

# Impressions of Senior High School Students on Teacher Efficacy and Instruction: Relationship to Performance in Mathematics

Wilbert F. Cabuhat

Department of Education, Bunsuran National High School, Pandi, Bulacan, Philippines

## Abstract

The respondents of the study involved senior high school students of Guiguinto Vocational High School, Guiguinto, Division of Bulacan during the second half of the school year 2017-2018. The study focuses on students' appraisals of teachers' efficiency along six measures. The descriptive method of research was employed with checklist to gather data. Statistical treatment of data was limited to weighted mean, analysis of variance, and the Pearson r. The following hypotheses were tested at the .05 level: [1] Students across grade level do not differ in their appraisals of their Mathematics teachers' efficacy along the six measures. [2] Students' performance in Mathematics is not significantly related to their appraisals of teachers' efficacy along six measures. Based on findings, the following conclusions were arrived at: [1] The students have strongly agreed of their teachers' efficacy along the three measures: trust, high morale, opportunity for input, and agree of respect, sustaining academic and social growth and guidance concerns. [2] Gender was observed to be a factor that contributes differences in the students' appraisals of teachers' efficacy along six measures; no significant differences were observed to exist in the students' appraisals of teachers' efficacy along six measures; no significant differences were observed to exist in the students' appraisals of teachers' efficacy along opportunity for input across grade level and significant differences were observed across grade level on teachers' efficacy on the other measures. [3] Students' academic performance is significantly related to their appraisals of teachers' efficacy relative to respect, high morale, opportunity for input, sustaining academic and social growth; students' academic performance is not significantly related to students' appraisals of teachers' efficacy as regards trust and guidance concerns.

**Keywords:** Teacher Efficacy; Respect; Trust; High Morale; Opportunity For Input; Guidance Concerns.

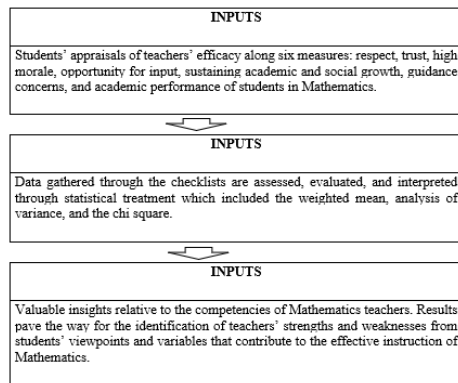
## 1. Introduction

Success in students' performance and accomplishments are, to a great extent, dependent on several circumstances. The potentials a student has in acquiring skills and competencies may be grounded on factors associated with students' impressions which teachers can base their instructional schemes to elicit students' interest. While the significance of effective classroom instruction and management is an integral part of teaching, it is imperative for teachers to investigate students' impressions and attributes that can enhance their learning and acquisition of skills.

From the researcher's observation, there seems to be a lackadaisical attitude among students relative to the significance of any subject. Teachers, thus, should be concerned about coming up with strategies and

approaches to make their subject more meaningful and responsive to arouse students’ enthusiasm. The researcher, a Mathematics teacher, hoped to come up with valuable data and information that may help enhance the eagerness and interests of students toward mathematics and the evolvement of motivational strategies among teachers to maintain and sustain students’ interest and enthusiasm toward mathematics.

**1.1 Conceptual Framework**



**Figure 1. The Paradigm of the Study**

The inputs of the study include students’ valuations of the six measures of impressions. Profile variables for correlation analysis were confined to gender.

Checklist was the main tool to gather data with observations and the interviews to reinforce findings. Statistical tools to assess data-gathered included the frequency count, percentage distribution, weighted mean, analysis of variance, and Pearson Product Moment of Correlation.

Cognizant of students’ recognition of their impressions for their accomplishment in Mathematics will enable teachers of Mathematics to come up with approaches to intensify their instruction and to elicit the interest of the students. To fully come up with a more responsive instruction in Mathematics in consideration of students’ acknowledgement of their impressions that promote or impede learning, the study can provide valuable insights of how students perceived themselves in their class in Mathematics; thus, the provision of approaches to enhance students’ self-confidence can be formulated by teachers of Mathematics. The effects of the quality of teaching on student achievement have been well documented. Teaching effectiveness has shown that positive teacher behaviour produces positive student outcomes.

**1.2 Theoretical Perspectives**

Bandura (1999) stated that the task impressions an individual is equipped to foster changes in learners’ behavior and increases productivity results by employing self-regulatory strategies like goal setting and self-monitoring. Self-management allows individuals to manage their own behaviors so that less external management control is necessary.

Defesti (2011) comments that the personal and professional qualities of teachers do not rest only on their knowledge of the subject matter to be taught. It includes their understanding and appreciation of the teaching profession – instructional strategies employed, self-efficacy, locus of control, and achievement motivation.s

Harvey (2011) says that success in the teaching profession demands effective interaction with learners, peers, fellow teachers, higher authorities, parents of students and people in the community. Teaching involves varied relationships among various individuals.

Krapp (2005) proposed this fundamental distinction between personal interest and situational interest, there is at present no research that directly speaks to the tenability of this proposal. Whereas personal

interest and situational interest can be thought of as distinct, they also have been hypothesized to be related. From an educational perspective, one would hope that if a classroom is high in situational interest, the environment would change an individual's personal interest level in the subject over time. In other words, whereas a teacher may have no control over students' incoming personal interest, that same teacher may be capable of having a noticeable influence on the students' outgoing personal interests by the

### 1.3 Research Questions

The researcher assessed secondary public school students' appraisals of the efficacy and instruction of their teachers in Mathematics. Specifically, the study sought to answer the following:

1. Students' appraisals of their Mathematics teachers' efficacy along the following measures:
  - a. Respect
  - b. Trust
  - c. High morale
  - d. Opportunity for input
  - e. Sustaining academic and social growth
  - f. Guidance concerns
2. Whether students across gender and grade level differ in their appraisals of their Mathematics teachers' efficacy along the six measures.
3. Whether students' performance in Mathematics is significantly related to the students' appraisals of teachers' efficacy along the six measures.

### 1.4 Significance of the Study

The study is expected to yield significant findings and information that will enable school authorities and teachers that will be very important to them which they will employ as baseline data in their supervision and instruction of activities related to mathematics.

The study is expected to yield valuable insights relative to the competencies of teachers of Mathematics in managing classroom activities and maintaining discipline as appraised by the students.

Findings will aid teachers of Mathematics enhance their productivity and ability relative to classroom management and discipline. Likewise, the teachers will be afforded very valuable facts which they will be able to use to modify their instructional strategies and to come up with some methods that will increase the interest of students in Mathematics as a subject.

Findings to be drawn will reveal some aspects of the teachers' instructional efficiency and whatever strengths and weaknesses identified will enable the teachers to become more cognizant of how students assess them; thus, the necessary adjustments can be undertaken.

## 2. Related Work

Effective delivery of instruction requires teachers of Mathematics to have some responsibilities like determining the principal activities in which they will engage directly while teaching. Such choices usually involve several of the following: giving formal or informal lectures, conducting group discussions, organizing various types of role playing, giving demonstrations, supervising field work and instruction, conducting field works and community work, selecting appropriate instructional materials.

One aspect of the rationale for teaching and learning relates to the way the teacher regards his subject matter content and that of the learners. Teachers must exert efforts to inculcate into the minds of the student the need to improve their ability to work effectively with others, and to learn to think critically and scientifically. The researcher is reminded of what Winteler, 2013 remarked when he said:

“The teacher of Mathematics wanting to do his best will have that of awakening the interest of the learners, of bringing them to react and to delight in the use of mind, they enjoy the process of gaining information in order to follow ideas to see where they lead. The true teacher will accept this responsibility – to increase his capacity to lead the learners through his subject matter content, not merely to know and to feel comfortable in doing so.”

Winteler remarks that interest and achievement motivation are two important factors that enhance performance and achievement. Interests represent a theme focused on motivational variables while performance motivation can be regarded as a general motivational orientation that elicits students' interests and resources to perform better without necessarily specifying a particular area of concern.

On the other hand, Zigler considers self-concept as a personality variable is an essential construct that has been associated with academic performance. It can inhibit or motivate students to strive harder.

The need for people to be productive and useful citizens was the focus of an article written by Bob Jack Collins. He said that people are the greatest resource of every country and the most effective agents and managers of change. However, unless people are equipped with essential knowledge, skills and the right attitudes, these capabilities can never become a reality. He added that to become agents and managers of change, the people must be prepared or educated. They must be equipped with critical knowledge and skills, and the right attitudes and values not only to function and live well in society, but also to be creative, productive, and useful citizens of the country. These capabilities and many more are most effectively developed in people through education.

The concept of education as a basic tool to inculcate work values was the focus of Daryll's article. He forwarded the idea that education is a process or a product and as a process, education is a system whereby an individual acquires knowledge, skills and attitudes that are essential in attaining an objective or set of objectives in life. It is a conscious effort of developing one's capabilities through formal schooling, non-formal or informal education and training. It is a dynamic process of growth and development. He commented, too, that the concept of education as a product is based on what a person can do after schooling, training, or learning process. It is the sum of all the experiences an individual acquires and/or applies in the society where he lives or works. It is a set of behavior acquired by a person and perceived by society as the standard pattern of behavior after some schooling or training.

