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## Research Article

### Performance of Grade 8 Students in Mathematics Intervention Program

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#### ABSTRACT

Mathematics interventions are being provided for students nationwide who perform below basic on various assessments. The assessment of students' performance in Mathematics gave rise to the conduct of this study. In this research, Grade 8 students who did not meet the expected competencies will have the opportunity to receive extra Mathematics assistance. Hence, this study is proposed so as to support the sustainability of Mathematics intervention program. This study is an action research utilizing survey questionnaire in order to determine the performance of the students in the pre and post-tests of students under the Mathematics intervention program. The subject and the respondents of this study are the identified students in the Grade 8 who have not met the required competencies in Mathematics subject. Result showed that post-test result (Tutorial:  $18.151 \pm 5.548$ ; Remedial:  $18.944 \pm 5.395$ ) is higher than the pre-test result (Tutorial:  $11.019 \pm 4.144$ ; Remedial:  $11.519 \pm 3.565$ ) under tutorial program and remediation program. Result of the study also revealed that there is a significant difference between the performance of the students in the pre and post-test under tutorial program ( $t = -11.632$ ,  $p = 0.000$ ) as well as in the performance of the students under remediation program tutorial program ( $W = 0.000$ ,  $p = 0.000$ ). Indeed, the aforementioned program is effective to improve the performance of students in Mathematics. Mathematics intervention program is effective to improve grades and performance of students, thus teachers should design a more improved techniques of this program.

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**Keywords:** Academic performance, grade 8 students, JHS, Junior High School, tutorial, remedial

## Background

Mathematics interventions are being provided for students nationwide who perform below basic on various assessments. Schools try to provide interventions to students in need especially in Mathematics. But in spite of all the efforts low performing students still exist. Thus, teachers try to explore the educational research which expended time and energy trying to unravel the possible. Although the goal of Intervention is not necessarily to make Mathematics fun, by varying the learning tasks and making the instruction engaging the intervention teacher has the opportunity to reach more students and build success (Sundling, 2012).

Assessing the Mathematics performance of students in Barangay Singcang-Airport National High School, it is best that the academe practices a certain routine of interventions. Intervention focus on supporting students' understanding through explicit instruction based on diagnostic assessments. The main goal of intervention is to help students gain independent strategies and take responsibility for their own learning. This approach leads to an emphasis on bigger ideas in Mathematics and their applications to students' skills.

The intervention program is a form of a remedial class where the participants are Grade 8 students whose grades are below 80. The remedial classes are done every 4:00PM, after the regular classes.

The assessment of students' performance in Mathematics gave rise to the conduct of this study. In this research, Grade 8 students who did not meet the expected competencies will have the opportunity to receive extra Mathematics assistance. This is done in order to gain higher performance. Hence, this study is proposed so as to support the sustainability of Mathematics intervention program. The efforts now underway to raise academic performance in Mathematics, improve the effectiveness of Mathematics intervention program, and design more programs that could uplift performance of students, to better motivate them to learn,

persevere and succeed in school and later in life.

## Statement of the Problem

This study aimed to determine the performance of students in Mathematics intervention program in Barangay Singcang-Airport for School Year 2018-2019.

This study sought to answer to the following questions:

1. What is the performance of Grade 8 students in pre-test and post-test under tutorial program?
2. What is the performance of Grade 8 students in pre-test and post-test under remediation program?
3. Is there a significant difference in the performance of the students in the pre-test and post-test under tutorial program?
4. Is there a significant difference in the performance of the students in the pre-test and post-test under remediation program?
5. Is there a significant difference in the performance of the students under tutorial and remediation program?

## Hypotheses

The research was conducted to address the following null hypothesis:

1. There is no significant difference in the performance of the students in the pre-test and post-test under tutorial program.
2. There is no significant difference in the performance of the students in the pre-test and post-test under remediation program.
3. There is no significant difference in the performance of the students under tutorial and remediation of program.

## Methods

### Research Design

This study is an action research utilizing survey questionnaire to determine the basic profile of the students. Action Research is a type of investigation that seeks to improve people's lives by investigating the issues or prob-

lems they face. As a result, the goal of action research is to effect change and solve social problems (Creswell, 2007). In this study action research is used in order also to determine the performance of the students in the pre and post-tests of students under the Mathematics Intervention Program.

### **Participants**

The subject and the respondents of this study are the identified students in the Grade 8 who have not met the required competencies in Mathematics subject. Students' grade were evaluated and served as their performance which became the basis of their groupings. Those students who have gained a grade of 79-78 were categorized in the remediation program. On the other those students who got the grades of 77-75 were recipients of tutorial teaching. On the implementation of the Mathematics Intervention Program, the researcher administered a pre-test and post-test for both group of students. The respondents and subject of this study were the 53 students in tutorial and 54 students in remediation program.

