

Attitude Toward and Achievement in Mathematics of Grade III Learners of Aritao Central School: Bases for Learning Intervention

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achievement in mathematics, attitude toward mathematics, multiplication

Abstract. The study aimed to ascertain attitude toward and achievement in Mathematics of Grade III learners of Aritao Central School: Bases for the learning intervention SY 2025-2026. The study included 97 Grade III learners who were selected using stratified sampling procedure. The study used quantitative research. The respondents' attitude toward Mathematics with the components such as enjoyment in mathematics, fear, anxiety, and distress in mathematics, and the use of mathematics in everyday life was measured using the questionnaire adapted from Calingayan (2025). The test measured the achievement of the respondents in Mathematics which covered the least mastered skills for quarter 3 like properties of multiplication on tables, multiplying numbers with and without regrouping, and solving 1-2 step multiplication problems, including money problems. It found that the respondents' level of attitude in terms of enjoyment in mathematics with the mean 3.06 and SD of 0.49 (Positive); fear, anxiety and distress in mathematics with mean of 2.80 with SD of 0.67 (Positive); and the use of mathematics in everyday life with the mean of 3.12 with SD of 0.67 (Positive). Generally, the respondents have high level of attitude toward Mathematics with the overall mean of 2.99 and SD of 0.36. Properties of multiplication on tables, the respondents have a mean of 5.84 with the MPS 48.63 which has satisfactory level; multiplying numbers with and without regrouping has a mean of 3.94 with MPS of 39.43; and solving 1-2 step multiplication problems, including money problems has a mean of 3.15 with MPS of 39.43, both with fairly satisfactory level. There is a significant influence between the respondents' attitude toward and achievement in mathematics. The results of this study have led to the construction of a learning intervention that focuses on improving the achievement level of the Grade III learners in Aritao Central School particularly on properties of multiplication on tables, multiplying numbers with and without regrouping and solving 1-2 step multiplication problems, including money problems. The purpose of this learning intervention is to provide contextualized materials for the Grade III learners in order to enhance their achievement level in Mathematics.

Introduction

Mathematics is an essential part of education all throughout the world since it shapes students' analytical and problem-solving abilities. Nonetheless, students' attitudes toward mathematics have a big impact on their performance and general success in the course. While negative perceptions may impede learning outcomes and restrict academic development, positive attitudes frequently result in increased engagement, perseverance, and improved performance. Therefore, in order to create effective tactics that encourage mathematical competence and confidence in students, educators must look at the relationship between students' attitudes and their mathematical achievement.

However, there are two primary aspects of attitudes toward mathematics. One is that opinions about mathematics are probably multifaceted and difficult to quantify using a grade, score, or number. Additionally, attitudes about mathematics are likely to influence future learning, and experiences with mathematics will influence attitudes toward mathematics. In

essence, an individual's attitude is a tendency that frequently shapes his or her thoughts, feelings, and behaviors in relation to the psychological event. The sum of the cognitive, affective, and behavioral components is the attitude's power. According to Bhowmik and Banerjee (2016), attitude is a mental, emotional, and behavioral reaction against a person's pretensions that are based on him and any objects in his environment, as well as on a societal issue, an item, or an experience in opposition to an incident, knowledge, sentiment, or motive.

Teachers have focused a lot of attention on students' attitudes about mathematics (Chen et al., 2018; Goldin et al., 2016). According to Kiwanuka, et al. (2020) and Mullis et al. (2020), students who have a positive attitude toward mathematics are more likely to prioritize the subject, enjoy it, and have confidence in it. This could result in high performance in the subject (Guo et al., 2015; Wigfield et al., 2016). Some researchers have found a nonsignificant correlation between students' attitudes toward mathematics and their mathematical achievement, while others have found a positive relationship (Chen et al., 2018; Dowker et al., 2019; Guo et al., 2015; Lipnevich et al., 2016).

