# Learning Styles, Math Anxiety, and Academic Performance of Grade VI Pupils

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## ABSTRACT

Berte, Monica B., Capiz State University – Roxas City Main Campus, May 2024. "Learning Styles, Math Anxiety, and Academic Performance of Grade VI Pupils" The Department of Education, Division of Capiz is also doing its best to improve the mastery level or performance of every pupil in Mathematics. Many programs have been launched to awaken the interest of pupils and to improve their mathematical skills. The pupils of the District of Panay are not far different from other pupils out there. Since children's mathematical reasoning and skills varies, it is now a question of whom or what influences them in this area of their personality. This descriptive study aimed to determine the learning styles, Math anxiety, and academic performance in Mathematics of Panay Central School Grade VI pupils in the District of Panay during the School Year 2023-2024. The survey questionnaire underwent validity testing by a panel of experts. The results showed that the learning styles of the Grade VI pupils with the average of M=4.24 describe as always with the verbal interpretation of "very evident". The level of Math anxiety with the mean of 4.24 described as "moderately". The academic performance of Grade VI pupils show that they all have "satisfactory" performance. However, there was a significant relationship among learning styles, math anxiety, and academic performance. This study recommends teachers may exert more efforts to arouse their interest towards Mathematics. Make some revisions and enhancements on the teachers' teaching strategies. The school administration may make a priority plan for the improvement of Mathematics facilities for enrichment of the

Mathematics program to overcome even the pupils' who are in the high level of stress towards this subject that may lead to higher achievement on the subject. The teaching methods may be enhanced well and give more emphasis on teaching methods which include less lecture, more pupils directed classes and more discussion. Teachers may design classrooms that will make children feel more successful. Math subject must be looked upon in a positive light to reduce math anxiety. Parents may provide the necessary assistance to their children morally, spiritually and encourage them in learning Mathematics as a basis for current and future understanding. For future researchers, a similar study of this nature is recommended using other variables.
*Keywords: Learning styles, math anxiety, academic performance*

## INTRODUCTION

Mathematics is a form of reasoning. Thinking mathematically consists of thinking in a logical manner, formulating and testing conjectures, making sense of things, forming and justifying judgments, inferences, and conclusions. Pupils could demonstrate mathematical behavior when they recognize and describe patterns, construct physical and conceptual models of phenomena, create symbol systems to help them represent, manipulate, and reflect on ideas, and invent procedures to solve problems Alegre, (2014).

Education must equip all students with mathematical skills that provide them with the flexibility, adaptability,

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and creativity to function as productive citizens in the changing technological society of the twentyfirst century. Mathematical skills must extend beyond the ability to calculate into the use of Mathematics to investigate, analyze and interpret. Thinking mathematically in every life skill is critical, from balancing a check book to understanding the newspaper. People use math skills daily to identify problems, look for information that will help solve the problems, consider a variety of solutions, and communicate the best solution to others. A Math classroom should provide practical experience in mathematical skills that serves as a bridge to the real world, as well as explorations which develop an appreciation of the beauty and value of Mathematics. Using a variety of tools, such as calculators, computers, and hands-on materials, under the guidance of a skillful teacher creates a rich mathematical learning environment. Such an environment will help to prepare students for a world were using calculators and computers to carry out mathematical procedures is common place, a world where mathematics is rapidly growing and extensively being applied in diverse fields (Transitionmath, 2006).

Recent national test results provide continuing documentation of the need to increase the focus on improving student achievement mathematics. Mathematics achievement is an object of utmost importance in any elementary school (Idris, 2014.) It is defined as a measure of the ability of pupils to understand, analyze and answer specially designed test items based on the learning competencies in elementary Mathematics. The level of achievement exhibited by the pupils will categorize them as high or low Mathematics achievers. In the present technology-oriented society, Mathematics achievement is often seen as a key factor in ensuring the success of a pupil in the school system (Alegre, 2015).

The Department of Education, Division of Capiz is also doing its best to improve the mastery level or performance of every pupil in Mathematics. Many programs have been launched to awaken the interest of pupils and to improve their mathematical skills. The pupils of the District of Panay are not far different from other pupils out there. Since children's mathematical reasoning and skills varies, it is now a question of whom or what influences them in this area of their personality.

