High School Students' Performance in Elementary and Intermediate Algebra: A Correlational Study

Sherlyn V. Romasoc[1] and Julio M. Cervantes[2]
[1]Head Teacher III, Math. Dept. Alaminos City National High School
[2]Asst. Prof. IV, College of Computing Sciences, Pangasinan State University

Abstract – The research study investigated the Students' Performance in Elementary and Intermediate Algebra of high school students in the Division of Alaminos City focused on the a) student-related factors in terms of the following: Students' Profile includes sex, age, educational attainment of parents, occupation of parents, and family income; students' performance in Elementary Algebra based from the first year final rating and Intermediate Algebra based from first and second grading rates, and aptitude in Algebra based from the Division Test; and students' characteristics includes interest in Algebra and attitude towards Algebra, b) the school-related factors along the following: Algebra Teachers' profile includes age, sex, highest educational attainment, field of specialization, length of teaching experience, performance rating, and number of preparations; and, status of existing physical facilities and instructional materials: adequacy, functionality, and accessibility, c) the significant difference between students' performance in Algebra across their profile variable, d) the significant difference between students' performance in Elementary Algebra and Intermediate Algebra, e) the significant relationship between the students' performance in Algebra and their interest and attitude towards Algebra, f) the significant relationship between the students' performance in Algebra and the characteristics of Algebra Teachers, and g) the significant relationship between the students' performance in Algebra and the status of existing physical facilities and instructional materials.

The descriptive comparative correlation research design was used because it was the most suitable design and it could go beyond the mere gathering and tabulation data. It involved the analysis and interpretation of meaning or significance of what was described. The result of the Aptitude Test in the said research was also gathered to determine the factors affecting the achievement of the students in the Division of Alaminos City.

Based on the above findings, the following conclusions were derived: 1) more females than males are enrolled in Intermediate Algebra in the Division of Alaminos City this school year 2011-2012, 2) most of the students' fathers have college education and engaged in farming 3) most of the students' mothers have high school and college education and have no work, 4) the family income of most student-respondent is below PHP 10,000 and it is on the budget of average Filipino Families, 5) the level of interest of students towards Algebra is in moderate, 6) the students have a strong positive attitude toward Algebra, 7) there are more scores of the students in the aptitude test that were below than the above the mean, 8) there are more female Algebra Teachers than male, 9) majority of the Algebra teachers have MA units, major in mathematics, 10 years-above length of service, very satisfactory rating and two preparations, 10) the extent of adequacy of school facilities and instructional materials in schools are in high extent, the functionality of school facilities and instructional materials in schools are in moderate extent, and the accessibility of school facilities and instructional materials in schools are in high extent, 11) the correlation is significant between the student-respondents performance in Algebra and their sex and age, 12) the correlation is significant between students' performance in Elementary Algebra and performance in Intermediate Algebra, 13) the correlation is significant between the student-respondents performance in Algebra and their interest and attitude towards Algebra, 14) the correlation is significant between the student-respondents performance in Algebra and the adequacy, functionality and accessibility of school facilities and instructional materials, and the factors related to the students' performance in Elementary Algebra

and Intermediate Algebra are their sex and age, their interest and attitude towards Algebra, and the adequacy, functionality and accessibility of school facilities and instructional materials.

On the basis of the findings and conclusion, the following recommendations were made: 1) students should exert effort in doing their school work especially on the Algebra learning activities which tap their potentials and abilities, 2) schools should organize workshops on doing investigatory project to determine their skills and knowledge particularly on their field of interest, 3) students should have a positive attitude towards Algebra, 4) teacher should provide an equal treatment to the students to uphold the right attitude, dignity and responsibility towards Algebra subjects, 5) Algebra teachers should team up with the curriculum formulated to ensure interesting and integrative learning, transfer and application of knowledge, 6) teachers should use modern technologies in teaching Algebra like computer, TV, VCD player and other resource materials which enhance the students' idea and knowledge in terms of realistic approach, 7) more attention should be given to the teaching and learning activities which serve as a pivot in learning mathematical concepts, 8) parents who have the competence and knowledge about Algebra should directly assist their children in their studies and always encourage their children to study well, 9) parents, teachers and administrators should cooperatively work together for the enhancement of student's achievement in all subjects particularly in Algebra, and 10) conduct more research studies in the achievement of students in Algebra and consolidate findings in this study with those of the other studies in order to arrive at a more reliable and tangible generalizations on the factors affecting the students' performance in Elementary Algebra and Intermediate Algebra.

Keywords – accessibility, Algebra, aptitude, performance

INTRODUCTION

Mathematics is being defined as a SALT (Science, Arts, Language and Tool) of life. The knowledge in mathematics is very important to solve day-to-day living.

Poverty is negatively associated with student achievement. Analyses of NAEP 2000 mathematics data show that fourth graders in schools with higher proportions of students eligible for the Free/Reduced-Price Lunch Program, a commonly used indicator of poverty, tend to have lower scores. This pattern occurred among eligible and not eligible students. These high-poverty schools also enrolled a greater percentage of black and Hispanic students and had higher rates of absenteeism, a lower proportion of students with a very positive attitude toward academic achievement, and lower levels of parent involvement in school activities. According to the report last school year, some students enrolled in Intermediate Algebra find difficulty in studying and neglected to pass the subject.

Educators have long held the belief that successful learning relies on a series of building blocks. Students often begin with an introductory course that overviews the general concepts of a subject, and additional courses sequentially cultivate the students' expertise in that discipline. As with many other disciplines, economics students sequence from principles level courses, which typically require algebra level mathematical skills, to intermediate courses that focus on advanced technical skill development, and finally to higher level courses that develop increasingly complex applications of economic theory. Critical thinking skills are also developed (hopefully) in a sequential pattern, as students learn to apply normative analyses to ever more intricate questioning.

Mathematics education has long been recognized as a major factor in development, prompting nations to emphasize this in their national agenda. How students learn and how to measure student performance in these areas is thus a priority concern of policy makers and educators worldwide. One study that measures

student performance in mathematics which is generating increasing attention, is the Trends in Mathematics and Science Study (TIMSS) which is being done since 1995 and every four years hence by the International Association for the Evaluation of Educational Achievement (IEA).

In this study, a special TIMSS conducted by IEA in 2008 among students with advanced preparation in science and mathematics in ten (10) countries including the Philippines will be looked into. Specifically, Filipino students studying in science high schools will be benchmarked as a whole, and disaggregated by type of SHS, against students in other participating countries studying in schools with similar curriculum, which is designed to lead students to science-oriented higher education courses. Results of the TIMSS-Advanced showed that among the ten (10) countries that participated in the study, Russian Federation, got the highest average scale score at 561, while the Philippines ranked 10th, with an average scale score of 355. Compared with the other countries, the Philippines had the least number of years of formal schooling and had the youngest students at the time of the assessment. Coverage index, which is the estimate of the ratio of population of students enrolled in schools with special curriculum to the population size of the entire corresponding age cohort, was also lowest in the Philippines, indicating that only a small percentage (0.7%) of the population makes it to the SHS. The most liberal in the selection process for admission to schools offering special curriculum in mathematics was Slovenia, which had a coverage index of 40.5% provided. Russian Federation, which had the highest mean scale score, also had the highest percentage of students that reached the Advanced International Benchmark at 24%, while Norway, Sweden and Philippines had the lowest percentage at 1% each.