Furthermore, performance in mathematics is still a major problem on a local, national, and worldwide level. Since other essential courses have been found to outperform mathematics in international evaluations like the Program for International Student Assessment (PISA), student performance in mathematics is showing a downward trend across all countries. Improving pupils' mathematics skills is difficult in many countries since it affects their future potential to succeed in the workforce and contribute to the economy. Because many pupils are unable to meet the necessary threshold, students' competence levels in mathematics continue to fall short of the target based on results from standardized national tests (Organization for Economic Cooperation and Development, 2023).

The issues related to this study include learners' involvement and success in mathematics are hampered by negative attitudes including anxiety, fear, and poor self-confidence. Math anxiety affects a lot of learners, which causes them to avoid it and perform poorly (Hwang & Son, 2021; Lipnevich, 2016). Learners who do not perceive how mathematics is relevant or beneficial in everyday life are more likely to be disinterested in the subject, which lowers their motivation and performance. However, understanding the importance of arithmetic improves students' attitudes and performance (Etcuban et al., 2023). Negative opinions of mathematics are exacerbated by rigid curricula and a dearth of interesting, interactive education. To enhance attitudes and performance, research suggests learner-centered methods and techniques for boosting confidence (Asian Journal of Advanced Research and Reports, 2025).

Gaps of the study include relatively few research have looked at the particular dynamics of attitudes and accomplishment in lower primary grades, such as Grade 3, when core math skills are established. The majority of studies concentrate on secondary or higher grade levels (Mazana et al., 2025; Ciftci et al., 2019). Although a lot of research shows that attitude and achievement are positively correlated, the effect sizes differ, and little is known about the underlying mediating elements, such motivation and instructional strategies, for students in Grade 3 (Hadi et al., 2023). Also, practical insights into what works best at this point are limited because few research initiatives have examined tailored interventions to promote attitude and achievement specifically for Grade 3 learners (Ngussa & Mbuti, 2017).

By offering concrete data on how students' positive or negative attitudes affect their mathematical performance, the study on the attitude toward and mathematical accomplishment of third-grade learners makes a substantial contribution to the Department of Education's research program. It emphasizes that students who have a good attitude toward mathematics are more likely to succeed academically, which supports programs that boost affective and motivational variables in early mathematics education (Chen, 2018; Dowker, 2019). This supports the Department's mission to improve learning outcomes through focused interventions that encourage positive attitudes and engagement in mathematics beginning at the elementary level, thereby raising the standard of basic education. Additionally, the results can guide initiatives for curriculum creation, teacher training, and family participation that seek to create nurturing environments that improve early learners' attitude and academic performance (Wigfield & Eccles, 2000; Lipnevich et al., 2016).

At Aritao Central School, most of the Grade 3 learners have poor attitude and achievement in Mathematics as indicated in the recently conducted first quarter examination. Further, the proponent often hear the learners say "Makapasadot no Math nagrigat met"; "Math matmaturrog met"; "Numbers met nga kanayun, no Math makapaturog nga talaga"; and many more. In addition, the grade III learners in Aritao Central School have least mastered skills in Mathematics based from the result of the second quarter examination primarily on properties of multiplication on tables, multiplying numbers with and without regrouping and solving 1-2 step multiplication problems, including money problems. Learning interventions were given to the pupils like activity sheets but still they lack mastery on these competencies.

Hence, this study is hereby proposed.

Methodology

The research design for this study was quantitative, which is a collection of methods, approaches, and presumptions used to examine numerical patterns in order to investigate social, psychological, and economic phenomena (Creswell & Creswell, 2018). A significant amount of numerical data is gathered when performing quantitative research. The two primary goals of quantitative research are the generation of information and the comprehension of society. Communication scholars and other social scientists employ quantitative research to examine events or phenomena that have an impact on people. The goal of social science is to comprehend people. A sample population is a specific group of people about whom quantitative research can be done.

A systematic examination that focuses largely on quantifying behaviors, relationships, or occurrences through the collection and statistical analysis of numerical data is known as quantitative research. Through the use of structured procedures like surveys, experiments, or secondary data analysis, it seeks to measure variables, test hypotheses, and identify patterns or causal links. Quantitative research is crucial for subjects that need exact measurement and empirical validation because it prioritizes objectivity, replicability, and the use of tools that yield measurable and generalizable results (Creswell & Creswell, 2024).

