



THE CORRELATES OF GRADE 5 LEARNERS' ACADEMIC PERFORMANCE IN MATHEMATICS

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Abstract :

The purpose of this study was to find out the correlates of Grade 5 learners' academic performance in Mathematics in public elementary schools of West B District, Tarlac City Division during the academic year 2024-2025. Descriptive-correlational method of research was used in this study with a sample of 329 Grade 6 learners. The findings revealed that among the mentioned independent variables as correlates of the learners' performance in Mathematics, the following were found to be significant: age, sex, mother's educational attainment, father's educational attainment, income of father, number of books, availability of computer, access to internet, study hours, and GPA in Mathematics. There existed a significant relationship between the identified correlates and the performance of the learners in Mathematics. There was a significant relationship between the attitude and the performance of the learners in Mathematics. The attitude partially mediated the effect of study hours to performance. In terms of the attitudes of the learners towards Mathematics, it was found to be generally neutral which means they were still undecided as to how they felt when they encounter mathematical concepts. Nevertheless, attitude was found to be significant predictor of learners' performance in Mathematics, which means learners with positive attitude performed better than their counterparts with negative attitude. Generally, the correlates used in this study played a big role in explaining the learners' performance in the subject. Implications for mathematics teaching were forwarded as well as recommendations for further research.

Keywords: correlates, academic performance, Mathematics

INTRODUCTION

"Life is futile without mathematics." In other words, mathematics is the basic element towards life, the substance that gives life to the world and all the things around. In fact, mathematics subjects are necessary tools if one has to finish a course. It has many areas that a student needs not to study all just to earn a degree.

Intermediate algebra is one of the courses in mathematics which all secondary students have to deal with. However, this course is also one which most secondary students find hard to cope with; they often claim that one of the most painful parts of studying mathematics is during high school years. To solve mathematics problems, some students rely on imitating the solution given by the teacher. But what happens when students are introduced to problems without giving them examples or solutions? The answer would vary from one student to another. Some students would be able solve the problems because of their inherent high intellectual capacity, while others would not solve them because of their seemingly poor background knowledge of the subject. However, the bigger question is; what factors really affect students' performance in mathematics? This question raises many issues that warrant scientific investigation. This is the reason why the researcher is interested to delve into this topic.

Several statistical surveys conducted by different agencies and institutions show evidences of students' low performance in mathematics, in both local and international setting.

Characteristics of learner, family, school and region have been identified in the research literature to have important influences on academic achievement. It has been argued that individual learner is most directly responsible for their academic outcomes. Therefore, they are the basic element in the explanation of academic achievement. The theoretical root of this argument can be found in child-centered learning theory that emphasizes the unique privileges of individual learners in any educational process where in students are encouraged to make academic progress at their own rates. The process of learning is, therefore, affected and determined by characteristics of student who are self-activated makers of meanings and active agents in their learning process.

This study, then, put learning into a socio-cultural context based upon the assumption that the unique privileges of individual learners may well be compromised by his/her socio-cultural aspect in which individual learner interacts with personal

characteristics, family, and environment. As a matter of fact, personal, family and environment have long been identified as factors that have important influences on students' academic outcomes.

Wolleat, et al., stated that achievement in math has been one of the most significant sex-related differences observed in late adolescent and adulthood. She said that males have been more visible than females in mathematics-related activities. Although, according to her, research on cognitive factors related to mathematics achievement is inconclusive, the study of non-cognitive factors has yielded some interesting results; this was concluded from the findings of several studies that much of the variance in adult achievement in mathematics can be accounted for by differential course taking in high school and college. This differential in the studying of mathematics, she further said, contributes to sex differences in mathematics achievement beginning in high school and increasing after the high school years.

On the other hand, Tatsuoka et. al., as cited by Moenikia, indicated that there is difference between females and males in math motivation, attitude towards math and math achievement. It was supported by The U.S. Department of Education as cited by Thomas, who made an analysis of the Third International Mathematics and Science Study data in English-speaking countries, the data revealed that males outperformed females in 3 of the 25 countries at the fourth-grade level, in 8 of the 39 countries at the eighth-grade level, and in 18 of the 21 countries participating in their final year of secondary school.

Socio economic status of the family of the students, on the other hand, also affects their performance in school, especially in intermediate algebra. Apolonio revealed that several investigations have shown that the socio-economic status appears to be of crucial importance in determining a learner's academic achievement. She said that, this is also one of the variables which affected the performance of the respondents in her study. She stated that based on the geographical and statistical analysis of 2003 survey data, it shows that educational inequalities among black school age children were substantial and systematically associated with socio-economic status. Children of more affluent, better educated and metropolitan parents progressed better in schools, thus attaining higher levels of education and also outperformed others who had progressed in terms of cognitive outcomes (measured by literacy and numeracy test scores).

Biddle, also concluded that child poverty predicts 55% of the variance of state differences in mathematics achievement based on the 1996 NAEP data for state-level mathematics achievement and for state level poverty and Education Week's 1997 edition of Quality Counts for state-level funding of education. It was followed by Darling-Hammond, who also used NAEP data at the state level, in examining the two years of fourth-grade mathematics results and two years of eighth-grade mathematics results. She concluded also that poverty was significantly and negatively correlated with student outcomes at the state level. It was supported by the results of the Stanford Achievement Test indicated that the greater the concentration of poverty in the school districts, the lower the student achievement.

