and the second one is about mathematics achievement and the consequent factors that can be related with it. From the above literature, it is clearly shown that most of the studies tried to discover the role and significance of Adversity Quotient® in human performance and the possible factors that highly influence the person's performance in academics, work and in everyday life. Also, it is distinctively discussed that mathematics achievement has different factors, and these factors can really affect not only the performance of a student

but also his beliefs and attitudes. Many of the researchers used foreign related studies about Adversity Quotient® as the framework to help their own study; and the researches are highly related and focused on the workplace, in school or on job analysis. Also, many articles and journals explain the importance of ability, attitude and motivation in getting good performance in mathematics, and thus imply a higher achievement in mathematics.

However, for the present study, the researchers chose a new field as the basis which is the mathematics education field, the relationship between the level of Adversity Quotient® and the Mathematics Achievement. With this, the researchers would like to discover the AQ® Profile of sophomore students in Pamantasan ng Lungsod ng Maynila, and the correlation between their AQ® and Math Achievement. The main purpose is to help these students to improve their performance in Math by knowing that it may help them enhance their way of facing different problems not just in the subject but also in life and also it will help them understand more about their ability to overcome obstacles and face the challenges and difficulties in their life.

### **C. Conceptual Framework**

The basis for conceptualizing possible relationship between the Adversity Quotient® and Mathematics Achievement was patterned from Huijuan on his study entitled “*The Adversity Quotient® and Academic Performance among College Students at St. Joseph’s College, Quezon City*” where he tested the relationship between the Academic Performance and the Adversity Quotient® of the respondents and also

determined if there are significant differences on Adversity Quotient® of the respondents when grouped according to sex and course.

The researchers have constructed the following paradigm to represent the relationship among the variables used in the current study.

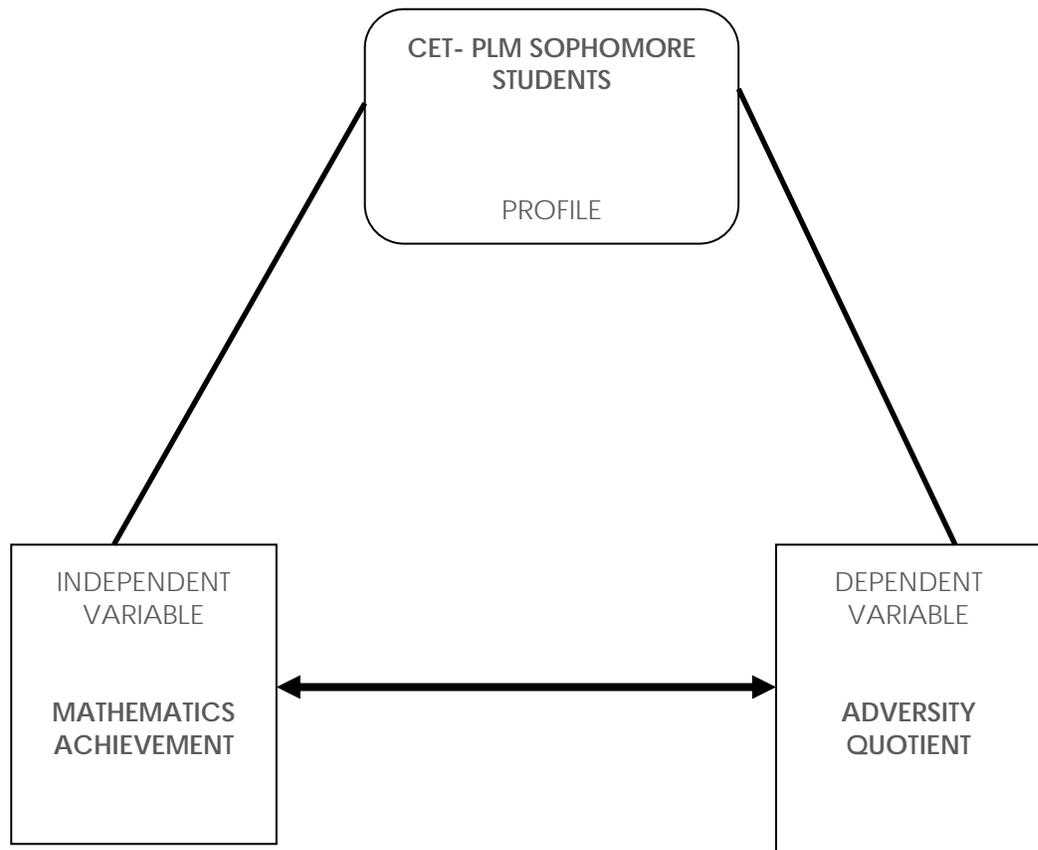


Figure 1: Research Paradigm of the Study

The main interest of the study is to explore the application of AQ® in the field of mathematics education and to find out if the Adversity Quotient® of sophomore students has something to do with their mathematics achievement.

Adversity Quotient® made a breakthrough in scientific fields such as Cognitive Psychology, Psychoneuroimmunology and Neurophysiology. Since mathematics is also a science, it may be possible that Adversity Quotient® might be related to a person's performance in Mathematics. But the Adversity Quotient® itself will be fully understood if one shall look closely at the AQ®'s dimensions. These dimensions are Control, which gauges resilience and health; Ownership, which gauges accountability and willingness to take action; Reach, which gauges perspective on burden and stress level; and lastly, Endurance, which gauges hope and optimism. This level of Adversity Quotient® is the dependent variable of the study.

The independent variable is the mathematics achievement of a sophomore student. This achievement will be reflected on the profile of the student and his grades in mathematics courses obtained in the past three semesters. It is a method where the researcher will use to evaluate how well a student performed in Mathematics in the said time frame.

The researchers will also compare if there are any significant differences on the independent and dependent variables based on the profile of the respondents. The differences that will occur may contribute to the relationship of the two variables.

#### **IV. Definition of Terms**

The following terms are operationally defined so that readers would have a better understanding of the words to achieve clearness and to avoid false impression.

**Academic Head** – It refers to a person who manages the academic affairs of educational institutions. The academic heads in the study include the deans of different colleges and chairpersons of different departments.

**Adversity** – It refers to a state of distress, misery, suffering, trouble, misfortune, disaster, and challenges.

**Adversity Quotient® (AQ®)** - The total score obtained from the Adversity Response Profile®.

**Components of Adversity Quotient® (CO2RE)**

**Control score** – This is a measure of the degree of control a person perceives that he or she has when adverse events happened.

**Ownership score** – This is a measure of the extent to which a person owns, or takes responsibility for the outcomes of adversity or the extent to which a person holds himself or herself accountable for improving the situation.

**Reach score** – This is a measure of the degree to which a person perceives good or bad events reaching into other areas of life.

**Endurance score** – This is a measure of the perception of time over which good or bad events and their consequences will last or endure.

**Adversity Response Profile® (ARP®)** – This is a self-rating questionnaire designed to measure an individual's style of responding to adverse situations. It is a series of scientifically engineered questions developed by PEAK Learning®. As an exceptionally robust measure of resilience, the AQ® Profile is the only statistically valid, reliable tool in existence for measuring AQ®.

**Mathematics achievement** – the weighted average of the following mathematics courses of the respondents from First Semester 2009-2010 to First Semester 2010-2011

**A. College Algebra** -the branch of mathematics concerning the study of the rules of operations and relations, and the constructions and concepts arising from them, including terms, polynomials, equations and algebraic structures.

**B. Solid Mensuration** (also known as **Solid Geometry**) - the study of various solids. It is the study of the measure of volume, area, height, length, and many more. This subject is used extensively in the practice of engineering. The knowledge of this subject is a necessity to engineers in any project construction.

**C. Trigonometry** - a branch of mathematics that studies triangles and the relationships between their sides and the angles between the sides. Trigonometry defines the trigonometric functions,

**D. Advanced Algebra** - the second high school course taught in the college prep mathematics curriculum. Advanced algebra is the first step toward the study of Calculus and lays the foundation upon which advanced mathematics is based.

**E. Analytic geometry** - the study of geometry using a coordinate system and the principles of algebra and analysis. This contrasts with the synthetic approach of Euclidean geometry, which treats certain geometric notions as primitive, and uses deductive reasoning based on axioms and theorems to derive truth.

**F. Differential calculus** - is a subfield of calculus concerned with the study of the rates at which quantities change. It is one of the two traditional divisions of calculus, the other being integral calculus

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

This chapter presents the research design, research locale, sampling technique, research instrumentation, data gathering procedure and statistical treatment of the data.

#### **A. Research Design**

The present study made use of the descriptive type of research using comparative-correlational design. In descriptive research, the researcher seeks to find answers to questions through the analysis of variable relationships. Comparative method involves comparing the likeness and difference for the given phenomena, while correlational method is used to obtain description of the existing phenomenon and enable a researcher to determine the extent of relationship existing between variables.

Descriptive method was applied to find the levels of the respondents' Adversity Quotient® in this study and their Mathematics Achievement during the past three semesters from SY 2009 – 2010 to SY 2010 – 2011.

The comparative design was used in this study to determine if there is a significant difference in the levels of Adversity Quotient® and Mathematics Achievement among the selected respondents in Pamantasan ng Lungsod ng Maynila-College of Engineering and Technology according to sex, course, academic status, scholastic status, type of high school they graduated and scholarship they had.

The correlational design was used to test if there existed a significant relationship between the level of Adversity Quotient® and the Mathematics Achievement of the respondents in the past three semesters starting SY 2009 – 2010. Since the researcher wished to study the variables Adversity Quotient® and Mathematics Achievement and ascertain the relationship between these variables, it was clear that it is correlational in nature.

## **B. Research Locale**

The researchers conducted this study in Pamantasan ng Lungsod ng Maynila, Intramuros, Manila. Pamantasan ng Lungsod ng Maynila (PLM) is a public city-funded university run by the City Government of Manila and is located inside the Intramuros District.

PLM is one of the local universities in the Philippines which served as higher institution of learning for students around the country. The university operates 14 undergraduate colleges and six graduate schools.

One of the undergraduate colleges in PLM is the College of Engineering and Technology which had existed for 42 years. The College of Engineering and Technology (CET) has seven departments, namely the Chemical Engineering Department, Civil Engineering Department, Computer Engineering Department, Computer Studies Department, Electrical and Electronics Engineering Department, Mechanical and Manufacturing Engineering Department and the Engineering Sciences Department.

### **C. Sample and Sampling Technique**

The population for the study includes the second year engineering students of Pamantasan ng Lungsod ng Maynila – College of Engineering and Technology. The sampling frame was for the students who were enrolled at ESC 222- Integral Calculus during the 2<sup>nd</sup> semester of SY 2010 – 2011.

The researchers made use of a probability sampling, where the units of the population are not selected at the discretion of the researcher, but by means of certain procedures, which ensure that every unit of a population has one fixed probability of being included in the sample. One type of probability sampling is the stratified random sampling technique using proportional allocation, which was employed by the researchers. This technique was used because the respondents were grouped according to their courses namely BS Chemical Engineering (CHE), BS Civil Engineering (BSCE), BS Computer Engineering (BSCpE), BS Electronics Engineering (BSECE), BS Electrical Engineering (BSEE), BS Mechanical Engineering (BSME), BS Computer Studies- major in Computer Science (BSCS-CS) and BS Computer Studies- major in Information Technology (BSCS-IT).

The following table shows the number of second year students per course in the College of Engineering and Technology.

**Table 1**  
**The Frequency of the Number of Students of PLM- College of Engineering and Technology when grouped according to Course**

Course	Number
BSCHE	26
BSCE	62
BSCpE	79
BSECE	98
BSEE	8
BSME	16
BSCS-CS	25
BSCS-IT	84
Total	398

The researchers tried to get the whole population to get more reliable data but due to the different circumstances that happened (i.e. attended trainings and seminars, was sick when the test was administered, etc.), it was decided that 75% of the population will be taken as the sample respondents. To avoid any partiality on the selection of the respondents, the proportional allocation was employed to get the sample size per course. Seventy-five percent of the total population per course was taken as the respondents for the study. The following table shows the distribution of proportional sample size of the students per course.

