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Problem Solving Prompts for Grade VI Mathematics

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Abstract: ***The researcher employed descriptive-quantitative method of research to describe the performance level of the grade 6 pupil in mathematics and evaluate the problem solving prompts used. The respondents of this study were the 130 Grade VI pupils and 3 teachers of the selected schools in the Sorsogon East District. The findings revealed that the overall performance of the pupils in the pretest is 28% and interpreted as beginning level. There was a developed Problem Solving Prompts aligned with the learning competencies in the first quarter to be utilized by the teacher-respondent. After its utilization the grade 6 pupils attained a performance level of 51% in the post-test and interpreted as beginning level. The t-computed value of 12.44 for the difference of the pre-test and post-test is higher than the tabulated value of 1.6568. Hence, demands for the rejection of the null hypothesis and therefore states that there is a significant difference between the results of the performance level of the grade 6 pupils in the pre-test and post-test. Based from these findings, it can therefore be concluded that the performance level of Grade 6 pupils in the pre-test is significantly low. The prompts developed were utilized to help increase the learners' performance in problem solving. With its implementation, the result of the post-test was increased to 51% which marks a significant difference from the pre-test results. The researcher recommended among others that pupils must be provided with intervention materials that would help them improve their skill in problem solving. Furthermore, teachers should not settle to only one strategy rather provide varied activities that are suited to his/her pupil's cognitive abilities***.

Keywords: Prompts, Problem Solving

1. Introduction

The No Child Left Behind Act (NCLB) of 2001 has placed an emphasis on student achievement in Mathematics. As a result, school administrators and teachers have begun a quest to find interventions to assist students, especially those at risk, in meeting the rigorous standards and passing the required standardized testing (DepEd, 2017).

Today, education remains an inaccessible right for millions of children around the world. More than 72 million children of primary education age are not in school and 759 million adults are illiterate and do not have the awareness necessary to improve both their living conditions and those of their children (humanium.org, 2019).

In connection, education is indeed a vital key in the development of a progressive society. It is the main ingredient in creating competent, resilient, and responsible humanity. Hence, it is the best solution in getting rid of ignorance and poverty.

For many decades, education continues to stand firm and indestructible in the challenges of time. In fact, it smoothly accepts changes. It vigilantly undergoes varied reforms. It enthusiastically presents new approaches and strategies which suit to learners' capabilities and interests. It aims every learner's excellence. It hopes big for each learner to perform best not just in academics but also in practical skills.

From one of the most highly educated developing countries in the world in the 1980s, the Philippines' diminishing importance we give to education is all too obvious in the results of the Trends in International Mathematics and Science Study (TIMSS) in 2003 which placed the country in the lowest 10 percent of participating countries in Grades 4 and 8. Among 45 countries that participated in the TIMSS for eight-grade students the Philippines ranked 41st in Math (Manila Times, 2004). Our score was more than 100 points lower than Malaysia and more than 200 points lower than Singapore, which ranked first. TIMMS result specifically in Algebra has an international average of 45% correct answers and Philippine average of 30 %. This proved that vast majority of Filipino students performed below par in the Algebra achievement test and below the levels of most students from other countries based on the international tests.

In rich countries, technology has been given high emphasis as tool in producing quality in education. Yet, it does not really guarantee perfection. It has been discovered to be destructive and not safe to the growth and development of a learner. Technology contributes much to the poor academic performance not just physical but more on mental aspect. Therefore, educators should undergo first varied trainings wherein technology experts are present so that they will become adept and equip on how it must be applied properly in the teaching-learning process. Using technology in education is not self-learned. It must be trained (clasroom. synonym.2011).

Moreover, as the education persists to hurdle uplifting its status, Mathematics subject has been determined to be the most challenging subject among learners. As such, many learners hate and not interested in this subject.complicated problem-solving is one of the reasons why learners tend to feel it is not fun to study Mathematics. The numbers and formula are confusing to them (Vygotsky, 2011).

Having this kind of view on Mathematics, still learners should face the fact that this subject pervades life at any age, in any circumstance. Thus, its value goes beyond the classroom and the school. Mathematics as a school subject, therefore, must be learned comprehensively and with much depth.

According to Reymundo (2004), the Philippines strives to become newly industrialized country. Thus, the government tries to improve its educational system and gives emphasis on teaching Mathematics and Science. It is now time for educators to assess whether they are providing their pupils the full range of skills needed for maximum development.