Obviously, the socio-economic status of a child is most commonly determined by combining parents' educational level, occupational status, and income level. Studies have repeatedly found that socio-economic status affects student outcomes. Students who have low SES earn lower test scores and are more likely to drop out of school. Low SES students have been found to score about ten percent lower on the National Assessment of Educational Programs than higher SES students.

Eamon stated that it has been believed that the low SES negatively affects academic achievement because low SES prevents access to vital resources and creates additional stress at home. According to him, the economic hardships that are caused by low SES lead to disruptions in parenting, an increasing amount of family conflicts, and an increased likelihood of depression in parents and single-parent households.

However, the study of Navarro as cited by Poquiz considered three socio-economic factors, namely: educational attainment of parents, monthly family income and parents' occupation. She also included sex and scholastic achievement in her variables and tested the hypothesis that the performance of first year students in the mathematics summative test is not normally distributed. Navarro also proved that there was no significant relationship between the performance of first year students and their socio-economic status.

On the other hand, study habit also predicts students' performance in intermediate algebra. Fielden as cited by Balbalosa, stated that good study habits help the student in critical reflection in skills outcomes such as selecting, analyzing, critiquing, and synthesizing. It was further explained by Steinberger & Wagner, who distinguished more simply among three intelligences; the academic-problem solving; the practical intelligence; and creative intelligence; they said that all these three have peculiar influence to performance. Thus, success in study does not depend only on ability and hard work but also on effective methods of study.

Maternal and paternal characteristics are another key factor that affects academic achievement. According to Bahadurin et al, Mothers who are more educated and higher self-esteem have children who received higher test scores.

On the other hand, smaller family size of a student has been linked with his/her higher academic achievement. Eamon, found out that students with fewer siblings are likely to receive more parental attention and have more access to resources than children from large families.

Finally, students' foundation on the basic concepts also affects their present performance in intermediate algebra. Thus, learning the pre-requisite subjects are necessary in order for a student to perform well in the present mathematical subject. It was confirmed by Lee as he stated that each student's previous knowledge and experience with the object or even under investigation will either facilitate or hinder his or her attempt at each skill. Unfamiliar contexts will increase task complexity; whereas familiar will reduce it.

Statement of the Problem

This study attempted to discover the correlates of Grade 5 learners' academic performance in Mathematics in West B District, Tarlac City Division during the school year 2024-2025.

Specifically, it sought to answer the following sub-problems:

1. What is the socio-demographic profile of the respondents in terms of:
 - 1.1 Age;
 - 1.2 Sex;
 - 1.3 Educational attainment of mother;
 - 1.4 Educational attainment of father;
 - 1.5 Monthly income of mother;

- 1.6 Monthly income of father;
- 1.7 Number of brothers;
- 1.8 Number of sisters;
- 1.9 Number of books available at home;
- 1.10 Availability of computer;
- 1.11 Internet access;
- 1.12 Number of study hours daily;
- 1.13 Assistance from other persons;
- 1.14 Assistance from parents;
- 1.15 GPA in Mathematics subject.
2. What is the attitude of the Grade 5 learners towards Mathematics?
3. What is the level of academic achievement of the Grade 5 learners in Mathematics?
4. To what percent do the predictors contribute to the total variance in the academic achievement of Grade 5 learners in Mathematics?
5. What independent variables significantly predict Mathematics academic achievement of the Grade 5 learners?
6. Does attitude toward the subject predict the Mathematics academic achievement of the learners?
7. Does attitude mediate the relationship between independent variables and Mathematics academic achievement of the Grade 5 learners?

METHODOLOGY

This chapter presents the research design, sources of data, instrumentation and data collection and tools for data analysis.

Research Design

The descriptive-correlational method of research was used. It provided the means by which all the factors that correlate learners' academic performance in Mathematics were described and compared as if the relationships between and among variables were significant. Descriptive research involved collection of data in order to test hypotheses or to answer questions concerning the current status of the subject of the study.

Sources of Data

This study was conducted in West B District, Tarlac City Division. The respondents of this study were the Grade 5 learners who were randomly selected from elementary schools of the said District.

Instrumentation and Data Collection

To obtain the level of performance of the learners, SF10 was used. This form was also known as the learners' permanent record. It contains the following information: learners' name, place of birth, parents/ guardian, general average of the learner during his previous year. In this form also are the data about the learner's curriculum year, grades from the different subjects prescribed in every curriculum year, periodic rating, the average in every subject they have taken, the remarks "passed" or "failed", and the credits they earned in a particular subject. It also included the month, days of school, and the days that the learner attended school in every curriculum year.

The data on socio-demographic profile of the respondents were obtained using researcher-made questionnaires. This was patterned from that of Arandia's unpublished thesis with little modification. The grade in Grade 5 Mathematics of the respondents was obtained from the SF10 or the permanent records of grades of the respondents.

The attitude of the Grade 5 learners was determined through the use of the scale patterned from that of Pelonia's unpublished master's thesis.

In order to answer the problems stated, the researcher used the survey questionnaire to gather necessary data from the learners of Grade 5 in West B District. The researcher asked permission from Tarlac City Division down to the principal of each school to conduct the study. Thus, the questionnaires on personal profile of the learners as well as the instrument to determine their attitudes towards mathematics were distributed to the respondents.