**Table 2**  
**Distribution of Proportional Sample Size of PLM- College of Engineering and  
 Technology Students when grouped according to Course**

Course	Number	Sample Size
BSCHE	26	21
BSCE	62	47
BSCpE	79	58
BSECE	98	73
BSEE	8	6
BSME	16	12
BSCS-CS	25	19
BSCS-IT	84	66
Total	398	302

#### **D. Instrumentation**

The following instruments were used for data gathering:

##### 1. Student Proforma

This was prepared by the investigator with the view to gather personal details of the students. It contained questions about the following aspects: name of the student, gender, course, academic status, scholastic status, type of high school they graduated, scholarship grant (if any), and their mathematics achievement. The mathematics achievement would be computed by asking to the respondents their final grades in the following mathematics subjects that they had taken in the past three semesters: College Algebra (3 units), Plane and Spherical Trigonometry (3 units), Advanced Algebra (2 units), Solid Mensuration (2 units), Analytic Geometry (3 units), and Differential Calculus (4 units).

The researchers calculated the weighted mean average of each student in the following manner:

$$\text{Mathematics Achievement} = \{[(\text{Grade in ESC 112} * 3) + (\text{Grade in ESC 113} * 3) + (\text{Grade in ESC 122} * 2) + (\text{Grade in ESC 123} * 2) + (\text{Grade in ESC 124} * 3) + (\text{Grade in ESC 212} * 4)] / 17\}$$

An individual with a math achievement between 1.00 and 1.375 is considered to have an excellent achievement and in a range of 1.375 – 1.875 is considered to have very good achievement, the individual with a mean in the rate of 1.875 – 2.375 falls in the level of good achievement and with an average between 2.375 and 2.875 is said to have a satisfactory achievement. An individual who got a mean between 2.875 and 3.000 is said to have a low achievement in mathematics.

## 2. The Adversity Response Profile (ARP)

The Adversity Response Profile (ARP) is a self-rating questionnaire designed to measure an individual's style of responding to adverse situations (Stoltz, 1997). The ARP describes ten scored situations and each scenario is followed by four questions to be answered in a 5-point bipolar scale. Each of the four answers is scored on a different scale. Hence, there are four scales of ten questions each. The sum of the four scales is the person's Adversity Quotient® (AQ®). Each of these scale measures a different aspect of AQ®, and the score on each scale of the ARP can range from 10 – 50, while the total AQ® scores can range from 40 to 200.

The four scales of AQ® are Control, Ownership, Reach and Endurance. Although these scales may be correlated with one another, they measure very different elements of AQ®.

The Control scale measures the degree of control a person perceives that he or she has over adverse events. The Ownership scale is the extent to which a person owns, or takes responsibility for the outcomes of adversity or the extent to which the person holds himself or herself accountable for improving the situation. The Reach scale is a measure of the degree to which a person perceives good or bad events reaching into other areas of life. The Endurance scale is the measure of the perception of time over which good or bad events and their consequences will last or endure.

AQ® scores are now available from various samples of 500,000 employees and students in 37 different companies and educational institutions nationwide. The distribution of their AQ® scores provides norms with which anyone taking the ARP can compare his or her own score.

This test has been completed by more than 7,500 people from around the globe representing a broad range of careers, ages, races, and cultures. Formal analysis of the results reveals that the instrument is a valid measure of how people respond to adversity and a powerful predictor of success. (Stoltz, 1999).

An individual with a score greater than 177 (177- 200) is considered to have high AQ® and in a range of 165 – 176 is considered to have above average AQ®, the individual with a score in the range of 145 – 164 falls in the level of average and with a score between 134- 144 is said to have below average AQ®. An individual who scores between 44 and 143 is said to have low AQ®.

## **E. Data Gathering Procedure**

The researchers asked permission from Dr. Paul G. Stoltz to use the Adversity Quotient® Response Profile (ARP) in measuring the Adversity Quotient® level of the respondents through electronic mail.

Next, the researchers sought permission from the Dean of the College of Science, in order to administer the said main instrument (ARP) in PLM-CET, after getting their approval; the researchers approached the respondents and distributed the instrument together with a personal-constructed tool. The researchers requested the participants to answer the instrument honestly and to finish it within the allocated time. Upon retrieval of all the questionnaires, the results were subjected to data analysis, while the ARP had been encoded individually and sent then to the author's office in California, USA. Finally after the researchers had worked out all the respondents' AQ® scores, they began the statistical analysis used for this study.

## **F. Statistical Treatment**

The following statistical tools were utilized in this study:

1. Frequency distribution was used to present the profile of the respondents in terms of sex, course, academic status, scholastic status, scholarship grant, and type of high school they graduated. It was also used to establish the levels of Adversity Quotient and the levels of Academic Performance of the respondents in this study according to the factors said above.

2. Weighted Mean was used to determine the Mathematics Achievement of the respondents based on the grades of the math courses they took in the past three semesters.
3. T-test for independent means was used to utilize to test if there was a significant difference in the Adversity Quotient and the Academic Performance of the respondents in terms of gender, scholastic status and scholarship grant.
4. One-Way Analysis of Variance (ANOVA) was used to measure the significant difference in the level of Adversity Quotient and the Mathematics Achievement of the students when grouped by course, academic status and type of high school they graduated.
5. Pearson Product Moment Correlation Coefficient ( $r$ ) was employed to determine the relationship between the Adversity Quotient and Mathematics Achievement of the samples investigated in this study.
6. Coefficient of Determination was used to determine how much of the level of Adversity Quotient is attributed to Mathematics Achievemen

## Chapter IV

### PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the data obtained through the survey conducted, and the analysis of the data using the appropriate statistical treatment and the interpretation of the results obtained.

Problem No. 1: What is the profile of the respondents according to the following variables?

1.1 Gender

1.2 Course

1.3 Type of High School where they graduated

1.4 Scholastic Status

1.5 Scholarship Program and

1.6 Academic Status?

**Table 3**  
**Distribution of Respondents by Gender**

Gender	Frequency	Percentage
Male	186	61.6
Female	116	38.4
Total	302	<b>100</b>

As shown in Table 1, the population of male respondents dominate the sample with 61.6% while the female follows with 38.4%. These numbers show a good

representation because majority of the students of PLM-CET students are male. In addition, male students are more interested with the courses that the College of Engineering and Technology offers as compared to female students.

**Table 4**  
**Distribution of Respondents by Course**

Course	Frequency	Percentage
CHE	21	7
CE	47	15.6
CPE	58	19.2
ECE	73	24.2
EE	6	2
ME/MFGE	12	4
CS-CS	19	6.3
CS-IT	66	21.7
<b>TOTAL</b>	<b>302</b>	<b>100</b>

In terms of the course, majority of the respondents with 24.2% were taking ECE. It is followed by the respondents taking up CS-IT. The remaining respondents were composed of the following: 19.2% were taking up CPE, 15.6% were taking up CE, 7% were taking up CHE, 6.3% were taking up CS-CS, 4% were taking up ME/MFGE, and lastly, 2% were taking up EE.

**Table 5**  
**Distribution of Respondents by Type of High School They Graduated**

Type of High School They Graduated	Frequency	Percentage
Public	177	58.7
Science High	24	7.9
Private Nonsectarian	27	8.9
Private Sectarian	74	24.5
Total	<b>302</b>	<b>100</b>

With regards to the type of high school they graduated, majority of the respondents came from public school with 58.7% because PLM is a locally-funded university and most high school students who are financially unstable enter the university and pursue their tertiary education. The minority of the respondents came from Private Sectarian with 24.5%, Private Non-Sectarian with 8.9% and the least of the respondents came from Science High with 7.9% which is not surprising because most of the graduates of science high schools pursue college in other top universities

**Table 6**  
**Distribution of Respondents by Scholastic Status**

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Paying	68	22.5
Non-Paying	234	77.5
<b>Total</b>	<b>302</b>	<b>100</b>

When grouped according to their scholastic status, 77.5% of the respondents were non-paying which shows the majority of the respondents and 22.5% of the respondents were paying. It is a good reflection of the total population in PLM since in other colleges in the university; most students in their college have non-paying status versus paying status.

**Table 7**  
**Distribution of Respondents by Scholarship Grant**

<b>Possesses Scholarship Grant</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	54	17.9
No	248	82.1
<b>Total</b>	<b>302</b>	<b>100</b>

With regards to having a scholarship program, majority of the respondents don't have a scholarship with 82.1% while only 17.9% were having a scholarship grant. But still, since many institutions offer scholarships in engineering and technology programs, a few of these students do possess a scholarship grant to support their study in the college.

**Table 8**  
**Distribution of Respondents by Academic Status**

<b>Academic Status</b>	<b>Frequency</b>	<b>Percentage</b>
Good Standing	274	90.7
Probation	21	7
ASA	7	2.3
<b>TOTAL</b>	<b>302</b>	<b>100</b>

Lastly, when grouped according to Academic Status, 90.7% of the respondents which corresponds to the majority were Good Standing while 7% were in Probationary Status and 2.3% were in the Academic Status Adjustment. Since the courses in the College of Engineering and Technology contain the fields in mathematics and other sciences, it is expected that a high percentage of the students are in good standing.

Problem No. 2. What is the level of Adversity Quotient® of the student respondents in this study?

**Table 9**  
**The Frequency and Percentile Distribution of the Respondents on their Level of Adversity Quotient®**

<b>Description</b>	<b>Frequency</b>	<b>Percent</b>	<b>Rank</b>
High	5	1.7	5
Above Average	12	4	4
Average	62	20.5	3
Below Average	77	25.5	2
Low	146	48.3	1
<b>TOTAL</b>	<b>302</b>	<b>100</b>	Mean = 134.09

As seen on Table 2, a large number of respondents or 48.3% of them are having the level of Low Adversity Quotient® . Seventy-seven or 25.5% got below average Adversity Quotient® , sixty-two or 20.5% got average Adversity Quotient® , twelve or 4% got above average Adversity Quotient® and only five of the whole population got a high level of Adversity Quotient® .

Most college students today have the tendency to give up easily once they are facing an adversity. They tend to leave and change their dream once they have noticed that an adversity is about to arise and their patience and skills would be tested. These are the people who just stand at the foot of the mountain and watch other climbers go up the mountain (Stoltz, 1997).

Pamantasan ng Lungsod ng Maynila - College of Engineering and Technology  
Sophomore students were having a below average Adversity Quotient® based on the study. This level of Adversity Quotient® is very much evident to the respondents because the school has set an atmosphere that the students be very much aware about their grades because of the maintaining average set by the university.

Problem No. 3. What is the Weighted Average in Mathematics courses taken by the student respondents in the first and second semester of School Year 2009-2010 and in the first semester of School Year 2010-2011?

**Table 10**  
**The Frequency and Percentile Distribution of the Respondents on their Mathematics Achievement**

<b>Description</b>	<b>Frequency</b>	<b>Percent</b>	<b>Rank</b>
Excellent (1.00 – 1.375)	4	1.32	5
Very Good (1.375 – 1.875)	41	13.58	3
Good (1.875 – 2.375)	128	42.38	1
Satisfactory (2.375 – 2.875)	124	41.06	2
Low (2.875 – 3.00)	5	1.66	4
<b>TOTAL</b>	<b>302</b>	<b>100</b>	Mean = 2.265

As seen on the table, majority of the respondents' level of mathematics achievement is between good, residing in the range of 1.875 – 2.375 and satisfactory, within the range of 2.375 – 2.875. Also, the overall mean of math achievement of the respondents is 2.265, which is in the good range. It indicates that the general performance of the students in their mathematics is just good, meaning that the students of CET-PLM are not exceptional, but not as weak as expected. Only 1.32% of the respondents got an excellent performance in mathematics and 1.66% got a low achievement.

Problem No. 4. Is there a significant difference in the Adversity Quotient® among the respondents according to the following attributes:

#### 4.1 Gender

**Table 11**  
**The Adversity Quotient® of the respondents according to Gender**

Sex	Mean	Mean Diff.	t	P-value(2-tailed)	Decision	Conclusion
Male	135.02	2.421	1.524	0.129	Accept HO	Not Significantly Different
Female	132.59					

Table 11 shows the results of the t-test between the Adversity Quotient® of the respondents and their gender.

As presented on the table the mean of male respondents' Adversity Quotient® is 135.02 whereas the female respondents' Adversity Quotient® is 132.59. The t-value of 1.524 has a significance value of 0.129. Although the mean of the male is a little bit higher than the mean of the female respondents, the difference is not sufficient to reject the null hypothesis. The conclusion is based on the significance value of the t-test which is higher than 0.05.

