Enhancing Mathematical Performance Of Grade 9 Learners For Least Mastered Most Essential Learning Competencies Using Project RLM (Rationalizing Learning Materials)

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Abstract – *This study focuses on the least mastered Most Essential Learning Competencies in mathematics 9. It was observed that having not mastered the learning competencies affects the academic performance of the learners so this study was conducted. In answer to the new normal education the researcher implemented an intervention called Project RLM (Rationalizing Localized Materials) the project focuses on how to deliver the lesson to the learners despite of all the challenges that are encountered cause by COVID – 19 pandemic. The researcher uses quasi – experimental design to measure the effectiveness of the usage of the intervention project RLM in enhancing the academic performance of grade 9 learners in Mathematics. The respondents of this study are the grade 9 learners of Batangan National High School, where in the researcher uses a total population sampling. The researcher utilizes a paired t – test to compare and see if there is a significant difference between the academic performance of grade 9 learners before and after the implementation of project RLM. The results shows that the null hypothesis was rejected where in there is a significant difference in academic performance of grade 9 learners before and after the implementation of project RLM. It was also concluded that the use of project RLM as an intervention provides a positive improvement in the academic performance in Mathematics of grade 9 learners of Batangan National High School. Hence, it was recommended that (a) continuous innovations of localized learning materials should be imposed. (b) Enhancing computer literacy skills by providing a correct training in innovating instructional materials. And (c) Constant assessment and evaluation of learner's academic performance may be conducted.*

Introduction

According to Paul Halmos the only way to learn mathematics is to do mathematics. It is the basic concept yet the hardest part that most of the learners cannot mastered. Based on observation, learners can perform simple arithmetic in real situation but hardly understand the basic concepts of Mathematics. It was also observed that most of the learners lacks comprehension especially in solving word problems. Mathematics anxiety was proven to be one of the factors that affects student achievement. That is why, teachers should learn to understand and develop teaching and learning strategies for the students to overcome math anxiety [1]. In answer to this, the Department of Education (DepEd) introduced the use of Strategic Intervention Material (SIM) as a form of remediation to increase the academic achievement of low – performing learners in addressing this problem in schools as enclosed to Department of Education Memorandum No. 117, s. 2005, entitled, "Training Workshop on Strategic Interventions for Successful Learning; 2005". It was evident that the usage of Strategic Intervention Material (SIM) in Mathematics as a tool of remediation for Grade 9 students in solving problems involving quadratic functions was effective [2].

Mathematics are perceive to be the common difficult subject to the students as they developed anxiety in Math in school. Mostly, Mathematics is the hated subject and learners tend to avoid solving

mathematical problems [3]. Facing the New Normal Education, the Department of Education implemented the used of Most Essential Learning Competencies as stated in the DepEd Memorandum No. 29, s. 2020. MELCs are used as the primary reference for all schools and a tool to determine the different learning delivery approaches. It was contextualized according to the needs and diversity of the learners while adapting to the challenges of COVID – 19 pandemic. One of the advantages of using MELCs is that, it was a focus instruction on the most essential and indispensable competencies. In spite of this, there are still competencies that are still least mastered the reason why this study was conducted.

Continuous improvement is better than a delayed perfection (Mark Twain), and there will always be a room for improvement. Despite the fact that the Most Essential Learning Competencies are designed to local context and diversity of learners for a simple understanding, there are still competencies that are least mastered and unable to deliver accurately. That is why teachers are still advice to do unpacking of MELCs, this allows the teacher to develop appropriate strategies for a better understanding and what are students are expected to know in each grade level. The problem was also identified as a lack of effective motivation and introduction, as well as a lack of creativity in tailoring approaches to the learner's potential in the teacher's instruction [4]. For this reason, the researcher will conduct an intervention called Rationalizing Learning Materials that is to address the least mastered competencies in Mathematics of Grade 9 learners in Batangan National High School. The intervention RLM (Rationalizing Learning Materials) focuses on localizing of Activity Sheets that will able the learners to understand the lesson in a simple way.

Objectives Of The Study

This study will aim to enhance the academic performance of Grade 9 Learners for Least Mastered Most Essential Learning Competencies using Project RLM (Rationalizing Learning Materials) in Mathematics.

Materials and Methods

The researcher used a Quasi – Experimental Research Design to measure the effectiveness of the usage of intervention RLM in enhancing the mathematics performance of grade 9 learners of Batangan National High School, in the least mastered Most Essential Learning Competencies.

Research Design

The utilization of SIM – based instruction was found effective in the means of reaching the mastery on least mastered competencies in General Mathematics. Moreover, it is not recommended to limit the capability in using direct instruction in least mastered competencies alongside with SIM – based instruction [5]. The difference between pre-test and post – test observations is utilize to assess the extent of intervention. Evaluating the level of learner's achievement prior to instruction will assist the teacher in localizing instruction material and approaches suited to student's academic needs [6].

The quasi – experiment was used in this study, concerning with the development and implementation of intervention program for least mastered competencies in grade 9 Mathematics.