A descriptive and correlational methodology were used in this investigation since the study aims to measure correlation of the attitude toward and achievement in mathematics of grade III learners. Descriptive and correlational research was used to ascertain how respondents' attitude toward and achievement in Mathematics relate to one another. Often referred to as descriptive research, descriptive technique is a study strategy that methodically observes, characterizes, and records the features of a population, phenomena, or circumstance without changing variables or elucidating causes. It provides what, where, when, and how answers, emphasizing exact depiction above why something happens. Further, correlational methodology was also used in the study. A non-experimental research strategy called correlational technique looks at the statistical link between two or more variables without changing them. In order to detect patterns like positive, negative, or no connection, it usually uses a correlation coefficient to assess the strength and direction of correlations. This approach aids in investigating probable connections in natural environments, but it is unable to prove causation because of numerous confounding factors according to Pubrica Academy (2025).

Results and Discussion

Respondents' level of attitude in terms of enjoyment in Mathematics, fear, anxiety and distress in Mathematics, and the use of Mathematics in everyday

Attitude Toward Mathematics	Mean	SD	Level
Enjoyment in Mathematics	3.06	0.49	Positive
Fear, Anxiety & Distress in Mathematics	2.80	0.67	Positive
Use of Mathematics in Everyday Life	3.12	0.67	Positive
Overall	2.99	0.36	Positive

Table 1. Level of Attitude Toward Mathematics of the Grade III Learners of Aritao Central School Toward Mathematics

Enjoyment in Mathematics. The finding described as a positive level of satisfaction in mathematics implies that, on average, respondents likely to agree that they like and enjoy learning mathematics rather than being neutral or negative about it.

Practically speaking, this degree of enjoyment is a reflection of a positive affective climate toward mathematics, which is frequently linked to increased participation in tasks, perseverance in the face of adversity, and openness to tough challenges.

A fundamental aspect of attitude toward mathematics is enjoyment, which is frequently paired with motivation, anxiety, perceived benefit, and confidence.

The research employing multidimensional attitude assessments consistently demonstrates that greater enjoyment ratings are negatively connected with anxiety and strongly and favorably correlated with confidence and the perceived worth of mathematics. Therefore, the finding of the study's positive score might be regarded as a sign that learners are more likely to feel confident, value mathematics, and feel less anxious or tense when they are studying it. This implies that the attitude toward Mathematics in terms of enjoyment in Mathematics of the grade III learners in Aritao Central School is positive.

The finding of the study is supported by Malque (2025). A 2025 study conducted in the Philippines on college students' attitudes toward mathematics found that most of them had positive attitudes, and that their interest and enjoyment of the subject were strongly correlated with their perceptions of their own abilities and the usefulness of math.

Fear, Anxiety and Distress in Mathematics. The table shows that the respondents' attitude toward Mathematics in terms of fear, anxiety and distress in Mathematics has a mean of 2.80 with SD of 0.67 which is described as positive.

The results show that respondents have a very favorable attitude toward mathematics, especially when it comes to dread, worry, and despair. This suggests that participants generally feel a lot of these positive emotions while interacting with the topic. A positive level of attitudes under fear, anxiety and distress in mathematics indicates that the respondents are able to maintain favorable perceptions, willingness, or motivation despite experiencing peer or anxiety toward mathematics. The finding implies that the grade III learners in Aritao Central School are not bored in Mathematics, that the respondents love their Mathematics subjects. It indicates further that these grade III learners in Aritao Central School never experience negative emotions in math, aligning with descriptions of feeling bored and not enjoying the subject.

Finding of the study is contradicted by a 2024 Australian study which stated that math anxiety is characterized by a fear of tasks, and one-point increases in anxiety are associated with 18-point declines in PISA scores (one year's worth of learning); low-anxiety primary students demonstrated benefits from focused tutoring that decreased fear reactions (Centre for Independent Studies, 2024). Another contradicting study is the study of Gumilang (2025) which revealed a somewhat negative correlation with performance in a research of senior high school students, although good attitudes showed a slight positive correlation, highlighting the importance of emotional aspects in results.