The researcher, being a teacher in Mathematics in a public school in the District of Panay has observed that some of the Grade VI pupils experience difficulties and problems towards the subject. They are experiencing different learning styles, Math anxiety and there was a decline in the performance in Mathematics.

It is on this line of concern that the researcher was motivated to conduct a study on the learning styles, Math anxiety and academic performance in Mathematics of Panay Central School Grade VI pupils in the District of Panay.

**Research Objectives**

This descriptive study aimed to determine the learning styles, Math anxiety, and academic performance in Mathematics of Panay Central School Grade VI pupils in the District of Panay during the School Year 20232024.

Specifically, this study sought answers to the following questions:

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1. What is the level of learning styles of the Grade VI pupils?
2. What is the level of Math anxiety of the Grade VI pupils?
3. What is the level of academic performance of the Grade VI pupils?
4. Are there significant relationship among learning styles, Math anxiety and performance in Mathematics?

## METHODOLOGY

This chapter presents the research design, locale of study, the respondents, research instrument, data gathering procedure, and data analyses procedure.

**Methods of Research**

This study used the descriptive method of research. Travers and Gay Garingo, (2015) define descriptive research as involving collection of data in order to test the hypotheses or the subject of the study. It determines and reports the way things are. The process of descriptive research goes beyond mere gathering and tabulation of data. This description is often combined with comparisons and contrasts involving measurements, classification, interpretation, and evaluation David, (2016).

This descriptive research employed a validated learning styles checklist, Math anxiety checklist and the students' permanent record or School Form 10 (SF10).

In this study, the researcher aimed to determine the learning styles, Math anxiety and performance in Mathematics of Panay Central School Grade VI pupils in the District of Panay for the School Year 2023 - 2024. It likewise aimed to ascertain how learning styles, Math anxiety and performance in Mathematics relate to each other.

**Research Instrument**

The main instrument used in data gathering was the questionnaire. The first part was the pupils' profile. The second part was the 14-item checklist about learning styles.

The Learning Style Inventory by Shepherd (1996) is a self-scoring questionnaire that was adopted to assess pupils' preferred learning style. This questionnaire was made up of (14) items with three (3) statements each. The first statement was for visual learners, the second statement was for auditory learners, and the third or last statement was for kinesthetic learners. The pupils were asked to check one (1) of the three (3) statements that best describes how they learn in each item.

The pupils' score for the statements that refer to each learning style was then tallied and compared. If the pupil's highest score was the first indicator, they were classified as always observed , if their highest score was for the second indicator, they were classified as sometimes observed, if their highest score was for the third indicator, they were classified as often observed, if their highest score was the fourth indicator, they were classified as seldom observed, and if their highest score was the fifth indicator they were classified as never observed learning styles. For description purposes, numbers were assigned to each learning style as follows: Always - 5; Sometimes – 4; Often – 3; Seldom – 2; and Never – 1.

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The third part was the 15-item checklist about Math anxiety of pupils. Responses range from strongly disagree to strongly agree. The Math anxiety questionnaire asked the pupils to choose one how they feel anxious towards Math subject.

**Math Anxiety Questionnaire**. Found on the next page were the weights of the responses, the scale of means and the description that was used to describe the Math anxiety of Grade VI pupils.

| Responses | Weight | Scale of Means | Description |
|---|---|---|---|
| Strongly Agree (SA) | 5 | 4.21 – 5.00 | Very High |
| Agree (A) | 4 | 3.41 – 4.20 | High |
| Uncertain (U) | 3 | 2.61 – 3.40 | Moderate |
| Disagree (D) | 2 | 1.81 – 2.60 | Low |
| Strongly Disagree (SD) | 1 | 1.00 – 1.80 | Very Low |

**Performance in Mathematics**. The Mathematics performance of the pupils was measured using their Form 137-A second grading grade in Mathematics.

