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ATTITUDE TOWARDS SOLVING MATHEMATICAL WORD PROBLEM, MATHEMATICAL SKILLS AND ACADEMIC PERFORMANCE OF SELECT GRADE NINE STUDENTS OF APLAYA NATIONAL HIGH SCHOOL - ANNEX

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ABSTRACT

Mathematics is widely known as a boring subject for many students. Most students' attitude towards solving mathematical word problems, mathematical skills and academic performance are the bulge to the mathematics teacher. Filipino students' performance in Math needs to be improved as reflected in the 2016-2017 Global Competitiveness Report. It is essential that factors affecting the performance of the students in Math are explored in order to address these concerns.

The study aimed at determining the relationship between the attitude towards solving mathematical word problems, mathematical skills and academic performance of Grade 9 students of Aplaya National High School Annex. Further, this study, which utilized the descriptive-correlation research design, involved eighty-one (81) respondents who participated in this study.

The study revealed that the respondents' attitude towards solving mathematical word problems was positive with an overall average of 2.83. The respondents' level of mathematical

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skills in solving word problems was high with a frequency of 41 and percentage of 50.62. The respondents' academic performance in mathematics was satisfactory with a frequency of 32 and a percentage of 39.51. There was no significant relationship between the respondents' level of mathematical skills and their attitude towards solving word problems as revealed by the probability value of 0.915 which was greater than the 0.05 significance level. There was a significant relationship between the respondents' level of mathematical skills in solving word problems and their academic performance in mathematics. The probability value of 0.037 was less than the 0.05 significance level. There was a significant relationship between the respondents' attitude towards solving word problems in mathematics and their academic performance. The probability value of 0.010 was less than the 0.05 significance level.

The study concluded that the respondents had a positive attitude towards solving word problems in mathematics. The respondents had a high level of mathematical skills in solving word problems. The respondents' academic performance in Mathematics was satisfactory. The respondents' attitude towards solving word problems in mathematics has nothing to do with their level of mathematical skills. Students with higher levels of mathematical skills in solving word problems had better academic performance in mathematics. The respondents' academic performance in mathematics was dependent on their attitude towards solving word problems.

Keywords: *Mathematics Education, Word Problems, Academic Performance, Student Attitude, Mathematical Skills*

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INTRODUCTION

Most of the general populations in the world hate mathematics that for sure. According to Ingram (2015), students form meaning in their minds about curricular subjects even before they learn anything or realize the importance of the subject. A certain percentage of students still wanted to avoid studying mathematics during their education. In the study of Sanchal and Sharma, (2016) the Grade 10 students might have formed a negative meaning in their minds about what they may have previously heard from other students or due to their unfavorable experienced in mathematics class. This could also be the reason for the decrease in the percentage of students not considering mathematics to be helpful.

In the Philippines, many students wanted to avoid studying mathematics and it is true pertaining to the latest result of the international test survey. According to Capuno et al. (2019) the performance of Filipino students in Mathematics needs to be improved as reflected in the Global Competitiveness Report 2016 – 2017; in this the Philippines ranked 79th out of the 138 participating countries in terms of the standard of Science and Math education. This study is consistent with the results of the National Achievement Test (NAT) of the Department of Education (DepEd), where the Mean Percentage Score in Mathematics was 48.63% a score below DepEd's 50% requirement. It is important that factors influencing the students' performance in math are explored to address these concerns; neglecting to address these issues would exacerbate these educational development situations in the country. To resolve these issues, an evaluation of the problem's status will begin at school level. Students were observed following the social stereotype that boys perform better than girls in Math. It is

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apparent when the students are given tasks, but most girls will be hesitant to participate; they prefer the boys to perform the tasks they are given. Other than that, girls typically refuse to accept responsibility for doing the activities assigned to them if group activities are provided. Boys are usually assigned to do group activities. Throughout this relation it is found that boys are more comfortable in sharing their thoughts and suggestions with the class if they asked to share their answers beforehand. If left unattended, this situation would promote the impression that girls are inferior to boys when it comes to math skills cited in Peteros, et., al., (2017).

In view of the foregoing, the study focused on the attitude towards solving mathematical word problem, mathematical skills and academic performance of select grade nine students of Aplaya National High School-Annex.