This means that there is no significant difference in the Adversity Quotient® of the respondents based on their gender. The respondents regardless of their gender have the same capability of coping up to the adversities they are facing. The results were similar to that of the study of Huijuan (2009) where there was no significant difference between the male and female respondents on their Adversity Quotient® at St. Joseph

College. The coping mechanisms of male and female do not vary relatively due to the same situations that happen in them so it would not matter on what biological structure you had.

#### 4.2 Course

**Table 12**  
**The Adversity Quotient® of the respondents according to Course**

Course	Mean	MSB	MSW	F Ratio	P-value(2-tailed)	Decision	Conclusion
CHE	131.76	317.476	177.937	1.784	0.09	Accept HO	Not Significantly Different
CE	133.96						
CPE	138.24						
ECE	134.85						
EE	132.33						
ME/MFGE	136.75						
CS-CS	133.42						
CS-IT	130.29						

Table 12 shows the results of the One-way ANOVA that was employed to determine the significant difference in the Adversity Quotient® of the respondents in relation to their course.

The F- value as seen in the preceding table is 1.784 with a p-value of 0.9. The null hypothesis is accepted since the significance or p-value (0.09) is higher than 0.05. This means that there is no significant difference in the mean differences of the Adversity Quotient® of the different courses of the respondents.

The results show that there is no significant difference in the Adversity Quotient® of the respondents based on their course. The respondents have the same capability of coping up to the adversities they are facing no matter what course they are taking up. The courses in the same college offer the same mechanisms in coping up, since the subjects that are being taken by these courses are almost the same, so it will not greatly affect their response toward failure and trials.

#### 4.3 Type of High School where they graduated

**Table 13**  
**The Adversity Quotient® of the respondents according to the type of high school they graduated**

High School	Mean	MSB	MSW	F Ratio	P-value(2-tailed)	Decision	Conclusion
Public	134.62	282.647	180.16	1.569	0.197	Not Significantly Different	Accept HO
Science High	138.25						
Private Non-Sectarian	131.63						
Private Sectarian	132.36						

Table 13 shows the results of the One-way ANOVA that was employed to determine the significant difference in the Adversity Quotient® of the respondents in relation to the type of high school they graduated.

The F- value as seen in the preceding table is 1.569 with a p-value of 0.197. The null hypothesis is accepted since the significance or p-value (0.197) is higher than 0.05.

This means that there is no significant difference in the mean differences of the Adversity Quotient® of the type of high school the respondents have graduated.

The results show that there is no significant difference in the Adversity Quotient® of the respondents based on the type of high school they graduated from. The respondents have the same capability of coping up to the adversities they are facing no matter what high school they graduated from since every high school, no matter what environment it offers, will not affect the ability of a person to cope up since it is an individual mechanism and will not be absolutely affected by external factors.

#### 4.4 Scholastic Status

**Table 14**  
**The Adversity Quotient® of the respondents according to their Scholastic Status**

Scholastic Status	Mean	Mean Diff.	t	P-value(2-tailed)	Decision	Conclusion
Paying	132.74	-1.743	-0.94	0.348	Accept HO	Not Significantly Different
Non-Paying	134.48					

Table 14 shows the results of the t-test between the Adversity Quotient® of the respondents and their scholastic status.

As presented on the table the mean of paying respondents' Adversity Quotient® is 132.74 whereas the non-paying respondents' Adversity Quotient® is 134.48. The t-

value of -0.94 has a significance value of 0.348. The conclusion is based on the significance value of the t-test which is higher than 0.05.

This means that there is no significant difference in the Adversity Quotient® of the respondents based on their scholastic status. The respondents regardless of their scholastic status have the same capability of coping up to the adversities they are facing.

#### 4.5 Scholarship Program

**Table 15**  
**The Adversity Quotient® of the respondents according to Scholarship Grant they have**

Scholarship Program	Mean	Mean Diff.	t	P-value(2-tailed)	Decision	Conclusion
Yes	136.07	2.421	1.199	0.232	Accept Ho	Not Significantly Different
No	133.65					

Table 15 shows the results of the t-test between the Adversity Quotient® of the respondents and their scholarship grant they have.

As presented on the table the mean of the Adversity Quotient® of respondents with scholarship grant is 136.07 whereas the mean of the Adversity Quotient® of respondents with no scholarship grant is 133.65. The t-value of 1.199 has a significance value of 0.232. The conclusion is based on the significance value of the t-test which is higher than 0.05.

This means that there is no significant difference in the Adversity Quotient® of the respondents based on their scholarship grant. The respondents regardless of their

scholarship grant have the same capability of coping up to the adversities they are facing. The grades to be maintained by a scholar can also be considered the same grades that must be maintained by a non-scholar, and the way they encounter failures and trials will not be affected if they are scholar or not, due to the fact that the way a person faces problems will not depend on scholarship grants.

#### 4.6 Academic Status?

**Table 16**  
**The Adversity Quotient® of the respondents according to their Academic Status**

Academic Status	Mean	MSB	MSW	F Ratio	P-value(2-tailed)	Decision	Conclusion
Good Standing	134.46	222.518	180.905	1.23	0.294	Accept Ho	Not Significantly Different
Probation	131.05						
ASA	128.57						

Table 16 shows the results of the One-way ANOVA that was employed to determine the significant difference in the Adversity Quotient® of the respondents in relation to their Academic Status in school.

The F- value as seen in the preceding table is 1.23 with a p-value of 0.294. The null hypothesis is accepted since the significance or p-value (0.294) is higher than 0.05. This means that there is no significant difference in the mean differences of the Adversity Quotient® of their Academic Status.

The results show that there is no significant difference in the Adversity Quotient® of the respondents based on their Academic Status in school. The respondents have the same capability of coping up to the adversities they are facing no matter what their

Academic Status at school may be. Being Good Standing, on Probation, or on Academic Status Adjustment will not matter on the method of how a person faces trials because these are just standing on a particular period and not on a general perspective of their life.

Problem no. 5 Is there a significant difference in the Weighted Average among the respondents in their Mathematics Courses according to the following attributes:

### 5.1 Gender

**Table 17**  
**The Mathematics Achievement of the respondents according to Gender**

Sex	Mean	Mean Diff.	t	P-value(2-tailed)	Decision	Conclusion
Male	2.259488	-0.013839	-0.323	0.747	Accept HO	Not Significantly Different
Female	2.273327					

Table 17 shows the results of the t-test between the Mathematics Achievement of the respondents and their gender.

As presented on the table the mean of male respondents' Mathematics Achievement is 2.259488 whereas the female respondents' Mathematics Achievement is 2.273327. The t-value of -0.323 has a significance value of 0.747. Although the mean of the female respondents' Mathematics Achievement is a little bit higher than the mean of the male respondents, the difference is not that sufficient to reject the null hypothesis. The conclusion is based on the significance value of the t-test which is higher than 0.05.

This means that there is no significant difference in the Adversity Quotient® of the respondents based on their gender. The respondents regardless of their gender, cannot determine which of them performs better in class. They just have the same attitude and skills in class. It is usually a fallacy that male are better in math than female, but since math requires practice, the difference male makes in solving problems is small enough that the female respondents can solve the same problems in math as good as the males can.

## 5.2 Course

**Table 18**  
**The Mathematics Achievement of the respondents according to Course**

Course	Mean	MSB	MSW	F Ratio	P-value(2-tailed)	Decision	Conclusion
CHE	2.142157	0.894	0.113	7.935	0	Reject HO	Significantly Different
CE	2.074781						
CPE	2.309331						
ECE	2.158541						
EE	2.227941						
ME/MFGE	2.289216						
CS-CS	2.418731						
CS-IT	2.472148						

Table 18 shows the results of the One-way ANOVA that was employed to determine the significant difference in the Mathematics Achievement of the respondents in relation to their course.

The F- value as seen in the preceding table is 7.935 with a p-value of 0.000. The null hypothesis is rejected since the significance or p-value (0.00) is lower than 0.05. This

means that there is a significant difference in the mean differences of the Mathematics Achievement of the different courses of the respondents.

The results show that there is a significant difference in the Mathematics Achievement of the respondents based on their course. Students on certain courses, tend to perform better than the other students of the remaining courses.

**Table 19**  
**The Post Hoc Test Result of the Significant Difference**  
**in the Mathematics Achievement and Course**

<b>(I)Course</b>	<b>(J)Course</b>	<b>Mean Difference</b>	<b>Sig</b>
<b>CHE</b>	CE	0.0673759	0.995
	CPE	-0.1671738	0.514
	ECE	-0.0163846	1
	EE	-0.0857843	0.999
	ME/MFGE	-0.1470588	0.928
	CS-CS	-0.2765738	0.159
	<b>CS-IT</b>	<b>-0.3299911</b>	<b>0.003</b>
<b>CE</b>	<b>CPE</b>	<b>-0.2345497</b>	<b>0.01</b>
	ECE	-0.0837605	0.885
	EE	-0.1531602	0.966
	ME/MFGE	-0.2144347	0.5
	<b>CS-CS</b>	<b>-0.3439497</b>	<b>0.005</b>
	<b>CS-IT</b>	<b>-0.397367</b>	<b>0</b>
<b>CPE</b>	ECE	0.1507891	0.177
	EE	0.0813895	0.999
	ME/MFGE	0.0201149	1
	CS-CS	-0.1094	0.921
	CS-IT	-0.1628173	0.128
<b>ECE</b>	EE	-0.0693997	1
	ME/MFGE	-0.1306742	0.916
	CS-CS	-0.2601892	0.056
	<b>CS-IT</b>	<b>-0.3136065</b>	<b>0</b>
<b>EE</b>	ME/MFGE	-0.0612745	1
	CS-CS	-0.1907895	0.927
	CS-IT	-0.2442068	0.683

<b>ME/MFGE</b>	CS-CS	-0.129515	0.967
	CS-IT	-0.1829323	0.663
<b>CS-CS</b>	CS-IT	-0.0534173	0.999
<b>Analysis</b>	The mean difference is significant at the 0.05 level.		

Based on table 19, the mean of the Mathematics Achievement of the CS-IT students was significantly different from the means of the Mathematics Achievement of the CHE students (p-value=0.003), CE students (p-value=0.00) and ECE students (p-value=0.00) but was not significantly different from means of the CPE students (p-value=0.128), EE students (p-value=0.683), ME/MFGE students (p-value=0.663) and the CS-CS students (p-value=0.999). The courses, Chemical Engineering, Computer Engineering and Electronics and Communication Engineering shows the highest performance in the Engineering Department of Pamantasan ng Lungsod ng Maynila. They evidently have the best and fit students for the course offered by the school, and all of these courses have big opportunities after college, so the training in these courses are more intensive and more rigid to use these basic mathematics in the advanced engineering analysis with full proficiency for the future.

## 5.3 Type of High School where they graduated

**Table 20**  
**The Mathematics Achievement of the respondents according to the type of high school they graduated**

High School	Mean	MSB	MSW	F Ratio	Sig.	Decision	Conclusion
Public	2.278332	0.792	0.124	6.383	0	Reject Ho	Significantly Different
Science High	1.969363						
Private Non-Sectarian	2.340414						
Private Sectarian	2.300676						

Table 20 shows the results of the One-way ANOVA that was employed to determine the significant difference in the Mathematics Achievement of the respondents in relation to the type of high school they graduated.

The F- value as seen in the preceding table is 6.383 with a p-value of 0.000. The null hypothesis is rejected since the significance or p-value (0.00) is lower than 0.05. This means that there is a significant difference in the mean differences of the Mathematics Achievement of the type of high school the respondents have graduated from.

The results show that there is a significant difference in the Mathematics Achievement of the respondents based on the type of high school they graduated. Students on certain schools, tend to perform better than the other students of the remaining high school.