Education is, as viewed by Daryll, a dynamic process of increasing one's knowledge and skills and of developing attitudes and values essential for useful, productive, wholesome, and responsible membership in society.

Competence in communication is an important segment of the total educational program and it has a philosophy that is meant to enhance the country's overall educational and development efforts was the contention of (Sach's, 2009 article).

He believes that as a major component of education, communication must be geared to equip every citizen with knowledge, skills, and attitudes to be able to function effectively in the ever-changing society. It must be addressing the need for everyone to understand and apply the fundamental skills and processes performed in everyday living to appreciate the value of the technological changes and their contribution to the improvement of the quality of life, and, if interested, to select an area or field of study which he could pursue through a purposeful productively in society.

According to (Hernicko, 2011) the importance of enhancing instruction is the critical need for trained manpower to accentuate the need for education. He said that effective tools for communication must be designed to prepare appropriate type and quality of trained manpower needed by the employment market

and supports the growth and development of the various sectors of economy. It must prepare individuals who are not only equipped with technical skills and knowledge but also appropriate attitudes and work ethic of a productive and useful member of society.

Education and communication contribute to national development by equipping people to work efficiently and effectively. It enhances the application of science and the development of creativity, productivity, innovation, and other values which are essential parts of the engine for growth. Technology education equips people to be efficient consumers or users of technical knowledge and skills and, more importantly, to become producers of new and appropriate technologies.

The nature of the acquirements approaches of students has caught the interest of authorities in education. Often times questions are raised relative to the acquirement's approaches undertaken by students across various intellectual levels. Educational psychology has contributed a great deal to an understanding of the nature of the learning process and of the principal issues involved in learning which consequently led to the improvement of instructional procedures.

To better understand the teaching process, teachers are tasked to be aware about learning process concerns and the acquirements approaches of students. Although teachers cannot do the actual learning of students, the teacher can facilitate learning through effective instruction. It is imperative that acquirements approach of students be clearly discerned by school authorities and teachers as cognizance of students' acquirements approaches effective instructional activities may proceed with the essential information relative to students' acquirements approaches. Directing and guiding and knowing the learning activities of students' aid in the attainment of goals and objectives. Teachers are tasked to know not only how learning takes place, but also how instruction and classroom activities are learned by students. Consequently, students are sufficiently and effectively directed to bring about their desired growth and development.

Profound knowledge about teaching and learning processes has undergone development in recent years. Once it seemed sufficient for teachers to formulate a set of principles of learning fairly simple concepts of exercise and effect. The teachers applied these principles through the techniques of drill, reward, and punishment. But with the development of theory and research, experts in education have found necessary to expand and refine the understanding of teachers relative to learning with consequent important implications to effective instructions. The goal of schools is focused on effective learning and the modern consent of the modern school is based upon new insights on how students learn. It is important that teachers understand and continue to appraise other aspects of students' behaviors, specifically their performance goals and acquirements approaches.

Many of the students' learning activities involve the use of their intellect and other higher mental processes. How these thought processes operate in learning is important to teachers. Proper direction and control of these processes can affect transfer, retention, and utilization of learning. Recognition of the role of learning processes and the acquirements approaches of students including their goals is an acceptance of sound pedagogical strategies. Effective learning among students is a consequence of their behaviors in terms of their motivational system. This general way of looking at learning seems simple, but it has far reached implications in understanding and appreciating concerns relative to effective teaching and learning.

Effective learning goes on in accordance with the students' motivations. The significance of an awareness of students' goals and learning characteristics are of prime importance if total development of students is desired. (Petri, 2010) comments:

*"Improvement in teaching and learning can scarcely be made without a careful recognition of laws and principles upon which to base any valuable structure for the betterment of the learners.*



*Attempts must be made to know the motives of learners as these are the foundations of the learning interests of students. Fundamental conditions favorable to the learning process must likewise be looked into as these are essentials to make learning more permanent. The more the teachers understand the conditions of learning, the goals of students, and their styles in learning, the more the teacher fully brings his or her knowledge into relationship with the situations in the classroom and the better and more effective instruction is likely to become.”*

From the words of (Miller, 2012) he puts forward that motivation to learn depends upon such factors as the learner's purpose or interest, objectives and goals, his self-concept and self-confidence, his levels of aspiration, and his knowledge and appraisal of how well he is doing in relation to his goals. It is, thus, the job of the teacher to create an atmosphere which provides desirable outlets for students' needs in the direction of worthwhile incentives - an atmosphere in which interests will, consequently, flourish. Students' performance goals and learning behaviors are at times jeopardized because the school groups have values which conflict with the values held by other groups. The group to which learners belong should be looked into according to (Alderman, 2009) when he says:

*“The way in which groups function, the manner in which members of groups are interested, and the teacher's role in classroom activities have paramount importance in the motivations and learning of students. Most school learning takes place under conditions wherein the social and emotional climate of the classroom and the school are major determinants not only of the quality and amount of learning, but also the way in which students react to class work, and the attitudes which they develop about school.”*

It cannot be denied that the psychological setting of the classroom is basic to the teaching-learning situation and to the general growth and development of the learner. It is an atmosphere in which the learner desires to learn and makes knowledge as his own. The desired setting for learning is one in which the acquisition of learning is accepted as a worthwhile goal of the learner. To quote (Gettinger, 2011) he says:

*“The proper setting for learning is one of cooperation and competition with other learners. Competition cannot be eliminated in favor of cooperation. As the learner develops, he cooperates to receive benefits from others. Both competitive and cooperative tendencies can be developed for the benefit of the individual and the group. Thus, individual and group interests in both competitive and cooperative atmospheres are to be fostered to provide setting for learning.”*

Effective learning needs proper setting for growth and development. No one can take the task of the learner. Teachers can stimulate, direct, and guide; they can support, they can provide situations that may encourage learners' growth and development. Vongtheries, (2011) analyzed some common grammatical errors made by advanced Thai students. The findings revealed that errors of high frequency were on the verb system, preposition, articles, noun form, and vocabulary items. Even though some errors are in low frequency category, they are prevalent enough to cause ambiguity and unintelligibility since it can make communication difficult, if not impossible. The findings also showed that errors stem from over-organization, performance, and interference. Most errors dealing with distribution of linguistic usage are related to errors of competence rather than performance, for instance, verb tenses.

Another study on grammatical errors was made by Bataineh, who made a cross-sectional investigation of the major syntactic errors in compositions written by sixty Jordanian learners of Mathematics as a second language. It analyzes the errors these learners make in the use of articles, prepositions, verbs, tense, and concord. Its purposes are to a) compare frequencies of errors to find out if any developmental patterns exist among the three levels and b) draw conclusions about the causes of these errors.

Error analysis Was the principal method used in this analysis. In addition to errors of omission, deletion, and substitution, syntactically correct instances were studied as a means to find out the overall improvement, if any, these learners make as they advance in their study of Mathematics.

A variety of explanations were offered for the various errors found in the learners' essays. Interlingual interference was used to account for the majority of these errors. Interlingual interference, a term coined by the present researcher to refer to errors resulting from the influence of the target language, was also found to account for a good number of errors. Techniques of teaching and material presentation, also known as transfer of training, accounted for the remaining few errors.

The learners of the three levels were found to exhibit different degrees of difficulty within and among the five error categories. Overall, this difficulty, measured by the number of errors in each of these categories, was found to decrease from one level to the next. This, paired with the increase in the number of correct instances, is consistent with the assumptions on which this research is based. The Elementary Level learners are the least familiar with the target language, which causes them to make more errors than their Intermediate and Advanced counterparts.

To ensure efficient teaching of Mathematics for Jordanian learners, the present researcher recommends that the focus of teaching be one selected syntactic problems instead of a general presentation of Mathematics syntax. The Mathematics teaching syllabi in Jordanian schools and universities ought to find intelligent ways to deal with these problems.

The history of Mathematics language teaching in the People's Republic of China was made by Shen, 2009. Mathematics language teaching plays an important role in Chinese education. The teaching of Mathematics in China can be traced as far back as the year of 1807 when a British missionary first brought Mathematics teaching to China. In the study proposed here, an attempt will be made to answer the question what the historical origins of Mathematics language teaching in China are and what are the identifiable periods of change in the development of Mathematics language teaching in China.

The purpose of this study was to provide the international community and people in the People's Republic of China with detailed information about Mathematics language teaching in China and the historical factors that affected the teaching of Mathematics. It was also determined whether or not there were discernible Mathematics that occurred patterns in the teaching of Mathematics during different historical periods. Based on these historical patterns, results suggested future directions in Mathematics language teaching. Recommendations for improving the teaching of Mathematics in China were provided.