STATEMENT OF THE PROBLEM

This study aimed to determine the factors related to the Intermediate Algebra Performance of the high school students in Alaminos City Division this school year 2011-2012. Specifically, it sought answers to the following questions: 1. What are the student-related factors in terms of the following: a. Students' Profile (a.1 Sex; a.2 Age; a.3 Educational attainment of parents; a.4 Occupation of parents; and a.5 Family income)? b. Students' Performance (b.1 Elementary Algebra based from the first year final rating; b.2 Intermediate Algebra based from first and second grading grades; and b.3 Aptitude in Algebra based from the Division Test)? c. Students' Characteristics (c.1 Interest in Algebra; and c.2 Attitude towards Algebra)? 2. What are the school-related factors along the following: a. Algebra Teachers' Profile (a.1 Age; a.2 Sex; a.3 Highest Educational Attainment; a.4 Field of Specialization; a.5 Length of Teaching Experience; a.6 Performance Rating; and a.7 Number of Preparations)? b. Status of the Existing Physical Facilities and Instructional Materials (b.1 Adequacy; b.2 Functionality; and b.3 Accessibility)? 3. Is there a significant difference between students' performance in Algebra across their profile variable? 4. Is there a significant difference between students' performance in Elementary Algebra and Intermediate Algebra? 5. Is there a significant relationship between the students' performance in Algebra and their interest and attitude towards Algebra? 6. Is there a significant relationship between the students' performance in Algebra and the characteristics of Algebra Teachers? 7. Is there a significant relationship between the students' performance in Algebra and the status of existing physical facilities and instructional materials?

MATERIALS AND METHODS

In this study, the descriptive comparative correlation research design was used because it is the most suitable design and it went beyond the mere gathering and tabulation data. It involves the analysis and interpretation of meaning or significance of what is described.

It is descriptive comparative correlation research design that measured the association of student factor, teacher factor and the school factor.

Data Gathering Procedure

The researcher sought first the permission from the City Schools Division Superintendent upon approval of the questionnaire to determine

the factors affecting the performance of second year high school students in Alaminos City Division, Pangasinan. Permission was secured to conduct the study from her Principal as well as from the Principals and Departments Heads of the public and private secondary schools in the division.

The researcher personally administered the floating of the questionnaire to the randomly selected pupils in the chosen schools to explain the objective of the study.

The subjects of the study are the sophomore students presently enrolled in public and private secondary schools during the school year 2011-2012. These schools are in the jurisdiction of Alaminos City Division. The mother national high school are located in the city proper while the other six public barangay national high schools are distant from the city proper. Data gathered among the randomly selected students from these respective schools determined the students' performance in Elementary and Intermediate Algebra.

Treatment of Data

The profile data of the student-respondent will computed using the frequency counts and percentages. The performance of the students in Elementary Algebra based on the final rating in first year, Intermediate Algebra based on the first and second grading period and Algebra Aptitude were described by using the mean, standard deviation, skewness and kurtosis. For purposes of using it as a grouping variable, it was categorized as low (below mean) and high (above the mean) and then describe by using frequency counts and percentages. The distribution was illustrated by histogram.

The students' Algebra interest and students' attitude towards Algebra were described by using the scale mean.

The profile data of the teacher-respondent will computed using the frequency counts and percentages. The adequacy, functionality and accessibility of the physical facilities and instructional materials in school were described using the mean.

To determine the significant difference between students' performance in Algebra across

their profile variable Two-Way Analysis of Variance was used.

To determine the significance of the difference between Students' performance in Elementary and Intermediate Algebra of the students, the T-test for compared variables was used.

The relationship between the students' performance in Elementary and Intermediate Algebra and Algebra interest and attitude towards Algebra was determined using the Pearson product coefficient of correlation.

The relationship between the students' performance in Algebra and the profile of Algebra Teachers was determined using the Pearson product of coefficient of correlation.

To determine the relationship between the performance in Algebra and the status of physical facilities and instructional materials in school, of the materials used in lecture room the Pearson product coefficient of correlation was used.

RESULTS AND DISCUSSION

The data gathered by the researcher are (1) Profile of students with respect to sex, age, educational attainment of parents, occupation of parents, and family income; (2) Profile of students with respect to their Grade Point Average in Elementary Algebra and Intermediate Algebra and Aptitude; (3) Profiles of Teachers teaching Algebra; (4) Extent of interest of students in Algebra; (5) Attitude of students toward Mathematics;(6) Status of Physical Facilities and Instructional Materials in School; (7) Difference between students' performance in Algebra across their profile variable; (8) Difference between students' performance in Elementary Algebra and Intermediate Algebra; (9) Correlation between the students' performance in Algebra and their interest and attitude towards Algebra; (10) Correlation between the students' performance in Algebra and the characteristics of Algebra Teachers; and, (11) Correlation between the students' performance in Algebra and the status of existing physical facilities and instructional materials in school.

STUDENT-RELATED FACTORS AFFECTING ELEMENTARY ALGEBRA AND INTERMEDIATE ALGEBRA PERFORMANCE

The profile of the students is determined as the variables were used as grouping variables when their Elementary Algebra and Intermediate Algebra Performance are compared.

Students Profile

Table 1 presents the profile variable of the students with respect to sex, age, educational attainment of parents, occupation of parents, and family income.

Sex

The table shows that the frequency of the female respondents from public high schools in the Division of Alaminos City is 226 or 65.9% and male respondents have a frequency of 117 or 34.1%.

