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OBEDIZED LEARNING MATERIAL AND TUTORIAL: A NUMERACY PROGRAM FOR LEARNERS WITH LOW ACADEMIC PERFORMANCE IN GENERAL MATHEMATICS

MARIBEL M. QUIMORA
Lead Proponent

RONALD D. ROMERO
Member

Biñan City Senior High School-Timbao Campus

ABSTRACT

In this study, the researchers crafted a learning material that is designed to an Outcomes-Based Education (OBE). It was validated by the experts and was used for the selected learners who served as the participants of this study. The thirty-five (35) participants were selected by the following criteria: (1) they were failed with the teacher-made Numeracy Test that consists of the five least learned competencies in General Mathematics from the previous school year, (2) they were permitted to attend the tutorials by their parents, and (3) they are willing to attend the tutorials within one hour after their regular classes.

Part of the objectives of this study was to reveal the pretest scores of the participants. Likewise, the researchers aimed to show the post-test scores after implementing the OBEdized learning material and tutorials. Then, they tested if there was a significant difference between the pretest and post-test scores of the participants.

Based on the findings of the study, none of the participants passed in the pretest, while only three (3) participants passed the numeracy test after the implementation of the OBEdized learning material through tutorials. Among the three (3) passers, only one (1) was identified as Highly Competent. The result from the Paired T-Test indicates a highly significant difference between the pretest and post-test scores, meaning the numeracy program improved the knowledge of the learners particularly in the five selected topics in General Mathematics.

Therefore, the researchers recommended that numeracy programs should still be implemented in the Senior High School level since the results revealed that all the participants failed during the pretest and only three (3) passed out of the thirty-five (35) in the post-test. Also, Outcomes-Based Education should still be considered despite the various changes in the DepEd Curriculum; however, teachers should be more vigilant in assessing their learners and determining in which method they learn best. Lastly, learners should invest more time in learning the basics in academics, whether in numeracy of literacy. They should engage themselves in activities, interventions, or other programs that would augment their knowledge and skills.

Keywords: *OBEdized Learning Material, General Mathematics, Low Academic Performance*

INTRODUCTION

Today, the quality of education is measured not only in effectiveness, efficiency, and sustainability but also by relevance. Relevance by which the true learning of students needs to satisfy the employers. Learning produces an outcome to provide and adapt to the challenges of this generation. The global challenge for education is to have someone with skills to flourish in the 21st century. Teachers will help enable them access to high-quality education, leading to defined learner outcomes.

For this reason, the development of well-managed quality education has been strongly advocated. Teachers at all levels utilize various instructional materials, such as textbooks, presentations, and handouts, to enhance the quality of the lessons. The quality of those materials directly affects the quality of things as well as the performance of the students. The importance of instructional materials is to improve students' knowledge, abilities, and skills to monitor their assimilation of information and to contribute to their overall development and upbringing. It may also aid a student in concretizing a learning experience to make learning more exciting, interesting, and interactive.

The students' numeracy proficiency level is alarming despite the teachers' best efforts. The Philippines and its less affluent neighbors do not have the minimum reading and math skills expected at the end of primary education, according to Dela Pena (2023), who noted this in the article titled "Philippines ranks 2nd to worst in Grade 5 students' reading, math skills in Southeast Asia." The United Nations Children's Fund (Unicef) emphasized the need to "harness the potential" of early childhood education (ECE). Likewise, recent international studies revealed the learners' poor performance, especially in English, Mathematics, and Science. Hence, the Department of Education (DepEd), through the leadership of the current Vice President and Secretary of Education Sara Z. Duterte, aims to revitalize its Reading, Science and Technology, and Math programs as part of the MATATAG: Bansang Makabata, Batang Makabansa agenda. Thus, the researchers of this study want to initiate an intervention program that would hopefully augment the skills and performance of the Grade 11 learners in Mathematics, particularly in the General Mathematics subject.

This research aimed to prevent students from failing in General Mathematics. It would motivate them to take their studies seriously as they realize other ways of discovering the lessons in General Mathematics through the OBEdized learning material. Their pretest and post-test results would also determine the improvements and problems that could be addressed after gathering the data. Furthermore, suitable actions can be taken to improve the numeracy skills of the learners after the tutorial, and enhanced learning materials can be created as well in the next school year.

The researchers aimed to enhance the academic performance of the Grade 11 students for the 2023-2024 of Biñan City Senior High School-Timbao Campus during the first semester through a tutorial program using the OBEdized Instructional Material in Teaching General Mathematics. Specifically, it seeks to answer the following questions:

1. What is the level of numeracy competency of the participants in the pretest and post-test?
2. Is there a significant difference between the participants' pretest and post-test levels of numeracy competency?
3. What are the implications of implementing the OBEdized Learning Material and Tutorial in General Mathematics?

