

Remedial Program and Students' Performance Level in Solving Mathematical Problems

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Abstract

Many high school students find it very challenging to solve mathematical problems. Many students have reached high school without mastering the necessary skills in solving simple word problems. This study primarily aimed to determine the effects of the remedial program on the performance level of Grade 7 students in solving mathematical problems. A pre-experimental research design was utilized in this study using 33 purposively selected Grade 7 students as respondents. The researcher used a standardized examination tool in determining the performance level of the students. Based on the findings, most of the students had a very poor performance level in solving mathematical problems before the conduct of the remedial program, and most of them still had a poor performance after the program. However, findings revealed that there was a significant difference between the performance levels of the students in solving mathematical problems before and after the conduct of the program which implied that there was a significant increase in the performance level of the students after the program. Moreover, there was a significant relationship between the performance level of the students in solving mathematical problems after the program and their attendance in the program.

Keywords: remedial program; solving mathematical problems

INTRODUCTION

Mathematics Education in the Philippines has been one of the major concerns of the Department of Education (DepEd). According to Imam, Mastura, and Jamil (2013), DepEd attributed this issue to students' poor reading comprehension. This poor performance of the students in Mathematics has been evident in the local, national, and international assessment results. According to Ramirez et. al. (2013), Mathematics is commonly perceived as a difficult subject and students avoid solving mathematical problems. With the reasons stated above, it is only just and proper that the Mathematics teachers must make ways for students to gain mastery of all the learning competencies in Mathematics. One of these competencies is solving mathematical problems. This is in adherence to the mandate of the Department of Education, through the DepEd Order No. 27, series of 2005, that all public high schools must organize and provide remedial instruction programs to increase the chances that all students complete high school with sufficient mastery of the subjects.

All public high schools in the country must conduct intervention programs and initiate innovative strategies to remediate students who have poor academic performances in different subject areas. Students must not only have the right to approach Mathematics equally but they must also learn and understand Mathematics equally. Moreover, teachers must ensure that all students are given equal education, not neglecting those who need more attention (Yang et. al.,2013).

In a study conducted by Foshee, Elliot, and Atkinson (2016), findings showed successful remediation to incoming college students. Their intervention had a positive and statistically significant effect on students' learning and academic competence in Mathematics. Khazanov (2011) also found out in his study that peer mentoring and tutoring improved the performance and the retention rate in a remedial Mathematics course.

On the other hand, based on the study conducted by George (2012), the majority of the students in remedial Mathematics were not remediated successfully. This failure in the intervention raised the question of motivation. He suggested that students must be directly compelled to actively participate in the remedial class. However, he mentioned that it could negatively affect student autonomy, which has a positive factor in education.

Since many high school students had very poor performance levels in Mathematics, especially in solving mathematical problems, the researcher tried to determine whether the remedial program has a significant effect on the performance level of the Grade 7 students. Also, the researcher tried to emphasize the importance of remedial programs. Hence, it could serve as a basis for the strict implementation of the conduct of remedial programs in schools to ensure that the students are learning and to improve the quality of Mathematics education.

Statement of the Problem

This study primarily aimed to determine the effects of the remedial program on the students' performance level in solving mathematical problems. Specifically, it sought to answer the following questions:

1. What is the performance level of the Grade VII students before the remedial program?
2. What is the performance level of the Grade VII students after the remedial program?
3. Is there any significant difference between the performance levels of the students in solving mathematical problems before and after the remedial program?
4. Is there any significant relationship between the performance level of the students in solving mathematical problems after the remedial program and their attendance in the program?

Research Hypothesis

This study was guided by the following null hypotheses:

1. There is no significant difference between the performance levels of the students in solving mathematical problems before and after the remedial program.
2. There is no significant relationship between the performance level of the students in solving mathematical problems after the remedial program and their attendance in the remedial program.

Significance of the Study

The result of this study is important to the following groups of people:

To parents, this research will help them motivate their children to attend their classes. This study will also encourage them to support their children in deepening and strengthening their knowledge, understanding, skills, and mastery in solving mathematical problems. They could also be enlightened on the influence of some factors on the academic well-being of their children.