The purpose of the study of Torut, 2010 was to compare language learning strategies employed by Thai university students studying in different disciplines and at different Mathematics proficiency levels. The major research questions were: 1) Do subjects studying in different disciplines use language learning strategies differently when controlling their Mathematics proficiency? 2) Do subjects having different Mathematics ability levels use language learning strategies differently? 3) Is there a correlation between language learning strategies and Mathematics proficiency and 4) which sets of the strategies are good predictors for Mathematics proficiency of the subjects?

A cloze test used for measuring Mathematics proficiency and self-reporting learning strategy questionnaire Were administered to 611 undergraduate students studying in three rural public universities in Thailand. ANCOVA, ANOVA, and stepwise multiple regression were applied for analyzing data. The findings of the study were: 1) When the subjects Mathematics proficiency scores were Controlled, the subjects in humanities used overall/Cognitive Strategies differently from the subjects in sciences and technology, and social sciences. However, discipline differences Could not account for differences in the

scores of each set of the following strategies: Memory, Compensation, Metacognition, Affective and social strategies. 2) The subjects with high and mid Mathematics ability level had scores on overall qDirect Strategies including Memory Cognitive and Compensation Strategies different from and higher than the subjects with low Mathematics ability level. Subjects in every group had scores On Direct Strategies, especially on Compensation Strategies, higher than scores on indirect strategies. Among these three sets of Indirect Strategies, only Metacognitive strategy scores of the subjects with low Mathematics ability level were significantly different from those with better Mathematics ability. There was no significant difference among the scores of Affective and Social Strategies of the subjects in three disciplines and at three Mathematics ability levels. 3) The global language learning strategy (LS) means of the subjects with different Mathematics ability levels in humanities were significantly different. No significant difference, however, was found in the global language learning strategy means of the subjects having different Mathematics proficiency levels in sciences and technology, and social science groups. 4) Cognitive and Compensation Strategies were God overall predictors of Mathematics proficiency of overall subject. Compensation and Metacognitive Strategies Were good predicting variables for Mathematics proficiency of the subjects in humanities, Compensation Strategies and Affective

### 3. Method

#### 3.1 Type of Research

The study used the descriptive method of research. Best and Khan (2008) define descriptive research as a method that deals with the relationships between variables, the listing of hypotheses, and the development of generalization, principles of theories that had universal validity. It is concerned with functional relationships. Descriptive research isa a process of gathering, analyzing, classifying, and tabulating data about prevailing conditions, practices, beliefs, processes, trends, and cause – effect relationships and then making adequate and accurate interpolation about such data with or without statistical treatment.

Strategies for the subjects in Sciences and Technology, and Compensation Strategies for the subjects with low Mathematics proficiency. Memory Strategies and Social Strategies were not good predictors for Mathematics proficiency of the subjects.

Results of this study with reference to specific findings can be summarized as follows: 1) Differences in the use of language learning strategies of the subjects, particularly their Cognitive Strategies, are related to studying in different learning disciplines. 2) Use of language learning strategies is affected by Mathematics language ability. 3) the classroom environment for teaching Mathematics in Thailand fosters the use of Direct Strategies rather than Indirect Strategies especially Affective Strategies rather than Indirect Strategies especially Affective strategies and Social Strategies. 4) Mathematics ability of Thai students in Mathematics teaching context in Thailand is based on Conscious process strategies. 5) Generally, learners' differences in learning disciplines and Mathematics ability levels affect different uses of language learning strategies. Social sciences and Science areas of study, however, have more effect on the strategy uses than Mathematics ability.

Mitcheli, (2013) investigated the relationship between Cooperative and individualized computer-based learning environments, auditory and visual learning styles, and the academic achievement of adult ESL students enrolled in an intermediate grammar course. This study was Conducted with 55 ESL students (male 18, female = 37). All students were trained in the use of CAI materials and equipment. Students in the cooperative learning techniques. Data were obtained by means of the Learning Styles Survey (LSS), and pre/post tests of past tenses.



ANCOVA was used to analyze differences among the post test scores, testing main effects and interactions. Cross-tabulations and Correlation Were performed to determine other relationships between the independent variables. The results of the post test assessment of the use of past tenses did not reveal any main effects or interaction between groups. There were no significant differences for cooperative versus individualized CAI environments, or between auditory and visual learners. A significant positive Correlation Was found between students age and the amount of time required to complete the task. The number of absences and achievement were found to be significantly negatively correlated.

The conditions set up for this study proved to be favorable for supporting equally cooperative and individualized CAI environments. It was suggested that because there Were no differences between the two CAI learning environments, that cooperative CAI learning environments might be utilized when Cost is factor. Suggestions for future research are offered that might produce more insights into the relationship between learning environments, learning styles, and academic achievement among adult ESL students.

Some educational reform efforts have focused upon the internal organization of the high school and have included attempts to reduce its size and to make learning experiences more personal and relevant. The purpose of Jacob's, 2011 study was to investigate the effects of Project SAIL, a program designed to increase student achievement through interdisciplinary learning, upon the achievement, attendance, and attitude toward school of the ninth-grade students who participated in it. The study also identified its benefits and liabilities from the perspective of teachers and students.

The population consisted of 135 ninth grade students who attended high school in a large suburban school district in North Central Texas. The experimental group was Composed of 93 students who participated in Project SAIL while the control group contained 42 students who did not participate. Project SAIL Students were taught by four teachers who shared a common planning period and also instructed the students in a fifth course, Peer Assistance and Leadership. The control group was taught by teachers working independently.

Analysis of Covariance procedures Were used to analyze the students' achievement in Mathematics I and Algebra I as well as their attitude toward school as reflected on the School Attitude Measure. An independent Samples t-test Was used to compare attendance rates of the two groups, Benefita and liabilities were identified by interviewing the four teachers three times during the year. Ten students were interviewed at the end of the year to determine their reaction to the project. A categorical coding system was used to analyze transcripts of all interviews.

Analysis of statistical data showed that students who participated in project SAIL did as well as students who did not participate in terms of achievement, attendance, and attitude toward school. Data gathered in interviews indicated that students and teachers had positive attitude about the experience and believed that the interdisciplinary approach was effective and offered needed support for students and teachers, Shidyak-Hoche, 2010 investigated Hispanic students' achievement in Mathematics, in grades five and ten, as related to their cultural identity, home integrative orientation, and proportion of Hispanics in their schools. Festinger's cognitive dissonance, Gardner, and Lambert's integrative motivation,

Based on Festinger's theory of cognitive dissonance, Gardner, and Lambert's integrative motivation, and Graham's assimilative motivation, it was hypothesized that: 1) Mathematics-proficient students will show greater individual identification with the American Culture and will have integrative home backgrounds. 2) Consonance between culture identification and the school population will be associated with higher achievement: Therefore, students with a greater affinity for the Latin culture will perform better in schools with a Hispanic majority, while students identifying with the American culture will perform better in

schools with a non-Hispanic majority. 3) Due to peer group pressure, students attending schools with a non-Hispanic student majority would show greater affinity for the American culture, while those enrolled in more Hispanic schools would show greater affinity for the Latin culture.

Three different measures of proficiency were used: Final grades in Mathematics, self-reported speaking and writing abilities and SAT/GTAT Verbal percentile ranks. A questionnaire was developed to collect biographic data. It resulted in two Composite scales for assessing individual cultural identity and home cultural background. Results indicate:

1. significant Correlation exists between acculturation and percentiles, positive in tenth grade and negative in fifth grade,
2. In the younger group, newer immigrants and students born out of the U.S. outscored American natives,
- 3) In the Older group, differences in the proportion of Hispanics at school triggered reactions of ethnic and bicultural affirmation.
3. Ahmed, 2012 studied the problem of unsatisfactory achievement in business Mathematics of the students at the College of Business Studies in Kuwait. It is a twofold study. It is an attempt to find out why many students find the major courses offered in Mathematics difficult to learn. similarly, it attempts to reveal why many graduates fail to meet the -Kuwaiti workplace language requirements. For this purpose, the author evaluates the situation of teaching BE at the CBs.

In this study the author aimed to achieve the following:

1. define the problem under investigation,
2. determine whether it is solely an ESP problem or otherwise,
3. identify the factors that may impede the satisfaction of the students' educational needs and the achievement of their occupational ends, and
4. suggest an effective solution to the problem and make recommendations for further studies related to teaching Mathematics in Kuwait, ESP in particular.

The author, in this study, argued that the students' unsatisfactory achievement in Business Mathematics was mainly attributed to the teaching materials of the Business Mathematics courses offered at the college. He investigated the significance of teaching materials in teaching Mathematics for Specific Purposes (ESP) and examined the appropriateness of those used for teaching Business Mathematics courses, in particular, at the college.

Based on the findings, the author concluded that:

1. The problem investigated in this work is a problem of low proficiency in General Mathematics involving a lack of mastery of specific Business Mathematics.
2. It is neither solely a Business Mathematics nor an absolute General Mathematics problem, but a cumulative combined problem.
3. The labor market Mathematics language requirements are attainable and realistic. However, they are not fully considered in the Mathematics courses offered at the college.
4. Many students find the courses taught in Mathematics at the college difficult to learn because of their low level of Competence in Mathematics including Business Mathematics.
5. The students' low achievement in Mathematics, b) the inappropriateness of the General Mathematics and the Business Mathematics courses offered at the college, c) the heterogeneity of the Mathematics groups (classes), the Business d) the large classes, Mathematics groups in particular, d) especially the Business Mathematics groups, and e) the students' limited practice of Mathematics.