**Table 21**  
**The Post Hoc Test Result of the Significant Difference**  
**in the Mathematics Achievement and in relation to the type of high school they**  
**graduated**

(I) TYPEOFHS	(J) TYPEOFHS	Mean Difference (I-J)	Sig.
PUBLIC	<b>SCIENCE HIGH</b>	<b>0.3089689</b>	<b>0</b>
	PRIVATE NS	-0.062082	0.829
	PRIVATE SEC	-0.022344	0.968
SCIENCE HIGH	<b>PRIVATE NS</b>	<b>-0.371051</b>	<b>0.001</b>
	<b>PRIVATE SEC</b>	<b>-0.331313</b>	<b>0</b>
PRIVATE NS	PRIVATE SEC	0.0397383	0.959
<b>Analysis</b>	The mean difference is significant at the 0.05 level.		

Based on table 21, the mean of the Mathematics Achievement of the respondents from Science High School was significantly different from the means of the Mathematics Achievement of the Public School students (p-value=0.000), Private Non-Sectarian School students (p-value=0.001) and Private Sectarian School students (p-value=0.000). The respondents from Science high school, evidently shows the highest performance in the Engineering Department of Pamantasan ng Lungsod ng Maynila. These respondents had the best and advance training when they were in high school giving them the best advantage they could have to get a high Mathematics Achievement and this training and advanced studies are only given in the special science high school curriculum. Other type of schools whether public or private offer the same type of courses and instruction in learning mathematics.

## 5.4 Scholastic Status

**Table 22**  
**The Mathematics Achievement of the respondents according to their Scholastic Status**

Scholastic Status	Mean	Mean Diff.	t	P-value(2-tailed)	Decision	Conclusion
Paying	2.31942	0.070489	1.417	0.157	Accept Ho	Not Significantly Different
Non-Paying	2.248932					

Table 22 shows the results of the t-test between the Mathematics Achievement of the respondents and their scholastic status.

As presented on the table the mean of paying respondents' Mathematics Achievement is 2.31942 whereas the non-paying respondents' Mathematics Achievement is 2.248932. The t-value of 1.417 has a significance value of 0.157. The conclusion is based on the significance value of the t-test which is higher than 0.05.

This means that there is no significant difference in the Mathematics Achievement of the respondents based on their scholastic status. The respondents regardless of their scholastic status have the same capability and same performance level in Mathematics Achievement. In PLM, both non-paying and paying students must maintain the same general weighted average per semester to be on the same status next semester. This is one factor why the difference between the two groups is not substantial.

## 5.5 Scholarship Program

**Table 23**  
**The Mathematics Achievement of the respondents according to the scholarship grant they have**

Scholarship Program	Mean	Mean Diff.	t	P-value(2-tailed)	Decision	Conclusion
Yes	2.054739	-0.255805	-4.886	0	Reject Ho	Significantly Different
No	2.310543					

Table 23 shows the results of the t-test between the Mathematics Achievement of the respondents and their scholarship grant they have.

As presented on the table the mean of the Mathematics Achievement of respondents with scholarship grant is 2.054739 whereas the mean of the Mathematics Achievement of respondents with no scholarship grant is 2.310543. The t-value of -4.886 has a significance value of 0.000. The conclusion is based on the significance value of the t-test which is lower than 0.05.

This means that there is a significant difference in the Adversity Quotient® of the respondents based on their scholarship grant. The respondents with scholarship grant tend to perform better for their Mathematics Achievement simply because they have a maintaining grade to comply with to sustain their scholarship grant. And also, these scholars surely had a good foundation of mathematics in their high school, so being a scholar in the collegiate level has a big attribute on their high school performance.

## 5.6 Academic Status?

**Table 24**  
**The Mathematics Achievement of the respondents according to their Academic Status**

Academic Status	Mean	MSB	MSW	F Ratio	Sig.	Decision	Conclusion
Good Standing	2.228961	2.008	0.118	16.986	0	Reject Ho	Significantly Different
Probation	2.666667						
ASA	2.462185						

Table 24 shows the results of the One-way ANOVA that was employed to determine the significant difference in the Mathematics Achievement of the respondents in relation to their Academic Status in school.

The F- value as seen in the preceding table is 16.986 with a p-value of 0.000. The null hypothesis is rejected since the significance or p-value (0.000) is lower than 0.05. This means that there is a significant difference in the mean differences of the Adversity Quotient® of their Academic Status.

**Table 25**  
**The Post Hoc Test Result of the Significant Difference in the Mathematics Achievement and Academic Status**

(I) ACADEMIC	(J) ACADEMIC	Mean Difference (I-J)	Sig.
GOOD STANDING	<b>PROBATION</b>	<b>-0.4377057</b>	<b>0</b>
	ASA	-0.2332239	0.181
PROBATION	ASA	0.2044818	0.362
<b>Analysis</b>	The mean difference is significant at the 0.05 level.		

Based on table 25, the mean of the Mathematics Achievement of the respondents with Good Standing was significantly different from the mean of the Mathematics

Achievement of the students with Probationary Status ( $p$ -value=0.000). The respondents with Good Standing, evidently shows the highest performance in the Engineering Department of Pamantasan ng Lungsod ng Maynila. Literally speaking, respondents with Good Standing as their Academic Status have high grades because they have met the required grade set by the university.

Problem No. 6 Is there a significant relationship between the Mathematics Achievement and the following dimensions of Adversity Quotient® of the respondents?

#### 6.1 Control

**Table 26**  
**The Relationship of Mathematics Achievement and the Control Dimension of Adversity Quotient® of the Respondents**

<b>Variables</b>	<b>Pearson R</b>	<b><math>r^2</math></b>	<b>P-value</b>	<b>Decision</b>	<b>Conclusion</b>
Math Achievement	-0.120	0.0144	0.037	Reject Ho	Significantly Related
Control					

Table 26 shows the value of the Pearson R that tests the relationship between the math achievement and the control dimension of AQ® of the respondents in the study.

The Pearson R is -0.120, with a  $p$ -value of 0.037 and a coefficient of determination of 1.44%. The  $p$ -value is less than 0.05, so it implies a significant relationship between the two variables, and so the null hypothesis is rejected. It shows that there is a negative low correlation between the control dimension of AQ® and the math achievement of the respondents, but they are significantly related with one another.

It means that the Control dimension, which measures the degree of control a person, perceives that he or she has over adverse events, could be related with a person's performance in mathematics. Being good in mathematics may imply that a person remains steadfast in determination and possess an agile approach in solving problems while having low achievement may imply a person's vulnerability to adversity and increasing potential toll in his performance and energy. But only 1.44% of math achievement could be attributed with the Control dimension of AQ®, so other predictors such as EQ and study habits may contribute to the Control dimension of AQ®.

## 6.2 Ownership

**Table 27**  
**The Relationship of Mathematics Achievement and the Ownership Dimension of Adversity Quotient® of the Respondents**

<b>Variables</b>	<b>Pearson R</b>	<b>r<sup>2</sup></b>	<b>P-value</b>	<b>Decision</b>	<b>Conclusion</b>
Math Achievement	-0.142	0.0202	0.001	Reject Ho	Significantly Related
Ownership					

Table 27 shows the value of the Pearson R that tests the relationship between the math achievement and the control dimension of AQ® of the respondents in the study.

The Pearson R is -0.142, with a p-value of 0.001 and a coefficient of determination of 2.02%. The p-value is less than 0.05, so it implies a significant relationship between the two variables, and so the null hypothesis is rejected. It shows that there is a negative low correlation between the ownership dimension of AQ® and the math achievement of the respondents, but they are significantly related with one

another. It implies that having high achievement in mathematics is a reflection that the person has ability to avoid unnecessary self-blame while putting his own responsibility into perspective. Also, having low math achievement may imply that he avoids himself accountable for working the situation and blames himself for the things he maybe was or was not accountable for. But only 2.02% of math achievement could be attributed with the Ownership dimension of AQ® , so other predictors such as EQ and study habits may contribute to the Ownership dimension of AQ® .

### 6.3 Reach

**Table 28**  
**The Relationship of Mathematics Achievement and the Reach Dimension of Adversity Quotient® of the Respondents**

<b>Variables</b>	<b>Pearson R</b>	<b>r<sup>2</sup></b>	<b>P-value</b>	<b>Decision</b>	<b>Conclusion</b>
Math Achievement	-0.088	0.0078	0.125	Accept Ho	Not Significantly Related
Reach					

Table 28 shows the value of the Pearson R that tests the relationship between the math achievement and the reach dimension of AQ® of the respondents in the study.

The Pearson R is -0.088, with a p-value of 0.125 and a coefficient of determination of 0.78%. The p-value is greater than 0.05, so it implies there is no significant relationship between the two variables, and so the null hypothesis is accepted. It shows that there is no correlation between the reach dimension of AQ® and the math achievement of the respondents. It implies that math achievement will not affect the degree on how a person perceives good or bad events reaching into other areas of life.

Even a person response specifically or bleeding into aspects on life when he experience adversity, it will not be a determining factor on a person's performance in math.

#### 6.4 Endurance

**Table 29**  
**The Relationship of Mathematics Achievement and the Endurance Dimension of Adversity Quotient® of the Respondents**

<b>Variables</b>	<b>Pearson R</b>	<b><math>r^2</math></b>	<b>P-value</b>	<b>Decision</b>	<b>Conclusion</b>
Math Achievement	-0.210	0.0441	0.000	Reject Ho	Significantly Related
Endurance					

Table 22 shows the value of the Pearson R that tests the relationship between the math achievement and the endurance dimension of AQ® of the respondents in the study.

The Pearson R is -0.210, with a p-value of 0.000 and a coefficient of determination of 4.41%. The p-value is less than 0.01, so it implies there is a significant relationship between the two variables, and so the null hypothesis is rejected. It indicates that a person who's good in math might view success as enduring, if not permanent and he considers adversity temporary and unlikely to recur. Meanwhile, having a low achievement in math may denote that person feels helpless or hopeless. But only 4.41% of math achievement could be attributed with the Endurance dimension of AQ®, so other predictors such as EQ and study habits may contribute to the Endurance dimension of AQ®.

Problem No. 7 Is there a significant relationship between the Adversity Quotient® and the Weighted Average in Mathematics courses of the respondents in the present study?

**Table 30**  
**The Relationship of Mathematics Achievement and the Adversity Quotient® of the Respondents**

Variables	Pearson R	$r^2$	P-value	Decision	Conclusion
Math Achievement	-0.286	0.0818	0.000	Reject Ho	Significantly Related
Adversity Quotient®					

Table 30 shows the value of the Pearson R that tests the relationship between the math achievement and the Adversity Quotient® of the respondents in the study.

The Pearson R is -0.286, with a p-value of 0.000 and a coefficient of determination of 8.18%. The p-value is less than 0.01, so it implies there is a significant relationship between the two variables, and so the null hypothesis is rejected. It implies that a person excelling in math has a bigger capability to cope up in adverse events and failures, while someone whose achievement in math is low may mean he underutilizes his potentials and may battle a sense of helplessness and despair. It is analogous to the study of Huijuan (2009) that the Adversity Quotient® and Academic Performance have a significant relationship between each other. It implies that the Academic Achievement of student is a strong predictor of Adversity Quotient®, likewise in this study, the Mathematics Achievement of students strongly predicts their Adversity Quotient®. The high ability in solving problems in mathematics greatly helps the ability of a person to cope up in adverse situations, overcome failures and continue to move forward and upward in life. Also, the coefficient of determination, which is 8.18%, attributes to the

Adversity Quotient® from the performance of the respondents in Mathematics. Other possible predictors of AQ® could be IQ, EQ and study habits.

## Chapter V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### A. Summary

The main purpose of this study was to find the relationship between the Adversity Quotient® and the mathematics achievement of the sophomore students of PLM-College of Engineering and Technology in the school year 2010-2011. It was also the goal of the researchers to determine whether the profile variables or psychosocial correlates examined affect the Adversity Quotient® and the Mathematics Achievement of the student respondents.

- The findings revealed that the great majority of the respondents in this study were male.

BSECE and BSCS-IT dominated the population of the sophomore students and the other courses were represented proportionate to their population. Also, most respondents came from public high schools, and thus denoted non-paying students. Around a fourth of the samples were scholars and 9 out of 10 respondents were good standing in terms of their academic status.

- The level of Adversity Quotient® among the highest percentage of respondents is below average.
- The overall mean in Mathematics Achievement of the respondents is 2.265 and the level of Math Achievement of the majority of the respondents is good.