Table 2.a
Profile Variable of the Students

Variable	Categories	Frequency	Percentage
Sex	Female	226	65.9
	Male	117	34.1
Age	13	82	23.9
	14	240	70.0
	15	18	5.2
	18	1	3
	19	1	3
	20	1	3
Educational Attainment of Father	Elementary Undergraduate	12	3.5
	Elementary Graduate	23	6.7
	High School Undergraduate	28	8.2
	High School Graduate	109	31.8
	College Undergraduate	35	10.2
	College Graduate	136	39.7
Educational Attainment of Mother	Elementary Undergraduate	10	2.9
	Elementary Graduate	21	6.1
	High School Undergraduate	42	12.2
	High School Graduate	119	34.7
	College Undergraduate	34	9.9
	College Graduate	117	34.1
Occupation of Father	Farming	107	31.2.
	Fishing	23	6.7
	Professional	34	9.9
	Overseas Filipino Worker	26	7.6
	Business Operator	5	1.5
	Local Government Employee	10	2.9
	and Official	127	37.0
	Others	11	3.2
	None		
Occupation of Mother	Farming	23	6.7

	Fishing	2	.6
	Professional	30	8.7
	Overseas Filipino Worker	32	9.3
	Business Operator	16	4.7
	Local Government Employee and Official	12	3.5
	Others	152	44.3
	None	72	22.2
Family Income	Below Php 10,000	242	70.6
	Php 10,001-Php 20,000	70	20.4
	Php 20,001-above	31	9
Total		343	100

Based from the research of Thomas J. Colin 2005 gender differences on standardized math tests in elementary and high school have been small since 1990 moreover, the 1970's gap in average math scores on standardized tests that favored 17-year-old boys had disappeared by 1999, and the science gap has also declined. In fact, girls now receive better math and science grades than boys right up through college. Today they constitute more than half the biology majors, almost half the math majors and half of medical school enrolments. Girls take more high school classes than boys in Chemistry, Biology and most types of Math. Although more boys take advanced classes in Physics and advanced Calculus, the differences appear to be shrinking rapidly.

Age

The table shows the frequency of the respondents ages 13 years old is 82 or 23.9%, 14 years old is 240 or 70%, 15 years old is 18 or 5.2%, 18 years old is 1 or 3%, 19 years old is 1 or 3% and 20 years old is 1 or 3%.

Educational Attainment of the Father

The collected data reveals that the educational attainment of the father elementary undergraduate have a frequency of 12 or 3.5%, elementary graduate have 23 or 6.7%, high school undergraduate have 28 or 8.2%, high school graduate have 109 or 31.8%, college undergraduate have 35 or 10.2%, and college graduate have 136 or 39.7%.

Educational Attainment of the Mother

The data in Educational Attainment of the Mother shows that 2.9% or a frequency of 10 is elementary undergraduate, 6.1% or a frequency of 21 is elementary graduate, 12.2 % or a frequency of 42 is a high school undergraduate, 34.7% or a frequency of 119 is a high school graduate, 9.9% or a frequency of 34 is a college undergraduate, and 34.1 or a frequency of 117 is a college graduate.

According to Cherlin 1992, students perform batter academically, have fewer discipline problems, and become more responsible adults when their parents are actively involved in their learning. But over the years, the "parent involvement" often has meant "mother's involvement". In schools, pre-schools and Head Start programs, and within the family itself, it has been assumed that mothers have the primary responsibility for encouraging the children's learning and development. These assumptions miss the importance of father's involvement. In addition, the adverse effects of a father's absence on the development of his children are well documented. Nevertheless, over half of the children in United States will spend

part of their child-hood in a single parent home.

According to NCES 1997, in two-parents families where fathers are highly involved in children's schools, students are more likely to get top grades and enjoy school than in families where father have low involvement, even after taking into account a variety of other child and family conditions that may influence learning. In these circumstances, the chances that children will get mostly as are higher when the father is highly involved than when the mother is highly involved.

Occupation of Father

The data in of the Occupation of Father shows that 31.2% or a frequency of 107 is engaged in farming, 6.7% or a frequency of 23 is engaged in fishing, 9.9 % or a frequency of 34 is engaged in performing their professions, 7.6% or a frequency of 26 is hired as Overseas Filipino Workers, 1.5% or a frequency of 5 is engaged in their business operation, 2.9% or a frequency of 10 is hired/elected as Local Government Employee and Official, 37% or a frequency of 127 is engaged in other occupations and 3.2% or a frequency of 11 have no work.

Occupation of Mother

The data in of the Occupation of Mother shows that 6.7% or a frequency of 23 is engaged in farming, 0.6% or a frequency of 2 is engaged in fishing, 8.7 % or a frequency of 30 is engaged in performing their professions, 9.3% or a frequency of 32 is hired as Overseas Filipino Workers, 4.7% or a frequency of 16 is engaged in their business operation, 3.5% or a frequency of 12 is hired/elected as Local Government Employee and Official, 44.3% or a frequency of 152 is engaged in other occupations and 22.2% or a frequency of 76 have no work.

Family Income

The table clearly shows that a family income below PHP 10,000 has a frequency of 242 or 70.6%, PHP 10001-PHP20,000 has a frequency of 70 or 20.4% and PHP 20001-above has a frequency of 31 or 9%.

Wilson, Smeeding and Haveman (2007) said that parental education and occupational class are more strongly associated with student's educational attainment. It has been put forward that parents of high socio-economic status have more positive attitudes towards their children's schooling and have high expectations for the children since they have the economic empowerment to buy the advantages that money can buy. Money may encourage or discourage going to school. The children from comfortable homes eats balanced diet and thus have a good health. Again, the values he/she is exposed to at home are similar to the ones he finds in school and therefore he is able to adjust easily to school life. A feeling of belonging to a comfortable social school environment further helps him/her to show his best. Payne, (1998) believes that students from poverty lack cognitive strategies needed to be successful in the educational system. Conger and Elder (1994) asserts that families at a variety of income levels who suffer economic stress of any kind are more likely than families that are not economically stressed to experience depression, marital clashes and to be harsh with their children which points to the fact that, poverty and economic stress are associated with parent- child conflict which leads to poorer grades and weakens emotional and social growth. The disparity in home learning environment of higher and lower income children is a reason for nearly half of the effect income on the achievement scores of preschool children (Klebanor, 2002).

Students' Performance in Elementary and Intermediate Algebra and Aptitude in Algebra

The outcome of the instruction is needed to find out if the objectives and had been achieved or not. The Algebra achievement of the students was determined by finding their grade point average during the preceding grading period. Their Algebra aptitude was also determined with the use of an aptitude test. The results are presented in the following table:

Table 2.b presents the profile of the students with respect to their Grade Point Average in Algebra and Algebra Aptitude.

Table 2.b
Students' Performance in Elementary and Intermediate Algebra and Aptitude in Algebra
(N=343)

| Variable	Mean	Standard Deviation	Skewness	Kurtosis
Elementary Algebra	86.97	3.852	.012	-1.200
Intermediate Algebra	86.23	3.714	-.402	-0.670
Aptitude in Algebra	14.66	4.722	1.312	4.059

Students' Performance in Elementary Algebra Based from the First Year Final Rating

As gleaned from the table 2.b, the student- respondents from all public high school in Division of Alaminos City generally obtained a performance rating in Elementary Algebra of 86.97 with a standard deviation of 3.852, skewness of .012 and kurtosis of -1.200. The kurtosis of -1.200 shows a leptokurtic distribution which indicates that the rating are clustered closely about the mean, while the positive skewness indicates that there are more ratings above than below the mean.

The histogram describes the distribution of the student's performance rating in Elementary Algebra in the Division of Alaminos City. It can be seen that the leptokurtic distribution specify that the rating of the students are clustered closely to the mean, while the positive skewness signifies that there are more ratings above than below the mean.