Participants/Respondents

The respondents of the study was the grade 9 learners in Batangan National High School General Nakar, Quezon during the school year 2020 – 2021. The total population sampling was utilize since the total enumeration of grade 9 students composed of 92 in total was being used.

Table 1. Respondents of the Study

Section	Grade 9 Heterogeneous Learners
Dimasalang	30
Rio Alma	31
Plaridel	31
Total	92

Table 1 shows the grade 9 learners of Batangan National High School as the respondent of this study. Based on the records the academic performance of the three groups; Dimasalang, Rio Alma, and Plaridel are satisfactory with an average of 80.33, 81.52, and 81.68 respectively during the first and second quarter of the school year 2020 – 2021.

Instrumentation

An item analysis was conducted for the identification of the least mastered competencies during the first and second quarter of the school year 2020 – 2021. The researcher then focused on the least mastered learning competencies by localizing the learning materials and using project RLM. The researcher used a pre and post – test about the least mastered competencies consisting of 40 items. A pre – test was conducted to determine the pre – existing knowledge of the learners and comprehend the knowledge baseline that will administer by RLM intervention. The test covers the least mastered competencies of mathematics 9 Quarters 1 and 2 as identified during the school year 2020 – 2021. Pilot testing was done and asked for the cooperation of the teacher of grade 10 students of Batangan National High School. Cronbach's Alpha was used to determine the reliability of the test, as well as an item analysis was administered after the pilot testing in order to determine the index of difficulty for possible revisions of the items. The revisions and removal of some items were done.

Upon the implementation of the program, the researcher uses tutorial videos and used the online platform to deliver the lesson to the learners as responds to the new normal education. As well as, the researcher uses the knowledge and skills in using computer technology in making localized instruction materials for the learners. Due to pandemic and compliance to health and restrictions implemented by Inter – Agency Task Force, the pre – test were distributed individually and answered the test at home. After the pre – test, the implementation of the intervention started. The researcher used tutorial videos, Localized activity sheets and home visitations. The implementation of the program lasted for (28) days consisting of (4) weeks and a test was conducted every Friday of the week to measure the mastery of the learners. After the 28 – day implementation of the program, a post – test was conducted. Post – test was administered by batch since strict observation of the health protocol must follow. Unfortunately, due to the distance of the school from home there were 12 students who was not able to answer the test on time so the researcher conducted a home visitation.

Data Collection Procedure

After the researcher – made questionnaire was validated, it was produce into multiple number of copies enough for the respondents. As well as, the letter of request to Schools District Supervisor was prepared. Pre – test were answered at home due to compliance to the health protocol implemented by Inter – Agency Task Force. Since the researcher used a quasi – experimental design the primary data was utilized. On the other hand, secondary data was also used since the researcher needed the academic performance of the learners from the school registrar. Upon collecting the retrieve test questionnaire of the learners the scores were tabulated and interpreted using the appropriate statistical procedures.

The implementation of the program started after the data of pre – test were gathered. Subsequently,

the post – test was administered individually for the reliability of the result of the intervention. The data gathered from pre – test and post – test were compared, analyse and interpreted using a paired t – Test.

Ethical Consideration

The researcher prepared a letter of request which was presented to the Public Schools District Supervisor of the General Nakar District I where the school of the respondents located. Upon approval, researcher administered the program to the respondents. The mathematics performance of the respondents during the first and second quarter during the school year 2020 – 2021 was obtained from the Registrar's office upon approval of the school head. The test item used was evaluated by the master teacher I who was designated in the same school of the researcher.

Data Analysis

The data gathered from the test was carefully recorded in tables, analyzed and interpreted accordingly based on the results of the statistical treatment.

To make a valid and scientifically acceptable analysis and interpretation of data gathered, the following statistical tools was used:

	Variables	Statistical tool
1.	Least Learned Competencies	Mean
2.	Level of Mathematics performance of Grade 9 students	Mean, standard deviation,
3.	Difference of the mean scores in pre and post tests	Paired t-Test using Excel
4.	Reliability of the teacher-made test	Cronbach's Alpha

The following rating scale was used to describe the mathematics performance of the respondents (DepEd Order No. 8, s. 2015);

90 – 100	Outstanding
85 – 89	Very Satisfactory
80 – 84	Satisfactory
75 – 79	Fairly Satisfactory
Below 74	Did not meet expectations

Results And Discussion

This portion provides the presentation of the statistical data relative to statement of the problem presented. The researcher gathered and compared the two data of pre – test and post – test to determine if the there is a significant difference in math performance of Grade nine learners before and after the implementation of project RLM (Rationalizing Localized Materials).

The researcher compared the two mean from pre – test and post – test coming from the same group of respondents. The reason why the researcher used paired t – Test as a statistic treatment of this study to see if there is a significant difference by using the alpha level of significance of 0.05.