- The Adversity Quotient® of the respondents was not influenced by their sex, course, academic status, scholastic status, scholarship grant and the type of high school they graduated.
- The Mathematics Achievement was not influenced by their sex and scholastic status. However, course, academic status, scholarship grant and the type of high school they graduated were found to be significantly different with the respondents' achievement in mathematics.
- The dimensions of Adversity Quotient® such as Control, Ownership and Endurance had a significant relationship with the Mathematics Achievement of the respondents in the study.
- The level of Adversity Quotient® and the Mathematics Achievement of the respondents were significantly related with one another.

## **B. Conclusions**

Based on the findings, the following conclusions were derived:

1. The level of Adversity Quotient® of the sophomore CET students of PLM is low because of the pressure on the maintaining grade that is set by the school.
2. The level of mathematics achievement of the sophomore CET students of PLM is good.
3. There is no significant difference in the Adversity Quotient® of sophomore CET students of PLM when grouped according to gender, academic status, course, scholarship grant, scholastic status and type of high school they graduated.

4. There is no significant difference in Mathematics Achievement of sophomore CET students of PLM when grouped according to gender and scholastic status.
5. There is a significant difference in Mathematics Achievement of sophomore CET students of PLM when grouped according to course, academic status, scholarship grant and type of high school they graduated.
6. There is a significant relationship between the Mathematics Achievement and the scores of Control, Ownership and Endurance dimensions of Adversity Quotient® , while there no exists a relationship between the Reach score and the performance in Mathematics of the student respondents.
7. There is a significant relationship between the Adversity Quotient® and Mathematics Achievement of sophomore CET students of PLM.

### **C. Recommendations**

Based on the conclusions, the following were recommended:

1. There is a need to make the students aware of their Adversity Quotient® so that they can improve their optimism and resiliency which will lead to increased capacity to accept challenges, bounce back and thrive in adversity.
2. The school administrators must create programs that will allow the students to engage in activities that will enhance their math achievement as well as their Adversity Quotient® .
3. Further research must be conducted which will link the Adversity Quotient® to other disciplines.

4. The dimensions of Adversity Quotient® such as Control, Ownership and Endurance should be improved further as it will help students to have confidence in getting high achievement in mathematics.
5. The Adversity Quotient® of individual learners must be considered in curriculum planning.

## BIBLIOGRAPHY

### A. BOOKS

Armstrong, S., Thompson, G., & Brown, S., (1997), *Facing up to Radical Changes in Universities and Colleges*, The Staff Development and Educational Development Series (SEDA), London: Kogan Page Limited.

Bessoondyal, Hermant (2008), *Factors Affecting Mathematics Achievement*, Mauritius: Vdm Verlag.

Dweck, C.S. & Bush, E., (1980), Sex differences in learned helplessness: I. Differential debilitation with peer and adult evaluators. *Developmental Psychology*.

Martin, Danny Bernard, (2000), *Mathematics Success and Failure among African-American Youth: The Roles of Sociohistorical Context, Community Forces, School Influence, and Individual Agency*, USA: Lawrence Erlbaum Associates..

Stoltz, P.G., (1997), *Adversity Quotient® : Turning Obstacles into Opportunities*, USA: John Wiley and Sons, Inc..

### B. INTERNET

#### STUDIES / THESES/ DISSERTATIONS / ABSTRACT

D'souza, R. (2006). A Study of Adversity Quotient® of Secondary School Students in Relation to their School Performance and the School Climate. Dissertation of the University of Mumbai. Retrieved from [www.peaklearning.com/measuringAQ®\\_arp.html](http://www.peaklearning.com/measuringAQ®_arp.html). (accessed 16 December 2010)

Enriquez, J. (2009). The Effects of Mentoring Program on Adversity Quotient® of Selected Freshmen College Students of FAITH. Retrieved from [http://www.peaklearning.com/documents/PEAK\\_GRI\\_enriquez.pdf](http://www.peaklearning.com/documents/PEAK_GRI_enriquez.pdf)

Ferrer, M (2009). Relationship of Personal Characteristics, Leadership Styles, and Job Satisfaction to Adversity Quotient® of Academic Heads of Selected Colleges and Universities in the National Capital Region. Dissertation of the Polytechnic University of the Philippines. Retrieved from [www.peaklearning.com/measuringAQ®\\_arp.html](http://www.peaklearning.com/measuringAQ®_arp.html). (accessed 16 December 2010)

Huijuan, Z. (2009) The Adversity Quotient® and Academic Performance among College Students at St. Joseph's College, Quezon City. Undergraduate Thesis of St. Joseph's College. Retrieved from [www.peaklearning.com/measuringAQ®\\_arp.html](http://www.peaklearning.com/measuringAQ®_arp.html) (accessed 16 December 2010)

Kytt, M. and P. Byorn. (2010). Prior mathematics achievement, cognitive appraisals and anxiety as predictors of Finnish students' later mathematics performance and career orientation. Retrieved from <http://www.informaworld.com/smpp/content~content=a922208401~db=all~jumptype=rs> (accessed 20 December 2010)

#### C. JOURNAL

Affrassa, T.M. and Keeves, J.P. (1999) Changes in students' mathematics achievement in Australian lower secondary schools over time, *International Educational Journal*, 1(1), 1-21.

Isikal et. Al. (2008). Gender differences regarding mathematics achievement: the case of Turkish middle school students. *School Science and Mathematics*. Vol. 108, pp. 113-120

#### D. ON-LINE JOURNAL

Brewin, C.R., Andrews B., & Valentine J.D. (2000), "Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults," National Center for Biotechnology Information, PubMed, A service of the U.S. National Library of Medicine and the National Institutes of Health. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11068961>. (accessed 11 December 2010).

Ma, X. and J. Xu. (2004). The Link Between Attitude Toward Math and Mathematics Achievement. *American Journal of Education*. Retrieved from <http://www.o cair.org/files/KnowledgeBase/willard/MathAttitAb.pdf>. (accessed 20 December 2010).

Stevenson, H. et. Al. (1986) *Mathematics Achievement of Chinese, Japanese and American Children*, American Association for the Advancement of Science. Retrieved from <http://www.jstor.org/stable/1696295> (accessed 18 December 2010).

#### E. ON-LINE BOOK

Lukey, B.J. & Tepe, V. (2008), *Biobehavioral Resilience to Stress*, CRC Press, Taylor and Francis Group. Retrieved from [books.google.com/books?isbn=1420071777](http://books.google.com/books?isbn=1420071777). (accessed 11 February 2009)

## **APPENDICES**

**APPENDIX A**  
**LETTER OF PERMISSION TO ADMINISTER THE AQ® PROFILE**  
**AND STUDENT PROFORMA FROM THE DEAN**



**PAMANTASAN NG LUNGSOD NG MAYNILA**  
*(University of the City of Manila)*  
 Intramuros, Manila

February 2, 2011

**Prof. Procula B. Amarillo**

Officer-in-Charge  
 College of Science  
 This University

Dear Madam:

Greetings in the name of the People's University!

We are Jonas M. Cura and Jeric L. Gozum, taking up BS Mathematics and is currently working on our thesis as a partial fulfillment for the course STAT 42- Statistical Methods and Research. Our thesis is entitled “ A Correlational Study in the Adversity Quotient® and the Mathematics Achievement of Sophomore Students of College of Engineering and Technology in Pamantasan ng Lungsod ng Maynila” where we will correlate the Adversity Quotient® of the Students to their Math Achievement during the past three semesters of their stay in their college.

In this regard, we would like to ask for your permission to allow us to administer our instruments; the Student Proforma which tackles the profile of the respondents, and the Adversity Response Profile ®, a valid instrument that measures the Adversity Quotient® of the respondents during the time of their ESC 222 – Integral Calculus classes among the second year students. Rest assured the results will be confidential and will be used only for the purpose of this research.

We are looking forward for your favorable response. Thank you for your full cooperation.

Respectfully yours,

JONAS M. CURA  
 Researcher

JERIC L. GOZUM  
 Researcher

Noted by:

Prof. Janette Lagos  
 Adviser

**APPENDIX B**  
**LETTER OF PERMISSION TO THE RESPONDENTS**



**PAMANTASAN NG LUNGSOD NG MAYNILA**  
*(University of the City of Manila)*  
Intramuros, Manila

February 2, 2011

Dear Sir/ Madam:

Greetings in the name of the People's University!

We are Jonas M. Cura and Jeric L. Gozum, taking up BS Mathematics and is currently working on our thesis as a partial fulfillment for the course STAT 42-Statistical Methods and Research. Our thesis is entitled " A Correlational Study in the Adversity Quotient® and the Mathematics Achievement of Sophomore Students of College of Engineering and Technology in Pamantasan ng Lungsod ng Maynila" where we will correlate the Adversity Quotient® of the Students to their Math Achievement during the past three semesters of their stay in their college.

In this regard, we would like to ask your cooperation by answering the attached questionnaires. If possible, please do not leave any questions unanswered. Be assured that your answers will be treated with utmost confidentiality.

Thank you for your cooperation and participation in this study and God Bless!

Respectfully yours,

JONAS M. CURA  
Researcher

JERIC L. GOZUM  
Researcher

## APPENDIX C

### AGREEMENT BETWEEN THE RESEARCHERS AND PEAK LEARNING



January 13, 2011

AQ Profile® Official Research Agreement

By signing this document, I agree to

1. Use the AQ Profile® for only the research project I have proposed to, and which has been approved by Dr. Paul Stoltz, CEO of PEAK Learning, Inc.
2. Not use the AQ Profile® for any monetary gain
3. Not to duplicate the AQ Profile for any purpose except for the approved research
4. Not to allow anyone else to duplicate the AQ Profile
5. To return or destroy the original AQ Profile to PEAK Learning, Inc. once my research is complete
6. To share all AQ® data and a copy of my study with PEAK Learning, Inc.
7. To have my name and paper posted on the Global Resilience Institute/PEAK Learning web page
8. Not to include the AQ Profile in research paper or appendix
9. To use the symbol ® whenever I mention AQ®, Adversity Quotient®, and AQ Profile® in any written form
10. To protect PEAK Learning's intellectual property to the best of my ability

---

Jeric Gozum

---

Date

Please sign and fax back to the attention of Katie Martin, 805-595-7771

**APPENDIX D**  
**LETTER OF PERMISSION TO USE ADVERSITY QUOTIENT®**  
**RESPONSE PROFILE**

Hi Jeric~ Please find attached the spreadsheet dated Feb. 21, 2011.

Let me know if I may be of further assistance.

Warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Feb 20, 2011, at 6:41 AM, Jeric Gozum wrote:

Hi Katie! I would like to inform you that I am finished encoding the data for the AQ® Profile. I would gladly wait for you reply and the next spreadsheet of data. It didn't reach 404 respondents because some of the students were absent during the survey. Hoping for your consideration. thank you!

---

**From:** Katie Martin <[katie@peaklearning.com](mailto:katie@peaklearning.com)>  
**To:** Jeric Gozum <[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)>  
**Sent:** Fri, February 11, 2011 2:53:06 AM  
**Subject:** Re: Global Resilience Institute

Hi Jeric~ I noticed your needing the spreadsheet of research data today. Please note that as of today, there are 274 participants who have completed the AQ® Profile.

Warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314

Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Feb 3, 2011, at 9:10 PM, Jeric Gozum wrote:

Greetings!

We will be able to complete the AQ® Profile of the 404 participants on Tuesday afternoon, time in the Philippines. We will just ask if we could get the results of the AQ® Profile before Thursday, February 10, 2011. It is for the reason that we will having our final defense on February 12, 2011 as told by our college because we are one of the selected proponents to explain our study on a research forum for the students of Pamantasan ng Lungsod ng Maynila. Rest assured that we will be able to complete it in the shortest time possible.

We are looking forward for your favorable regarding this matter.

Thank you and more power to PEAK Learning!

Warm regards,  
Jeric

---

**From:** Katie Martin <[katie@peaklearning.com](mailto:katie@peaklearning.com)>  
**To:** Jeric Gozum <[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)>  
**Sent:** Fri, January 28, 2011 2:06:20 PM  
**Subject:** Re: Global Resilience Institute

Hi Jeric~

Thank you. Your unique URL is: [www.peaklearning.com/jericgozum](http://www.peaklearning.com/jericgozum)

Remember - each participant is only allowed one test.