Shay, 2013 examined the relationship between learning styles preference as measured by the Myers-Briggs Type Indicator (MBTI) and the Kolb Learning Style Inventory (KLSI), and achievement in Mathematics and mathematics courses for high school students enrolled in vocational educational programs. The sample consisted of 270 high school students in auto-mechanics and cosmetology vocational programs in Boards of Cooperative Services (BOCES) in New York.

Two questions were posed:

1. Is there a relationship between learning styles and achievement for high school students enrolled in auto-mechanics and cosmetology vocational educational programs, and
2. Do high school students in vocational education programs have a learning styles preference matched to the hands-on vocational education instructional approach (e.g. tactual, sensing, concrete active experimentation, kinesthetic).

It Was hypothesized that learning styles would affect achievement such that differences would be found-in-the-effects on Mathematics and mathematics as compared to vocational achievement.

A series of canonical correlation analyses indicated a single significant relationship at the .05 level. Vocational program and the judging/perception learning style were found to be meaningful in their effect on Mathematics achievement, with program most important. The gender specific nature of the cosmetology (female) and auto-mechanics (male) programs suggests the need for further inquiry to examine the possible effect of gender in the analysis is.

The descriptive data provided some evidence to support learning styles theory in relation to the MBTI and RLSI. As expected, students in the sample did exhibit extroversion, sensing, perception, and active experimentation learning styles preferences.

Students' highest achievement mean scores were in their vocational programs with grades slightly skewed to the high end of the distribution. The academic grades were skewed in the opposite direction.

The results did not refute nor support the research hypothesis nor fully answer the research questions. The research questions remained valid, and further research was suggested to address the limitations identified in this study.

Demographic transformations Occurring in United States society resulted in increasing diversity in school populations and a need for effective instructional programs in Mathematics as second language (ESL) Hackett's, 2014 study addressed this need. Structural modeling Was used to analyze hypothesized causal relationships among five latent variables: self-efficacy, motivation, interest, language anxiety, and ESL achievement. In the causal model, specified within a framework of social cognitive theory, it was hypothesized that self-efficacy and language anxiety would directly affect ESL achievement, and that self-efficacy would also indirectly affect ESL achievement through motivation and interest.

In a study conducted by Dionisio, 2007 On the status of Mathematics instruction in eight public secondary schools in Cebu City, he found out that activities supposed to be undertaken were not carried out due to the inadequacy of basic instructional facilities. His study, however, revealed the creative potential of the Mathematics teachers specifically on the use of local reading materials in the various reading activities they undertake in the classroom. He likewise observed that the Mathematics teachers find difficulty in formulating objectives that related to the cognitive and affective domains. The teachers were found to be at ease in making objectives relative to the psychomotor domains.

Corrales, 2009 conducted a study on the perceptions and problems of teachers and students in the teaching and learning of Mathematics in the public high schools in the First District of Laguna. she came out with the following findings: (1) most of the teachers were females, married, less than 36 years old, BSE Or AB

graduates, major in Mathematics; underwent the SEDP training and had taught the subject from one year to 12 years ; (2) the teachers of Mathematics had favorable perception about Mathematics while the students Were more favorable in their perception; (3) both teachers and students encountered Serious problems regarding the teaching and learning of Mathematics.

Jimenez's, 2001 study on the problems of Mathematics teachers came out with the following findings:

1. Teachers are not prepared to handle Mathematics as this is not their area of specialization during their pre-service education.
2. The low socioeconomic status of pupils does not allow them to Come up with worthy projects.
3. To an extent, the teachers admitted that their class in Mathematics is spent cleaning the school compound as a consequence of the inadequacy of facilities and equipment to carry out activities.
4. Parents are sympathetic to the needs of their children. There are conditions essential to effective learning. An especially important condition of learning is that learners' perceptions of teachers' efficacy project the quality of instruction they receive and aid in the attainment of goals and objectives. Such awareness of teachers' efficacy provides purposive bases for the selection and organization of the delivery of instruction teachers make in each learning situation - be it reading activities, listening to lectures, performing work projects, etc. Fulfillment of this condition of facilitated when the teacher learning is teacher takes the time to explain in sensible, understandable terms what the Course subject is all about, what it seeks to achieve, how the students is expected to be changed in his attitudes, his knowledge, his ability to use by the teacher and that knowledge, and his skills – by student activities related to the subject.

Teacher's competencies are vital if success in the teaching-learning processes is desired. Learning proceeds best when the student is motivated to learn, when he wants to learn and when he puts forth effort to learn. Achievement of these conditions is aided when the learner Considers learning tasks as having intrinsic worth and value for immediate or eventual use, Or both. The learner must be helped to recognize how their achievement will contribute to his development. Teachers who recognize and accept the importance of this condition of learning will find opportunities to point out real-life applications of principles, values, or skills; they will indicate specifically some of the potential contributions of their subject to the good life". Devotion in the practice of profession does not excuse a teacher's lack of expertness. Students are quick to detect faking by an unprepared, incompetent teacher, teetering on the brink of confusion.

Subject matter becomes more interesting to students and creates immeasurable enthusiasm and interests among learners. Glasser (2009) stated:

*"People become ImOre productive when what is being asked of them is psychologically satisfying. Teachers must exert efforts to make every lesson gratifying to learners and more consistent with their interests, so they can acquire a sense of fulfillment, accomplishment, power, and importance in the classroom."*

The importance of effective and sound classroom management to enhance teaching-learning activities was emphasized by Brophy and Putnam (2010) when they said:

*"Poor classroom management and discipline result in behavioral problems among learners while unsound and ineffective classroom management make classroom activities more difficult, arduous, and strenuous. Teachers are, thus, expected to be cognizant of classroom procedures to avoid behavioral problems emanating from teacher-student interactions."*

Learning is enhanced when the outlook of the classroom is challenging when there is opportunity to examine points of view rather than simply to accept them and when honest and informed disagreement is encouraged. Learning is likewise improved when students have appropriate opportunities where they were, and to evaluate how they have been developed by the learning activities in which they have engaged. Learning is also improved when students have the opportunities to verbalize their observations of classroom situations and conditions, such observations and verbalizations of students of teachers' competencies may improve learning processes. It is along this direction that the researcher was motivated to undertake this study to find out students' assessments of their teacher's competencies and their learning environment (Wendell, 2012).

### 3.2 Participants

Participants of the study were the senior high school students of Guiguinto National Vocational High School, Guiguinto, Division of Bulacan during the second half of the school year 2017-2018.

The academic performance in Mathematics among the students ranged from 73 to 97 with a mean grade of 80. The population and sample of respondents are detailed in Table 1.

**Table 1. Respondents of the Study**

Respondents	Population	Sample Size
Grade 11 Students	520	175
Grade 12 Students	694	195
<b>Total</b>	<b>1,214</b>	<b>370</b>

### 3.3 Instruments

Teacher Efficacy Checklist. The checklist was constructed by Saunders (2010) to come up with information relative to teachers' efficacy that contributes to the students learning activities in school. The checklist consists of seven parts with five (5) item – statements each.

Six options were offered to the students for a response which included the following:

- 6 – I strongly agree
- 5 – I agree
- 4 – I slightly agree
- 3 – I slightly disagree
- 2 – I disagree
- 1 – I strongly disagree

To arrive at a verbal description of each item – statement, the following arbitrary numerical guide were used:

- 5.16 – 6.0 – strongly agree
- 4.32 – 5.14 – agree
- 3.49 – 4.31 – slightly agree
- 2.66 – 3.48 – slightly disagree
- 1.83 – 2.65 – disagree
- 1.0 – 1.82 – strongly disagree

#### 3.3.1 Reliability and Validity of the Instruments

The reliability of the checklist was confirmed in earlier confirmatory studies abroad; however, to ensure it is culture – free, it was subjected to a test – retest to 40 students (20 males and 20 females) ten from each curriculum grade level in the setting of the study who were no longer be used as respondents. The interval of the administration of the pretest was one month. The scores obtained in the first administration



were compared with the scores obtained in the second administration using the Pearson Moment of Correlation. A reliability index of .88 was observed which is a manifestation of high reliability index.

### 3.5 Data Collection Procedure

The researcher sought the permission of the Schools Superintendent, Division of Bulacan through the Principal. The assistance of teachers was, likewise, secured. The instruments were administered by the researcher without the presence of their teacher in Mathematics. Others visited their homes to corroborate the answers of the students. Elucidation of the intent of the study was undertaken to enable the students to better understand the direction of the undertaking.

### 3.6 Data Analysis

The following procedures were employed:

1. The mean weighted average was employed to arrive at a verbal description of each of the items in the scaled checklist. The formula Heath (2008) is as follows:
2. The analysis of variance employing the Duncan’s Multiple Range Test (Walpole, 2005) was utilized to determine whether the various dependent variables contribute significant effects on the students’ circumstantial home activities.