The population of the study was composed of 107 students in the Grade 8 who were recommended for Mathematics intervention program. These students were classified in two types of intervention: the tutorial program and the remediation program. The grades on the pre and post-test of the 53 and 54 students were assessed and were statistically treated. Sample size was not computed because respondents of the study were based from the recommendation of the teachers.

This study did a complete inclusion of the Grade 8 students who have the follow criteria stated.

### **Instruments**

In gathering the needed data of the study, instruments on Pre-tests and Post-Tests were:

Pre-test determines the prior and current knowledge of students in Mathematics subject. This was a standardized questionnaire which elicited responses from the students. It is also a test to check the competencies attained by the students on the previous grading.

Post-Test is the same test as the pre-test administered to students in order to determine

their Mathematical skills after the implementation of the Mathematics Intervention Program.

The standardized questionnaire is adopted from the module 2 of the K to 12 Mathematics Grade 8 textbooks prescribed by the Department of Education. It is a 40 items test which assess knowledge of students on logic, triangles and proving. The test covered the topics discussed in the Module 2 of the textbooks which was also the lessons covered for second grading Mathematics competencies. The topics included in the items of the test were clearly discussed and emphasized in the Mathematics intervention programs.

The research instrument did not undergo validity and reliability tests because it is a standardized questionnaire which is adopted from K to 12 Grade 8 Mathematics textbook and prescribed by the Department of Education. The validity and reliability of the standardized questionnaire had already been tested and proven for classroom assessments and mastery of skills in Mathematics.

### **Data Gathering Procedures**

Approval from the Schools Division Superintendent and School Head was secured to gather data from the Grade 8 students who were recommended for Mathematics intervention program. Then, teachers of the students were requested to fill in the grades in Mathematics of the students on the 2<sup>nd</sup> grading to the academic performance form. Likewise, the researcher conducted the filling up of the profile of the respondents for those students in the intervention program. Upon evaluation of the 2<sup>nd</sup> grading grades, the researcher assessed the grades of the students and classified students in two groups of Mathematics intervention. Immediately after the assessment of the grade, pre- test was conducted in both groups. Furthermore, Mathematics teachers were assigned to the tutorial and remediation group for the conduct of intervention. The post-test was conducted before the 3<sup>rd</sup> grading examination. Thus, grades on this grading were secured from the teachers. Lastly, upon completing the needed data, encoding, analysis and interpretation of data were done.

### Statistical Treatment

The data collected were processed, analyzed and interpreted using the following:

For objectives number 1 and 2, mean and standard deviation was used to determine the performance of the Grade 8 students in the pre-test and post-test under tutorial program

To interpret the mean of their performance the scale on the next page was used (based on DepEd Order 73 series of 2012).

Scale	Interpretation
90-100	Outstanding
85-89	Very Satisfactory
80-84	Satisfactory
75-79	Fairly Satisfactory
Below 75	Did not Meet Expectation

For objectives number 3 and 4, to determine the significant difference in the performance of the students in tutorial, the paired t-test was used.

For objective number 5, to determine the significant difference in the performance of the students under tutorial and remediation, the independent samples t-test was used.

### Results and Discussion

The results of the study is illustrated according to the chronological order of the statement of the problem and data analysis of the study.

#### Performance of students in the Pre-Test and Post-Test Under Tutorial Program

Table 1. Performance of Students in the Pre-Test and Post-Test Under Tutorial Program

	N	Mean	SD
Pre-test	53	11.019	4.144
Post-test	53	18.151	5.548

Table 1 shows that the mean result of the students before the Tutorial Program is 11.01 and the highest score is 19. On the other hand, the mean result after the program soar high to 18.15 and the highest score is 29 showing higher difference from the pre-tests.

This implies that the Tutorial Program in Mathematics helps students improve their performance.

The result of the increase of scores in the post test after the Mathematical Intervention Program was also proven in the case study conducted in Helen Smith Elementary School in Nevada. Their students undergo a series of Mathematics intervention program and gain a status of Blue Ribbon or High Achievement

award in their school performance. Students have begun to make the shift too, they know where they are and where they need to be at the beginning, middle and the end of the year. They have control over their own performance (Ulichnie, 2015). Furthermore, Maxwell (2015) stated that intervention programs, or Mathematics support at the secondary level, have shown to be an era of concern with little to no clear definition of successful programs. Thus, Carter and Dean (2006) said activating prior knowledge is especially important in Mathematics in understanding relationships between previous learning and current learning.