After administering the questionnaire, the researcher used Microsoft excels in tallying the data. Meanwhile, SPSS descriptive statistics was used in analyzing the frequency of each of the correlates of learners' performance as well as in determining the attitude and the academic achievement level of the learners in their Grade 5 Mathematics subject. On the other hand, in order to determine the percentage that the predictors contribute to the total variance of the learners' academic achievement in Mathematics, to find out the factors which affect learners' academic achievement and to determine the effect of attitude on the learners' academic achievement and in mediation analysis, the researcher utilized a multiple regression analysis through the SPSS linear regression.

Tools for Data Analysis

In this study, the researcher used the following statistical measures to analyze the data for the problems.

Hierarchical regression analysis was used to determine the relationship between the dependent and independent variables. The software Statistical Package for the Social Sciences (SPSS version 16) was utilized in all statistical analyses in this study.

Hierarchical regression adds terms to the regression model in stages. At each stage, an additional term or terms were added to the model and the change in R^2 is calculated. A hypothesis test was done to test whether the change in R^2 is significantly different from zero.

On the other hand, the purpose of multiple regression was to predict a single variable from one or more independent variables. Multiple regression with many predictor variables is an extension of linear regression with two predictor variables. A linear transformation of the X variables is done so that the sum of squared deviations of the observed and predicted Y is a minimum. The computations were more complex, however, because the interrelationships among all the variables must be taken into account in the weights assigned to the variables. The interpretation of the results of a multiple regression analysis is also more complex for much the same reason.

Following Barron and Kenny (2006), Mediation analysis was employed to determine the effect of the attitude on the relationship between the independent and the dependent variables.

The grades of each respondents in Mathematics 5 from the first to second grading period reflected in the SF10 during the school year 2024-2025 were added to obtain the average grade in order to determine the level of academic achievement of each learner in Mathematics which served as the dependent variable in this study.

The statistical analysis was done through the use of the SPSS descriptive statistics and linear regression.

For the categorization of the dependent and independent variables the following were used:

The age of the respondents was grouped and categorized as follows:

Age	Categorization
12	3
11	2
10	1

Sex of the respondents was coded as follows:

Sex	Code
Male	0
Female	1

On the educational attainment of mother or father of the respondents, the following categorization was used:

Educational attainment (mother or father)	Code
Elementary Level	1
Elementary Graduate	2
High School Level	3
High School Graduate	4
College Level	5
College Graduate	6

On the income of father and mother the following categorization was followed:

Income of Father/Mother (Monthly)	Category
₱20000 - above	4
₱15001 – 20000	3
₱10001 – 15000	2
₱5001 – 10000	1

The number of brothers and sisters was grouped and categorized as follows:

Number of Brothers/Sisters	Categorization
10-above	4
7-9	3
4-6	2
1-3	1

The number of books available at home of the students was grouped and categorized as follows:

Number of books	Categorization
7-above	4
5-6	3
3-4	2
1-2	1

The following codes were used for the availability of computer and internet access:

Availability of computer/internet access	Code
Yes	1
No	0

The number of study hours of the respondents was grouped and categorized as follows:

Number of Study Hours	Category
5-above	3
3-4	2
1-2	1

On the assistance of other persons or parents to the respondents in studying the Mathematics subject, the following codes were used:

Assistance of parents/other persons	Code
Yes	1
No	0

The General Percentage Average of each of the respondents in Grade 5 Mathematics as well as the performance in Grade 5 mathematics were categorized as follows:

Range of Grades	Code
96-100	5
89-95	4
80-88	3
75-79	2
65-74	1

The following interpretations were used for the General Percentage Average of the respondents in Grade 6 as well their performance in Grade 6 Mathematics subject:

Range of Grades	Interpretation
96-100	Excellent
89-95	Very Good
80-88	Good
75-79	Poor
65-74	Failed

The following are the scores for the responses of the respondents to measure their attitude towards mathematics:

Response	Score
Very Much Favorable	5
Much Favorable	4
Favorable	3
Less Favorable	2
Least Favorable	1

The mean for the scores of the respondents to measure their attitudes towards Mathematics was determined and interpreted as follows:

Mean	Interpretation
3.6 - 5.0	Positive
2.6 - 3.5	Neutral
1.0 - 2.5	Negative

RESULTS AND DISCUSSION

This chapter presents the elements of presenting and interpreting data to answer the sub-problems posited in the chapter of the study.

Profile of the Respondents

Table 1.1 Age of the Respondents

Age	Frequency	Percent
10	91	27.7
11	194	59.0
12	44	13.3
Total	329	100.0

Age. As shown in Table 1.1, 91 or 27.7% were 10 years old, 194 or 59.0% were 11, 44 or 13.3% were 12 years old.

Table 1.2 Sex of the Respondents

Sex	Frequency	Percent
Male	123	37.4
Female	206	62.6
Total	329	100.0

Sex. Table 1.2 shows that 123 or 37.4% were male respondents while 206 or 62.6% were female. Most of the Grade 5 learners are females. This is because maybe majority of the population today are females, which reflects the uneven distribution of population between sex.

Table 1.3 Educational Attainment of Mothers of the Respondents

Educational Attainment	Frequency	Percent
Elementary Level	76	23.1
Elementary Graduate	28	8.5
High School Level	91	27.7
High School Graduate	58	17.6
College Level	40	12.2
College Graduate	36	10.9
Total	329	100.0

Educational Attainment of Mother of the Respondents. The results in Table 1.3, show that 76 or 23.1% of the mothers of the respondents were elementary level, 28 or 8.5% were elementary graduates, 91 or 27.7% were high school level, 58 or 17.6% were high school graduates, 40 or 12.2% were college level, and 36 or 10.9% were college graduates. Most of the mothers of the respondents were high school level.