The Duncan’s Multiple Range Test was employed to determine the range of any subset of p sample means which must exceed a certain value before any of the p means are found to be different. The formula for  $R_p$

$$R_p = r_p \sqrt{\frac{S^2}{n}}$$

Where:  $R_p$  = the least significant range for the p means

$r_p$  = the least significant studentized range, depends on the desired level of significance and the number of degrees of freedom of the error mean square

n = number of observations per treatment

$S^2$  = the error mean square

Analysis of Variance (ANOVA) for the Randomized Complete Block Design were:

SST = total sum of square

SSA = the treatment sum of square

SSB = the block sum of square

SSE = error sum of square

3. The chi square was employed to test whether students’ academic performance is significantly related to the circumstantial home activities and to establish whether there is significant relationship between fortification of education and outside-of-the-home activities as constructs of the circumstantial home processes.

## 4. Results and Discussion

### 4.1 Students’ Appraisals of their Teachers’ Efficacy

#### Respect

Table 1 presents the students’ appraisals of their teachers’ efficacy relative to respective.

Table 1 Students’ Appraisals of Teachers’ Efficacy Relative Respect				
Limits	Degree	f	%	Cum%
25-30	Strongly agree	34	9.19	9.19
20-24	Agree	188	50.81	60.00

15-19	Slightly agree	89	24.05	84.05
10-14	Slightly disagree	59	15.95	100.00
5-9	Disagree	0	0.00	
5-below	Strongly disagree	0	0.00	
Total		370	100.00	

The majority of students, 188 or 50.81 percent, were found to agree with their teachers’ efficacy relative to respect.

The students agree that their teachers in Mathematics treat them as people, feel proud to be teachers, consider their parents as important partners, respect even low achieving students, and respect fellow teachers in school.

The teachers are cognizant of who the students are in terms of their needs. Aware of the needs of the students, the teachers seemingly are conscious of individual differences; hence, are versed in strategies to meet individual differences prevailing among the students specifically the low achieving students. The students discerned that their teachers are proud of themselves as facilitators of learning. Effective instructions from teachers of Mathematics becomes more meaningful as teachers consider their parents as essential partners for effective education. Teachers respecting one another enhances the inculcation of values as students become observant of the prevailing interactions teachers have in school. Very evident among the teachers of Mathematics is the high esteem they have for students, fellow teachers, and parents. This would give the students the eagerness to learn if they had a teacher who has big respect for them as a student.

**Trust**

Table 2 presents the students’ appraisals of their teachers’ efficacy relative to trust.

Limits	Degree	f	%	Cum%
25-30	Strongly agree	192	51.89	51.89
20-24	Agree	88	23.78	75.67
15-19	Slightly agree	23	6.22	81.89
10-14	Slightly disagree	67	18.11	100.00
5-9	Disagree	0	0.00	
5-below	Strongly disagree	0	0.00	
Total		370	100.00	

The majority of the students, 192 or 51.89 percent, were found to be strongly agree in their teachers’ efficacy relative to trust.

The students strongly agree that their teachers serve as their second parents in school.

They agree that their teachers are concerned in their welfare, trust them, understand their needs and interests, and listen to problems students bring to their attention.

Feelings of belonging among the students are enhanced when they consider their teachers as second parents. Whatever problems students bring to their teachers are attended to and this endears more the students to the teachers. Feelings that they are being trusted by their teachers promote enthusiasm and eagerness among the students towards learning. Academic success is, thus, ensured. Very evident are the teachers’ concern, faith, and confidence they bestow on the students.

### High Morale

Table 3 presents the students’ appraisals of their teachers’ efficacy relative to high morale.

<b>Table 1 Students’ Appraisals of Teachers’ Efficacy Relative Trust</b>				
<b>Limits</b>	<b>Degree</b>	<b>f</b>	<b>%</b>	<b>Cum%</b>
25-30	Strongly agree	188	50.81	50.81
20-24	Agree	90	24.32	75.13
15-19	Slightly agree	33	8.92	84.05
10-14	Slightly disagree	59	14.95	100.00
5-9	Disagree	0	0.00	
5-below	Strongly disagree	0	0.00	
Total		370	100.00	

The majority of students, 188 or 50.81 percent, were found to strongly agree with their teachers’ efficacy relative to high morale.

The students strongly agree that their teachers motivate them to strive harder, emphasize how important Mathematics is in their future life activities; and exert efforts to make their lessons very interesting.

They agree that teachers advise them to attend their classes regularly and boost their morale to better appreciate the subject.

Highly motivated students generally lead to students’ appreciation of school endeavors and concern for the importance of education. Mathematics is an international language and the emphasis given by teachers of its importance to the students’ future life activities opens their eyes to the reality that Mathematics as a subject is imperative. Obviously, the teachers of Mathematics from students’ valuations, do exert efforts to make students appreciate the subject better.

### Opportunity for Input

Table 4 presents the students’ appraisals of their teachers’ efficacy relative to opportunity for input.

<b>Table 4 Students’ Appraisals of Teachers’ Efficacy Relative Opportunity for Input</b>				
<b>Limits</b>	<b>Degree</b>	<b>f</b>	<b>%</b>	<b>Cum%</b>
25-30	Strongly agree	190	51.35	51.35
20-24	Agree	88	23.78	75.13
15-19	Slightly agree	58	15.68	90.81
10-14	Slightly disagree	34	9.19	100.00
5-9	Disagree	0	0.00	
5-below	Strongly disagree	0	0.00	
Total		370	100.00	

The majority of students, 190 or 51.35 percent, were found to be strongly agree in their teachers' efficacy relative to opportunity for input.

The students strongly agree that their teachers motivate them to develop their skills and critical thinking and listen eagerly to new ideas students present in class.

They agree that their teachers inform them of activities and programs in school where they can actively participate and do include them in some decision-making activities like the putting up of school programs. Whatever hidden potentials students have can be tapped as teachers are Concerned in the student’s development of skills and Critical thinking. The students’ Social Competencies, too, are harnessed as teachers motivate them to participate in school programs and activities. It is during school programs and activities that the students can display whatever critical thinking and skills they may have. There are

conditions, circumstances, and situations which the teachers of Mathematics provide for their students to enhance further their analytical learning skills in Mathematics.

**Sustaining Academic and Social Growth**

Table 5 presents the students’ appraisals of their teachers’ efficacy relative to sustaining academic and social growth.

Limits	Degree	f	%	Cum%
25-30	Strongly agree	58	15.68	15.68
20-24	Agree	195	52.70	68.38
15-19	Slightly agree	85	22.37	90.75
10-14	Slightly disagree	32	8.65	100.00
5-9	Disagree	0	0.00	
5-below	Strongly disagree	0	0.00	
Total		370	100.00	

The majority of students, 195 or 52.70 percent, were found to be agree in their teachers’ efficacy relative to sustaining academic and social growth. The students agree that their teachers are seeking better ways of teaching? provide opportunities where they can display their critical thinking and analytical skills; are interested in everything that can be shared to them; and push them to solve problems in Mathematics.

The teachers of Mathematics, from students’ viewpoints, uphold and promote students’ learning competencies and general development. The teachers exert efforts to provide the students with possibilities which heighten their social Competencies.

**Guidance Concerns**

Table 6 presents the students’ appraisals of their teachers’ efficacy relative to guidance concerns.

Limits	Degree	f	%	Cum%
25-30	Strongly agree	99	26.76	26.76
20-24	Agree	186	50.27	77.03
15-19	Slightly agree	49	13.24	90.27
10-14	Slightly disagree	36	9.73	100.00
5-9	Disagree	0	0.00	
5-below	Strongly disagree	0	0.00	
Total		370	100.00	

The majority of students, 186 or 50.27 percent, were found to be agree in their teachers’ efficacy relative to guidance Concerns.

The students agree that their teachers are Concerned with their future; call the attention of students who are unruly: emphasize values in the selections and readings they study: have solutions to problems they bring to their teachers; and never embarrass students in front of others.

Rapport between teachers and students is very evident as teachers are concerned about the welfare of their students. More so, whatever problems students have been solved with teachers’ assistance and concern. Very apparent is the teachers’ interests relative to the total development and well-being of their students.

**2. Whether Students differ in their Appraisals of their Mathematics Teachers’ Efficacy Along the Six Measures Across and Grade Level**

**Gender**

Table 7 presents the analysis of variance table on students’ appraisals of teachers’ efficacy relative respect across Gender.

<b>Table 7 Analysis of Variance Table on Students’ Appraisals Teachers’ Efficacy Relative Respect across Gender</b>			
<b>Teachers’ Efficacy</b>	<b>F-ratio</b>	<b>Sig.</b>	<b>Decision</b>
Respect	8.2444	0.001	Rejected
Trust	4.268	0.000	Rejected
High Morale	8.7057	0.003	Rejected
Opportunity for Input	7.2356	0.863	Accepted
Sustaining Academic and Social Growth	8.3797	0.899	Accepted
Guidance Concerns	10.0636	0.004	Rejected

\*p<0.05

**Respect**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers" efficacy relative to respect across gender" was 8.2444 which Was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to respect across the two gender groups. Male and female students differ in their appraisals of their teachers' efficacy relative to respect. Mean scores revealed that the female students are more favorable in their appraisals of their teachers’ efficacy relative to respect. The female students are more reserved and docile in their comporment; hence, they feel their teachers to admire them more as compared to the feelings of the male students.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to respect across gender was, thus, rejected.