To teachers, the findings of this study will help them be enlightened to give more time to students to help them cope with the competencies to master. This way they can devise more creative ideas or concepts that could help deepen and strengthen the knowledge, understanding, and skills of the students towards Mathematics.

To school heads and guidance counselors and coordinators, the findings of this research will help them devise school-level plans and programs to address this problem of students' low performance towards solving mathematical problems.

METHODOLOGY

This study used a pre-experimental research design. It generated information and described the performance level of the Grade 7 students in Ligaya High School before and after the conduct of the remedial program which took seven days of one-hour sessions.

Scope and Delimitation

This study was focused on the remedial program and its bearing on the performance level of the students towards solving mathematical problems. The respondents of the study were the Grade 7 students of Ligaya High School in the Division of General Santos City for School Year 2016-2017.

Definition of Terms

For a clearer understanding of this research work, the following terms were functionally defined:

Attendance refers to the number of days the students attended and participated in the remedial program.

Numeracy refers to the ability of the students to understand and to work with numbers.

Performance Level refers to the scores of the students in the standardized test.

Remedial Program is an instructional program designed for students in high school who have identified deficiencies in Mathematics. It provides support for the current curriculum.

Sampling of Respondents

The sampling technique that was utilized was purposive sampling. The respondents were selected purposively since there were only two sections of Grade 7 learners in Ligaya High School. Also, it was because the students have already been identified to be having difficulty in solving mathematical problems.

Respondents of the Study

The respondents of the study were 33 Grade 7 students of Ligaya High School in the Division of General Santos City.

Data Gathering Procedure

The researcher first sought the permission of the principal of the school and the approval of the Schools Division Superintendent of the Division of General Santos City to conduct the study. After the approval was granted, a pre-test was then conducted to Grade 7 student-respondents before the remedial program. The post-test was conducted on Grade 7 student-respondents immediately after the program. The data were then tabulated and were analyzed.

Research Instrument

This research used a standardized examination tool that was taken from the Department of Education, Division of General Santos City. This standardized examination tool was used to ensure the validity of the test.

Data Analysis

In analyzing the data, frequency distribution, percentage distribution, Paired t-test, and Pearson Product Moment Coefficient of Correlation were utilized.

In interpreting the test scores of the students before the remedial program, the following scale was utilized:

Test Scores	Description
17-20	Excellent
13-16	Very Good
9-12	Good
5-8	Fair
1-4	Poor
0	Very Poor

RESULTS AND DISCUSSION

This section presents the presentation, analysis, and interpretation of the data gathered. The results of the study are presented according to the sequence of the problems set in this study.

The first research problem deals with the performance level of Grade 7 students before the remedial program. Table 1 is presented as follows:

Table 1
Performance Level of Grade VII Students Before Remedial Program

Description	Test Scores	Frequency (<i>f</i>)	Percentage (%)
Excellent	17-20	0	0
Very Good	13-16	0	0
Good	9-12	0	0
Fair	5-8	0	0
Poor	1-4	7	21.21
Very Poor	0	26	78.79
Total		33	100.00

Table 1 reveals that the majority (78.79%) of the students got zero in the standardized pre-test. Only 7 (21.21%) among 33 Grade VII students got scores of 1 to 4. This shows that the performance level of the Grade VII students in solving mathematical problems before the remedial program is very poor. This implies that the students needed remediation on solving mathematical problems.

The second research problem deals with the performance level of Grade VII students after the 7-day remedial program. Table 2 is presented as follows:

Table 2
Performance Level of Grade VII Students After Remedial Program

Description	Test Scores	Frequency (<i>f</i>)	Percentage (%)
Excellent	17-20	0	0
Very Good	13-16	0	0
Good	9-12	0	0
Fair	5-8	1	3.03
Poor	1-4	27	81.82
Very Poor	0	5	15.15
Total		33	100.00

Table 2 reveals that after the conduct of the 7-day remedial program, the majority (81.82%) of the students got scores of 1 to 4 in the standardized post-test. There was a minimal increase in the

performances level of the Grade 7 students and there were still 5 students who got a score of zero in the standardized post-test. After the remedial program, the performance level of the majority of Grade 7 students in solving mathematical problems was still poor. The 5 students who still got a score of zero needed more time in remediation since there were times that they were not able to attend the said remedial classes.