#### Performance of Students in the Pre-Test and Post-Test Under Remediation Program

Table 2. Performance of Students in the Pre-Test and Post-Test Under Remedial Program

	N	Mean	SD
Remedial Pre	54	11.519	3.565
Remedial Post	54	18.944	5.395

Table 2 presents the performance of Grade 8 students in the pre-test and post-test under

remediation program in Mathematics intervention program. An analysis and interpretation is

made based from the scores obtained by the students before and after the Mathematics intervention program.

Table 2 shows that the mean result of the students before the Remediation Program is 11.52 and the highest score is 20. On the other hand, the mean result after the program increases to 18.94 and the highest score is 31 showing higher difference from the pre-tests.

This implies that the remediation program in Mathematics improves the performance of students in Mathematics course.

This result of this study is parallel to the conclusion of Tallorin (2014) that remedial classes are necessary for students who don't understand a subject properly. This emphasis proved the importance of remedial classes in any level and in any learning institutions. In

reality, there are children who fall behind in their basics and advancement of the subject which is not fully understood by them. This condition calls for remedial classes. Generally, students have an issue with major subjects like English, Mathematics and Science. Students can understand these subjects if the teacher takes a little care about them like attending to them personally and explaining the concept until they understand. According to Garcia (2017) remedial classes are necessary for students who don't understand a subject properly. The students have different learning styles which should be considered while teaching and conducting remedial classes. This classes served as an input to attain better performance on the part of the learners.

#### ***Difference in the Pre-Test and Post-Test Performance of Students Under the Tutorial Program*** Table 3. Paired Samples T-Test

<b>Statistic</b>	<b>df</b>	<b>p</b>	<b>Interpretation</b>
-11.632	52.000	0.0000*	Significant at $\alpha=0.05$

\* $p \leq 0.05$

Table 3 shows the difference in the pre-test and post-test scores of the students under tutorial program in Mathematics intervention program. The interpretation and analyses of the data is presented based on the result of the study.

The result of the study shows that there is a significant difference in the pre-test score from that of the post test score. The post-test score increase preferably after the students undergo a tutorial program of Mathematics intervention program.

There was no violation in the assumption of normality as the Shapiro-Wilk Test of Normality shows a p-value of 0.08 which is not

significant. Hence, the Paired Samples t-test was applied.

Using the Paired Samples t-test, the t-value is -11.63, with p-value equal to 0.0000 which is less than 0.05. Therefore, the null hypothesis is rejected at 0.05 level of significance. Thus, there is a significant difference between the score of the students in the pre-test and post-test under the tutorial program.

The result implies that tutorial program increases students' performance in Mathematics.

The result conforms to the study of Kashalkar-Karve (2013) which states that Tutorial Program is an important teaching-learning tool. It helps learners enhance their intellectual, communication and social skills.

#### ***Difference in the Pre-Test and Post-Test Performance of Students Under the Remediation Program***

Table 4. Wilcoxon Rank Test

<b>Statistic</b>	<b>p</b>	<b>Interpretation</b>
0.000	0.0000*	Significant at $\alpha=0.05$

\* $p \leq 0.05$

Table 4 presents the difference in the pre-test and post-test scores of the students under remediation program in Mathematics intervention program.

There was a violation in the assumption of normality as the Shapiro-Wilk Test of Normality shows a p-value of 0.01 which is significant. Hence, the Wilcoxon Rank Test was applied.

Using the Wilcoxon Rank Test, the test statistic value is 0.000, with a p-value of 0.0000 which is less than 0.05. Therefore, the null hypothesis is rejected. This mean that there is a significant difference between the score of the student in the pre and post-test under remediation program.

This implies that the performance of students in Mathematics progresses after they undergo Remediation Program.

This is in agreement to the statement of Prasad (2010) which states that Remediation Program is effective in resolving skills deficiencies among students. His study indicated that students who successfully passed Mathematics remediation courses successfully transferred into regular Mathematics courses over 50% of the time.

The result also affirms the study of Rawe (2014) that students who have gaps in their learning because of frequent absences or attention issues can often benefit from remediation programs.

### ***Difference in the Performance of the Students under Tutorial and Remediation Program***

*Table 5. Mann-Whitney U-test*

<b>Statistic</b>	<b>p</b>	<b>Interpretation</b>
157.500	0.00001*	Significant at $\alpha=0.05$

\* $p \leq 0.05$

Table 5 presents the data on the difference in the performance of the students in tutorial and remediation programs. The interpretation and analyses of the data is presented based on the data obtained from the teachers.

There was a violation in the assumption of normality as the Shapiro-Wilk Test of Normality shows a p-value of 0.003 which is significant. Hence, the Mann-Whitney U-test was applied.

Using the Mann-Whitney U-test, the test statistic value is 157.5, with the p-value equal to 0.00001 which is less than 0.05. Therefore, the null hypothesis is rejected. This means that there is a significant difference between the performance of the student under Tutorial and Remediation Program at 0.05 level of significance.