Please contact me once all 404 participants have completed the AQ® Profile online, and I will send you the spreadsheet of data.

Warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Jan 25, 2011, at 4:18 AM, Jeric Gozum wrote:

Hello. These are the answers for the necessary questions.

-We are thinking to have around 404 respondents

-Our target completion date is on March 2011

Thanks!

---

**From:** Katie Martin <[katie@peaklearning.com](mailto:katie@peaklearning.com)>

**To:** Jeric Gozum <[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)>

**Sent:** Mon, January 24, 2011 2:38:02 PM

**Subject:** Re: Global Resilience Institute

Hi Jeric~ I hope all is well. In going through our correspondence, I did not see a couple of items needed in order to get the link ready. Please let me know:

- The number of participants
- The completion date

Many thanks,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Jan 21, 2011, at 6:50 AM, Jeric Gozum wrote:

Good Day!

Its nice to hear that we will be receiving the link this coming Monday. We will gladly wait for that day.

Thank You. God Bless!

---

**From:** Katie Martin <[katie@peaklearning.com](mailto:katie@peaklearning.com)>  
**To:** Jeric Gozum <[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)>  
**Sent:** Fri, January 21, 2011 1:51:59 AM  
**Subject:** Re: Global Resilience Institute

Hi Jeric~ Thank you. We are in receipt of the agreement. You will receive your personal link to begin your data collection on Monday, January 24th.

Warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Jan 19, 2011, at 5:38 PM, Jeric Gozum wrote:

Good Morning. I would like to ask if you have recieved the signed agreement that I have faxed today? Please reply so that I would know if I would send another copy. Thank You for your reply..

---

**From:** Katie Martin <[katie@peaklearning.com](mailto:katie@peaklearning.com)>  
**To:** Jeric Gozum <[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)>  
**Sent:** Tue, January 18, 2011 2:17:03 PM  
**Subject:** Re: Global Resilience Institute

Hi Jeric~ The USA is 001, and the rest will suffice (805-595-7771). Thank you!

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Jan 17, 2011, at 7:22 PM, Jeric Gozum wrote:

Good Day.

I would like to ask for the country code and city code for the agreement to be faxed for you. We will be gladly waiting for your reply. Thank You!

---

**From:** Katie Martin <[katie@peaklearning.com](mailto:katie@peaklearning.com)>  
**To:** Jeric Gozum <[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)>  
**Sent:** Fri, January 14, 2011 1:50:05 AM  
**Subject:** Global Resilience Institute

Hi Jeric~

We are happy to offer you the use of the online AQ® Profile for the purpose of your research. Please sign the attached IP agreement and fax back to ATTN: Katie Martin (805-595-7771). Once received, I will send the personal link to the Global Resilience Institute and your research, along with instructions on how to use. Thank you for your interest in AQ® !

Warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Jan 8, 2011, at 3:30 AM, Jeric Gozum wrote:

Good day!

My group mate Jonas and I had an agreement that I will be the lead correspondent and I will be the one who will be communicating with Peak Learning. I will be waiting for your reply and the research agreement.

Thank You and God Bless.

---

**From:** Katie Martin <[katie@peaklearning.com](mailto:katie@peaklearning.com)>  
**To:** Jeric Gozum <[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)>  
**Cc:** [rayedear\\_jjj1745wales@yahoo.com](mailto:rayedear_jjj1745wales@yahoo.com)  
**Sent:** Fri, January 7, 2011 2:48:09 AM  
**Subject:** Re: Explanation for the conflict of title

Greetings Jeric~ Thank you for clarifying the doubling on thesis titles. If you and Jonas are both in agreement, we will continue our research agreement with Jeric as lead correspondent.

If you and Jonas would please both respond to this note, stating that you are both in agreement with the above, I will send the research agreement for Jeric to sign and return.

Many thanks & warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Jan 3, 2011, at 8:47 AM, Jeric Gozum wrote:

I have finally figured out why you have been working with the same title for my thesis. There was a simple misunderstanding with my group mate for the thesis. He also sent an application for request of permission to have an instrument for AQ® . He used our title and he did not inform me about the application he did. I hereby ask for consideration about the mistake we did and we would like to say that please study about my application and please disregard his application. Please reply in this email

[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)

We are willing to wait for your reply. Thank You and God Bless..

Hi Jeric~ Thank you for your interest in AQ® . Dr. Stoltz was kind enough to pass this along to myself and the team with Global Resilience Institute. Unfortunately, I'm unable to view your document.

If you would please save as a .doc (and not .docx) and resend, I would be delighted to move forward in your research proposal.

Many thanks and warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

Greetings Jeric~ Thank you for re-sending your document. I see that your title is the same as another researcher we are currently working with.

We sincerely appreciate your interest in AQ® and would like to further assist in your research endeavor. If you would please consider a different title, we may be able to continue our agreement.

Many thanks and warm regards,

Katie Martin  
PEAK Learning, Inc.  
3940 Broad Street, Suite 7-385  
San Luis Obispo, CA 93401

Phone - 805-595-7775  
Cell - 805-712-2314  
Fax - 805-595-7771  
email - [katie@peaklearning.com](mailto:katie@peaklearning.com)

On Dec 28, 2010, at 5:19 AM, Jeric Gozum wrote:

Dear Dr. Paul Stoltz,

I am Jeric L. Gozum from the Philippines. I am a student of Pamantasan ng Lungsod ng Maynila, a senior student and now making my thesis. We have read your book “Adversity Quotient® , Turning Obstacles into Opportunities “ and also tried the AQ® test. Your insights on how to overcome challenges in life are inspiring and motivating. I am about to finish my academic requirements for my Bachelors Degree and the thesis is the last thing to do. I am to use your idea because of the obstacles that present students are facing in their Mathematics Performance. I am planning to pursue my study on AQ® . The title of my thesis is, A Co relational study between the Adversity Quotient® and Mathematics Achievement of Second Year Engineering students of Pamantasan ng Lungsod ng Maynila.

For this reason, I want to ask your permission to please allow me to use the AQ® test or The Adversity Response Profile to be used as an instrument to assess the AQ® level of my respondents.

Please help me to go on with my ascent and fulfill my dreams.

Hoping for your favorable response on this humble request.

Thank you and God bless you and more power to PEAK Learning.

Very truly yours,

Jeric L. Gozum  
Researcher

<PaulStoltz.doc>

## APPENDIX E STUDENT PROFORMA

General Directions: Place a checkmark on the box corresponding to your choice honestly.

1. Name (optional):

---

2. Gender:  Male  Female

3. Scholastic Status:  Paying  Non- Paying

4. Do you have any scholarship grant? :  Yes  No

5. Course:  BSCHE

BSCE

BSCpE

BSEE

BSECE

BSME

BSMfgE

BSCS-CS

BSCS-IT

6. Academic Status:  Good Standing

Probation

Academic Status

Adjustment (ASA)

7. Type of High School Graduated:

Public

Science High

Private Non-Sectarian

Private Sectarian

8. What was your final grade in:

ESC 112- College Algebra \_\_\_\_\_

ESC 113- Plane and Spherical Trigonometry \_\_\_\_\_

ESC 122- Advanced Algebra \_\_\_\_\_

ESC 123- Solid Mensuration \_\_\_\_\_

ESC 124- Analytic Geometry \_\_\_\_\_

ESC 212- Differential Calculus \_\_\_\_\_

## APPENDIX F DATA OF THE RESPONDENTS

THE DATA OF THE RESPONDENTS FROM RUM - COLLEGE OF ENGINEERING AND TECHNOLOGY

RESPONDENT NO.	SEX	REGULATING BODY	SCHOLARSHIP	COURSE	ACADEMIC STATUS	TYPE OF RUM	MANUFACTOR	C	G	K	R	AQ
1	MALE	SCHOLARSHIP	SCHOLARSHIP	CIVE	GOOD	PUBLIC	1.8288	28	44	24	24	128
2	FEMALE	SCHOLARSHIP	SCHOLARSHIP	CIVE	GOOD	PUBLIC	1.8778	17	28	38	28	178
3	MALE	PARTIAL	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8758	28	21	28	28	128
4	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0888	28	28	28	28	128
5	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1288	27	28	28	28	128
6	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8228	27	28	27	27	127
7	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8772	27	28	28	27	128
8	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0728	27	27	27	27	128
9	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	28	28	28	28	128
10	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1878	28	44	28	28	127
11	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0828	18	27	18	27	178
12	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0228	24	18	28	28	124
13	MALE	SCHOLARSHIP	SCHOLARSHIP	CIVE	GOOD	PUBLIC	1.2228	28	27	28	28	128
14	MALE	SCHOLARSHIP	SCHOLARSHIP	CIVE	GOOD	PUBLIC	1	28	28	28	28	128
15	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8271	28	28	28	28	128
16	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.7228	28	28	27	28	128
17	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.7827	28	28	27	28	128
18	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.7827	28	28	28	28	128
19	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8228	27	28	24	28	128
20	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8228	28	28	28	27	127
21	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8271	28	27	28	28	128
22	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8728	27	28	28	28	128
23	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0727	28	27	27	27	124
24	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0227	27	28	28	28	128
25	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	24	28	28	28	128
26	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1271	28	28	28	28	128
27	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1872	28	27	27	28	127
28	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.2827	28	28	28	28	128
29	MALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.2828	28	28	28	28	128
30	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8228	27	28	28	27	128
31	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	1.8271	28	28	28	28	128
32	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0227	28	27	28	28	128
33	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.0228	27	28	28	28	128
34	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	27	27	28	28	128
35	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	27	27	28	28	128
36	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	27	27	28	28	128
37	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	27	27	28	28	128
38	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	27	27	28	28	128
39	FEMALE	SCHOLARSHIP	NOT ABO-COLAR	CIVE	GOOD	PUBLIC	2.1228	27	27	28	28	128
40	MALE	PARTIAL	SCHOLARSHIP	CIVE	GOOD	PUBLIC	2.2828	24	28	28	28	128
41	FEMALE	PARTIAL	SCHOLARSHIP	CIVE	GOOD	PUBLIC	1.8228	28	28	28	28	127
42	MALE	SCHOLARSHIP	SCHOLARSHIP	CIVE	GOOD	PUBLIC	1.2228	28	28	28	28	128

45	MALE	NON-ARR VIND	SEC-COLAR	CVE	00000	070002010	PUBLIC	33000	45	41	29	45	145
46	MALE	NON-ARR VIND	SEC-COLAR	CVE	00000	070002010	PUBLIC	33007	33	29	46	33	145
47	FEMALE	NON-ARR VIND	SEC-COLAR	CVE	00000	070002010	PUBLIC	14076	36	36	47	36	129
48	FEMALE	NON-ARR VIND	SEC-COLAR	CVE	00000	070002010	PUBLIC	14077	37	42	36	48	160
49	FEMALE	NON-ARR VIND	SEC-COLAR	CVE	00000	070002010	PUBLIC	33007	36	29	37	37	129
50	MALE	P-PTVID	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	330	31	42	31	41	129
51	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	14004	43	42	48	47	160
52	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33072	36	32	37	34	129
53	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33076	37	34	36	36	143
54	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33076	36	36	46	43	160
55	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33004	42	32	47	36	150
56	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33078	41	34	37	36	129
57	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33073	33	34	36	36	129
58	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33072	41	36	36	45	145
59	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33058	42	46	46	46	160
60	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33063	39	37	37	37	127
61	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33064	36	36	37	37	129
62	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33047	34	36	46	44	145
63	MALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33078	34	34	43	36	129
64	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33009	46	36	46	46	160
65	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33069	33	32	32	41	129
66	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33061	36	36	36	37	124
67	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33063	38	37	44	44	127
68	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33069	37	34	36	36	129
69	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	CVE	00000	070002010	PUBLIC	33071	33	34	36	34	126
70	MALE	P-PTVID	SEC-COLAR	SEC	00000	070002010	PUBLIC	14001	47	36	46	37	161
71	MALE	P-PTVID	SEC-COLAR	SEC	00000	070002010	PUBLIC	33003	37	34	34	34	119
72	MALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	14058	36	36	36	34	127
73	MALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	14004	36	36	36	36	129
74	MALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	14076	41	36	36	43	160
75	MALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	14068	34	42	42	42	149
76	MALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	33003	42	37	46	34	129
77	MALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	33076	41	37	36	34	147
78	MALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	33069	36	37	36	36	145
79	FEMALE	NON-ARR VIND	SEC-COLAR	SEC	00000	070002010	PUBLIC	14009	36	36	46	36	146
80	MALE	P-PTVID	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	14076	42	34	34	34	122
81	MALE	P-PTVID	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	33076	37	37	36	36	127
82	MALE	P-PTVID	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	33068	46	36	36	36	129
83	MALE	P-PTVID	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	33069	36	37	36	36	129
84	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	14076	46	34	34	34	143
85	MALE	NON-ARR VIND	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	14076	42	42	42	42	143
86	FEMALE	NON-ARR VIND	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	14076	46	34	34	34	143
87	MALE	NON-ARR VIND	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	14076	42	42	42	42	143
88	MALE	NON-ARR VIND	NOT ASEC-COLAR	SEC	00000	070002010	PUBLIC	14068	46	34	34	34	143