Table 1.4 Educational Attainment of Fathers of the Respondents

Educational Attainment	Frequency	Percent
Elementary Level	101	30.7
Elementary Graduate	23	7.0
High School Level	85	25.8
High School Graduate	58	17.6
College Level	28	8.5
College Graduate	34	10.3
Total	329	100.0

Educational Attainment of Fathers of the Respondents. In table 1.4 101 or 30.7% of the fathers of the respondents were elementary level, 23 or 7.0% were elementary graduates, 85 or 25.8% were high school level, 58 or 17.6% were high school graduates, 28 or 8.5% were college level, and 34 or 10.3% were college graduates.

8.5% were college level and 34 or 10.3% were college graduates. Most of the fathers of the respondents attained elementary level of education.

Table 1.5 Monthly Income of Mothers of the Respondents

Income (IN PESOS)	Frequency	Percent
Above 20,000	7	2.1
15,001 - 20,000	11	3.3
10,001 - 15,000	14	4.3
5,001 - 10,000	18	5.5
5,000 and below	279	84.8
Total	329	100.0

Monthly Income of Mothers. As shown in Table 1.5, 279 or 84.8% of the mothers of the respondents had an income of ₱5000 and below, 18 or 5.5% had an income of ₱5001-10,000, 14 or 4.3% had ₱10,001-15,000 income, 11 or 3.3% had an income of ₱15,001-20,000, and seven or 2.1% had above ₱20,000 monthly income. Most of the mothers of the respondents had a monthly income of ₱5,000 and below.

Table 1.6 Monthly Income of Fathers of the Respondents

Monthly Income (In Pesos)	Frequency	Percent
above 20,000	16	4.9
15,001 - 20,000	15	4.6
10,001 - 15,000	26	7.9
5,001 - 10,000	61	18.5
5,000 and below	211	64.2
Total	329	100.0

Monthly Income of Father. As shown in Table 1.6, 211 or 64.2% of the father of the respondents had an income of ₱5000 and below, 61 or 18.5% had an income of ₱5001-10,000, 26 or 7.9% had ₱10,001-15,000 income, 15 or 4.6% had an income of ₱15,001-20,000 and 16 or 4.9% had above ₱20,000 monthly income. Most of the fathers of the respondents had a monthly income of ₱5,000 and below.

Table 1.7 Number of Brothers of the Respondents

Number of Brothers	Frequency	Percent
0	54	16.4
1-3	209	63.5
4-6	61	18.6
7-9	5	1.5
Total	329	100.0

Number of Brothers. It is shown in Table 1.7 that 54 or 16.4% of the Grade 5 learners have no brother, 209 or 63.5% have 1-3, 61 or 18.5% have 4-6 brothers and 5 or 1.5% have 7-9 brothers. Most of the respondents have 1-3 brothers, while only a few of them have 7-9 brothers.

Table 1.8 Number of Sisters of the Respondents

Number of Sisters	Frequency	Percent
0	37	11.2
1-3	218	66.3
4-6	68	20.7
7-9	6	1.8
Total	329	100.0

Number of Sisters. Table 1.8 shows 37 or 11.2% of the learner's respondents have no sister, 218 or 66.2% have 1-3 sisters, 61 or 18.5% have 4-6 sisters and 6 or 1.8% have 7-9 sisters. Most of the respondents have 1-3 number of sisters, while only few of them have 7-9 sisters.

Table 1.9 Number of Books Available at the Respondents' Home

Number of Books	Frequency	Percent
0	104	31.6
1-2	193	58.7
3-4	16	4.9
5-6	10	3.0
7 and above	6	1.8
Total	329	100.0

Number of Books Available at Home. As shown in Table 1.9, 104 or 31.6% of the learner did not have any book at home, 193 or 58.7% had 1-2 books at home, 16 or 4.9% had 3-4 books, 10 or 3.0% had 5-6 books and 6 or 1.5 percent had seven or more books as reference materials in Mathematics that were available in learners' homes. Most of the students had 1-2 books at home, while only few of them had seven or more books available at home.

Table 1.10 Availability of Computer in the Respondents' Homes

Availability of Computer	Frequency	Percent
Not Available	293	89.1
Available	36	10.9
Total	329	100.0

Availability of Computer. The results shown in Table 1.10 revealed that 293 or 89.1% of the students said that they did not have any computer at home, while only 36 or 10.9% of them had computers available at home. Most of the respondents are still unfortunate when it comes to technology, particularly the availability of computer, which is already considered part of the society since the world today is undeniably ruled by computers.

Table 1.11 Internet Access of the Respondents

Access to Internet	Frequency	Percent
No Access	235	71.4
have Access	94	28.6
Total	329	100.0

Internet Access. The data presented in Table 1.11 show that 235 or 71.4% of the Grade 5 learners had no access to internet, while only 94 or 28.6% of them had access to internet. The result suggests that most elementary had no access to internet while only few of them had the opportunity to surf the internet.

Table 1.12 Number of Study Hours Daily of the Respondents

Number of Hours	Frequency	Percent
0	53	16.1
1	226	68.7
2	43	13.1
3	6	1.8
5	1	0.3
Total	329	100.0

Number of Study Hours Daily. It is shown in Table 1.12 that of all the Grade 5 learners, 53 or 16.1% of them had no time to study Mathematics, 226 or 68.7% had (1) hour in studying the subject, 43 or 13.1% had (2) study hours, six or 1.8% had (3) hours in studying and one or 0.3% of them had (5) hours in studying the subject, daily. Most of the respondents devoted (1) hour of studying math daily, however only (1) of them spent five hours everyday in studying the subject.