**Trust**

Table presents the analysis of variance table on students’ appraisals of teachers' efficacy relative trust across gender.

The Computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers’ efficacy relative to trust across gender" was 4.268 which was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to trust across the two gender groups. Male and female students differ in their appraisals of their teachers' efficacy relative to trust. Mean scores revealed that the female students are more favorable in their appraisals of their teachers’ efficacy relative to trust. Several studies have Confirmed that females are more adept in languages as compared to males and the findings of the study confirmed the veracity or earlier findings.

The hypothesis that students do not differ in appraisals of their teachers’ efficacy relative to trust across grade level was, thus, rejected.

**High Morale**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers’ efficacy relative to high morale across gender" was 8.7057 which was significant at .05 level. A significant difference Was observed in the students' appraisals of their teachers' efficacy relative to high morale across the two gender groups. Male and female students differ in their appraisals of their teachers' efficacy relative to high morale. Mean scores revealed that the male students are more favorable in their appraisals of their



teachers' efficacy relative to high morale. Most often the teachers of Mathematics include in their instruction group spirit and activities that promote and cooperation which the male students appreciate more than the females. The female students have their own cliques and groups and any efforts exerted by the teachers of Mathematics to provide activities associated with group spirit is not cherished. Seemingly, the students in the lower years have not established their own groups and activities undertaken by their teachers for group interaction are esteemed more.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to high morale across grade level was, thus, rejected.

### **Opportunity for Input**

Table presents the analysis of variance table on students' appraisals of teachers' efficacy relative opportunity for input across gender.

The computed F-ratio to test the hypothesis "students do not differ in appraisals of their teachers' efficacy relative to opportunity for output across gender" was 7.2356 which was significant at .05 level. A significant difference Was observed in the students' appraisals of their teachers' efficacy relative to opportunity for output across grade level. Male and female students differ in their appraisals of their teachers' efficacy relative to opportunity for output. Mean scores revealed that the female students are more favorable in their appraisals of their teachers' efficacy relative to opportunity for output.

The hypothesis is that students do not differ in appraisals of their teachers' efficacy relative to opportunity for Output across grade level was, thus, accepted. Sustaining Academic and Social Growth Table presents the analysis of variance table on students' appraisals of teachers' efficacy relative sustaining academic growth and social growth across gender.

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across gender" was 8.3797 which was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to sustaining academic and social growth. Male and female students differ in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. Mean scores revealed that the female students are more favorable in their appraisals of their teacher's efficacy relative to sustaining academic and social growth. Female students apparently are very perceptive of their teachers in terms of their efforts to improve their ways of teaching and their provision of opportunities where the students can display their critical thinking and skills.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level was, thus, accepted.

### **Guidance Concerns**

Table presents the analysis of variance table on students' appraisals of teachers' efficacy relative guidance concerns across gender.

The Computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to guidance concerns across gender" was 10.0636 which was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to guidance concerns across grade level. Male and female students differ in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. In this study, the mean scores derived revealed that male students are more favorable in their appraisals of their teachers' efficacy relative to guidance concerns. The male students often are more exposed to trivial misdemeanors which need the are guidance concerns of teachers.

Most often their attention is called by the teachers which consequently leads them to have more favorable appraisals of their teachers' guidance concerns.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to guidance concerns across gender was, thus, rejected.

**Grade Level**

Table 8 presents the analysis of variance table on students' appraisals of teachers' efficacy relative respect across grade level.

<b>Table 7 Analysis of Variance Table on Students' Appraisals Teachers' Efficacy Relative Respect across Grade Level</b>			
<b>Teachers' Efficacy</b>	<b>F-ratio</b>	<b>Sig.</b>	<b>Decision</b>
Respect	11.0052	0.004	Rejected
Trust	15.4120	0.003	Rejected
High Morale	4.5360	0.002	Rejected
Opportunity for Input	1.8056	0.845	Accepted
Sustaining Academic and Social Growth	14.9514	0.011	Rejected
Guidance Concerns	13.1540	0.025	Rejected

The Computed F-ratio to test the hypothesis "students do not differ in appraisals of their teachers' efficacy relative to respect across grade level" was 11.0052 which was significant at .05 level. Significant differences were observed in the students' appraisals of their teachers' efficacy relative to respect across grade level. The students differ in their appraisals of their teachers' efficacy relative to respect across grade level. Mean scores revealed that the Grade 11 students are more favorable in their appraisals of their teachers' efficacy relative to respect. The students have been exposed for a year or two to the teachers of Mathematics; hence, they feel their teachers esteem them more as compared to the feelings of Grade 12 students.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to respect across grade level was, thus, rejected.

**Trust**

The Computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to trust across grade level" was 15.4120 which was significant at .05 level. Significant differences were observed in the students' appraisals of their teachers' efficacy relative to trust across grade level. The students differ in their appraisals of their teachers' efficacy relative to trust across grade level. Mean scores revealed that the Grade 12 students are more favorable in their appraisals of their teachers' efficacy relative to respect. The students have been exposed to Mathematics instruction for three to four years and are cognizant of their teachers' instructional competencies; hence, they look upon their teachers.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to trust across grade level was, thus, rejected.

**High Morale**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to high morale across grade level" was 4.5360 which was significant at .05 level. Significant differences were observed in the students' appraisals of their teachers' efficacy relative to high morale across grade level. The students differ in their appraisals of their teachers' efficacy relative to high morale across grade level. Mean scores revealed that Grade 11 students are more favorable in their appraisals of their teachers' efficacy relative to high morale. Most often, the teachers of Mathematics include in their

instruction activities that promote group spirit and cooperation which students in the lower years appreciate more than those in the higher years. The Grade 12 students' female students have their own cliques and groups and any efforts exerted by the teachers of Mathematics to provide activities associated with group spirit is not cherished.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to high morale across grade level was, thus, rejected.

### **Opportunity for Input**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to opportunity for output across grade level" was 1.8056 which was not significant at .05 level. No significant differences were observed in the students' appraisals of their teachers' efficacy relative to opportunity for output across grade level. The students, regardless of what year they are, do not differ in their appraisals of their teachers' efficacy relative to opportunity for output.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to opportunity for output across grade level was thus accepted.

### **Sustaining Academic and Social Growth**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level" was 14.9514 which was significant at .05 level. Significant differences were observed in the students' appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level. The students, regardless of what year they are differ in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. In this study, the mean scores derived revealed that the students in the upper years are more favorable in their appraisals of their teachers' efficacy relative to sustaining academic growth. Students in the upper years have had sufficient opportunities interacting with their teachers and in their academic intercourse they had the advantage to discern their recognition of their teachers in the exercise of their profession including their skills and competencies.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level was, thus, rejected.

### **Guidance Concerns**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to guidance Concerns across grade level" was 13.1540 which was significant at .05 level. Significant differences were observed in the students' appraisals of their teachers' efficacy relative to guidance concerns across grade level. The students, regardless of what year they are, differ in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. In this study, the mean scores derived revealed that the students in the lower years are more favorable in their appraisals of their teachers' efficacy relative to guidance concerns. Grade 11 students have spent a few months interacting with their teachers and in this short period of interplay, the students evidently felt the efforts of their teachers to extend them the necessary assistance. Being new in school requires adjustments and the efforts extended by teachers to aid them in their adjustments seemingly advanced their appraisals to be more favorable as compared to the upper years.

The hypothesis is that students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level was, thus, rejected.

**3. Relationship of Students' Academic Performance to the Six Measures of Teachers' Efficacy**

Table 9 presents the coefficients of correlation to establish significant relationship between students' academic performance and the six measures of teachers' efficacy.

Table 9 Coefficients of Correlation Between Students' Academic Performance and Teachers' Efficacy						
Grade 11						
Grade	.3497*	.1876	.2855*	.3707*	.1966	.1109
Significance	.003	.120	.017	.002	.103	.361
Grade 12						
Grade	.2942*	.1472	.4462*	.3531	.4822*	.0188
Significance	.012	.217	.000	.002	.000	.875
Overall						
Grade	.2008*	.0788	.2416*	.2940*	.1899	.0084
Significance	.000	.16	.000	.000	.001	.881

\*p<0.05

**Respect**

The coefficient of correlation between students' academic performance and teachers' efficacy relative to respect was .2008 which was significant at .05 level. Significant relationships exist between academic performance and students' appraisals of teachers' efficacy relative to respect from Grade 11 and 12. Findings imply that respect as an attribute of teachers' efficacy in their instruction of Mathematics is a factor that determines the academic performance of students in Mathematics.

The null hypothesis was rejected.