For the descriptive interpretation of the performance in Mathematics, the DepEd Grading system and description was used.

| Grade | Description |
|---|---|
| 90 – 100 | Outstanding |
| 85 – 89 | Very Satisfactory |
| 80 – 84 | Satisfactory |
| 75 – 79 | Fairly Satisfactory |
| Below 75 | Did not meet expectations |

The learning styles and Math anxiety were adopted questionnaires but were still submitted for reliability testing. To test their reliability, it was pilot tested to thirty (30) Grade VI pupils of Libon Elementary School. Pupils who were involved in pilot-testing were not included as respondents of the study. Data from the pilot test were then encoded and processed using the Cronbach Alpha, employing the Statistical Package for Social Science (SPSS) software. According to Smith, as cited by Pagoso, (1987), if the reliability coefficient of a questionnaire is 0.7 or more but not more than 1.0, then the questionnaire is considered reliable. The Cronbach Alpha for the learning style was found to be 0.901, which means that the questionnaire was reliable. For the reading Math anxiety questionnaire, the Cronbach alpha was found to be 0.758, hence, it was also considered reliable.

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**Data Gathering Procedure**

After the researcher sought the approval of the Principal and Grade VI advisers of Panay Central School, she personally went room by room and requested the Grade VI pupils to fill-up the questionnaires. The grades of the respondents were taken from their advisers. When all the questionnaires were accomplished, these were retrieved immediately. Data were then encoded, tallied, tabulated, and submitted to the statistician for analyses using the Statistical Package for Social Science (SPSS) software.

**Statistical Tools and Analyses**

The data gathered for this study were subjected to the following computer-processed statistics.

**Frequency count.** This was used to determine the number of respondents according to their profile which are sex, sibling rank, number of children in the family, fathers' occupation, mothers' occupation, Math class schedule, and number of pupils in a class.

**Mean.** This was used to determine the pupils' performance in Mathematics.

**Correlations.** Set at 0.05 alpha level, this test was used to determine the significant relationship among learning, Math anxiety, and performance in Mathematics.

**Presentation, Analysis, and Interpretation of Data**

**Learning Styles of the Grade VI Pupils**

Table 3 shows the results on the learning styles of the Grade VI pupils.

As shown in the table, the average M=4.24, describe as always with the verbal interpretation of "Very Evident". This means that all indicators under the learning styles had perceived by the respondents as very effective on the way they learn and acquire knowledge. This implies that the learning the styles of every pupil had greatly impacted their learning.

This study supports the study of Wilhelm (2014) which states that many students with reading problems have kinesthetic learning styles and have never learned to visualize what they are reading.

**Table 3** Level of learning styles of the grade VI pupils

**Table: Indicators, Mean Scores, and Verbal Interpretation**

| Indicators | Mean | Verbal Interpretation |
|---|---|---|
| When given instructions on how to build something, I: Read them silently and try to visualize how the parts will fit together; read them out loud and talk to myself as I put the parts together; try to put the parts together first and read later. | 4.67 | Very Evident |
| If someone were verbally describing to me, I would: Try to visualize what she was saying; enjoy listening but want to interrupt and talk myself; become bored if her… | 4.46 | Very Evident |

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**Table 3 continued...**

**Table: Indicators, Mean Scores, and Verbal Interpretation**

| Indicators | Mean | Verbal Interpretation |
|---|---|---|
| Description gets too long and detailed. When asked to give directions, I: See the actual places in my mind as I say them or prefer to draw them; have no difficulty in giving them verbally; have to point or move my body as I give them. | 4.41 | Very Evident |
| When I write, I: Am concerned how neat and well-spaced my letters and words appear; often say the letters and the words to myself; push hard on my pen or pencil and can feel the flow of the words or letters as I form them. | 4.30 | Very Evident |
| I prefer teachers who: Use the board, overhead projector, or multimedia projector while they lecture; talk with a lot of expression; use hands-on activities. | 4.29 | Very Evident |
| To keep occupied while waiting, I: Look around, stare or read; talk or listen to others; walk around, manipulate things with my hands or move/shake my feet as I sit. | 4.28 | Very Evident |
| When I read, I often find that I: Visualize what I am reading in my mind's eye; read out loud or hear the words inside my head; fidget and try to "feel" the content. | 4.22 | Very Evident |
| When solving a problem, I: Write or draw diagrams to see it; talk myself through it; use my entire body or move objects to help me think. | 4.20 | Moderately Evident |
| If I had to remember a list of items, I would remember it best if I: Wrote them down; said them over and over to myself; moved around and used my fingers to name each item. | 4.13 | Moderately Evident |
| If I had to verbally describe something to another person, I would: Be brief because I do not like to talk at length; go into great detail because I like to talk; gesture and move around while talking. | 4.13 | Moderately Evident |
| If I am not sure how to spell a word, I: Write it to determine if it looks right; spell it out in order to determine if it sounds right. | 4.10 | Moderately Evident |

**Table 3 continued..**

write it in order to determine if it feels right.