Table 1.13 Assistance from other Persons in Studying Mathematics

ASSISTANCE from other PERSONS	Frequency	Percent
No Assistance	139	42.2
With Assistance	190	57.8
Total	329	100.0

Assistance from other Persons. As shown in Table 1.13, 139 or 42.2% said that there were other people helping them in studying the subject, while 190 or 57.8% had claimed that no other people help them in studying math subjects.

Table 1.14 Assistance from Parents in Studying Mathematics

Parents' Assistance	Frequency	Percent
Without Parents' Assistance	147	44.7
With Parents' Assistance	182	55.3
Total	329	100.0

Assistance from Parents. Table 1.14 shows that 147 or 44.7 % of the Grade 5 learners said that their parents did not help them in studying Mathematics, while, 182 or 55.3 % agreed that they were assisted or mentored by their parents in studying the Mathematics subject. Most of them received help from their parents in dealing with the subject. This is interesting to note that parents today are already aware of the value of education as well as of Mathematics in everyday life.

Table 1.15 GPA of the Learners in their Grade 4 Mathematics

GPA First Year	Frequency	Percent
65 - 74	2	0.6
75 - 79	133	40.4
80 - 88	181	55.0
89 - 95	13	4.0
Total	329	100.0

General Percentage Average of the Grade 5 learners. The data shown in Table 1.15 reveals that two or 0.6% of the Grade 5 learners got a General Percentage Average in their Grade 4 Mathematics of 65-74, 133 or 40.4% got a GPA of 75-79, 181 or 55.0% got a GPA of 80-88 and 13 or 4.0% of them got the GPA of 89-95. Most of the Grade 5 learners got 80-88 GPA in their Grade 4 Mathematics, while only few of them got the GPA of 65-74. These figures show that generally, the respondents have good performance in their Grade 4 Mathematics.

Table 2. Learners' Attitude Towards Mathematics

Attitude	Frequency	Percent
Negative	43	13.1
Neutral	153	46.5
Positive	133	40.4
Total	329	100.0

Learners' Attitude towards Mathematics. Presented in Table 2 are the data which show that 43 or 13.1% of the Grade 5 had negative attitudes towards Mathematics, 153 or 46.5% of them were neutral and 133 or 40.4% of the respondents had positive attitude towards the subject. Most of them revealed to be neutral in answering the statements found in the instrument which measured their attitude towards Mathematics; neutral in the sense that Grade 5 learners were still undecided as to how they feel whenever they encounter Mathematical concepts.

Table 3. Level of Performance of the Learners in Mathematics 5

LEVEL OF PERFORMANCE	Frequency	Percent
Failed	7	2.1
Poor	96	28.6
Good	206	62.6
Very Good	22	6.7
Total	329	100.0

Level of Performance of the Grade 5 learners in Mathematics. Shown in Table 3 are the data of the frequency distribution of the level of performance of the learners in Mathematics. It shows that seven or 2.1% of the Grade 5 learners failed in the subject, 206 or 62.6% were poor, and 22 or 6.7% were good in Mathematics. Most of the respondents performed well in their Grade 5 Mathematics, while only a minimal number of them failed in the subject. The findings reveal that the Grade 5 learners are generally good in their level of performance in Mathematics.

Relationship between the Independent and the Dependent Variables

Predictors' Contribution to the Total Variance in the Performance of the Grade 5 learners in Mathematics. Regression analysis was utilized to test the effect of the independent variables on academic achievement of the learners in Mathematics. The analysis reveals that with an F-value of 20.396 and significance value of 0.000, the null hypothesis was rejected, which means that there was a significant relationship between the predictors and the academic achievement of the learners in Mathematics. Regression analysis showed that the predictors contributed 49.4% to the total variance in the academic achievement of the Grade 5 learners in Mathematics. In other words, the correlates used in this study played a big role in explaining learners' academic achievement in Mathematics.

Table 4. Predictors' Contribution to the Total Variance in the Performance of the Grade 5 learners in Mathematics

Regression summary

R	R Square	Adjusted Square	R	Std. Error of the Estimate
.703^a	.494	.470		3.081

Analysis of Variance

	Sum of Squares	Df	Mean Square	F	Significance value
Regression	2904.729	15	193.649	20.396	.000 ^a
Residual	2971.696	313	9.494		
Total	5876.426	328			

The Independent Variables that Predict the Performance of the Grade 5 learners in Mathematics. Among the correlates used as independent variables of this study, the following were found to be significant predictors of the learners' academic achievement in Mathematics, namely: age ($p=0.433$, $\alpha=0.009$), sex ($p=1.697$, $\alpha=0.000$), educational attainment ($p=0.521$, $\alpha=0.000$), father educational attainment ($p=0.569$, $\alpha=0.000$), income of father ($p=0.466$, $\alpha=0.019$), number of books ($p=0.352$, $\alpha=0.007$), availability of computer ($p=1.757$, $\alpha=0.019$), access to internet ($p=2.353$, $\alpha=0.000$), study hours ($p=1.229$, $\alpha=0.001$) and GPA in first year math ($p=0.579$, $\alpha=0.000$). Otherwise, income of mother ($p=-0.088$, $\alpha=0.634$), number of brothers ($p=0.025$, $\alpha=0.820$) and sisters ($p=0.134$, $\alpha=0.216$), assistance of other people ($p=-0.412$, $\alpha=0.260$), and parents' assistance ($p=-0.184$, $\alpha=0.609$) in studying Mathematics did not predict significantly learners' performance in Mathematics.