**Trust**

The r-coefficient to determine whether students' academic performance is significantly related to teachers' efficacy relative to trust was .0788 which was not significant at .05 level. There exists significant relationship between academic performance and students' appraisals of teachers' efficacy relative to trust among Grade 11 students; however, no significant relationships were observed between academic performance and students' appraisals of teachers' efficacy relative to trust among Grade 11 and 12 students. Findings imply that the academic performance of the Grade 11 students is a factor in the academic performance of students in Mathematics. Grade 11 students seemingly are more sensitive of their teachers' attributes relative to trust. The more the Grade 11 students perceive their teachers of Mathematics trust them, the more favorable will their success in academic performance.

The null hypothesis was accepted.

**High Morale**

The Correlation coefficient to establish a significant relationship between students' academic performance and teachers' efficacy relative to morale was .2416 which was significant at .05 level. There exists significant relationship between academic performance and students' appraisals of teachers' efficacy relative to morale among Grade 12 students; however, no significant relationship Was observed between academic performance and students' appraisals of teachers' efficacy relative to morale among Grade 11 students. Grade 11 students, evidently, perceive their teacher of Mathematics the need to exert more efforts to provide the students opportunities that promote and enhance group spirit and cooperation.

The null hypothesis was rejected.

### **Opportunity for Input**

The r-coefficient to test the hypothesis "Students' academic performance is not significantly related to teachers' efficacy relative to opportunity for input was .2940 which was significant at .05 level. Finding implies that the conditions, factors, and situations teachers provide to aid students' analytical learning skills further enhance the academic performance of the students. Table shows that the academic performance of students in all curriculum grade levels manifest significant association with teachers' efficacy relative to opportunity for input.

The null hypothesis was rejected.

### **Sustaining Academic and Social Growth**

The correlation coefficient to determine whether significant relationship exists between students' academic performance and teachers' efficacy relative to sustaining academic and social growth was .1899 which was significant at .05 level. In this study, Grade 12 students have distinct genial development, and they give students have distinct credence to their teachers that uphold and promote students' learning competencies. Generally, this measure is factor that determines the extent of students' performance in the school.

The null hypothesis was rejected.

### **Guidance Concerns**

The r-coefficient to establish a significant relationship between students' academic performance and teachers' efficacy relative to guidance concerns was .0084 which was not significant at .05 level. It can be discerned from the findings that academic performance of the students is independent of the guidance concerns of the teachers relative to total development of the well-being of the students. Only Grade 12 students were found to be dependent on this measure.

The null hypothesis was accepted.

## **5. Summary of Findings, Conclusions, and Recommendations**

### **Summary of Findings**

#### **1. Students Appraisals of their Mathematics Teachers' Efficacy Respect**

Majority of students, 188 or 50.81 percent, were found to be agree in their teachers' efficacy relative respect. The students agree that their teachers in Mathematics treat them as persons, feel proud to be teachers, consider their parents as important partners, respect even low achieving students, and respect fellow teachers in school the teachers are cognizant of who the students are in terms of their needs. Aware of the needs of the students, the teachers seemingly are conscious of individual differences; hence, are versed in strategies to meet individual differences prevailing among the students specifically the low achieving students. The students discerned that their teachers are proud of themselves as facilitators of learning. Effective instruction from teachers of Mathematics becomes more meaningful as teachers Consider their parents as essential partners for effective education. Teachers respecting one another enhances the inculcation of values as students become observant of the prevailing interactions teachers have in school. Very evident among the teachers of Mathematics is the high esteem they have for students, fellow teachers, and parents.

#### **Trust**

Majority of students, 192 or 51.89 percent, were found to be strongly agree in their teachers' efficacy relative to trust.



The students strongly agree that their teachers serve as their second parents in school. They agree that their teachers are Concerned in their welfare, trust them, understand their needs and interests, and listen to problems students bring to their attention.

Feelings of belonging among the students are enhanced when they consider their teachers as second parents. Whatever problems students bring to their teachers are attended to and this endears more the students to the teachers. Feelings that they are being trusted by their teachers promote enthusiasm and eagerness among the students towards learning. Academic success is, thus, ensured. Very evident are the teachers' concern, faith, and confidence they bestow on the students.

### **High Morale**

The majority of students, 188 or 50.81 percent, were found to strongly agree with their teachers' efficacy relative to high morale.

The students strongly agree that their teachers motivate them to strive harder, emphasize how important Mathematics is in their future life activities; and exert efforts to make their lessons very interesting.

They agree that teachers advise them to attend their classes regularly and boost their morale to better appreciate the subject.

Highly motivated students generally lead to students' appreciation of school endeavors and concern for the importance of education. Mathematics is an international language and the emphasis given by teachers of its importance to the students' future life activities open their eyes to reality that Mathematics as a subject is imperative. Obviously, the teachers of Mathematics from students' valuations, do exert efforts to make students appreciate the subject better.

### **Opportunity for Input**

The majority of students, 190 or 51.35 percent, were found to be strongly agree in their teachers' efficacy relative to opportunity for input.

The students strongly agree that their teachers motivate them to develop their skills and critical thinking and listen eagerly to new ideas students present in class.

They agree that their teachers inform them of activities and programs in school where they can actively participate and do include them in some decision-making activities like the putting up of school programs. Whatever hidden potentials students have can be tapped as teachers are concerned in the students' development of skills and Critical thinking. The students' Social Competencies, too, are harnessed as teachers motivate them to participate in school programs and activities. It is during school programs and activities that the students can display whatever critical thinking and skills they may have. There are conditions, circumstances, and situations which the teachers of Mathematics provide their students to enhance further their analytical learning skills in Mathematics.

### **Sustaining Academic and Social Growth**

The majority of students, 195 or 52.70 percent, were found to be agree in their teachers' efficacy relative to opportunity for input.

The students agree that their teachers are seeking better ways of teaching; provide opportunities where they can display their critical thinking and skills; are interested in everything that can be shared to them; and push them to communicate in Mathematics, the teachers of Mathematics, from students' viewpoints, uphold and promote students learning competencies and general development. The teachers exert efforts to provide the students possibilities which heighten their social competencies.

### **Guidance Concerns**

The majority of students, 186 Or 50.27 percent, were found to be agree in their teachers' efficacy relative

to opportunity for input.

The students agree that their teachers are concerned with their future; call the attention of students who are unruly emphasize values in the selections and readings they study: have solutions to problems they bring to their teachers; and never embarrass students in front of others.

Rapport between teachers and students is very evident as teachers are concerned in the welfare of their students. More So, whatever problems students have been solved with teachers' assistance and Concern. Very apparent is the teachers interests relative to the total development and well-being of their students.

## **2. Whether Students differ in their Appraisals their Mathematics Teachers' Efficacy Along the Six Measures across Gende and Grade Level**

### **Gender**

#### **Respect**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to respect across gender" was 8.2444 which Was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to respect across the two gender groups. Male and female students differ in their appraisals of their teachers' efficacy relative to respect. Mean scores revealed that the female students are more favorable in their appraisals of their teachers' efficacy relative to respect. The female students are more reserved and docile in their comporment; hence, they feel their teachers to admire them more as compared to the feelings of the male students.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to respect across gender was, thus, rejected.

#### **Trust**

Table presents the analysis of variance table on students' appraisals of teachers' efficacy relative trust across gender.

The Computed F-ratio to test the hypothesis students do not differ in appraisals of their teachers' efficacy relative to trust across gender was 4.268 which was significant at.05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to trust across the two gender groups. Male and female students differ in their appraisals of their teachers' efficacy relative to trust.

Mean scores revealed that the female students are more favorable in their appraisals of their teachers' efficacy relative to trust, several studies have confirmed that females are more adept in languages as compared to males and the findings of the study confirmed the veracity of earlier findings.

The hypothesis is that students do not differ in appraisals of their teachers' efficacy relative to trust across grade level was, thus, rejected.

#### **High Morale**

The computed F-ratio to test the hypothesis is students do not differ in appraisals of their teachers' efficacy relative to high morale across gender" was 8.7057 which was significant at .05 level. A significant difference Was observed in the students' appraisals of their teachers' efficacy relative to high morale across the two gender groups. Male and female students differ in their appraisals of their teachers' efficacy relative high morale. Mean scores revealed that the male students are more favorable in their appraisals of their teachers' efficacy relative to high morale. Most often the teachers of Mathematics include in their instruction activities that promote group spirit and cooperation which the male students appreciate more than the females.

The female students have their own cliques and groups and any efforts exerted by the teachers of Mathematics to provide activities associated with group spirit is not cherished. Seemingly, the students in

the lower years have not established their own groups and activities undertaken by their teachers for group interaction are esteemed more.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to high morale across grade level was, thus, rejected.

### **Opportunity for Input**

Table presents the analysis of variance table on students' appraisals of teachers' efficacy relative opportunity for input across gender.

The Computed F-ratio to test the hypothesis "students do not differ in appraisals of their teachers' efficacy relative to opportunity for output across gender" was 7.2356 which was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to opportunity for output across grade level. Male and female students differ in their appraisals of their teachers' efficacy relative to opportunity for output. Mean scores revealed that the female students are more favorable in their appraisals of their teachers' efficacy relative to opportunity for output.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to opportunity for output across grade level was, thus, accepted.

