

The Correlation Between Students Study Habits and Their Mathematical Problem-Solving Skills

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Abstract

Social arithmetic, which involves practical applications of mathematical concepts in everyday life, plays a crucial role in developing students' problem-solving skills. This study examines the relationship between students' study habits and their ability to solve mathematical problems in social arithmetic among seventh-grade students at Nidaa Al Haar Middle School, Bekasi, during the 2023-2024 academic year. A quantitative approach with correlational survey methods was used, involving a sample of 30 students selected through cluster random sampling. Data were analyzed using both descriptive and inferential statistics. The findings show a positive correlation between study habits and problem-solving abilities. This indicates that students with better study habits tend to perform better in mathematical problem-solving tasks, particularly in social arithmetic. The results highlight the importance of fostering effective study habits to improve students' mathematical skills.

Keywords: Learning independence, problem solving ability, relationships

1 INTRODUCTION

Education is considered a crucial aspect of human resource development. High-quality education not only encompasses academic achievement but also the ability to solve problems. In this context, mathematics plays a vital role as a foundational science that supports critical and analytical thinking in both daily life and academic settings. According to Riyanto (2020), "mathematics plays an important role in building students' logical and analytical thinking frameworks, which are essential in various aspects of life."

Mathematical problem-solving requires systematic steps, including understanding the problem, planning a solution, implementing the plan, and evaluating the results. This is crucial as it helps students face complex challenges in their lives. However, field observations show that problem-solving abilities in social arithmetic at Nidaa Al Haar Middle School in Bekasi are still low. Many students struggle to develop solutions for complex mathematical problems. According to the Indonesian Ministry of Education Regulation No. 24 of 2016, "one of the main challenges in mathematics education is the low ability of students to solve problems that require critical and analytical thinking."

One key factor believed to influence this ability is students' study habits. Good study habits, such as regular study time, effective methods, and consistency in studying, can improve students' understanding of the material and their overall academic performance. According to Wulandari (2021), "good study habits have a direct impact on improving academic performance, including in mathematics."

This research aims to investigate whether there is a positive relationship between students' study habits and their mathematical problem-solving abilities in social arithmetic. Based on the problem identification, the question arises whether poor study habits hinder

mathematical problem-solving and if there is a significant relationship between study habits and problem-solving skills.

To focus the study, the research is limited to social arithmetic material taught in the second semester of the 2023/2024 academic year for seventh-grade students at Nidaa Al Haar Middle School in Bekasi. Based on the problem identification and limitations, the main research question is: "Is there a positive relationship between students' study habits and their mathematical problem-solving abilities in social arithmetic at Nidaa Al Haar Middle School?"

This research is expected to contribute theoretically by enriching the understanding of the relationship between study habits and mathematical problem-solving abilities. Practically, the results are expected to provide valuable input for teachers to improve teaching methods in mathematics and help students develop more effective study habits for solving mathematical problems.

2 RESEARCH METHODS

This research was conducted at Nidaa Al Haar Middle School, located at Jl. Rawa Gede No. 55, Jatimelati, Pondok Melati District, Bekasi City. The study employed a survey method with correlational analysis techniques, which aim to determine the relationship or influence between two or more variables. The research approach used is quantitative, relying on statistical data to analyze the relationships between variables (Creswell, 2014).

The study sought to investigate the relationship between students' study habits and mathematical problem-solving abilities in social arithmetic material in the seventh-grade class at Nidaa Al Haar Middle School. The sampling technique used was Cluster Random Sampling, which ensures that the sample represents the entire population (Fraenkel & Wallen, 2012). The instruments used included a questionnaire to measure students' study habits and a test consisting of essay questions to evaluate their mathematical problem-solving abilities.

Data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to describe the characteristics of the data, including the lowest and highest scores, mean, median, mode, standard deviation, and variance. Inferential statistics included hypothesis testing through normality and linearity tests, as well as correlation coefficient analysis, significance testing (t-test), and effect size (Howell, 2013).

3 RESULT AND DISCUSSION

Education plays a vital role in developing problem-solving abilities, with mathematics being key to fostering critical thinking skills. Observations at Nidaa Al Haar Middle School, Bekasi, indicate that students face difficulties in solving complex problems in social arithmetic. Effective study habits are believed to significantly impact their mathematical problem-solving skills. This research investigates the correlation between study habits and students' ability to solve mathematical problems in social arithmetic.

3.1 Students Study Habits

Study habits are consistent, repetitive behaviors in the learning process, encompassing how students manage their time, environment, and strategies to achieve optimal learning outcomes. Study habits involve not only cognitive aspects but also discipline, motivation, and effective time management skills. According to Purwanto (2020), "good study habits significantly influence the effectiveness of the learning process and students' academic performance". Moreover, consistent study habits are considered a crucial factor in shaping positive attitudes towards learning and academic achievement (Rahmawati, 2019).

Based on the questionnaire data, the scores for the study independence variable showed a wide range, with the lowest score being 45 and the highest reaching 76. The average score, or mean, was calculated at 60.13, indicating a moderate level of study independence among the participants. The data also revealed a variance of 50.67, suggesting a noticeable spread in the individual scores. Additionally, the standard deviation was 7.12, highlighting the degree of variation from the mean, which reflects a diverse range of study independence behaviors among the students surveyed. Smith (2021) also emphasizes that well-established study habits provide a structured approach to learning, which enhances students' ability to absorb information and retain it over the long term, leading to better academic success.