This study found out that age of the Grade 5 learners was a significant predictor of their academic achievement in Mathematics 5. This finding confirms Piaget's Developmental Theory which emphasized that intellectual ability of a child is qualitatively different at different ages. It further means that a more mature academic achievement has greater capability to learn Mathematics.

It was also found out that the sex of the learners that showed significance in predicting Mathematics performance. The findings revealed a highly positive correlation between sex and learners' academic achievement which means that female learners outperformed the male learners. It could be attributed to the fact that female learners have a more positive attitude towards mathematics compared to male learners. This is in conformity with the findings of Bassey, et al., that female learners have more positive attitude towards Mathematics than male learners.

Fathers' and mothers' educational attainments were also found to be predictors of learners' academic achievement in Mathematics 5. There was a direct correlation between the mother/father educational attainment and the learners' academic achievement in Mathematics 5, which means that the higher the educational attainment of the mother/father the better the learners' academic achievement will be. This finding conforms to the Socio-Cultural Theory of Vygotsky who argued that the role of MKO (More Knowledgeable Other) is very important for learning to take place. The mother/father leads the role of the more knowledgeable person to the learners while studying the subject. Thus, the more knowledgeable the MKO is the more knowledge the learner will be. In other words, parents who have higher educational attainment has more capability and capacity in teaching and mentoring their children resulting to better performance. It indicates then that the more educated a mother/father of the learners the higher the grades they will earn in the subject. Inversely, when the father/mother is less educated, the academic achievement the learners will be poor. It supports the study of Lamsis which found out that educational attainment of parents correlated to the learners' academic achievement.

Interestingly, learners' performance was also found to be significantly affected by the fathers' income. Although the correlation is not very high, there is an indication that the higher the income of the father, the better is the academic achievement of the learner. Undeniably, the father is usually the bread winner, he is the one who provides for the financial needs of the family. In other words, his income favorably defines and categorizes the socio-economic status of the family the learners belong to. Somehow it affects learners' academic achievement because for instance, when the income of the father does not suffice the needs of the family, learners become less motivated thinking that they could not be readily given by their parents of the things they need in school such as projects, allowance, and etc. This finding supports the study of Barry that the learners' socio-economic status was the strongest predictor of learners' test scores in Mathematics. In the study of Crosby, this finding also confirms that familial aid

was one of the most important factors in learners' success in their studies. It was actually theorized by Bronfenbrenner that family, as part of microsystem, contributes much the learners' academic achievement in school as well as to their development.

Another interesting result was found that the number of study hours of the learners daily, number of books present at home, availability of computer at home, access to internet and study hours of the learners were significant predictors of the learners' academic achievement in Mathematics 5. Based on the p-value, the more the books present at home and the more hours learners devote to studying, the better is their performance in the subject. On the other hand, there is a high positive correlation between the availability of computer and internet access and the learners' academic achievement. It shows that learners who have computers at home and have internet access performed better than those who do not have. These findings then strongly support Vygotsky's sociocultural theory which emphasized the influence of culture on the cognitive development of a child. The use of computer and internet surfing are part of the respondents' culture, which significantly and positively affects their academic achievement in Mathematics 5. In the same manner, books as one of the most important references in studying any field and as part of respondents' culture affect learners' performance in the subject. These findings serve as proofs of Bronfenbrenner's ecological system theory that considered learner's environment as part of microsystem which contributes much to her/his development. The results on study hours show a positive correlation with the learners' academic achievement, which indicates that the more hours the learner spends in studying Mathematics 5, the better is her/his academic achievement in the subject. This agrees with the statement of Vygotsky that a good study habit as a result of learners' behavior leads to her good development in the subject. This finding is also similar to that of Cajindos in which she found that there is a significant relationship between the learners' level of academic achievement in Mathematics and time in study. However, this finding contradicts that of Balbalosa, which revealed that there was no significant correlation between study habits and their academic achievement in Mathematics.

Interesting also was the result on the GPA in Grade 5 Math subject of the respondents, which is revealed to be a significant predictor of the learners' performance in Mathematics 5. The p-value indicates that the higher the GPA in Grade 6 math of the learners, the higher is the average grades in their Grade 5 math or vice versa. This was supported by Lee as he stated that each learner's previous knowledge and experience with the object or even under investigation will either facilitate or hinder his or her attempt at each skill.

Table 5. Regression Analysis on the Independent Variables that Predict the Learners' Academic Achievement in Mathematics

INDEPENDENT VARIABLES	B	SignificantT value	INTERPRETATION
Age	0.433	0.009	Significant
Sex	1.697	0.000	Significant
Educational Attainment of Mother	0.521	0.000	Significant
Educational Attainment of Father	0.569	0.000	Significant
Monthly Income of Mother	-0.088	0.634	Not Significant
Monthly Income of Father	0.466	0.019	Significant
Number of Brothers	0.025	0.820	Not Significant
Number of Sisters	0.134	0.216	Not Significant
Number of Books Available at Home	0.352	0.007	Significant
Availability of Computer at Home	1.757	0.019	Significant
Internet Access	2.353	0.000	Significant
Number of Study Hours Daily	1.229	0.001	Significant
Assistance from Other Persons	-0.412	0.260	Not Significant
Assistance from Parents	-0.184	0.609	Not Significant
GPA in Grade 4 Math	0.579	0.000	Significant