METHODOLOGY

Quantitative data analysis was used in this study. Responses in the data collection instruments were analyzed and interpreted. The study employed descriptive and inferential quantitative methods for its data analysis. Descriptive statistics include frequency and percentage distribution. For inferential statistics, Paired T-test helped the teacher-researchers reveal the difference between the participants' pretest and post-test scores. Descriptive analysis was also employed to show the implications of

implementing the OBEdized Learning Material for General Mathematics Tutorials.

The selected Grade 11 learners of Biñan City Senior High School-Timbao Campus were the target participants of this research since they are all taking General Mathematics subject during the first semester of SY 2023-2024. The researchers choose learners based on their scores on their numeracy test. The learners who were identified with failing scores and with poor performance were selected as the participants of this study. In total, there were thirty-five (35) participants in this study. These were the participants who failed the General Mathematics Test. Although there were more than thirty-five (35) students who failed the exam, others did not participate in the tutorial program because their parents did not allow them. Only the students who were qualified in the criteria and permitted to join by their parents or guardians were involved in the intervention program and in this study.

The researchers employed the ODEdized learning materials, which was created depending on the least learned competencies of the learners during the school year 2022-2023. Prior to the implementation of the tutorial, the researchers prepared the numeracy test focusing on the five (5) least learned competencies from the previous school year, and then once validated, it was conducted on the Grade 11 learners who served as the target participants. The tutorial was implemented during the First Quarter of the SY 2023-2024, which covers only the topics under Quarter 1. After the tutorial, a post-test was executed. Then, the collection of data was performed, followed by analysis and interpretation. Lastly, this study assumed that the level of numeracy competence of the participants would be enhanced.

RESULTS

Level of Competency of the Participants in the General Mathematics Pretest and Post-Test

Table 1 presents the pretest and post-test scores of the participants in their General Mathematics Test which reveals their level of competencies. As shown in the table below, none of the participants passed the numeracy test that consisted of five topics in General Mathematics. The highest score for the pretest was twenty-six (26) and the lowest score was eight (8) out of the fifty items in the test. In addition, twenty-one (21) out of the thirty-five (35) participants were identified as Less Competent while the remaining fourteen (14) participants were Not Competent.

Moreover, the table also shows that there were three (3) participants who passed the General Mathematics Test after the implementation of the OBEdized Learning Material through tutorials in the post-test results. Although majority of the participants failed the numeracy test, progress can still be seen through the improved post-test results. There was one (1) participant who was identified as Highly Competent, while twenty (20) were classified as Moderately Competent, while the remaining fourteen (14) were identified as Less Competent. Lastly, none of the participants was classified as Not Competent after the intervention program.

These results from the pretest and post-test of the participants confirm that the numeracy skills have improved after the intervention on the selected five topics in General Mathematics. The results also indicate that learners may enhance their knowledge using Outcome Based Education.

Table 1

Pretest and Post-Test Results from the General Mathematics Assessment

Learners/Participants	Pretest Score	Level of Competence	Post-Test Score	Level of Competence
1	22	LC	33	MC
2	16	LC	30	MC
3	13	NC	21	LC
4	11	NC	29	MC
5	14	LC	28	MC
6	14	LC	24	LC
7	13	NC	30	MC
8	16	LC	33	MC
9	14	LC	24	LC
10	9	NC	26	LC
11	12	NC	27	MC
12	17	LC	23	LC
13	15	LC	33	MC
14	8	NC	28	MC
15	12	NC	33	MC
16	13	NC	25	LC
17	20	LC	26	LC
18	12	NC	39	MC
19	16	LC	26	LC
20	16	LC	28	MC
21	18	LC	39	MC
22	14	LC	23	LC
23	20	LC	25	LC
24	14	LC	31	MC
25	13	NC	26	LC
26	26	LC	31	MC
27	19	LC	24	LC
28	9	NC	25	LC
29	19	LC	32	MC
30	16	LC	43	HC
31	13	NC	32	MC
32	12	NC	25	LC
33	14	LC	33	MC
34	19	LC	36	MC
35	12	NC	27	MC
Mean Scores	**14.89**	**LC**	**29.09**	**MC**

Legend: HC - Highly Competent (40-50), MC - Moderately Competent (27-39), LC - Less Competent (14-26), NC - Not Competent (0-13)

Difference between the Pretest and Post-test in General Mathematics Test

Table 2 reveals the Paired T-Test results of the Pretest and Post-test of the participants in their General Mathematics Assessment. As shown, the learners' pretest score (mean = 14.89; SD = 3.81) is lower than the post-test score (mean = 29.09; SD = 5.07). Standard deviations indicate that the pretest scores were slightly more consistent than the post-test scores. The result confirms that some learners improved their numeracy skills from being Not Competent or Less Competent to Moderately Competent. However, other learners improved their scores in the General Mathematics Test but still identified as Less Competent.