The result of the study showed that tutorial and remediation programs have a significant difference in improving the performance of the students. Though tutorial is an important teaching-learning tool (Kashalkar-Karve, 2016) but there are other factor to consider remediation program gained higher increase in the performance of the students. Bahr (2008) indicated in his study on Mathematics

remediation class that these particular programs were effective in resolving skills deficiencies among students. He also noted that long-term effects of remediation were beneficial as well. The effects of tutorials and remediation class to the students were positive because of the increase in their performance after undergoing the said programs. It should be noted that both programs are effective to cater the learning needs of the students (Sarkar, 2017).

### **Conclusion**

Based on the result of the study, the following conclusions were derived.

1. Tutorial program is effective to improve the performance of students in Mathematics because post-test result is higher than the pre-test result.
2. This study concludes that remediation program is efficiently reliable to improve test scores and performances of students because post-test score of the students is higher than the pre-test.
3. The performance of students in Mathematics under the tutorial program is better in the post-test compare to the pre-test.

Thus, this study concludes that tutorial program improves the student's performance in Mathematics.

4. Strongly it is good to stressed out that the performance of students in Mathematics increases from the pre-test to the post-test under the remediation program.
5. The performance of students in Mathematics under the remediation program is higher than those who are under the tutorial program.

### Recommendations

Based on the results of the study the following recommendations have been outlined.

1. Tutorial program in Mathematics is effective to improve grades and performance of students, thus teachers are encouraged to design a more improved techniques of this program.
2. School Head are encourage to motivate teachers to continue conducting remediation program for higher performance of students and school in general.
3. Tutorial program in Mathematics is recommended for individual mastery of Mathematics skills. Also, parents are recommended take part in the said program through follow-up sessions at home.
4. It is best to recommend that teachers go hand in hand to implement remediation program. In addition, students should undergo themselves for a series of remediation programs in order to gain higher performance in Mathematics.
5. It is suitable to recommend that the Department of Education to come up with programs for the sustainability and continuity of Mathematics intervention program and allocate funds thereof for the said program especially in remediation.
6. It is recommended for future researcher to conduct similar study in other subjects. Tutorial and remediation programs can also be used by teachers to improve students' performance in other subjects.

### References

- Bahr, P. R. (2008). Does mathematics remediation work?: A comparative analysis of academic attainment among community college students. *Research in Higher Education, 49*(5), 420-450.
- Boylan, M., Maxwell, B., Wolstenholme, C., Jay, T., & Demack, S. (2018). The mathematics teacher exchange and 'mastery' in England: The evidence for the efficacy of component practices. *Education sciences, 8*(4), 202.
- Carter, T. A., & Dean, E. O. (2006). Mathematics intervention for grades 5–11: Teaching mathematics, reading, or both?. *Reading Psychology, 27*(2-3), 127-146.
- Creswell, J. W.; Hanson, W. E.; Clark Plano, V. L.; Morales, A. (2007). Qualitative Research Designs: Selection and Implementation. *The Counseling Psychologist, 35*(2), 236–264. doi:10.1177/0011000006287390.
- DEPED Order No 73, Series of 2012
- Flores, N., & García, O. (2017). A critical review of bilingual education in the United States: From basements and pride to boutiques and profit. *Annual Review of Applied Linguistics, 37*, 14-29.
- Kashalkar-Karve, S., & Damodar, S. N. (2013). Comparitive study of ancient gurukul system and the new trends of Guru-Shishya Parampara. *American International Journal of Research in Humanities, Arts and Social Sciences, 2*(1), 81-84.
- Prasad, G., Bhar, C., & Srivastav, M. V. (2010). Critical review of examination related problems in technical education in India.
- Rawe, J., 2014. *What Are Remedial Programs?*. Understood.org. Available at: < <https://www.understood.org/en/articles/remedial-programs-what-you-need-to-know> > [Accessed 13 July 2022].
- Sarkar, N., Ford, W., & Manzo, C. (2017). Engaging digital natives through social learning. *Systemics, Cybernetics and Informatics, 15*(2), 1-4.
- Sundling, N. (2012). Effective mathematics intervention programs for students in grades three through five. *Unpublished master's thesis, Northern Michigan University*.
- Tallorin, C., 2014. *Tulong-tulong sa Pagsulong ng Udyong!*. Udyong.gov.ph. Available at: < [http://udyong.gov.ph/index.php?option=com\\_content&view=article&id=4983:the-importance-of-remedial-clases&catid=90&Itemid=1267](http://udyong.gov.ph/index.php?option=com_content&view=article&id=4983:the-importance-of-remedial-clases&catid=90&Itemid=1267) > [Accessed 13 July 2022].
- Ulichnie, S. (2015). The Effects of Math Intervention on Student Achievement. *Online Submission*.