Relationship between Attitude and the Learners' Performance in Mathematics

Table 6. Attitude as Predictor of the Learners Performance in Mathematics 5

	Sum of Squares	Df	Mean Square	F	Significance value
Regression	134.702	1	134.702	7.672	0.006 ^a
Residual	5741.723	327	17.559		
Total	5876.426	328			

PREDICTOR	β	Significance value
Attitudes Towards Mathematics	0.943	0.006

Attitude as Predictor of Learners' Performance in Mathematics 5. Table 6 shows regression analysis on the effect of attitude on the learners' academic achievement in Mathematics 5. The analysis revealed that the conceptual model was significant with an F-value of 7.672 and significance value of 0.006. The null hypothesis was rejected, which means that there was significant relationship between the attitude and the academic achievement of the Grade 5 learners in Mathematics.

The findings also revealed that attitude was ($p=0.943$, $\alpha=0.006$) found to be a significant predictor of the learners' academic achievement in Mathematics 5. This means that the more positive is the attitude of the learners towards the subject, the better their academic achievement will be. Attitude as a modifier of behavior, according to Vygotsky, affects learners' cognitive development. Thus, it affected their academic achievement in the subject. Bandura stressed that learners' epistemological beliefs about the subject can make or break his/her academic achievement in that particular subject. Pajares also emphasized that attitude is one of the significant predictors of learners' performance in any academic subject. In the study of Cajindos, she found out that there was a significant relationship between the students' level of performance in trigonometry and attitude towards mathematics. The findings of Poquiz in her study also revealed that the attitude of the Grade 5 learners towards mathematics strongly influenced their scholastic rating. Meanwhile, the findings of Moenikia, et al., considered attitude to be one of the statistically significant predictors of students' mathematics achievement. It was further confirmed by Bassey, et al., who found out that the learners who had positive attitude towards mathematics performed better than their counterparts with negative attitude.

Test of Relationship between Independent Variables and Performance with Attitude as Mediator

Table 7. Mediation Analysis between the Correlates and the Learners'

Performance in Mathematics 5 with Attitude as Mediator

Steps	INDEPENDENT VARIABLES	DEPENDENT VARIABLES	p	Significance value	Interpretation
Regression 1	Age	Performance	0.742	0.000	Significant
Regression 2			0.048	0.173	Not Significant
Regression 1	Sex	Performance	0.521	0.000	Significant
Regression 2			-0.019	0.440	Not Significant
Regression 1	Educational Attainment of Mother	Performance	0.521	0.000	Significant
Regression 2			-0.019	0.440	Not Significant
Regression 1	Educational Attainment of Father	Performance	0.569	0.000	Significant
Regression 2			-0.018	0.460	Not Significant
Regression 1	Monthly Income of Father	Performance	0.466	0.019	Significant
Regression 2			-0.005	0.873	Not Significant
Regression 1	Number of Books	Performance	0.352	0.007	Significant
Regression 2			0.027	0.231	Not Significant
Regression 1	Availability of Computer	Performance	1.757	0.019	Significant
Regression 2			-0.234	0.066	Not Significant
Regression 1	Internet Access	Performance	2.353	0.000	Significant
Regression 2			0.097	0.273	Not Significant
Regression 1	Study Hour	Performance	1.229	0.001	Significant
Regression 2	Study Hour	Attitude	0.220	0.000	Significant
Regression 3	Attitude	Performance	0.991	0.002	Significant
Regression 4	Attitude	Performance	0.807	0.013	Significant
	Study Hour		1.051	0.004	Significant
Regression 1	GPA in Grade 5 Math	Performance	0.664	0.000	Significant
Regression 2			0.001	0.875	Not Significant

Note: Mediation of Attitude is present between study hour and Performance

Mediation Analysis. Shown in Table 7 is the regression analysis on the independent variables and learners' academic achievement with attitude as mediator. Among the significant independent variables, only study hour was mediated by attitude to the learners' academic achievement in Mathematics. In regression 1, while the study hours served as independent variable and the academic achievement of the learners in Mathematics 5 as the dependent variable, the result showed to have the value of $p=1.229$ and $\alpha=0.001$ which means the correlation was significant. Thus, the mediation analysis continued to regression 2, in which the study hour served as independent variable, while attitude as dependent, which resulted to $p=0.220$ and $\alpha=0.000$, it is interpreted as significant again. That is why, the analysis proceeded to regression 3 with attitude, this time, as independent variable and performance as dependent, which resulted to $p=0.991$ and $\alpha=0.002$. It means that the correlation was significant. Finally, the analysis continued to regression 4 in which the attitude and the study hours simultaneously served as independent variables and the performance as dependent variable which resulted to $p=0.807$ and $\alpha=0.013$ for the attitude and $p=1.051$ and $\alpha=0.004$ for study hours, which were both interpreted as significant correlations. The results showed that there is a partial mediation of the attitude that occurred between the study hours and the academic achievement. These findings indicate that attitude somehow affects the relationship of study hours and academic achievement. Although the number of hours devoted by learners to studying the subject has significant effect on his/her grade, and though attitude intervenes in studying the lesson, it cannot interfere so much if the learner spends a substantial amount of time studying the subject.