The following graph further describes the distribution of the students' performance rating in Elementary Algebra:
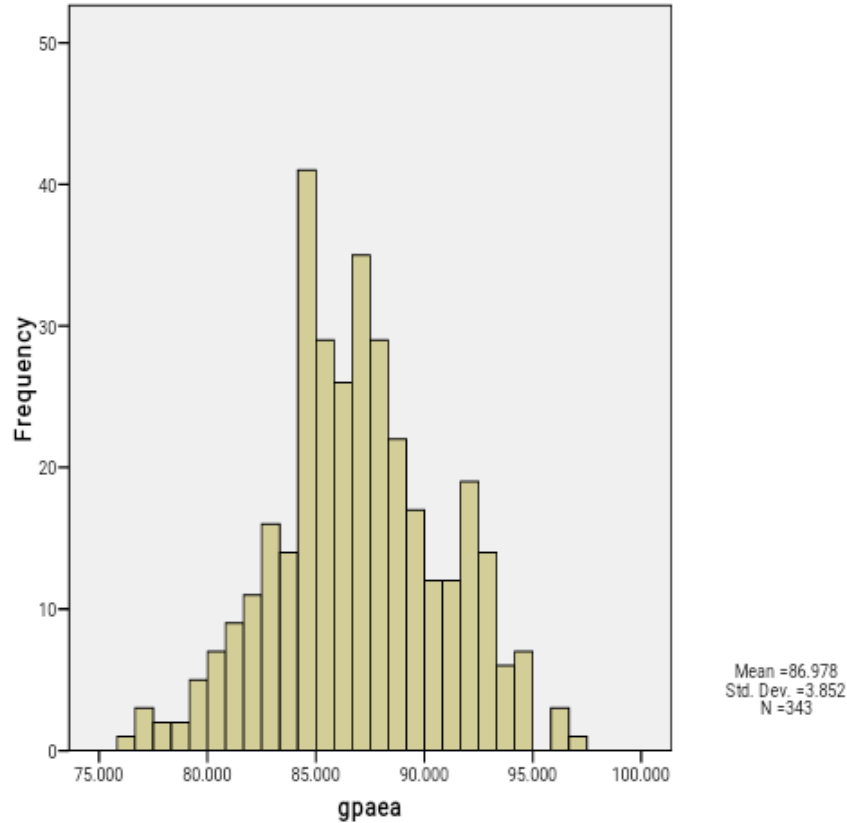
Figure 2 Students' Performance in Elementary Algebra in the Division of Alaminos City
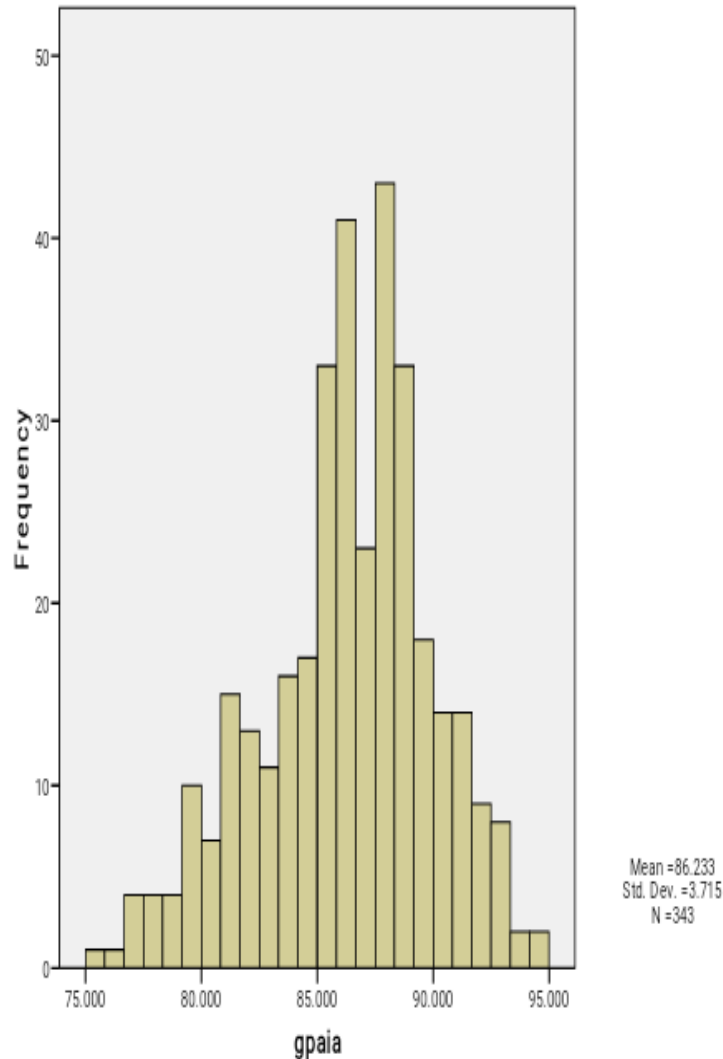
Students' Performance in Intermediate Algebra Based from the First and Second Grading Periods

As shown in the table, the student-respondents from all public high school in Division of Alaminos City generally obtained a students' performance rating in Intermediate Algebra based on the first and second grading periods of 86.23 with a standard deviation of 3.714, skewness of -.402 and kurtosis of -0.67. The kurtosis of -1.200 shows a leptokurtic distribution which indicates that the ratings are clustered closely about the mean, while the negative skewness indicates that there are more ratings below than above the mean.

The histogram describes the distribution of the student's performance in Intermediate Algebra in the Division of Alaminos City. It can be seen that the leptokurtic distribution specify that the performance rating of the students are clustered closely to the mean, while the negative skewness signifies that there are more ratings below than above the mean.

The following graph further describes the distribution of the performance ratings in Intermediate Algebra:

Figure 3 Students' Performance in Intermediate Algebra in the Division of Alaminos City

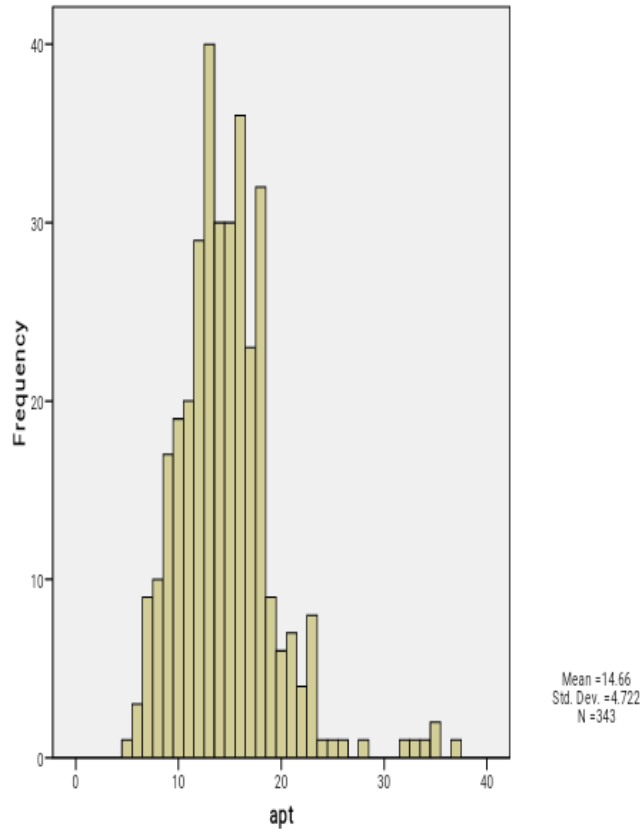**Aptitude in Algebra Based on the Division Aptitude Test**