Indeed, educators have the significant role in providing the needs of the learners. They are the front liners who must be responsive enough. In the issue of Mathematics that learners have difficulties in learning most especially in the problem-solving, educators are the ones who must know what to do. They are the key persons who are expected to know how it must be answered.

Since, the twin goals of mathematics in the basic education levels, K-10 are Critical Thinking and Problem Solving" (K to 12 Curriculum Guide Mathematics, 2012), educators must be active providing learners comprehensive lessons and exercises so that these will be achieved. What's more, they should give correct prompts so that the lessons in problem-solving will become easy, enjoyable, and successful.

Conceptualization of this prompts was indeed a response to what Dahar (2011) stressed out, that developing instructional materials in the teaching and learning process plays an integral role and served as a powerful link to increase the academic performance of the pupils. For through instructional materials, the learners could practice learning the concept in their own way while they are exposed more to the materials.

The study determined the effectiveness of the problem solving prompts that may help improve the performance of the Grade VI pupils in problem solving at Sorsogon East District, S. Y.2018-2019. It also identified the level of problem-solving performance level in pre-test and post-test of Grade VI Mathematics. Moreover, it discussed the significant difference of the performance level problem-solving in pre-test and post-test of Grade VI Mathematics. Undeniably, there is really a need for an immediate action toward achievement in education. One start is through making Mathematics an enjoyable subject most especially in problem-solving lessons. An effective intervention must be made right away.

Research Questions

The study determined the effectiveness of the problem solving prompts that may help improve the performance of the Grade VI pupils in problem solving at Sorsogon East District for school year 2018-2019.

Specifically, this study answered the following questions:

1) What is the performance level of the respondents in problem solving in the pre-test?
2) What intervention could be developed to enhance the problem solving skills of the pupils?
3) What is the performance level of the respondents in problem solving in the post-test after the intervention?
4) Is there a significant difference in the performance level of the pupils in the pre-test and post-test?

2. Methodology

This study determined the effectiveness of Problem-Solving Prompts for Grade VI Mathematics at Sorsogon East District for School Year 2018-2019.

This study used descriptive-quantitative design of research as it observed and reported a certain phenomenon (Barrot, 2016). This study showed and analyzed the performance level of Grade VI pupils in Mathematics before developing the prompts and after its implementation or integration in the lesson.

Furthermore, this study used descriptive-evaluative method of research to describe effectiveness of problem-solving prompts on the performance level of the Grade VI pupils in Mathematics. The researcher-made test and questionnaires were used to describe and evaluate the effectiveness of the developed problem solving prompts.

The Sample

The samples of this study were the one-hundred thirty (130) Grade VI pupils in three (3) elementary schools at Sorsogon East District, Sorsogon City, School Year 2018-2019 namely San Lorenzo Elementary School, Rosa T. Arellano Elementary School and Ambrosio J. Labrador Elementary School. These pupils took the pre-test and post-test in Mathematics problem-solving as assessment of the developed problem-solving prompts for Grade VI Mathematics.

Furthermore, the main respondents of this study were the three (3) teachers of the Grade VI pupils. They answered the checklist and questionnaire as evaluation of the prompts.

Total enumeration and purposive sampling were used as methods in determining the samples and respondents. To identify the schools as venue of the study as well as the samples, the researcher used the total enumeration. In addition, purposive sampling was utilized in identifying the respondents.

Table 1 shows the distribution of the respondents as well as the samples in this study.

Table 1: The Respondents

Schools	No. of Teacher-Respondents	No. of Pupils
San Lorenzo ES	1	40
Rosa T. Arellano ES	1	40
Ambrosio J. Labrador ES	1	50
Total	3	130

The Instrument

The researcher utilized research-made test, and interview schedule to gather the needed data for this study.

The research-made test (Appendix B) is for determining the performance level of Grade VI pupils in Mathematics problem-solving. It is composed of thirty (30) items. Each item was given a weight of one (1) point. In addition, Table of Specifications (Appendix C) was formulated for this research-made test to ensure that the number of items is equally distributed.

Furthermore, an interview schedule (Appendix E) was made to ensure the validity of the problem solving prompts used by the teacher respondents and for the purpose of assessing the effectiveness of the prompts.