Summary

This study was conducted in West B District, Tarlac City Division. The data were gathered from the 329 respondents with the use of the survey-questionnaire as the instrument. Descriptive-Correlational method of research was utilized in this study.

This investigation was done to find out the correlates of the learners' academic performance in Mathematics 5. It sought to determine the socio-demographic profile of the Grade 5 learners in terms of age, sex, monthly income of father, monthly income of mother, educational attainment of father, educational attainment of mother, number of study hours daily, assistance from other persons, assistance from parents, number of brothers, number of sisters, number of books, availability of computer, internet access, and GPA in Grade 4 Mathematics subject; to find out the attitude of the respondents towards the subject; to determine the level of academic achievement of the learners in Mathematics 5; to determine the percent that the predictors contribute to the total variance in the academic performance of learners in Mathematics 5; to find out the independent variables as factors which significantly predict the academic achievement of the learners in Mathematics 5; to determine if the learners' attitude predict their academic performance in Mathematics 5; and to determine if attitude mediates the relationship between factors and the academic performance of the learners in Mathematics 5.

The findings revealed that most of the Grade 5 learners are predominantly females, at their early adolescent stage, have fathers and mothers with 5000 and below monthly income which is interpreted as below poverty line, have fathers with elementary level of education and mothers of high school level of education, have one hour in studying math subject daily, with assistance by other persons in studying Mathematics, with parental assistance in studying the subject, with 1-3 number of brothers or sisters, have 1-2 number of books at home. However, most of them have no any computer available at home and no access to internet as well. Finally, Grade 5 learners of elementary department have good standing in Mathematics.

The Grade 5 learners were found to be neutral in their attitudes towards Mathematics. However, only few of them had negative attitude towards the subject. Despite this, the attitude was still found to be a significant predictor of learners' academic achievement in Mathematics 5.

In terms of level of academic achievement of the learners, most of them had average grade of 80-88 with a frequency of 206 or 62.6%, which means they performed well in their Grade 5 Mathematics subject.

This study found the predictors to have contributed a 49.4% to the total variance in the academic achievement of the learners.

Among the correlates used as independent variables of this study, the following were found to be significant predictors of the learners' academic achievement in Mathematics 5, namely: age; sex, mother educational attainment, father educational attainment, income of father, number of books, availability of computer, access to internet, study hours and GPA in Grade 4 Mathematics. On the other hand, income of mother, number of brothers and sisters, assistance of other people and parents' assistance in studying Mathematics did not predict significantly to the learners' academic achievement in Mathematics 5. Thus, they were not included in the mediation analysis.

The findings of this study also revealed that: there was a significant relationship between the predictors and the performance of the learners in Mathematics; there is significant relationship between the attitude and the academic achievement of the learners in Mathematics 5; and the attitude partially mediated between the study hours and the academic achievement of the learners in Mathematics 5.

Conclusions

Generally, the findings of the study revealed that there is a significant relationship between the demographic profile and academic achievement of the learners in Mathematics 5. Age, sex, mother's educational attainment, father's educational attainment, income of father, number of books, availability of computer, access to internet, study hours, and GPA in Grade 4 Mathematics have positive effect on the performance of learners in Mathematics 5. Result of the analysis indicates a sizeable amount of variance in the learners' academic achievement explained by the independent variables. It is therefore high time for teachers and parents to take note of these variables that directly or indirectly affect learners' academic achievement.

The direct correlation between attitude and Mathematics academic achievement shows how the attitude works in between study hours and mathematics performance. A learner who spends more hours in studying his/her lesson will perform better than those who do not. However, the effect of study hour on achievement is strengthened if his/her attitude towards the subject is positive. On the contrary, effect of study hours on performance will decrease if the learner possesses negative feelings about the subject. This finding exemplifies the bidirectional effect of behavior on cognition as cited in the theory of Bandura. Behavior can either dampen the spirit of the students or boost their attitude to study more and elevate his/her academic performance.

Recommendations

Based on the findings, the following recommendations are forwarded.

The teacher must establish a link with the parents through home visitations, to have casual conversations with parents about the academic performance of the learners in school, where the teacher would inject in the discussion of those significant factors (i.e. age, financial matter, study hour, books, computer, access to internet and assistance from other persons/parents) that affect the learners' academic achievement in Mathematics in general. This should be done so that the parents would realize the importance of monitoring the success of their children and would gain insights as to what factors contribute to the academic achievement of their children in school. Through this, they could find means to have these factors bring positive effects to their children and their studies. Parents should serve as extensions of teachers outside the classroom by assisting their children in studying the subject or by seeking other persons to help their children in studying Mathematics. This is because continuity of learning is necessary to develop the right attitude of learners towards learning.

Parents, aside from sending their children to school, should provide the means by which their children be given can gain access to reference books, computer and access to internet, since these contribute much to the academic achievement of the learners in Mathematics.

Teachers must utilize different strategies in teaching Mathematics and motivate the learners' interest to develop positive attitude towards the subject. This can be done through by injecting different tricks in teaching Mathematics, giving problem solving activities as part of their projects and assignments for which they would spend at least 2-3 hours dealing with Mathematical concepts everyday.

The teacher should give assignments or projects to the learners that would enable them to conduct in books or computer and find way to have an internet access since these are significant predictors of the learners' academic achievement in Mathematics.

Lastly, a similar study should be done utilizing the variables which significantly predicted learners' Mathematics academic achievement. Variables such as motivation, math anxiety, and other behavioral factors can be included as predictor variables of Mathematics performance.

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