Test	Mean	SD	T - computed	P - value	Difference
Pre	19.67	6.05	-10.71	<0.008	Significant
Post	24.13	5.17			
Difference	4.46				

Table 1. Significant difference between the Pre – Test and Post – Test on the Least Mastered Competencies in Mathematics 9

The table shows the computed mean and standard deviation of pre – test with 19.67 and 6.05 respectively. On the other hand, the computed mean of the post – test is 24.13 with the standard deviation of 5.17. The T – computed value was also evident with a – 10.71 and a P – value of <0.008. The researcher also calculated the difference of the Pre – test from Post – test with 4.46. Following the alpha value of significance with 0.05, the data shows that the computed probability value was <0.008 which is less than 0.05. Hence, the 4.46 difference of the two tests are said to be significant.

Table 2. Academic performance of grade 9 learners before and after the implementation of Project RLM

Quarter	Mean	Interpretation
First	81.18	Satisfactory
Second	84.57	Satisfactory

The table shows the level of academic performance of grade 9 learners of Batangan National High School. The data shows that the mean of their academic performance from first quarter to second quarter are 81.18 and 84.57 respectively. Using the DepEd Order No. 8 s. 2015 as the rating scale the interpretation of the

Quarter	Mean	SD	T - computed	P - value	Difference
First	81.18	4.02	-16.22	<0.001	Significant
Second	84.57	4.16			
Difference	3.39				

data was found in both satisfactory level.

Table 3. Significant difference of academic performance of grade 9 learners before and after the implementation of Project RLM

To test if there is a significant difference in academic performance of the grade 9 learners, another paired t – test of statistical treatment was used. The data revealed that the mean of the academic performance of the learners in first and second quarters are 81.18 and 84.57 respectively. The standard deviation of the academic performance was also computed with 4.02 during first quarter and 4.16 during the second quarter. It also shows the T – computed value which is -16.22 and a P – value of <0.001. The difference between the two quarters was also computed with 3.39.

A study identified that the used of strategic intervention materials gave a positive results in the mastery of the least – learned competencies in mathematics 9 [7]. Since the computed P – value is <0.001 as shown in the table, using the alpha value of 0.05 as the level of significance it was evident that the difference of 3.39 of the mean of the academic performance before and after the conduct of project RLM is proven to be significant.

It was concluded that the implementation of Strategic Intervention Material (SIM) is said to be effective as a remediation tool in improving the least mastered skill in mathematics [8]. On that account, after gathering, tabulating, computing and interpreting the data, it was found that there is a significant difference in math performance of grade 9 learners before and after the implementation of Project RLM (Rationalizing Learning Materials) concerning to the least mastered of Most Essential Learning Competencies (MELCs) in mathematics 9. Hence, the null hypothesis was rejected.

Conclusion, Limitations and Recommendations

Based on the findings, the following conclusions were drawn:

1. There is a significant difference in math performance of grade 9 learners before and after the implementation of Project RLM (Rationalizing Learning Materials) concerning to the least mastered of Most Essential Learning Competencies (MELCs) in mathematics 9.

2. The use of Project RLM intervention provides a positive improvement in the academic performance in Mathematics of grade 9 learners of Batangan National High School.

This study is limited on the mathematics performance of grade 9 learners. The general academic performance is not the main concern of this study.

This study revealed the effectiveness of project RLM in enhancing the academic performance in mathematics of grade 9 learners, the following recommendations was made:

1. Continuous innovations of localized learning materials should be imposed.

2. Enhancing computer literacy skills by providing a correct trainings in innovating instructional materials.

3. Constant assessment and evaluation of learner's academic performance may be conducted.

References

Abuda, BF., Balazo, GF., Orque, J., Cabili, MC., Maestra, Ma.FE.., (2019) International Journal in information Technology in Governance, Education and Business - Struggling Learners' Mathematics Achievement Level using Quick Response Embedded Strategic Intervention Material

Arpilleda, AJ 2021., Strategic intervention material: A tool in enhancing grade nine students' mathematical performance - International Journal of Research, 2021 - researchgate.net

BENFQ ABUDA - 2019 - academia.edu - INSTABRIGHT e-GAZETTE ISSN: 2704-3010 Volume I, Issue I August 2019 Mastery Level Of Students Using Strategic Intervention Material (Sim) In Teaching Mathematics: A Quasi Experimental Study

E Zakaria, NM Zain, NA Ahmad and A Erlina (2012), Mathematics Anxiety And Achievement Among Secondary School Students American, Journal of Applied Sciences, 2012, 9 (11), 1828-1832

JBR Diomampo 2019 - Ascendens Asia Journal of Multidisciplinary Research Conference Proceedings-ojs.aaresearchindex.com-Strategic Intervention Material (SIM): Improving Math Competence of Grade 7 Students in Solving Problems Involving Systems of Linear Equations with One Variable

MP Dumigsi, JBB Cabrella (2019), Effectiveness of Strategic Intervention Material in Mathematics as Remediation for Grade 9 Students in Solving Problems Involving Quadratic Functions, *Asian Journal of Education and Social Studies*, **Page 1-10**

NN Ganal, MR Guiab 2012 - Researchers World, 2014 - academia.edu - Problems And Difficulties Encountered By Students Towards Mastering Learning Competencies In Mathematics, Journal of Arts

Ramirez G, Gunderson EA, Levine SC, Beilock SL. Math anxiety, working memory and math achievement in early elementary school. Journal of Cognition and Development.2013; 14(2): 187-202.