A Paired samples t-test was conducted to determine the effect of the OBEdized Learning Material and Tutorial on the learners' test scores. The result indicates a highly significant difference (t = -14.745, df = 34, p <2.46 x 10-16) between the pretest and post-test scores. The intervention has significantly improved the numeracy competence of the learners. The result indicates that the learners' knowledge of General Mathematics, particularly in Basic Concepts of Functions, Rational Functions, Inverse Functions, Exponential Functions, and Logarithmic Functions, has been enhanced after conducting tutorials. Additionally, even though not everyone passed the assessment, the result implies there was progress in the numeracy skills of the learners.

Table 2

Paired T-Test results of the Pretest and Post-test of the Participants in the General Mathematics Test

	Mean	SD	*t*	*p*	Interpretation
Pretest	14.89	3.81	-14.745	2.46	Highly Significant
Post-Test	29.09	5.07		<.000	

Implications of Implementing the OBEdized Learning Material and Tutorial

After the assessment through the validated General Mathematics numeracy test and implementation of the OBEdized Learning Material and Tutorials to the participants within two (2) months, the researcher noted some implications regarding the study. Among these is the low interest of the Grade 11 learners in joining in the intervention program to improve their numeracy skills. Despite the high number of failed learners during the conduct of the pretest, the results revealed there were only thirty-five (35) learners who participated in this study. Next, since there were still learners who did not passed the assessment, extending the time for the intervention should be considered as well. Maybe, teachers who are teaching General Mathematics could directly teach using the validated OBEdized Learning Material during their regular classes. Lastly, and the most important thing, it is evident that creating extra efforts could lead to better performance of the learners, thus teachers should consider creating and implementing learning interventions that could help the learners improve their knowledge and skills.

DISCUSSION

Generally, this study identified the learners who need to improve their numeracy skills and helped them through the use of an OBEdized learning material and conducting tutorials. There were thirty-five learners who participated in this study and all of them enhanced their knowledge and skills in the five selected topics in General Mathematics which were based on the least learned competencies during the last school year. None of the learners passed the pretest, making them to be identified as Less Competent while others are Not Competent. Although Outcome Based Education is no longer being used in the DepEd Curriculum, it may still be applicable to some learners since they are diverse. OBE could also worth a try to some learners in teaching them in which they have hard time understanding. It may be seen in the results that there were only three (3) learners who passed the post-test, still all of the learners improved their scores after understanding the lessons the teacher-made OBEdized learning material.

Moreover, creating interventions such as tutorials, one on one, peer teaching, and other techniques could be beneficial for the struggling learners. They need to improve their knowledge and skills for them to be more prepared for their future, whether they will pursue college or land into different jobs.

The significant findings of this research led to the following conclusions:

1. None of the respondents was identified as Moderately Competent nor Highly Competent in pretest and their mean score is 14.89 which means that the majority of the participants are Less Competent.
2. Only three (3) participants passed the numeracy test after the implementation of the OBEdized learning material through tutorials, while only among the three (3) passers was identified as Highly Competent.
3. The result from the Paired T-Test indicates a highly significant difference ($t = -14.745$, $df = 34$, $p < 2.46 \times 10^{-16}$) between the pretest and post-test scores, meaning the numeracy program improved the knowledge of the learners particularly in the five (5) selected topics in General Mathematics.

Based on the findings, the following recommendations are proposed:

1. Numeracy programs should still be implemented in the Senior High School level since the results revealed that all the participants failed during the pretest and only three (3) passed out of the thirty-five (35) in the post-test.
2. Outcome Based Education should still be considered despite the various changes in the DepEd Curriculum; however, teachers should be more vigilant in assessing their learners and determining in which method they learn best.
3. Learners should invest more time in learning the basics in academics, whether in numeracy of literacy. They should engage themselves in activities, interventions, or other programs that would augment their knowledge and skills.

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REFERENCES

Dela Pena, K. (2023). Philippines rank 2nd to worst in Grade 5 students' reading, math skills in Southeast Asia. Philippine Daily Inquirer. https://asianews.network/philippines-rank-2nd-to-worst-in-grade-5-students-reading-math-skills-in-south-east-asia/

Department of Education. February 02, 2023. DepEd to strengthen numeracy, literacy programs, integrate 'peace competencies' in revitalized K to 12. https://www.deped.gov.ph/2023/02/02/deped-to-strengthen-numeracy-literacy-programs-integrate-peace-competencies-in-revitalized-k-to-12/