### **Sustaining Academic and Social Growth**

Table presents the analysis of variance table on students' appraisals of teachers' efficacy relative sustaining academic growth and social growth across gender.

The Computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across gender" was 8.3797 which was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to sustaining academic and social growth. Male and female students differ in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. Mean scores revealed that the female students are more favorable in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. Female students apparently are very perceptive of their teachers in terms of their efforts to improve their ways of teaching and their provision of opportunities where the students can display their critical thinking and skills.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level was, thus, accepted.

### **Guidance Concerns**

Table presents the analysis of variance table on students' appraisals of teachers' efficacy relative guidance concerns across gender.

The Computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to guidance concerns across gender" was 10.0636 which was significant at .05 level. A significant difference was observed in the students' appraisals of their teachers' efficacy relative to guidance concerns across grade level. Male and female students differ in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. In this study, the mean scores derived revealed that male students are more favorable in their appraisals of their teachers' efficacy relative to guidance concerns. The male students often are more exposed to trivial misdemeanors which need the guidance concerns of teachers. Most often their attention is called by the teachers which consequently leads them to have more favorable appraisals of their teachers' guidance concerns.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to guidance concerns across gender was, thus, rejected.

**Grade Level****Respect**

The computed F-ratio to test the hypothesis "students do not differ in appraisals of their teachers' efficacy relative to respect across grade level" was 11.0052 which was significant at .05 level. Significant differences were observed in the students' appraisals of their teachers' efficacy relative to respect across grade level. The students differ in their appraisals of their teachers' efficacy relative to respect across grade level. Mean scores revealed that the Grade 11 students are more favorable in their appraisals of their teachers' efficacy relative to respect. The students have been exposed for a year or two to the teachers of Mathematics; hence, they feel their teachers esteem them more as compared to the feelings of Grade 12 students.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to respect across grade level was, thus, rejected.

**Trust**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to trust across grade level" was 15.4120 which was significant at .05 level, Significant differences were observed in the students' appraisals of their teachers' efficacy relative to trust across grade level. The students differ in their appraisals of their teachers' efficacy relative to trust across grade level. Mean Scores revealed that the Grade 12 students are more favorable in their appraisals of their teachers' efficacy relative to respect. The students have been exposed to Mathematics instruction for three to four years and are cognizant of their teachers' instructional competencies; hence, they look upon their teachers.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to trust across grade level was, thus, rejected.

**High Morale**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to high morale across grade level" was 4.5360 which was significant at .05 level. Significant differences were observed in the students' appraisals of their teachers' efficacy relative to high morale across grade level, The students differ in their appraisals of their teachers' efficacy relative to high morale across grade level. Mean scores revealed that Grade 11 students are more favorable in their appraisals of their teachers' efficacy relative to high morale. Most often, the teachers of Mathematics include in their instruction activities that promote group spirit and cooperation which students in the lower years appreciate more than those in the higher years. The Grade 12 students' female students have their own cliques and groups and any efforts exerted by the teachers of Mathematics to provide activities associated with group spirit is not cherished.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to high morale across grade level was, thus, rejected.

**Opportunity for Input**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to opportunity for output across grade level" was 1.8056 which was not significant at 05 level. No significant differences were observed in the students' appraisals of their teachers' efficacy relative to opportunity for output across grade level. The students, regardless of what year they are, do not differ in their appraisals of their teachers' efficacy relative to opportunity for output.

The hypothesis that students do not differ in appraisals their teachers' efficacy relative to opportunity of output across grade level was, thus, accepted.

### **Sustaining Academic and Social Growth**

The computed F-ratio to test the hypothesis "Students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level Was 14.9514 which was significant at 05 level. significant differences were observed in the students' appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level, The students, regardless of what year they are, differ in their appraisals of their teachers' efficacy relative to sustaining academic and social growth. In this study, the mean scores derived revealed that the students in the upper years are more favorable in their appraisals of their teachers' efficacy relative to sustaining academic growth. Students in the upper years have had sufficient opportunities interacting with their teachers and in their academic intercourse they had the advantage to discern their recognition of with their teachers and in this short period of interplay, they students evidently felt the efforts of their teachers to extend them the necessary assistance. Being new in school requires adjustments and the efforts extended by teachers to aid them in their adjustments seemingly advanced their appraisals to be more favorable as compared to the upper years.

The hypothesis that students do not differ in appraisals of their teachers' efficacy relative to sustaining academic and social growth across grade level was, thus, rejected.

### **3. Relationship of Students' Academic Performance to the Six Measures of Teachers' Efficacy Respect**

The coefficient of correlation between students' academic performance and teachers' efficacy relative to respect was .2008 which was significant at .05 level. Significant relationships exist between academic performance and students' appraisals teachers' efficacy relative to respect from Grade 11 and 12. Findings imply that respect as an attribute of teachers' efficacy in their instruction of Mathematics is a factor that determines the academic performance of students in Mathematics.

The null hypothesis was rejected.

#### **Trust**

The r-coefficient to determine whether students' academic performance is significantly related to teachers' efficacy relative to trust was .0788 which was not significant at .05 level. There exists significant relationship between academic performance and students' appraisals of teachers' efficacy relative to trust among Grade 11 students; however, no significant relationships were observed between academic performance and students' appraisals of teachers' efficacy relative to trust among Grade 11 and 12 students. Findings imply that the academic performance of the Grade 11 students is a factor in the academic performance of students in Mathematics.

Grade 11 students seemingly are more sensitive of their teachers' attributes relative to trust. The more the Grade 11 students perceive their teachers of Mathematics trust them, the more favorable will their success in academic performance.

The null hypothesis was accepted.

#### **High Morale**

The Correlation coefficient to establish a significant relationship between students' academic performance and teachers' efficacy relative to morale was .2416 which was significant at .05 level. There exists significant relationship between academic performance students' appraisals of teachers' efficacy relative to morale among Grade 12 students; however, no significant relationship was observed between academic performance and students' appraisals of teachers' efficacy relative to morale among Grade 11 students. Grade 11 students, evidently, perceive their teacher of Mathematics the need to exert more efforts to pro-



vide the students opportunities that promote and enhance group spirit and cooperation.

The null hypothesis was rejected.

### **Opportunity for Input**

The r-coefficient to test the hypothesis "students' academic performance is not significantly related to teachers' efficacy relative to opportunity for input was .2940 which was significant at .05 level, Finding implies that the conditions, factors, and situations teachers provide to aid students' analytical learning skills enhance further the academic performance of the students. Table shows that the academic performance of students in all curriculum grade levels manifest significant association with teachers' efficacy relative to opportunity for input.

The null hypothesis was rejected.

### **Sustaining Academia and Social Growth**

The correlation coefficient to determine whether significant relationship exists between students' academic performance and teachers' efficacy relative to sustaining academic and social growth was .1899 which was significant at .05 level, in this study, Grade 12 students have distinct genial development, and they give credence to their teachers that uphold and promote students learning competencies. Generally, this measure is a factor that determines the extent of students' performance in the school.

The null hypothesis was rejected.

### **Guidance Concerns**

The r-coefficient to establish significant relationships between students' academic performance and teachers' efficacy relative to guidance concerns was .0084 which was not significant at .05 level. It can be discerned from the findings that academic performance of the students is independent of the guidance concerns of the teachers relative to total development of the well-being of the students. Only Grade 12 students were found to be dependent on this measure.

The null hypothesis was accepted.

### **Conclusions**

Based on the findings, the following conclusions were arrived at:

1. The students have strongly agreed of their teachers' efficacy along the three measures: trust, high morale, opportunity for input, and agree for respect, sustaining academic and social growth and guidance concerns.
2. Gender Was observed to be a factor that contributes differences in the students' appraisals of teachers' efficacy along the six measures; no significant differences were observed to exist in the students' appraisals of teachers' efficacy along opportunity for input across grade level and significant differences were observed across grade level on teachers' efficacy on the other measures.
3. Students' academic performance is significantly related to their appraisals of teachers' efficacy relative to respect, high morale, opportunity for input, sustaining academic and social growth: students' academic performance is not significantly related to students' appraisals of teachers' efficacy as regards trust and guidance concerns.

### **Recommendations**

In view of the findings and Conclusions drawn, the following recommendations were offered:

1. Teachers of Mathematics should continuously exert efforts to project very commendatory comportment and course of actions in the exercise of their profession as these are manifestations of

their efficiency, capability, and productiveness which all redound to the effective transfer of learning and the enhancement of students' interests in schoolwork.

2. The teachers of Mathematics should consider gender and grade level differences among their students in the projections of efficacious behaviors.
3. The teachers of Mathematics should endeavor further to project efficacious behaviors along trust by being more concerned and Confident of their students' capabilities and along guidance concerns by showing more interests towards the total development of the well-being of their students.
4. It is recommended that a replicate study be conducted in other research locales to confirm the findings of this study.

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