86	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18876	43	66	26	34	184
87	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18876	33	65	27	34	184
88	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18871	41	53	26	48	127
89	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18863	28	41	24	31	123
90	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17776	31	33	23	27	123
91	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17768	27	26	26	26	123
92	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17872	21	34	27	34	122
93	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18269	34	43	24	27	126
94	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18764	32	36	24	34	124
95	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18672	27	27	23	21	127
96	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18663	34	34	26	26	117
97	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18671	48	21	49	21	166
98	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18672	26	34	24	24	126
99	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18157	34	36	24	24	124
100	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17624	24	23	23	24	118
101	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17324	34	34	21	24	123
102	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17324	48	26	19	24	123
103	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18269	43	43	17	26	123
104	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18669	26	26	17	26	126
105	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18663	24	34	24	24	126
106	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18664	24	24	24	24	126
107	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18664	24	24	24	24	126
108	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18178	27	66	42	14	126
109	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18268	48	44	27	26	126
110	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18268	34	46	24	24	123
111	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18268	34	46	24	24	123
112	FEMALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18669	26	26	21	21	126
113	MALE	NON-VA RES	SC-SCHOLAR	SC	0000	EMERITUS	PUBLIC	17228	44	26	24	42	126
114	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17626	21	43	21	24	126
115	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17776	23	17	24	42	116
116	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17768	23	46	26	24	123
117	MALE	PARTID	SC-SCHOLAR	SC	0000	EMERITUS	PUBLIC	18264	27	24	21	41	127
118	MALE	PARTID	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	17228	48	17	49	21	124
119	MALE	NON-VA RES	NOT A SCHOLAR	SC	0000	EMERITUS	PUBLIC	18768	24	27	26	26	122
120	MALE	PARTID	SC-SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18172	41	46	26	24	122
121	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18268	23	27	26	21	119
122	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18671	26	26	26	44	121
123	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18178	26	26	21	24	121
124	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18178	26	17	26	21	126
125	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18758	24	46	41	46	126
126	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18758	24	46	41	46	126
127	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18758	24	46	41	46	126
128	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18176	26	41	24	24	122
129	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	18671	24	24	24	44	124
130	MALE	NON-VA RES	NOT A SCHOLAR	CAC3	0000	EMERITUS	PUBLIC	176	24	26	24	24	126
131	FEMALE	PARTID	SC-SCHOLAR	CMT	0000	EMERITUS	PUBLIC	17764	26	24	26	24	123
132	FEMALE	PARTID	SC-SCHOLAR	CMT	0000	EMERITUS	PUBLIC	18223	42	23	23	21	113
133	MALE	NON-VA RES	SC-SCHOLAR	CMT	0000	EMERITUS	PUBLIC	18768	24	26	26	24	123
134	MALE	NON-VA RES	SC-SCHOLAR	CMT	0000	EMERITUS	PUBLIC	18268	44	24	24	24	126









## APPENDIX G COMPUTATIONS

### SEX

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	186	61.6	61.6	61.6
	FEMALE	116	38.4	38.4	100.0
Total		302	100.0	100.0	

### SCHOLASTIC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PAYING	68	22.5	22.5	22.5
	NON-PAYING	234	77.5	77.5	100.0
Total		302	100.0	100.0	

### COURSE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CHE	21	7.0	7.0	7.0
	CE	47	15.6	15.6	22.5
	CPE	58	19.2	19.2	41.7
	ECE	73	24.2	24.2	65.9
	EE	6	2.0	2.0	67.9
	ME/MFGE	12	4.0	4.0	71.9
	CS-CS	19	6.3	6.3	78.1
	CS-IT	66	21.9	21.9	100.0
	Total	302	100.0	100.0	

**ACADEMIC**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GOOD STANDING	274	90.7	90.7	90.7
	PROBATION	21	7.0	7.0	97.7
	ASA	7	2.3	2.3	100.0
	Total	302	100.0	100.0	

**TYPEOFHS**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PUBLIC	177	58.6	58.6	58.6
	SCIENCE HIGH	24	7.9	7.9	66.6
	PRIVATE NS	27	8.9	8.9	75.5
	PRIVATE SEC	74	24.5	24.5	100.0
	Total	302	100.0	100.0	

**SCHOLAR**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	54	17.9	17.9	17.9
	NO	248	82.1	82.1	100.0
	Total	302	100.0	100.0	

**Group Statistics**

SCHOLASTIC		N	Mean	Std. Deviation	Std. Error Mean
ADVERSITYQUO	PAYING	68	132.74	14.700	1.783
	NON-PAYING	234	134.48	13.086	.855

**Independent Samples Test**

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ADVERSITYQUO Equal variances assumed	3.044	.082	-	300	.348	-1.743	1.855	-5.393	1.907
			.940						
Equal variances not assumed			-	99.889	.380	-1.743	1.977	-5.666	2.179
			.882						

**Group Statistics**

SCHOL AR	N	Mean	Std. Deviation	Std. Error Mean
MATHACHIEVE YES	54	2.054739	.4087852	.0556286
NO	248	2.310543	.3343018	.0212282

**Independent Samples Test**

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MATHACHIEVE Equal variances assumed	.001	.973	-.323	300	.747	-.0138389	.0428473	-.0981581	.0704803
MATHACHIEVE Equal variances not assumed			-.323	244.867	.747	-.0138389	.0428082	-.0981582	.0704804

**Group Statistics**

SCHOLASTIC		N	Mean	Std. Deviation	Std. Error Mean
MATHACHIEVE	PAYING	68	2.319420	.3999694	.0485034
	NON-PAYING	234	2.248932	.3490164	.0228159

**Independent Samples Test**

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MATHACHIEVE Equal variances assumed	5.200	.023	1.417	300	.157	.0704888	.0497362	-.0273872	.1683648
Equal variances not assumed			1.315	98.544	.192	.0704888	.0536017	-.0358748	.1768524

**Group Statistics**

SCHOLASTIC		N	Mean	Std. Deviation	Std. Error Mean
ADVERSITYQUO	PAYING	68	132.74	14.700	1.783
	NON-PAYING	234	134.48	13.086	.855

**Independent Samples Test**

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ADVERSITYQUO Equal variances assumed	3.044	.082	-.940	300	.348	-1.743	1.855	-5.393	1.907
Equal variances not assumed			-99.889	.882	.380	-1.743	1.977	-5.666	2.179

**Group Statistics**

SCHOLAR	N	Mean	Std. Deviation	Std. Error Mean
MATHACHIEVE YES	54	2.054739	.4087852	.0556286
NO	248	2.310543	.3343018	.0212282



	F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ADVERSITYQUO Equal variances assumed	.339	.561	1.199	300	.232	2.421	2.020	-1.554	6.396
Equal variances not assumed			1.193	77.424	.237	2.421	2.029	-1.620	6.461

## ANOVA

MATHACHIEVE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.255	7	.894	7.935	.000
Within Groups	33.107	294	.113		
Total	39.362	301			

## Multiple Comparisons

MATHACHIEVE

Tukey HSD

(I) COURSE	(J) COURSE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
CHE	CE	.0673759	.0880813	.995	-.201528	.336279
	CPE	-.1671738	.0854629	.514	-.428084	.093736
	ECE	-.0163846	.0830961	1.000	-.270069	.237300
	EE	-.0857843	.1553404	.999	-.560023	.388455
	ME/MFGE	-.1470588	.1214352	.928	-.517788	.223671
	CS-CS	-.2765738	.1062506	.159	-.600946	.047799

	CS-IT	-.3299911 <sup>+</sup>	.0840748	.003	-.586663	-.073319
CE	CHE	-.0673759	.0880813	.995	-.336279	.201528
	CPE	-.2345497 <sup>+</sup>	.0658597	.010	-.435613	-.033487
	ECE	-.0837605	.0627579	.885	-.275354	.107833
	EE	-.1531602	.1454793	.966	-.597294	.290974
	ME/MFGE	-.2144347	.1085361	.500	-.545785	.116915
	CS-CS	-.3439497 <sup>+</sup>	.0912293	.005	-.622464	-.065436
	CS-IT	-.3973670 <sup>+</sup>	.0640481	.000	-.592899	-.201834
CPE	CHE	.1671738	.0854629	.514	-.093736	.428084
	CE	.2345497 <sup>+</sup>	.0658597	.010	.033487	.435613
	ECE	.1507891	.0590266	.177	-.029413	.330992
	EE	.0813895	.1439091	.999	-.357951	.520730
	ME/MFGE	.0201149	.1064222	1.000	-.304782	.345011
	CS-CS	-.1094000	.0887038	.921	-.380204	.161404
	CS-IT	-.1628173	.0603966	.128	-.347202	.021568
ECE	CHE	.0163846	.0830961	1.000	-.237300	.270069
	CE	.0837605	.0627579	.885	-.107833	.275354
	CPE	-.1507891	.0590266	.177	-.330992	.029413
	EE	-.0693997	.1425162	1.000	-.504488	.365688
	ME/MFGE	-.1306742	.1045310	.916	-.449797	.188449
	CS-CS	-.2601892	.0864258	.056	-.524039	.003660
	CS-IT	-.3136065 <sup>+</sup>	.0569983	.000	-.487617	-.139596
EE	CHE	.0857843	.1553404	.999	-.388455	.560023
	CE	.1531602	.1454793	.966	-.290974	.597294
	CPE	-.0813895	.1439091	.999	-.520730	.357951
	ECE	.0693997	.1425162	1.000	-.365688	.504488
	ME/MFGE	-.0612745	.1677868	1.000	-.573511	.450962
	CS-CS	-.1907895	.1571468	.927	-.670543	.288964
	CS-IT	-.2442068	.1430891	.683	-.681044	.192630
ME/MFGE	CHE	.1470588	.1214352	.928	-.223671	.517788
	CE	.2144347	.1085361	.500	-.116915	.545785
	CPE	-.0201149	.1064222	1.000	-.345011	.304782

	ECE	.1306742	.1045310	.916	-.188449	.449797
	EE	.0612745	.1677868	1.000	-.450962	.573511
	CS-CS	-.1295150	.1237375	.967	-.507273	.248243
	CS-IT	-.1829323	.1053107	.663	-.504435	.138571
CS-CS	CHE	.2765738	.1062506	.159	-.047799	.600946
	CE	.3439497*	.0912293	.005	.065436	.622464
	CPE	.1094000	.0887038	.921	-.161404	.380204
	ECE	.2601892	.0864258	.056	-.003660	.524039
	EE	.1907895	.1571468	.927	-.288964	.670543
	ME/MFGE	.1295150	.1237375	.967	-.248243	.507273
	CS-IT	-.0534173	.0873672	.999	-.320141	.213306
CS-IT	CHE	.3299911*	.0840748	.003	.073319	.586663
	CE	.3973670*	.0640481	.000	.201834	.592899
	CPE	.1628173	.0603966	.128	-.021568	.347202
	ECE	.3136065*	.0569983	.000	.139596	.487617
	EE	.2442068	.1430891	.683	-.192630	.681044
	ME/MFGE	.1829323	.1053107	.663	-.138571	.504435
	CS-CS	.0534173	.0873672	.999	-.213306	.320141

\*. The mean difference is significant at the 0.05 level.