If I have to learn how to do something, I learn

| | | |
|---|---|---|
| best when I, Watch someone show me how, hear someone tell me how, try to do it myself. When trying to recall names, I remember: Faces but forget names, names but forget | 4.07 | Moderately Evident |
| faces, the situation that I met the person other than the person's name or face. When trying to concentrate, I have a difficult time when: There is a lot of clutter or | 4.04 | Moderately Evident |
| movement in the room, there is a lot of noise in the room, I have to sit still for any length of time. | 3.98 | Moderately Evident |
| **Average** | **4.24** | **Very Evident** |

**N=132**

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**Math Anxiety of the Grade VI Pupils**

Table 4 shows the results of the Math anxiety of the Grade VI pupils.

As presented in the table, as shown by the mean, the Grade VI pupils had "always" Math anxiety with the mean of 4.24, described as "very evident" in the scale of means.

This study supports the study of Ashcraft, (2015) which suggests that highly anxious math students will avoid situations in which they have to perform mathematical calculations. Unfortunately, math avoidance results in less competency, exposure and math practice, leaving students take fewer math courses and tend to feel negative towards Math. In fact, Ashcraft found that the correlation between Math anxiety and variables such as confidence and motivation are strongly negative.

**Table 4** Level of Math anxiety of the grade VI pupils

| Indicators | Mean | Verbal Interpretation |
|---|---|---|
| When taking a Math test, I start with the first problem and work the remaining problems in numerical order. | 3.54 | High |
| I understand Math now, but I worry that it's going to get really difficult soon. | 3.5 | High |
| I get stressed and forget important procedures in my Math class. | 3.08 | Moderately |
| It's clear to me in Math class, but when I go home it's like I was never there. | 3.03 | Moderately |
| I'm afraid I won't be able to keep up with the rest of the class. | 2.98 | Moderately |
| I am always worried about being called on in Math class. | 2.95 | Moderately |
| I fear Math tests more than any other kind. | 2.8 | Moderately |
| I am uneasy about going to the board in Math class. | 2.77 | Moderately |
| I stop reading the Math book when I get stuck. | 2.75 | Moderately |
| I am afraid to ask questions in my Math class. | 2.67 | Moderately |
| When I become confused in my Math class, I stop taking notes. | 2.64 | Moderately |
| If I don't see how to set up and solve a problem, I give up. | 2.43 | Low |
| I don't know how to study for Math class. | 2.34 | Low |
| I cringe or quiver when I have to go to Math class. | 2.21 | Low |
| I tend to zone out or pass out in Math class. | 2.16 | Low |
| **Average** | **2.79** | **Moderately** |

| Scale of Means | Verbal Description |
|---|---|
| 4.21 – 5.00 | Very High |
| 3.41 – 4.20 | High |
| 2.61 – 3.40 | Moderately |
| 1.81 – 2.60 | Low |
| 1.00 – 1.80 | Very Low |

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**Academic Performance of the Grade VI Pupils**

Table 5 presents the results on the performance of the Grade VI pupils.

As reflected in the table, the Grade VI pupils had "satisfactory" performance in Mathematics. The results further show that they all have "satisfactory" performance across all variables considered.

This study supports the study of Good, (2015) which states that grade as a percentage mark on achievement resulting from the use of the traditional marking system by which zero represents no achievement whatsoever, 100 represents perfection of performance, and a point usually established arbitrarily between 60 and 75 represents barely passing work.

**Table 4 Level of academic performance of the grade VI pupils**

| Indicator | GWA | Remarks |
|---|---|---|
| Academic Performance | 85.62 | Satisfactory |

| Grade Range | Scale of Means |
|---|---|
| 90 – 100 | Outstanding |
| 85 – 89 | Very Satisfactory |
| 80 – 84 | Satisfactory |
| 75 – 79 | Fairly Satisfactory |
| Below 75 | Did not meet expectations |

**Relationship among learning style, Math anxiety, and academic performance of the Grade VI Pupils**

Table 5 shows the relationships among learning style, Math anxiety, and performance in Mathematics of the Grade VI pupils.