3. Data Collection Procedures

To gather the data needed in this study, the following procedures were done by the researcher:

Primarily, the researcher asked permission from the Schools Division Superintendent of Sorsogon City (Appendix A). Upon approval of the letter on June 11, 2018, the researcher proceeded to the Public Schools District Supervisors of the Sorsogon East District, the Principals of San Lorenzo Elementary School, Rosa T. Arellano Elementary School and Ambrosio J. Labrador Elementary School and the grade six mathematics teachers of the aforementioned schools to seek approval of the administration of pre-test. The letters were duly signed by the researcher's adviser and the dean of Sorsogon State College Graduate Studies before these were distributed.

Upon approval of the request, the researcher prepared and validated the teacher-made test through a dry-run to determine the pupil's performance on problem solving. The researcher personally transported the test materials to the respective schools on June 22, 2018. With the assistance of each mathematics teachers, the researcher administered the pretest. The tests only lasted for one hour. After the collection of the tests, answers were checked and scored. The results of the test were subjected to tabulation, analysis and interpretation to determine the performance level of the pupils.

After a week, the researcher went back to every school to instruct the teacher-respondent to utilize the Problem-Solving Prompts paralleled with the learning competencies on solving word problem to incorporate in their daily lesson.

On August 16-17, 2018, the researcher went back to the schools to conduct the posttest to assess the performance level of each school after the utilization of the problem solving prompts and at the same time, have the teacher-respondents. The collected posttest scores were subjected to statistical treatment or analysis and interpretation

Moreover, it also aided with structure interview to validate the data from the survey with the use of the interview schedule. During the interview, the researcher recorded the responses of the teacher respondents using an audio recorder to validate the indicators used in the survey questionnaire.

After the finalization of the survey questionnaire, it was conducted to some friend teachers of the researcher in Sorsogon City. It was found out that there were lacking thoughts in some of the indicators under instructional management and assessment for learning. The researcher conducted unstructured interview to the teachers to gather data about the performance of the learners and some ways to create mathematical test for the learners and make them support to the research and it was transcribed by the researcher. Finally, towards February 2019 the retrieval rate was 100%.

4. Data Analysis Procedure

The data gathered were statistically treated using appropriate statistical formula. These were checked, analyzed, validated, and interpreted. The following were the statistical tools used by the researcher:

Performance Level (PL). This was used to determine the level of the pupils' score in pre-and post-tests, the researcher used the performance level formula:

$$\text{PL}=\frac{no.of\ correct\ items}{total\ no.of\ items}\ x\ 100$$

Moreover, to interpret the performance level, the researcher aligned the scale from DepEd Order No.73, s.2012 for proficiency level of the pupils, to wit;

Scale	Description
90%-above	Advanced
85%-89%	Proficient
80%-84%	Approaching Proficiency
75%-79%	Developing
74% and below	Beginning

T-test. This was used to determine if there is a significant difference in the performance level of pupils in pre-and post-tests as well as the effectiveness of the developed problem solving prompts for Grade VI Mathematics.

5. Results and Discussions

Findings from the data gathered, the following findings were revealed:

1) The computed performance level of the grade 6 pupils in the pre-test is 28% and interpreted as beginning level.
2) There was a developed Problem Solving Prompts from the identified learning competency in mathematics for the first quarter.
3) The Grade 6 pupils attained an overall performance level of 51% in the post-test and interpreted as beginning level.
4) The computed t value of 12.44 for the difference of the pre-test and post-test is higher than the tabulated value of 1.6568. Thus, the hypothesis of no significance between the performance level of the pretest and post-test is rejected.

6. Conclusions

Based form the findings, the following conclusions are drawn;

1) The performance level of Grade 6 pupils in the pretest is significantly low.
2) The Problem Solving Prompts that is developed and evaluated by the teacher respondents somewhat improve the performance level of the pupils in problem solving but is not sufficient to pass the prescribed rating of the Department of Education which is 75%.
3) The performance level of the Grade 6 pupils in the post-test attained higher learning competencies.

4) There is significant difference on the performance of the pupils in the pre and post-test. Thus, the utilization of the intervention material was effective.

7. Recommendations

Based from the conclusions of the study, the following recommendations are made:

1) The Problem Solving Prompts be submitted for further study and enhancement to ensure high mastery of the learning competencies.
2) The Prompts may not only focused on unlocking difficulties but also provide more activities during and after the problem solving.
3) Activities that will help the pupils master the prerequisites in solving word problems like the fundamental operations, translating verbal to numerical expressions and the like is provided.
4) Research parallel to this may also be conducted in other subjects and on wider scope.

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