The Students' Math Aptitude based on the Division Aptitude Test presented in table 2.b shows that the mean aptitude score of students in Algebra is 14.66 for all public high schools. The standard deviation is 4.722, skewness of 1.312, and kurtosis of 4.059. The skewness 0f 1.312 indicates that the distribution is skewed to the left or positively skewed meaning; there are more scores below than the above the mean. The distribution is leptokurtic which indicates that the scores are grouped closely to the mean.

The histogram as seen in Figure 4, describes the distribution of the Students' Math Aptitude in all public school. It can be seen that the leptokurtic distribution specify that the aptitude scores of students are closely to the mean, while the positive skewness signifies that there are more scores above than below the mean.

Before giving a grade, a student must take first an aptitude test. According to Marilla D. Svinicki Center for Teaching Effectiveness University of Texas at Austin, the process of deciding on a grading system is a very complex

one. The problems faced by an instructor who tries to design a system which was accurate and fair are common to any manager attempting to evaluate those for whom he or she is responsible.

Figure 4 Histogram of the Math Aptitudein the Division of Alaminos City

Students' Characteristics along their Interest and Attitude towards Algebra

Students' Interest in Algebra

The interest of the students in particular subject drives them to exert more efforts to acquire the learning outcomes. As an indicator of achievement in Algebra, the extent of interest of the students was determined with rating scale. The result is presented in Table 2.c:

The 5 Algebra Interests, Algebra is one of the most interesting subjects in school (3.65), I really enjoy our Algebra lessons (3.55), Algebra enhances my thinking skills (3.70), A life of a mathematician is interesting (3.56), and I like to belong to an Algebra Club(3.44) were rated by the student-respondents High.

The other 5 Algebra Interests, My mind is kept active when I'm in my Algebra class (3.31), I am willing to exchange other subject for Algebra (2.82), I love Algebra more than any subject (3.06), Algebra class always holds my interest (3.21), and I would like to take

mathematics-related course when I am in college (3.08), has a descriptive rating Moderate.

The student-respondents overall mean 3.34 for the extent of interest in Algebra has a

descriptive rating Moderate. This means that their level of interest toward Algebra is in average.

Table 2.c
Extent of Interest of Students in Algebra

Indicators	Mean	Descriptive Rating
1. Algebra is one of the most interesting subjects in school.	3.65	High
2. I really enjoy our Algebra lessons.	3.55	High
3.My mind is kept active when I'm in my Algebra class.	3.31	Moderate
4. I am willing to exchange other subject for Algebra.	2.82	Moderate
5. Algebra enhances my thinking skills.	3.70	High
6. I love Algebra more than any other subject.	3.06	Moderate
7. Algebra class always holds my interest.	3.21	Moderate
8. A life of a mathematician is interesting.	3.56	High
9. I would like to take mathematics-related course when I am in college.	3.08	Moderate
10.I like to belong to an Algebra Club.	3.44	High
Mean	**3.34**	**Moderate**

According to John R. Staver, in order to capture students' attention and activate their motivation to learn, teachers must consider the relevance of each topic. Then they can connect mathematics with students' interests, personal lives, societal issues, cultural backgrounds, and other school subjects. Cognitive learning theory emphasizes the importance of learning something new by relating it to things that are already meaningful and familiar. Math teachers must remember that their own intrinsic motivation to learn mathematics is likely not shared by many of their students, whose motivation is more likely activated instrumentally, by connecting mathematics to things that are already familiar and important to them.

Students' Attitude Towards Algebra

Attitude is another drive booster. If the attitudes toward something are positive, one will have more attention on it. Attitude toward Algebra as a subject probably is a conditioning factor. If the attitude is positive the student can scale greater heights of achievement. Table 2.b describes the attitude of the students toward Algebra.

Eight of the Students' Attitude Towards Algebra: Learning activities in Algebra are appealing and satisfying (3.59), Learning materials used in the subject are stimulating (3.43), I like solving a problem using experimentation than to be told the answer (3.48),

Through studies in Algebra, I learned new mathematical concepts and it interests me a lot (3.70), I would like to go over to a solution after being unsuccessful (3.45), I have learned In solving equations and problems (3.73), I like to discover new ways to find the solution (3.74), and Applying new mathematical concepts in solving problems would be an interesting way to prepare one's self in facing day-to-day problem (3.60), were given by the student-respondents a descriptive rating of Strongly Agree.

The other two, I like to solve mathematical equations and problems (3.31), and I prefer to solve problems than merely studying the given examples (3.21) were both rated Slightly Agree.

The Overall Mean 3.52 indicates that the students have a strong attitude toward Algebra.

Table 2.d
Attitude of Students Toward Algebra

Indicators	Mean	Descriptive Rating
1. Learning activities in Algebra are appealing and satisfying.	3.59	Strongly Agree
2. Learning materials used in the subject are stimulating.	3.43	Strongly Agree
3. I like solving a problem using experimentation than to be told the answer.	3.48	Strongly Agree
4. Through studies in Algebra, I learned new mathematical concepts and it interests me a lot.	3.70	Strongly Agree
5. I like to solve mathematical equations and problems.	3.31	Slightly Agree
6. I would like to go over to a solution after being unsuccessful.	3.45	Strongly Agree
7. I would like to solve problems correctly to apply the new concepts I have learned.	3.73	Strongly Agree
8. In solving equations and problems, I like to discover new ways to find the solution.	3.74	Strongly Agree
9. I prefer to solve problems than merely studying the given examples.	3.21	Slightly Agree
10. Applying new mathematical concepts in solving problems would be an interesting way to prepare one's self in facing day-to-day problem.	3.60	Strongly Agree
Overall Mean	**3.52**	**Strongly Agree**

According to Marilla D. Svinicki Center for Teaching Effectiveness University of Texas at Austin, it is very common practice to incorporate such things as turning in Assignments on time into the overall grade in a course, primarily because the need to motivate students to get their work done in a real problem for instructors. Also,

it may be appropriate to the selection function of grading that such values as timelines and diligence be reflected in the grades. External users of the grades may be interpreting the mark include such factors.

SCHOOL-RELATED FACTORS

Profile of Algebra Teachers

It is of great importance in this study to describe the profile of the teachers to get an idea about their ability to deliver the learning outcomes in Algebra.