It was therefore evident that as the remedial program was conducted, the scores of most of the students increased in just a short period of implementation of the program. This could mean that as the remedial program will continue, the performance level of Grade 7 learners in solving mathematical problems will also continue to significantly increase. It also proves that it is not impossible to upraise the performance level of the learners in solving standardized mathematical problems.

During the conduct of the remedial program, the researcher had observed that the students had to be motivated for them to give interest in the program. This means that many high school students were not that interested much in solving mathematical problems. Since they have already been bombarded with lots of requirements in all their subject areas and most of them are not mathematically inclined, they found it wearisome and a burden to attend the program. They were only encouraged when they were told that a reward will be given to them if they would get a high score. However, peer-sharing and peer-tutoring somehow helped the students during the remedial program.

The same issue was found out by George (2012) in his research. A significant majority of the students did not improve well in the remedial instructions. He argued that student autonomy must be considered when choosing interventions or strategies through which students are motivated for achievement. According to him, student autonomy is a positive factor in education.

The T-test Results

The third research problem inquires if there is a significant difference between the performance levels of the students in solving mathematical problems before and after the remedial program.

Table 3 below is presented to answer the question.

Table 3
The Results of T-Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pretest - PostTest	-1.36364	1.16775	.20328	-1.77770	-.94957	-6.708	32	.000

Results in Table 3 show that there was a statistically significant difference between the performance level of the students in solving mathematical problems before and after the remedial program, $t = -6.708$, $p < 0.01$ level of significance. This implies that the remedial program has a significant effect on the scores of the students in solving mathematical problems.

Results of this study concordance with the study conducted by Foshee, Elliot, and Atkinson (2016) wherein students gained positive and statistically significant effects on their learning and academic competence in Mathematics. Peer mentoring helped the struggling students.

Correlation Results

The fourth research problem inquires if there is a significant relationship between the performance level of the students in solving mathematical problems after the remedial program and their attendance in the program.

To answer the problem, Table 4 is presented below.

Table 4
The Results of Correlation Coefficient

		Pretest	PostTest	Attendance
Pretest	Pearson Correlation	1	.357*	.140
	Sig. (2-tailed)		.042	.438
	N	33	33	33
PostTest	Pearson Correlation	.357*	1	.619**
	Sig. (2-tailed)	.042		.000
	N	33	33	33
Attendance	Pearson Correlation	.140	.619**	1
	Sig. (2-tailed)	.438	.000	
	N	33	33	33

*. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficient between students' posttest scores in solving mathematical problems and their attendance as shown in Table 4 is .619. It tells us that a one-level increase of students' attendance in the program leads to a .619 higher performance level in solving mathematical problems. The probability of this correlation coefficient occurring by chance is .000. Hence, there is a statistically significant strong positive relationship between the performance level of Grade 7 students in solving mathematical problems and their attendance in the program ($r = .619, p < .001$)

The participation of the Grade 7 students in the remedial program made a significant effect on their performance level in solving mathematical problems. This is in concordance with the study conducted by George (2012). Attendance played a crucial role in improving the academic achievement of students.

CONCLUSIONS

Based on the results and discussions presented, the majority of the Grade 7 students had a very poor performance level in solving mathematical problems before the conduct of the remedial program. After the remedial program, the majority of students still had a poor performance level. However, there was a significant difference between the performance levels of the students in solving mathematical problems before and after the conduct of the program. The scores of the students in the post-test had significantly increased as compared to the pre-test scores. Also, there was a significant relationship between the performance level of the students in solving mathematical problems after the remedial program and their attendance in the program.

The remedial program played a very significant role in the students' progress in solving mathematical problems. Therefore, it must be strictly implemented in all schools to continually improve students' performance levels in Mathematics. Moreover, students' attendance in school must be increased to improve their performance in solving mathematical problems. To do this, the school and the teachers must devise a strategic plan to address this concern. Furthermore, parents and stakeholders must also do their

part to address the needs of the students who are often absent in school. The school administration, teachers, parents, and stakeholders must work collaboratively to improve the quality of Mathematics education.

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