The Use of Mathematics in Everyday Life. This means that the grade III learners at Aritao Central School exhibit a positive attitude toward using mathematics in daily life.

According to expectancy-value theory, which holds that perceived utility increases engagement, this data indicates that these 8-9-year-old learners value math's practical application, such as in shopping, time management, or games. Even though qualitative elements like instructor tactics might play a role, the low SD (0.67) indicates student agreement and suggests that real-world connections are consistently reinforced in the classroom. In contrast to abstract subscales where attitudes may decline, high everyday utility attitudes frequently predict persistent interest (Shah, 2025).

Recent research from the Philippines supports this trend. Basmayor (2024) discovered that although overall attitudes were neutral, Grade 11 students ranked the value of mathematics highest (positive) on the Attitude Toward Mathematics Inventory (ATMI), attributing this to awareness of daily and future applications. Despite having moderate overall attitudes, senior high school students in a 2025 study indicated high perceived usefulness, which was linked to improved performance through real-world attention.

Globally, ATMI subscales (which includes daily use) exhibit high correlations with accomplishment; for example, Klapp (2024) observed that positive attitudes increase the likelihood of math persistence, mediated by competence and enjoyment. Neutral-to-positive attitudes weakly influence performance, according to a 2025 correlational study, suggesting practical implications to combat anxiety.

Level of achievement of the respondents in Mathematics along properties of multiplication on tables, multiplying numbers with and without regrouping and solving 1-2 step multiplication problems, including money problems

Competency	Mean Score	MPS	Level
Properties of Multiplication on Tables	5.84	48.63	Satisfactory
Multiplying Numbers with and without Regrouping	3.94	39.38	Fairly Satisfactory
Solving 1-2 Step Multiplication Problems, including Money Problems	3.15	39.43	Fairly Satisfactory
Overall	12.93	43.09	Fairly Satisfactory

Table 2. Level of Achievement of the Respondents in Mathematics

This suggests that a large number of learners have not yet attained the multiplication proficiency level required for Grade III.

Properties of Multiplication on Tables has the highest mean (5.84) and MPS (48.63) of the three components, which is considered satisfactory. This indicates that learners are comparatively better at remembering or applying multiplication facts and fundamental properties (such as commutative and associative) than at more difficult tasks.

The fact that learners only perform reasonably well when multiplying numbers with and without regrouping (mean = 3.94; MPS = 39.43) indicates that they have trouble with carrying/borrowing and multi-digit processes, which are necessary for subsequent operations like division and multi-step problem solving.

It is also fairly satisfactory to solve one- to two-step multiplication word problems, including money problems (M= 3.15; MPS = 39.43). This indicates that learners struggle not only with fact recall but also with applying multiplication skills to contextualized situations and comprehending problem structures (e.g., equal groups, comparison, rate).

Overall, the pattern (lowest scores on multi-step/contextual tasks; highest scores on tables/properties) indicates that while education has resulted in a partial recall of multiplication facts, it has not yet guaranteed a thorough conceptual comprehension or adaptable application of multiplication in real-life situations.

Researchers noted that most of the learners still have difficulty in counting multiplication operations, with approximately 48% exhibiting poor automaticity, in a 2024 Philippine study on Grade 6 multiplication automaticity. They also underlined that a lack of fluency in fundamental facts impedes subsequent mathematical learning (Aper & Pangandaman, 2024).

Many Filipino elementary students have a very weak foundation in basic operations, particularly multiplication, according to Castañeda and Andres (2019). They also noted that inability to learn multiplication tables contributes to later difficulty in both multiplication and division.