**ANOVA**

ADVERSITYQUO

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2222.329	7	317.476	1.784	.090
Within Groups	52313.433	294	177.937		
Total	54535.762	301			

**ANOVA**

MATHACHIEVE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.016	2	2.008	16.986	.000

Within Groups	35.346	299	.118		
Total	39.362	301			

### Multiple Comparisons

MATHACHIEVE

Tukey HSD

(I) ACADEMIC	(J) ACADEMIC	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
GOOD	PROBATION	-.4377057*	.0778508	.000	-.621079	-.254333
STANDING	ASA	-.2332239	.1316029	.181	-.543207	.076760
PROBATION	GOOD	.4377057*	.0778508	.000	.254333	.621079
	STANDING					
	ASA	.2044818	.1500573	.362	-.148970	.557934
ASA	GOOD	.2332239	.1316029	.181	-.076760	.543207
	STANDING					
	PROBATION	-.2044818	.1500573	.362	-.557934	.148970

\*. The mean difference is significant at the 0.05 level.

### ANOVA

ADVERSITYQUO

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	445.037	2	222.518	1.230	.294
Within Groups	54090.725	299	180.905		
Total	54535.762	301			

### ANOVA

MATHACHIEVE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.377	3	.792	6.383	.000
Within Groups	36.986	298	.124		

**ANOVA**

MATHACHIEVE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.377	3	.792	6.383	.000
Within Groups	36.986	298	.124		
Total	39.362	301			

**Multiple Comparisons**

MATHACHIEVE

Tukey HSD

(I) TYPEOFHS	(J) TYPEOFHS	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
PUBLIC	SCIENCE HIGH	.3089689*	.0766327	.000	.110982	.506956
	PRIVATE NS	-.0620823	.0727872	.829	-.250134	.125970
	PRIVATE SEC	-.0223440	.0487689	.968	-.148343	.103655
SCIENCE HIGH	PUBLIC	-.3089689*	.0766327	.000	-.506956	-.110982
	PRIVATE NS	-.3710512*	.0988339	.001	-.626397	-.115705
	PRIVATE SEC	-.3313129*	.0827561	.000	-.545120	-.117505
PRIVATE NS	PUBLIC	.0620823	.0727872	.829	-.125970	.250134
	SCIENCE HIGH	.3710512*	.0988339	.001	.115705	.626397
	PRIVATE SEC	.0397383	.0792084	.959	-.164903	.244380
PRIVATE SEC	PUBLIC	.0223440	.0487689	.968	-.103655	.148343
	SCIENCE HIGH	.3313129*	.0827561	.000	.117505	.545120
	PRIVATE NS	-.0397383	.0792084	.959	-.244380	.164903

\*. The mean difference is significant at the 0.05 level.

**ANOVA**

ADVERSITYQUO

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	847.941	3	282.647	1.569	.197
Within Groups	53687.821	298	180.160		

## ANOVA

## ADVERSITYQUO

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	847.941	3	282.647	1.569	.197
Within Groups	53687.821	298	180.160		
Total	54535.762	301			

## Correlations

		MATHACHIEVE	CONTROL
MATHACHIEVE	Pearson Correlation	1	-.120*
	Sig. (2-tailed)		.037
	N	302	302
CONTROL	Pearson Correlation	-.120*	1
	Sig. (2-tailed)	.037	
	N	302	302

\*. Correlation is significant at the 0.05 level (2-tailed).

## Correlations

		MATHACHIEVE	OWNERSHIP
MATHACHIEVE	Pearson Correlation	1	-.142*
	Sig. (2-tailed)		.013
	N	302	302
OWNERSHIP	Pearson Correlation	-.142*	1
	Sig. (2-tailed)	.013	
	N	302	302

\*. Correlation is significant at the 0.05 level (2-tailed).

## Correlations

		MATHACHIEVE	REACH
MATHACHIEVE	Pearson Correlation	1	-.088

	Sig. (2-tailed)		.125
	N	302	302
REACH	Pearson Correlation	-.088	1
	Sig. (2-tailed)	.125	
	N	302	302

**Correlations**

		MATHACHIEVE	ENDURANCE
MATHACHIEVE	Pearson Correlation	1	-.210**
	Sig. (2-tailed)		.000
	N	302	302
ENDURANCE	Pearson Correlation	-.210**	1
	Sig. (2-tailed)	.000	
	N	302	302

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Correlations**

		MATHACHIEVE	ADVERSITYQU O
MATHACHIEVE	Pearson Correlation	1	-.286**
	Sig. (2-tailed)		.000

	N	302	302
ADVERSITYQUO	Pearson Correlation	-.286**	1
	Sig. (2-tailed)	.000	
	N	302	302

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**APPENDIX H**

**PROFILE OF THE RESEARCHERS**

## JONAS M. CURA

Blk 9 Lot 3 Genesis St. cor. Micah St.  
 Infant Jesus Subdivision, Molino 2, Bacoor, Cavite  
 (0926)6654438  
 E-mail Address: [jonascura\\_1745@yahoo.com](mailto:jonascura_1745@yahoo.com)

---

### EDUCATIONAL ATTAINMENT

**TERTIARY:** Pamantasan ng Lungsod ng Maynila, Intramuros, Manila  
**Bachelor of Science in Mathematics, 2010 - 2011**  
**Summa cum Laude, GWA: 1.23**

#### ACHIEVEMENTS:

- Most Outstanding College Student of College of Science (2010-2011)
- Outstanding Student Leader, PLM- Civic Welfare Training Service 2007-2008
- UP Manila QWIZZARDY (Champion, 2010 and 2011)
- MTAP-TL Math Count (Champion, 2010 and 2011)
- Mathematical Society of the Philippines Math Wizard (Finalist, 2009 and 2010)
- Scholar, DOST - GIFTS (RA7688), 2009-2011
- Consistent Dean's Lister

**SECONDARY:** Manila Science High School, Ermita, Manila  
**Silver Medalist, 2006 - 2007**

#### ACHIEVEMENTS:

- Metrobank - MTAP - DepEd Math Challenge 2007
  - 1<sup>st</sup> Place, National Finals, Team Category
- Scholar, MaSci Batch '74 Alumni Association
- 

### WORK EXPERIENCE

- **PhilhealthCare, Inc.**  
**Junior Actuarial Analyst (On-the-Job Training 160 Hours)**  
 November 17, 2009- January 12, 2010
  - Made profit and loss reports for evaluation of clients' rates
  - Used different software (EZCAP, ATPS, SAP) in retrieving records of clients
  - Analyzed and projected different data to draw inferences about the clients' future rate

## SKILLS AND INTERESTS

- Excellent in applied mathematical skills in the field of statistics, actuarial science and investment mathematics
- Proficient in using Microsoft Excel and other MS Office products and other Internet applications.
- Knowledgeable in programming languages, especially in COBOL and C++
- Capable of doing data analyses and models using SPSS and MATLAB
- Adaptable to learn various technologies and quickly assimilate newest trends, ideas and concepts
- Team player, decisive and analytical in resolving problems
- Highly motivated, goal-oriented and possesses good oral and written communication skills.

## ACTIVITIES AND AFFILIATIONS

- PLM Mathematical Society
  - President, 2010- 2011
  - Vice-President, 2009- 2010
- Metro Manila Christian Youth Fellowship
  - President, 2010-2011
  - Vice-President, Internal, 2009- 2010
- Mathematics Teachers Association of the Philippines
  - Trainor, Mathematics IV, (November - December 2010)
  - Trainor, Mathematics II, (November - December 2008)

## SEMINARS, TRAININGS AND CONFERENCES

- **CS Mini Conference: Thesis Presenter**  
 \*Topic: A Correlational Study on the Mathematics Achievement and Adversity Quotient® of Sophomore PLM-CET Students  
 \*February 16, 2011, Pamantasan ng Lungsod ng Maynila
- **SALT XV: Student Advancement through Leadership Training**  
 \*December 20, 2010, Pamantasan ng Lungsod ng Maynila
- **Jobstreet.com 3<sup>rd</sup> Annual Career Student Congress**  
 \*September 3, 2010, SMX Convention Center
- **51<sup>st</sup>, 52<sup>nd</sup>, and 53<sup>rd</sup> Samahang Pangkalahatang Kapisanang Kabataang Kristiyano Annual Camp and Seminar**  
 \*April 28- May 12, 2007, April 27- May 10, 2008, April 13-24, 2009, La Trinidad, Benguet and Nagsangalan, Vigan, Ilocos Sur

## REFERENCES

Ms. Carmel Felicitas  
 Senior Actuarial Analyst  
 Philhealthcare, Inc.  
 09175526226

Prof. Janette Lagos  
 Professor, Mathematics Department  
 Pamantasan ng Lungsod ng Maynila  
 09175696740

## JERIC L. GOZUM

735 San Sebastian St. Quiapo, Manila

(0922) 853-8423

[jeric\\_gozum@yahoo.com](mailto:jeric_gozum@yahoo.com)

**OBJECTIVE:** To obtain a position that will enable me to utilize my skills, educational background and ability to work well with people

### PERSONAL

**INFORMATION:**

Age	:	19 years old
Date of Birth	:	January 15, 1991
Place of Birth	:	Quezon City
Nationality	:	Filipino
Gender	:	Male
Height	:	5'7"
Weight	:	110 lbs.
Marital Status	:	Single
Religion	:	Roman Catholic

**EDUCATION:**

Tertiary:		Bachelor of Science in Mathematics Pamantasan ng Lungsod ng Maynila Intramuros, Manila 2007 – present
Secondary:		University of Santo Tomas High School España, Manila 2003 – 2007
Primary:		San Beda College Mendiola, Manila 1997 – 2003

### WORK EXPERIENCE:

- 1 Land Bank of the Philippines  
Central Clearing Department  
Malate, Manila  
On-the-Job Trainee  
December 2009 – January 2010
- 2 Social Security System  
Student-Trainee, Recto Branch  
Summer Social Security Services Training Program  
April 2009 – June 2009

**HONORS, CERTIFICATES AND ACHIEVEMENT:**

- 1 Certificate of Attendance  
Lecture Series – Contemporary Mathematics  
Mathematical Society of the Philippines – NCR Chapter  
July 24, 2010
- 2 Certificate of Participation  
Math-alastasan : Misconceptions on Algebra and  
Trigonometry  
July 17, 2010
- 3 Certificate of Completion  
Office Practicum at Central Clearing Department (LBP)  
With a rating of 97.77 (Outstanding)  
January 2010
- 4 Certificate of Completion  
Summer Social Security Services Training Program  
Summer of 2009
- 5 Branch Best Student – Trainee  
SSS Recto Branch, Summer of 2009  
Summer Social Security Services Training Program
- 6 Quadrivium Champion, 2005
- 7 6<sup>th</sup> Honorable Mention ( Silver Medalist ), Batch 2003
- 8 Consistent First Honor, 1997 – 2003

**PROFILE:**

Major in Pure Mathematics, Minor in Statistics and in Computer  
Science

**ACTIVITIES:**

PLM Mathematical Society (PLM MathSoc)  
Member, 1<sup>st</sup> and 2<sup>nd</sup> Semester, S.Y. 2008 – present  
Sanguniang Kabataan Member, 2007  
Barangay 390, Zone 40

**SPECIAL SKILLS:**

- Good communication skills both in English and Filipino
- Excellent in making presentations, spreadsheets, and documents using Microsoft Office
- Familiar in making websites using HTML
- Efficient in making programs using Turbo C / C++ and COBOL

**SEMINARS / TRAININGS ATTENDED**

- 1** “Contemporary Mathematics”  
By The Mathematical Society of the Philippines – NCR  
Chapter  
1<sup>st</sup> Lecture Series for S.Y. 2010 – 2011  
Centro Escolar University, Mendiola, Manila  
July 24, 2010
  
- 2** “Math-alastasan : A Seminar on the Common  
Misconceptions on Algebra and Trigonometry”  
By Adamson University Mathematics Society  
Adamson University, CS Architecture Hall  
July 17, 2010

**CHARACTER REFERENCES:**

Mrs. Susan Rebecca Larion  
FIS Section Head  
Social Security System – Recto Branch  
0917-522-9822

Prof. Ma. Isabel Lucas  
Professor, Mathematics Department  
Pamantasan ng Lungsod ng Maynila  
0917-804-1105

I hereby certify that the above information contained in this resume are true and correct to the best of my knowledge.

---

Jeric L. Gozum  
Applicant