Table 3 presents the profile of teachers and was described in terms of their sex, age, highest educational attainment, field of specialization, length of service, performance rating and number of preparations.

Age

There are 11 teacher-respondents. Mostly of the teachers aged 40.

Sex

There are more female Algebra Teachers with the frequency of 8 or 72.7% compared to male teachers with the frequency of 3 0r 27.3%.

Highest Educational Attainment

Most of the teachers have MA units, the frequency is 5 or 45.5%.

Field of Specialization

The frequency of Algebra teachers major in mathematics is 10 or 90.9% and only one Algebra Teacher non-major in mathematics or 9.1%.

Length of Teaching Experience

The frequencies of the length of the service were: 10 years- above is 6 or 54.5%, 5-9 years is 3 or 23.7% and below 5 years is 2 or 18.2%.

Performance Rating

There is only one Algebra Teacher rated as Outstanding or 9.1% and 10 rated Very Satisfactory or 90.9%.

Number of Preparations

There were 8 teachers that has only 2 preparations or 72.7%.

Table 3
Profile of Algebra Teachers
(N=11)

Variable	Categories	Frequency	Percentage
Age	30	1	9.1
	31	1	9.1
	35	1	9.1
	37	2	18.2
	40	2	18.2
	42	1	9.1
	52	1	9.1
	60	1	9.1
	61	1	9.1
Sex	Female	8	72.7
	Male	3	27.3
Highest Educational Attainment	MA Graduate with Doctorate Degree Units	1	9.1
	MA Graduate	3	27.3
	BS Graduate with MA Units	5	45.5
	BS Graduate	2	18.2
Field of Specialization	Non-mathematics	10	90.9
	Mathematics	1	9.1
Length of Service	Below 5 years	2	18.2
	5-9 years	3	23.7
	10 years-above	6	54.5

Performance Rating	Outstanding	1	9.1
	Very Satisfactory	10	90.9
Number of Preparations	2	8	72.7
	3	1	9.1
	5	1	9.1
	6	1	9.1
Total		11	100

Status of Physical Facilities and Instructional Materials in Schools

Adequacy of Physical Facilities and Instructional Materials in Schools

Learning Algebra concepts and skills takes place in classrooms. The adequacy of these facilities insures in part, the delivery of the learning outcomes. The following table presents the adequacy of the lecture rooms of public high schools.

The following were given a descriptive rating of High Extent: Tables and Chairs (3.99), Lighting and Illumination (3.50), Ventilation/Electric Fans (3.69), Visual Aids (3.62), Graphic Materials (3.48),Textbooks (4.14), and Reference Materials (3.97).

Among the indicators, there are 3 rated as Moderate Extent: Steel or Wooden Cabinets (3.19), Audiovisual Aids (2.82) and Manipulative (3.08).

Only the Audio Aids (2.46) rated Low Extent by student-respondents.

The overall weighted mean of the indicators is 3.51 with the descriptive rating of Moderate Extent. This means that the extent of adequacy of physical facilities and instructional materials in schools is in High Extent.

Table 4.a
Extent of Adequacy of Physical Facilities and Instructional Materials in Schools

Indicators	Weighted Mean	Descriptive Rating
Lecture Rooms		
1. Tables and Chairs	3.99	High Extent
2. Steel or Wooden Cabinets	3.04	Moderate Extent
3. Lighting and Illumination	3.50	High Extent
4. Ventilation/Electric Fans	3.69	High Extent
5. Audio Aids	3.18	Moderate Extent
6. Visual Aids	3.62	High Extent

7. Graphic Materials	3.48	High Extent
8. Audiovisual Aids	2.84	Moderate Extent
9. Manipulative	3.15	Moderate Extent
10. Textbooks	4.14	High Extent
11. Reference Materials	3.97	High Extent
Average Weighted Mean	**3.51**	**High Extent**

Functionality of Physical Facilities and Instructional Materials in Schools

Lecture rooms can be adequate but many fail to contribute to the attainment of the learning outcomes if they are not functioning in accordance with intended use. The functionality of the lecture rooms is describe in Table 4.b.

For the functionality of the lecture rooms, it is given High Extent in 7 indicators: Tables and Chairs (3.89), Lighting and Illumination (3.54), Ventilation/Electric Fans (3.71), Visual Aids (3.83), Graphic Materials (3.50), Textbooks (4.03), and Reference Materials (3.86).

Among the indicators, there are 3 rated as Moderate Extent: Steel or Wooden Cabinets (3.19), Audiovisual Aids (2.82) and Manipulative (3.08).

Only the Audio Aids (2.46) rated Low Extent by the student-respondents.

The overall weighted mean of the extent of functionality of physical facilities and instructional materials in schools is 3.45 with a descriptive rating Moderate Extent, which means that physical facilities and instructional materials are quite useful for the students.

Table 4.b
Extent of Functionality of Physical Facilities and Instructional Materials in Schools

Indicators	Weighted Mean	Descriptive Rating
Lecture Rooms		
1. Tables and Chairs	3.89	High Extent
2. Steel or Wooden Cabinets	3.19	Moderate Extent
3. Lighting and Illumination	3.54	High Extent
4. Ventilation/Electric Fans	3.71	High Extent
5. Audio Aids	2.46	Low Extent

6. Visual Aids	3.83	High Extent
7. Graphic Materials	3.50	High Extent
8. Audiovisual Aids	2.82	Moderate Extent
9. Manipulative	3.08	Moderate Extent
10. Textbooks	4.03	High Extent
11. Reference Materials	3.86	High Extent
Average Weighted Mean	**3.45**	**High Extent**

Accessibility of Physical Facilities and Instructional Materials in Schools

The adequacy and functionality of physical facilities and instructional materials should be insured but they must also be accessible to the user to optimize the benefits that can be acquired by the students.

Table 4.c presents the accessibility of facilities and instructional materials in schools.

The accessibility of facilities and instructional materials in schools that were rated High Extent: Tables and Chairs (3.95), Lighting and Illumination (3.56), Ventilation/Electric Fans (3.72), Visual Aids (3.59), Graphic Materials (3.53), Textbooks (4.01), and Reference Materials (3.93).

There 3 indicators rated Moderate Extent: Steel or Wooden Cabinets (3.18), Audiovisual Aids (2.83), and Manipulative (3.15).

The indicator rated Low Extent is the Audio Aids (2.50). The overall weighted mean of the extent of functionality of physical facilities and instructional materials in schools is 3.45 or interpreted as Moderate Extent which means that physical facilities and instructional materials are accessible for the students.