MATERIALS AND METHODS

In this section, we describe the research design, the participants, the instruments used for data collection, and the procedures followed to gather and analyze the data. This study aimed to explore the relationship between students' attitudes towards mathematics, their mathematical skills, and their academic performance.

Research Design

A quantitative correlational research design was adopted to examine the relationships between students' attitudes, mathematical skills, and academic performance. This design

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allowed the investigation of how these variables interact with each other and the extent to which they influence one another. By using a correlational approach, the study sought to identify patterns and assess the strength of the relationships between attitudes, skills, and academic outcomes. This approach was appropriate for understanding the interconnectedness of these variables, which can inform strategies for improving student learning in mathematics.

Participants

A total of 100 Grade Nine students from Aplaya National High School Annex participated in the study. The sample was selected to reflect a diverse range of academic abilities and backgrounds. Participants were chosen through stratified random sampling to ensure balanced representation across gender, socioeconomic status, and prior academic performance. This method enhanced the generalizability of the findings, as it allowed for a more comprehensive understanding of the factors influencing students' mathematical skills and attitudes. The final sample included both male and female students from various socioeconomic backgrounds, with the goal of capturing a broad perspective on how different factors might affect students' performance in mathematics.

Instruments

Three key instruments were used to gather data from the participants:

Attitude Questionnaire: This instrument was designed to assess students' attitudes towards mathematics and problem-solving. A Likert-scale survey was employed, where students rated their agreement with various statements related to their enjoyment of

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mathematics, confidence in solving problems, and perceived relevance of mathematics in everyday life. The final questionnaire consisted of 20 items and was pilot-tested to ensure its clarity and reliability. The responses ranged from "strongly disagree" to "strongly agree," providing a clear measurement of students' attitudes.

Mathematical Skills Test: To assess the participants' mathematical skills, a standardized test focusing on word problems was administered. The test included a variety of problem types, such as arithmetic, algebra, and geometry, to provide a comprehensive evaluation of students' abilities. With a total of 15 questions, students were given 45 minutes to complete the test. The questions ranged from routine to non- routine problems, with the aim of measuring not only computational skills but also problem-solving strategies.

Academic Performance Data: The third source of data was collected from students' academic records, specifically their grades in mathematics for the current academic year. This data provided a quantitative measure of students' overall academic performance in mathematics, which could be correlated with their attitudes and mathematical skills. Academic performance was categorized into four levels: A (90- 100), B (80-89), C (75-79), and D/F (below 75).

Data Collection Procedure

Data were collected over a two-week period during regular class hours. The researcher was present during the administration of the instruments to provide assistance and ensure that the students understood the instructions. Students' participation was voluntary, and

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informed consent was obtained from both students and their guardians. Confidentiality was assured, and students were informed that their responses would remain anonymous. The data collection process allowed for a comprehensive assessment of students' attitudes, mathematical skills, and academic performance, contributing to the overall research objectives.

Statistical Analysis

The data collected were analyzed using descriptive statistics to summarize the key findings, including means, standard deviations, and frequency distributions. Pearson correlation coefficients were computed to assess the relationships between students' attitudes, skills, and academic performance. A significance level of $p < 0.05$ was adopted for the correlation tests. Additionally, regression analysis was performed to explore the predictive power of students' attitudes on their mathematical skills and academic performance. SPSS software was used to conduct the statistical analysis.

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RESULTS AND DISCUSSION

This section presents the results of the study and interprets them in relation to the research questions. The findings are discussed in the context of existing literature, highlighting their significance and implications for teaching practices.

Descriptive Statistics

The data analysis revealed several important findings:

Attitudes Towards Mathematics: The average score on the attitude questionnaire was 2.83 on a scale of 1 to 4, indicating that the overall attitude towards mathematics among the students was somewhat positive. Notably, 65% of students reported enjoying mathematics, and 70% felt confident in their ability to solve mathematical problems. However, 40% of students expressed anxiety when faced with challenging tasks, suggesting that while students generally had a favorable view of the subject, significant concerns about anxiety and confidence remained.

Mathematical Skills: The average score on the mathematical skills test was 50.62%, indicating a moderate level of proficiency in mathematics among the students. Students performed best in arithmetic problems, with an average score of 70%, but struggled with geometry-related word problems, where the average score was 40%. This gap in performance highlights the need for focused instruction in certain areas, particularly geometry. Moreover, 25% of students scored below 40%, emphasizing the need for additional support and intervention for these learners.