As shown in the table, results show that the p-value is less than 0.05 ($0.045 < 0.05$) and it means there was a statistically significant relationship between learning style and Math anxiety. The result implies that there is sufficient evidence to reject the null hypothesis, suggesting a significant relationship between learning style and Math anxiety. This means that the observed data provides strong enough evidence to conclude that there is likely an association between how students learn and their levels of anxiety towards them.

This study supports the study of Ticar, (2015) which states that different instructional modes that the teacher employed in Math instruction, willingness of the pupils to learn more about the subject matter in Mathematics, hands-on activities organized by the teacher, the rich experiences of the pupils and adequate instructional materials and resources of Mathematics teacher may have resulted to the pupil's satisfactory performance in the subject. Pupils may still have many things to learn. Male and female pupils respond differently in Mathematics.

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As shown in the table also, result of 0.000 < 0.05 shows that there was a very strong statistically significant relationship between learning styles and academic performance of the Grade VI pupils. The result implies that there is compelling evidence to reject the null hypothesis, indicating a significant relationship between academic performance. In other words, the data strongly suggest that the way students learn is likely to have a notable impact on their academic performance.

Finally, when the Math anxiety of Grade VI pupils was related to the academic performance, yields a result of 0.005 < 0.05, it implies that there was a significant relationship between Math anxiety and academic performance at .05 significance level. The result suggests that higher levels of Math anxiety are likely associated with differences in academic performance, and the evidence is strong enough to reject the null hypothesis that there is no correlation between these variables.

This study supports the study of Willis, (2016) stated that other factors that could influence performance. He studied the relationship between the students' conceptual understanding and their achievement on a traditional standardized multiple-choice examination in Math as well as effects of gender, reasoning ability and mathematical ability.

**Table 5** Relationship among learning style, Math anxiety, and performance of the grade VI pupils

| **Variables** | **N** | **r** | **p-Value** | **Remarks** |
|---|---|---|---|---|
| Learning Style, Math Anxiety and Academic Performance | | -0.175<br>0.383 | 0.045<br>0.000 | Significant |
| Math Anxiety, Learning Style, and Academic Performance | 132 | -0.175<br>-0.245 | 0.045<br>0.005 | Significant |
| Academic Performance, Learning Style, and Math Anxiety | | -0.245<br>0.383 | 0.000<br>0.005 | Significant |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | | |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | |

## CONCLUSIONS OF THE STUDY

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

1. The Grade VI pupils of the District of Panay are in the "very evident" in their learning styles.
2. Majority of the Grade VI pupils are in the "moderately" in terms of Math anxiety.
3. Majority of the Grade VI pupils are in the "satisfactory level" in terms of academic performance in Mathematics. This means that can conceptualize and apply the knowledge and skills they have acquired.
4. There was a significant relationship between learning styles and Math anxiety.
5. There was a significant relationship between learning styles and academic performance of the Grade VI pupils.
6. There was a significant relationship between Math anxiety and academic performance of the Grade VI

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pupils.

## RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are suggested:

Since the Grade VI pupils demonstrated a very evident in the learning styles towards Mathematics subject, teachers may exert more efforts to arouse their interest towards Mathematics. Make some revisions and enhancements on the teachers' teaching strategies.

The school administration may make a priority plan for the improvement of Mathematics facilities for enrichment of the Mathematics program to overcome even the pupils' who are in the high level of stress towards this subject that may lead to higher achievement on the subject.

The teaching methods may be enhanced well and give more emphasis on teaching methods which include less lecture, more pupils directed classes and more discussion. Teachers may design classrooms that will make children feel more successful. Math subject must be looked upon in a positive light to reduce math anxiety. Teachers may examine traditional teaching methods which often do not match pupils' learning styles and skills. Teachers' lessons must be presented in a variety of ways.

Parents may provide the necessary assistance to their children morally, spiritually and encourage them in learning Mathematics as a basis for current and future understanding.

For future researchers, a similar study of this nature is recommended using other variables.

The positive correlation revealed among learning style and academic performance in Mathematics should aid pupils to determine their weakness and enhance their strengths among each area.

Curriculum planners can look at the present curriculum of the elementary schools and check if the activities and learning focus are directed towards Mathematics subject.

Similar studies may be conducted in other schools and districts to check on the veracity of the results.