Table 4.c
Extent of Accessibility of Physical Facilities and Instructional Materials in Schools

Indicators	Weighted Mean	Descriptive Rating
Lecture Rooms		
1. Tables and Chairs	3.95	HighExtent
2. Steel or Wooden Cabinets	3.18	Moderate Extent
3. Lighting and Illumination	3.56	HighExtent
4. Ventilation/Electric Fans	3.72	HighExtent
5. Audio Aids	2.50	Low Extent

6. Visual Aids	3.59	HighExtent
7. Graphic Materials	3.53	HighExtent
8. Audiovisual Aids	2.83	Moderate Extent
9. Manipulative	3.15	Moderate Extent
10. Textbooks	4.01	High Extent
11. Reference Materials	3.93	High Extent
Average Weighted Mean	**3.45**	**High Extent**

SIGNIFICANCE OF THE DIFFERENCE BETWEEN STUDENTS' PERFORMANCE IN ALGEBRA ACROSS THEIR PROFILE VARIABLE

To determine whether the profile variables affect the performance in Algebra, the performance were compared according to the profile variables. Table 5 shows the significance of the difference between students' performance in Algebra across their profile variable. The sex of the student-respondents had the F-ratio 1.628 at .003 level of significance. This indicates that there is a significant difference between the student's performance and their sex and the hypothesis of no significant difference between the student's performance across their profile variable is rejected at .05 level of significance.

The F-ratio of the age of the students is 2.433 at .000 significant level. This indicates that there is a significant difference between the students' performance and their age and the hypothesis of no significant difference between the student's performance across their profile variable is rejected at .05 level of significance.

The educational attainment of the father of the student-respondents had the F-ratio 1.156 at .203 level of significance to the students' performance. This indicates that there is no significant difference at .05 level of significance.

The occupation of the father of the student-respondents had the F-ratio 1.116 at .267 level of significance to the students' performance. This indicates that there is no significant difference at .05 level of significance.

The educational attainment of the mother of the student-respondents had the F-ratio 1.132 at .267 level of significance to the students' performance. This indicates that there is no significant difference at .05 significant level.

The occupation of the mother of the student-respondents had the F-ratio 1.129 at .118 level of significance to the students' performance. This indicates that there is no significant difference at .05 significant level.

The F-ratio of the family income is .980 at .557 significant level. This indicates that there is no significant difference between the students' performance and their family income at .05 significant level.

Table 5
Significance of the Difference Between Students' Performance in Algebra Across their Profile Variable

Source	Dependent Variable	Type III Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio	Sig.
Corrected Model	Sex	61.538(a)	242	.254	1.635	.003
	Age	145.283(b)	242	.600	2.429	.000
	Father's Education	510.881©	242	2.111	1.154	.207
	Father's Occupation	2322.541(d)	242	9.597	1.112	.273
	Mother's Education	475.968(e)	242	1.967	1.138	.231
	Mother's Occupation	1258.481(f)	242	5.200	1.225	.122
	Family Income	101.140(g)	242	.418	.994	.524
Intercept	Sex	12.938	1	12.938	83.188	.000
	Age	2381.235	1	2381.235	9634.145	.000
	Father's Education	235.052	1	235.052	128.462	.000
	Father's Occupation	209.582	1	209.582	24.283	.000
	Mother's Education	232.950	1	232.950	134.740	.000
	Mother's Occupation	476.162	1	476.162	112.183	.000
	Family Income	12.273	1	12.273	29.178	.000
Students' Performance	Sex	61.008	241	.253	1.628	.003
	Age	144.923	241	.601	2.433	.000
	Father's Education	509.874	241	2.116	1.156	.203
	Father's Occupation	2320.752	241	9.630	1.116	.267
	Mother's Education	471.669	241	1.957	1.132	.240
	Mother's Occupation	1257.569	241	5.218	1.229	.118
	Family Income	99.356	241	.412	.980	.557
Error	Sex	15.552	100	.156		
	Age	24.717	100	.247		
	Father's Education	182.974	100	1.830		
	Father's Occupation	863.086	100	8.631		
	Mother's Education	172.889	100	1.729		
	Mother's Occupation	424.452	100	4.245		
	Family Income	42.061	100	.421		
Total	Sex	694.000	343			
	Age	66033.000	343			
	Father's Education	7871.000	343			
	Father's Occupation	10073.000	343			
	Mother's Education	7438.000	343			
	Mother's Occupation	15097.000	343			
	Family Income	801.000	343			
Corrected Total	Sex	77.090	342			
	Age	170.000	342			
	Father's Education	693.854	342			
	Father's Occupation	3185.627	342			
	Mother's Education	648.857	342			
	Mother's Occupation	1682.933	342			
	Family Income	143.201	342			

a R Squared = .798 (Adjusted R Squared = .310)
b R Squared = .855 (Adjusted R Squared = .503)
c R Squared = .736 (Adjusted R Squared = .098)
d R Squared = .729 (Adjusted R Squared = .073)
e R Squared = .734 (Adjusted R Squared = .089)
f R Squared = .748 (Adjusted R Squared = .137)
g R Squared = .706 (Adjusted R Squared = -.005)

SIGNIFICANCE OF THE DIFFERENCE BETWEEN STUDENTS' PERFORMANCE IN ELEMENTARY ALGEBRA AND INTERMEDIATE ALGEBRA

To determine whether the performance in Elementary Algebra affects the performance in intermediate Algebra, the performances were compared. Table 5.a presents the significance of the differences between students' performance in Elementary Algebra and Intermediate Algebra.

Table 6
Significance of the Difference Between Students' Performance in Elementary Algebra and Intermediate Algebra
(N=343)

Compared Variables	Mean	Difference	t-Value	Significance
Performance in Elementary Algebra VS.	86.977	0.745	5.577	0.000
Performance in Intermediate Algebra	86.232			

* significant at .05 level

The difference of 0.745 between the students' performance in elementary algebra and intermediate Algebra has a t-value 5.577 with a significance level 0f .000. This indicates that there is a significant difference between students' performance in Elementary Algebra and Intermediate Algebra and that the hypothesis of no significant difference between students' performance in Elementary Algebra and Intermediate Algebra is rejected at the .05 level of significance.

SIGNIFICANCE OF THE RELATIONSHIP BETWEEN STUDENTS' PERFORMANCE IN ALGEBRA AND THEIR INTEREST AND ATTITUDE TOWARDS ALGEBRA

Table 7
Correlation Between Students' Performance in Algebra and their Interest and Attitude Towards Algebra

VARIABLES	Performance in Algebra	
	Correlation	**Significance**
Interest Towards Algebra	1.000	.000
Attitude Towards Algebra	0.551	.000

*significant at .05 level

The correlation between the student-respondents performance in Algebra and their interest towards Algebra is 1.000 and has a significance of .000. This means that the relationship is significant and that the hypothesis of no significant relationship performance in Algebra and their interest towards Algebra is rejected at the .05 level of significance.

The correlation 0.551 between the in Algebra and their interest towards Algebra and has a significance level.000. This means that the relationship is significant and that the hypothesis of no significant relationship performance in Algebra and their attitude towards Algebra is rejected at the .05 level of significance.