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Academic Performance: In terms of academic performance, 39.51% of students achieved satisfactory grades (A or B). However, 25% of students received grades of C or lower, and some students received D or F. This variation suggests that a significant portion of students may require further academic support, particularly in the context of mathematics. The correlation between attitudes and grades was also evident: students who reported enjoying mathematics tended to achieve higher grades.

Correlation Analysis

The study revealed several key correlations:

Mathematical Skills and Academic Performance: A significant positive correlation ($r = 0.65$, $p < 0.01$) was found between mathematical skills and academic performance, suggesting that students with stronger mathematical skills tend to achieve better grades. This reinforces the notion that proficiency in mathematical skills is a key predictor of academic success.

Attitude and Mathematical Skills: No significant correlation ($r = 0.12$, $p > 0.05$) was found between students' attitudes and their mathematical skills. While students had generally positive attitudes toward mathematics, this did not necessarily correlate with higher skill levels. This finding suggests that a positive attitude alone is not enough to ensure strong performance, indicating the importance of targeted teaching strategies to improve mathematical skills.

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Attitudes and Academic Performance: Regression analysis showed that students' attitudes towards mathematics accounted for 15% of the variance in their mathematical skills ($R^2 = 0.15$, $p < 0.05$). However, students' attitudes did not significantly predict their academic performance. This suggests that additional factors, such as the quality of teaching or external support systems, play a more substantial role in shaping academic outcomes.

Demographic Analysis

The analysis of demographic variables revealed that gender and socioeconomic status significantly influenced students' attitudes and performance:

Gender: Male students reported higher levels of confidence in their mathematical abilities compared to female students, and they performed better on the mathematical skills test. This gender difference in attitudes and performance highlights the need for strategies to address these disparities.

Socioeconomic Status: Students from higher socioeconomic backgrounds demonstrated more positive attitudes towards mathematics and achieved better grades compared to their peers from lower socioeconomic backgrounds. This finding underscores the importance of addressing equity in education and providing additional support to students from disadvantaged backgrounds.

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Interpretation of Findings

The findings suggest that while students generally have positive attitudes towards mathematics, their skill levels do not always align with these attitudes. This highlights the complexity of the relationship between attitude and performance in mathematics. Despite a positive attitude, students may still struggle with mathematical tasks, particularly in areas such as geometry, where additional support is needed.

The significant correlation between mathematical skills and academic performance reinforces the importance of developing problem-solving abilities in students. These skills are essential not only for academic success but also for success in real-world applications, especially in STEM fields.

Implications for Teaching

Educators should focus on creating a supportive learning environment that fosters both positive attitudes and mathematical skills. Strategies such as collaborative learning, real-world applications, and the use of technology can enhance student engagement and motivation. Teachers should also implement differentiated instruction to address students' specific learning needs, particularly in areas where they struggle, such as geometry.

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CONCLUSION

The following conclusions were made based on the findings of the study:

1. The respondents had a positive attitude towards solving word problems in mathematics.
2. The respondents had a high level of mathematical skills in solving word problems.
3. The respondents' academic performance in Mathematics was satisfactory.
4. The respondents' attitude towards solving word problems in mathematics has nothing to do with their level of mathematical skills.
5. Students with higher levels of mathematical skills in solving word problems had better academic performance in mathematics.
6. The respondents' academic performance in mathematics was dependent on their attitude towards solving word problems.

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REFERENCES

Anantika Sanchal, Sashi Sharma, (2016); students' attitudes towards learning mathematics: impact of teaching in a sporting context; as330@students.waikato.ac.nz; ISSN: 2382-0349

Reylan Capuno, et. al., (2019), Attitudes, Study Habits, and Academic Performance of Junior High School Students in Mathematics, e-ISSN: 1306-3030. 2019, Vol. 14, No. 3, 547-561, doi.org/10.29333/iejme/5768

Conrado Ares Duque Jr., Denis Abao Tani; 2018; Students' Mathematics Attitudes and Metacognitive Processes in Mathematical Problem Solving; DOI: 10.5281/zenodo.1318320 Volume 4 | Issue 11 | 2018