Mathematical problem-solving ability refers to an individual's capacity to understand, analyze, and find solutions to problems related to mathematical concepts. This process involves steps such as comprehending the problem, planning a solution strategy, implementing that strategy, and evaluating the final outcome. According to Polya (2019), "mathematical problem-solving ability encompasses the use of mathematical knowledge and skills to solve non-routine problems and apply appropriate strategies at each stage of the solution". Furthermore, this ability is crucial in supporting the development of students' critical and analytical thinking skills as they face various situations that require mathematical solutions (Suryadi, 2020).

The results of the study revealed that the highest score was 87, while the lowest score recorded was 41. The average score, or mean, was calculated at 61.67, indicating a moderate level of performance among the participants. Additionally, the variance was determined to be 6.73, suggesting a relatively low level of dispersion in the scores. The standard deviation was found to be 13.27, highlighting the extent to which individual scores varied from the mean, which reflects a diverse range of mathematical problem-solving abilities among the students assessed.

3.2 Mathematical Problem-Solving Skills

Mathematical problem-solving ability refers to an individual's capacity to understand, analyze, and find solutions to problems related to mathematical concepts. This process involves steps such as comprehending the problem, planning a solution strategy, implementing that strategy, and evaluating the final outcome. According to Polya (2019), "mathematical problem-solving ability encompasses the use of mathematical knowledge and skills to solve non-routine problems and apply appropriate strategies at each stage of the solution". Furthermore, this ability is crucial in supporting the development of students' critical and analytical thinking skills as they face various situations that require mathematical solutions (Suryadi, 2020).

Johnson (2021) also suggests that mathematical problem-solving is not only a skill but a mindset, requiring students to approach challenges with persistence and adaptability, which are essential for lifelong learning.

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3.3 The Correlation Students Study Habits and Mathematical Problem Solving Skills

From the Lilliefors table calculations, L_{count} is 0.152, while L_{table} for $n = 30$ with a significance level of 0.05 is 0.161. $L_{count} < L_{table}$ then it can be concluded that the data for variable X is distributed.

From Liliefors table calculations, L_{count} is 0.126, while L_{table} for $n = 30$ with a significance level of 0.05 is 0.161. $L_{count} < L_{table}$ then it can be concluded that the data for variable Y is normally distributed.

Table 1. Normality Test Table for Variable X and Variable Y

Variable	N	α	L_{count}	L_{table}	Keputusan
X	30	0,05	0,152	161	H_0 accepted
Y	30	0,05	0,126	161	H_0 accepted

3.3.1 ANAVA Test

A simple linearity test was created to determine the distribution of the two data. Done using simple linear regression ANAVA

Table 2. ANAVA Test Table for Variable X and Variable Y

Source	JK	Dk	Rk	F obs	F a	Information
Regression	1463,94	1	1463,94			
Tuna is Suitable	2612,873	18	145,159	1,412	2,41	$F_{obs} < F_a$
Pure Error	1027,857	10	102,786			
Total	5104,67	29				Linear

From Table 2, the value $F_{count} = 1.412$ and $F_{table} = 2.41$ is obtained because F_{count} is less than F_{table} ($F_{count} = 1.412 < F_{table} = 2.41$), so it can be said that the relationship between Study Habits and Mathematical Problem Solving Ability in Social Arithmetic Material is patterned. linear.

3.3.2 Correlation Significance Test

Hypothesis testing uses Pearson product moment correlation. This analysis is needed to find out whether there is a positive relationship between variable

Calculation of the Significant Correlation Test is used to determine whether there is a significant influence between Variable Then $t_{count} > t_{table}$ ($3.3904 > 1.701$). So it can be concluded that there is a significant influence between variable X and variable Y.

Table 3. Correlation Significance Test Table

N	α	t_{count}	t_{table}	Decision
30	0,05	3,3904	1,701	H_0 accepted

3.3.3 Hypothesis test

Hypothesis test calculations using Pearson's Product Moment Correlation obtained a value of $r_{xy} = 0.5395$. By looking at the interpretation of the correlation coefficient which is quite strong, it can be concluded that there is a positive relationship between student study habits and mathematical problem solving abilities in social arithmetic material in class VII SMP. Nidaa Al Haar Bekasi. So it can be interpreted that the higher the student's learning independence, the higher the score in the Social Arithmetic material.

Study habits are an important foundation in developing mathematical problem solving abilities. According to research, students who have good study habits, such as discipline,

perseverance, and effective time management, tend to have better problem-solving abilities than students who are less disciplined in their studies. Regular study habits enable students to better understand mathematical concepts, so they are better prepared to face challenges that require problem solving. This problem solving ability is not only the main goal in learning mathematics, but is also an important skill in everyday life. With good study habits, students can develop the critical and analytical thinking skills needed to solve complex and non-routine mathematical problems.

Thus, it can be concluded in this study that there is a positive relationship between students' study habits and mathematical problem solving abilities in the topic of social arithmetic.

4 CONCLUSION

Based on the analysis of the research results, it can be concluded that "There is a positive relationship between students' study habits and their mathematical problem-solving abilities in social arithmetic material." This finding aligns with research conducted by Rahmadani et al. (2018), which demonstrated that students with consistent study habits exhibited better performance in mathematical problem-solving compared to those with less structured study routines. Similarly, the study by Wijaya et al. (2019) supported these results, showing that students who regularly review lessons and engage in active learning are more proficient in problem-solving tasks.

In addition, Putra et al. (2020) found that good study habits, including time management and consistent practice, contribute significantly to higher achievements in mathematics, particularly in solving complex problems like those encountered in social arithmetic. This pattern was also reflected in earlier studies by Kartika (2017) and Sudrajat (2016), which indicated that students who adopt positive study habits not only enhance their understanding of mathematical concepts but also improve their ability to apply these concepts in real-life situations.

These results further highlight the importance of fostering positive study habits among students as a strategy for improving their mathematical problem-solving abilities, particularly in subjects like social arithmetic.

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