Significant influence between the respondents' attitude in terms of enjoyment in Mathematics, fear, anxiety and distress in mathematics, and the use of Mathematics in everyday life and achievement in mathematic

Predictor	Estimate	SE	T	P
Intercept	5.38	3.855	1.40	0.166
Enjoyment in Mathematics	2.92	1.071	2.73	0.008
Fear, Anxiety and Distress in Mathematics	-2.41	0.720	-3.34	0.001
Use of Mathematics in everyday life	1.25	0.773	1.62	0.109

$R=0.516; R^2=0.266$

Table 3. Regression Coefficients for Predictors of the Achievement of the Respondents in Mathematics in the Linear Regression Model

Each coefficient (Estimate) represents the expected change in mathematics achievement score for a one-unit increase in that predictor (Likely Likert-scale attitude subscale), holding others constant. Intercept (5.38, $p = 0.166$): Baseline achievement when all predictors are zero—not statistically significant, so not reliably different from zero. Enjoyment in Mathematics (2.92, SE = 1.071, $t = 2.73$, $p = 0.008$): Significant positive predictor. A one-unit increase in subscale Enjoyment in Mathematics (e.g., enjoyment in mathematics) predicts a 2.92-unit rise in achievement. Fear, anxiety and distress in Mathematics (-2.41, SE = 0.720, $t = -3.34$, $p = 0.001$): Significant negative predictor. A one-unit increase in subscale fear, anxiety and distress in Mathematics (e.g., fear/anxiety/distress) predicts a 2.41-unit drop in achievement—strongest effect here. Use of Mathematics in everyday life (1.25, SE = 0.773, $t = 1.62$, $p = 0.109$): Positive but nonsignificant ($p > 0.05$), so no reliable evidence of effect (e.g., everyday use of math).

Hence, positive attitudes (Enjoyment in Mathematics) boost scores, while negative ones (Fear, anxiety and distress in Mathematics) hinder them, supporting targeted interventions like reducing math anxiety via DepEd-aligned activities (e.g., games, real-life applications). Nonsignificant E suggests everyday utility attitudes need stronger links or better measurement for Grade III learners.

The finding of the present study is supported by Garcia et al. (2020) citing that perceived competence and intrinsic motivation/enjoyment significantly raised math achievement by anticipated units per scale point, according to a hierarchical regression; anxiety was not significant, reflecting Enjoyment in Mathematics (positive, significant) vs. use of Mathematics in everyday life (nonsignificant).

Also, Li and Liu (2025) revealed that the perceived utility of math frequently fails significance after adjusting other attitudes, suggesting improved measurement/context for primary students while supporting the use of games and real-world tasks to reduce anxiety.

In addition to this, $R^2=0.266$ (26.6%) means that approximately one-quarter of the variability in pupils' mathematics achievement is accounted for by the predictors included, while about 73.4% is due to other factors not in the model or random error.

Hence, there is a significant influence between the respondents' attitude toward and achievement in mathematics. As a result, the null hypothesis is rejected.

Learning intervention can be developed in order to improve the attitude toward and achievement in Mathematics of the respondents

The results of this study have led to the construction of a contextualized learning intervention that focuses on improving the achievement level of the Grade III learners in Aritao Central School particularly on properties of multiplication on tables, multiplying numbers with and without regrouping and solving 1-2 step multiplication problems, including money problems.

The purpose of this learning intervention is to provide contextualized materials for the Grade III learners in order to enhance their achievement level in Mathematics. The learners may be given 10-minute activities since the learners are only in Grade III and the learners have short span of attention. Further, so that the learners will not be bored in answering the activity sheets.

Conclusion and Recommendations

The findings of the study led to the following conclusions:

1. Although the overall moderate-high mean indicates space for developing weaker aspects, Grade III learners in Aritao Central School exhibit largely favorable attitudes about mathematics, characterized by high enjoyment and everyday value coupled with minimal fear, anxiety and distress in mathematics.
2. The respondents demonstrated satisfactory mastery of multiplication properties on tables but only fairly satisfactory performance in multiplying numbers with/without regrouping and solving 1-2 step multiplication problems, including money problems. This suggests that the respondents need to improve their achievement in Mathematics.
3. Respondents' attitudes toward mathematics—encompassing enjoyment, fear, anxiety, distress, and perceived everyday relevance—significantly influenced their mathematics achievement.
4. A contextualized learning intervention was designed that focuses on improving the achievement level of the Grade III learners in Aritao Central School particularly on properties of multiplication on tables, multiplying numbers with and without regrouping and solving 1-2 step multiplication problems, including money problems.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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Appendices

No appendices are attached to this study.