SIGNIFICANCE OF THE RELATIONSHIP BETWEEN STUDENTS' PERFORMANCE IN ALGEBRA AND THE CHARACTERISTICS OF ALGEBRA TEACHERS

Table 8
Correlation of the Relationship Between Students' Performance in Algebra and the Characteristics of Algebra Teachers

VARIABLES	Performance in Algebra		
	Correlation	**Significance**	**Description**
Sex	1.000	.000	Perfect Positive Correlation
Age	-.354	.316	Low Negative Correlation
Highest Educational Attainment	.464	.179	Low Positive Correlation
Field of Specialization	-.258	.472	Negligible Negative Correlation
Length of Service	-.073	.840	Negligible Negative Correlation
Performance Rating	.392	.263	Low Positive Correlation
Number of Preparations	-.251	.485	Negligible Negative Correlation

The correlation between the student-respondents performance in Algebra and the sex of Algebra Teachers is 1.000 and has a significance of .000 or described as Perfect Positive Correlation. This means that the relationship is significant and that the hypothesis of no significant relationship performance in Algebra and the Characteristics of Algebra Teachers is rejected at the .05 level of significance.

The correlation -.354 between the students' performance in Algebra and the age of Algebra Teachers and has a significance level .316 or with descriptive rating as Low Negative Correlation. This is an indication that there is no significant relationship between the students' performance and age of Algebra Teachers at .05 significant level.

The correlation .464 between the students' performance in Algebra and the highest educational attainment of Algebra Teachers and has a significance level .179 or descriptive rating as low Positive Correlation. This indicates that there is no significant relationship between the students' performance and the highest educational attainment of Algebra Teachers at .05 significant level.

The correlation between the student-respondents performance in Algebra and the Field of Specialization of Algebra Teachers is -.258 and has a significance of .472 level or descriptive rating as Negligible Negative Correlation. This indicates that there is no significant relationship at .05 level of significance.

The correlation between the student-respondents performance in Algebra and the length of service of Algebra Teachers is -.073 and has a significance of .840 level or descriptive rating as Negligible Negative Correlation . This shows that there is no significant relationship at .05 level of significance.

The correlation .392 between the in Algebra and the performance rating of Algebra Teachers and has a significance level .263 or descriptive rating as Low Positive Correlation. This means that there is no significant relationship between the students' performance and the performance rating of Algebra Teachers at .05 significant level.

The correlation -.251 between the in Algebra and the number of preparations of Algebra Teachers and has a significance level .485. This is an indication that there is no significant relationship between the students' performance and the number of preparations of Algebra Teachers at .05 significant level.

SIGNIFICANCE OF THE RELATIONSHIP BETWEEN STUDENTS' PERFORMANCE IN ALGEBRA AND STATUS OF PHYSICAL FACILITIES AND INSTRUCTIONAL MATERIALS IN SCHOOL

Table 9
Correlation Between Students' Performance in Algebra and
Status of Physical Facilities and Instructional Materials
in Schools

VARIABLES	Performance in Algebra	
	Correlation	**Significance**
Adequacy	1.000	.000
Functionality	0.872	.000
Accessibility	0.813	.000

*significant at .05 level

The correlation between the student-respondents performance in Algebra and the adequacy of school facilities and instructional materials is 1.000 and had a significance of .000. This means that the relationship is significant and that the hypothesis of no significant relationship performance in Algebra and adequacy of school facilities and the instructional materials is rejected at the .05 level of significance.

The correlation 0.872 between the in Algebra and functionality of school facilities and instructional materials and has a significance level.000. This means that the relationship is significant and that the hypothesis of no significant relationship performance in Algebra and functionality of school facilities and instructional materials is rejected at the .05 level of significance.

The correlation 0.813 between the in Algebra and accessibility of school facilities and instructional materials and has a significance level.000. This means that the relationship is significant and that the hypothesis of no significant relationship performance in Algebra and accessibility of school facilities and instructional materials is rejected at the .05 level of significance.

CONCLUSIONS AND RECOMMENDATIONS

Based on the above findings, the following conclusions were derived.
1. More females than males are enrolled in Intermediate Algebra in the Division of Alaminos City this school year 2011-2012.
2. Most of the students' fathers have college education and engaged in farming.
3. Most of the students' mothers have high school and college education and have no work.
4. The family income of most student-respondent is below PHP 10,000 and it is on the budget of average Filipino Families.
5. The level of interest of students towards Algebra is in moderate.
6. The students have a strong positive attitude toward Algebra.
7. There are more scores of the students in the aptitude test that were below than the above the mean.
8. There are more female Algebra Teachers than male.
9. Majority of the Algebra teachers have MA units, major in mathematics, 10 years-above length of service, very satisfactory rating and two preparations.
10. The extent of adequacy of school facilities and instructional materials in schools are in high extent, the functionality of school facilities and instructional materials in schools are in moderate extent, and the accessibility of school facilities and instructional materials in schools are in high extent .
11. The correlation is significant between the student-respondents performance in Algebra and their sex and age.
12. The correlation is significant between students' performance in Elementary Algebra and performance in Intermediate Algebra.
13. The correlation is significant between the student-respondents performance in Algebra and their interest and attitude towards Algebra.
14. The correlation is significant between the student-respondents performance in Algebra and the adequacy, functionality and accessibility of school facilities and instructional materials.
15. The factors related to the students' performance in Elementary Algebra and Intermediate Algebra are their sex and age, their interest and attitude towards Algebra, and the adequacy, functionality and accessibility of school facilities and instructional materials.

RECOMMENDATIONS

On the basis of the findings and conclusion, the following recommendations were made.

1. Students should exert effort in doing their school work especially on the Algebra learning activities which tap their potentials and abilities.
2. Schools should organize workshops on doing investigatory project to determine their skills and knowledge particularly on their field of interest.
3. Students should have a positive attitude towards Algebra.
4. Teacher should provide an equal treatment to the students to uphold the right attitude, dignity and responsibility towards Algebra subjects.
5. Algebra teachers should team up with the curriculum formulated to ensure interesting and integrative learning, transfer and application of knowledge.
6. Teachers should use modern technologies in teaching Algebra like computer, TV, VCD player and other resource materials which enhance the students' idea and knowledge in terms of realistic approach.
7. More attention should be given to the teaching and learning activities which serve as a pivot in learning mathematical concepts.
8. Parents who have the competence and knowledge about Algebra should directly assist their children in their studies and always encourage their children to study well.
9. Parents, teachers and administrators should cooperatively work together for the enhancement of student's achievement in all subjects particularly in Algebra.
10. Conduct more research studies in the achievement of students in Algebra and consolidate findings in this study with those of the other studies in order to arrive at a more reliable and tangible generalizations on the factors affecting the students' performance in Elementary Algebra and Intermediate Algebra.

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Please Include Contact Information:
NAME: **Sherlyn V. Romasoc and Julio M. Cervantes**
Contact No: **09171380275, 09219679800**
Email Address:
sherlynromasoc777@gmail.com and julycer0802@gmail.com