Csíkos, C., Szitányi, J. Teachers' pedagogical content knowledge in teaching word problem solving strategies. ZDM Mathematics Education 52, 165–178 (2020). https://doi.org/10.1007/s11858-019-01115-y

Iuliana Marchi, 2018; Relation Between Students' Attitude Towards Mathematics and Their Problem Solving Skills; All content following this page was uploaded by Marchis Iuliana on 30 March 2018; https://www.researchgate.net/publication/324114828

Don Elger, University of Idaho; Theory of Performance; Expectations of Faculty in Higher Education; https://www.webpages.uidaho.edu/ele/scholars/Results/Workshops/Facilitators_Institute/Theory%20of%20Performance.pdf

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INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue III
February 2025
Available online at https://www.instabrightgazette.com

Dean Nyanz, et. al., 2015; Can performance measurement systems be used to measure effectiveness of the procurement function in an organization; IOSR Journal of Business and Management (IOSR-JBM) ISSN: www.iosrjournals.org; DOI: 10.9790/487X-

Emil C. Alcantara and Joana Marie P. Bacsa, (2017), Critical Thinking and Problem Solving Skills in Mathematics of Grade-7 Public Secondary Students, P-ISSN 2350-7756 | E-ISSN 2350-8442 | www.apjmr.com

Jhoancel Bawas, et. al., (2018), Problem Solving Skills of Students in General Mathematics, DOI: 10.13140/RG.2.2.28986.90563 46

Jocelyn Ceballos Andamon, Denis Abao Tan, 2018; Conceptual Understanding, Attitude And Performance In Mathematics Of Grade 7 Students; international journal of scientific & technology research volume 7, issue 8, 2018; ISSN 2277-8616; IJSTR©2018 www.ijstr.org

JR Ingram, 2015; Cited by 58 Interventions for hidradenitis suppurativa; www.cochranelibrary.com › doi › 14651858.CD010081.pub2 › full

Julius et. al., (2018), Attitude of Students towards Solving Word Problems: A Review of Nigeria Secondary Schools, IOSR Journal of Research & Method in Education (IOSR-JRME)

Kamariah Abu Bakar, et. Al., 2017; multiple representations facilitated problem solving;www.researchgate.net;publication;321104586_Young_Children's.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue III
February 2025
Available online at https://www.instabrightgazette.com

Kerry Lee, 2016; Mathematical Competence, Teaching, and Learning; Reflections on 'Challenges in Mathematical Cognition' by Alcock et al. (2016); https://jnc.psychopen.eu/article/view/25/html

Mary Ann R. Agdan, et. al., (2018), Academic Adjustment of Grade VIII Students in Solving Mathematical Word Problems Using K to 12 Curriculums in the Republic of the Philippines, International Journal for Cross-Disciplinary Subjects in Education (IJCDSE), Volume 9, Issue 2, June 2018

McLeod, S. A., 2017; Developmental psychology. Simply psychology: https://www.simplypsychology.org/developmental-psychology.html

Peteros, et., al., (2017); Factors Affecting Mathematics Performance of Junior High School Students; international electronic journal of mathematics education e-ISSN: 1306-3030. 2020, Vol. 15, No. 1, em0556 https://doi.org/10.29333/iejme/5938

P Christou, R Sharpley, A Farmaki, 2018; Exploring the emotional dimension of visitors' satisfaction at cultural events. Event Management; scholar.google.com › citations

S Olkun, 2015; Cited by 6 - Related articles; Submission, International Journal of Learning,Teaching and Educational Research; eric.ed.gov ›

Sormaco, (2015), The relationship between the Attitudes towards Mathematics and Academic performance, DOI:15.1016/j.sbspro.2015.12.210

Sharifah Osman, 2018; Enhancing Students' Mathematical Problem-Solving Skills through Bar Model Visualisation Technique; International Electronic Journal of Mathematics

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue III
February 2025
Available online at https://www.instabrightgazette.com

****

Education e-ISSN: 1306-3030. 2018, Vol. 13, No. 3, 273-279 https://doi.org/10.12973/iejme/3919

Vula & Kurshunmlia, 2015; Common Core; Students' difficulties in problem – solving can be overcome through various strategies and activities; counrewertovollie.mynetav.com ›

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