Effectiveness of Numeracy Intervention Activities to the Test Performance of the Grade 3 Pupils in Mathematics: Basis for Instructional Supervisory

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ABSTRACT

This study aimed to Determine effectiveness of Numeracy Intervention Activities to the Test performance of the Grade 3 Pupils. The findings of the study served as a basis of a proposed Instructional Supervision plan. The method used to gather relevant data was Quasi Experimental Research Design for Grade 3 pupils to complete in the 2nd grading period and the performance of the respondents was based on their test scores before and after the Numeracy Intervention Activities has been introduced and delivered in the classroom during the teaching and learning process. The output of this study is to provide instructional supervisory plan to help the teachers to create a more effective learning processes that would help the learners to improve their test performances. Table 3 presents the test of difference between the scores in the pre-test and post-test of Grade 3 in mathematics subject which was lasted for 4 weeks from the implementation of the intervention to the lessons being delivered. These results are the manifestation to identify whether this intervention is effective or not based on the pretest and posttest performance as well as their significant difference.

Based on the results in table 3, A notable and constructive change in overall performance is shown by the examination have shown, the test of difference between the scores in the pre-test and post-test of Grade 3 learners in math. The null hypothesis (Ho) is rejected because the computed t-value is greater than the crucial t-value. This rejection suggests that there was a statistically significant difference in the students' pre-test and post-test results, proving that the interventions that were put in place had a major and beneficial effect on their math proficiency. The mean score on the pre-test and the mean score on the post-test demonstrate a significant improvement in performance during the instruction. The computed t-value supports the positive difference, indicating that the strategies, interventions, used for 4 weeks implementation have improved the learners' math skills in a way that is statistically significant. This finding has positive impact for the efficiency of the interventions and instructional strategies used to meet the various needs of the Grade 3 learners. The choice to reject the null hypothesis indicates that deliberate efforts made during the instructional period are what caused the observed change in scores, rather than chance. Additionally, it promotes a reflective approach by asking teachers to pinpoint and duplicate effective aspects of their teaching strategies to maintain and improve math learners' achievement. It was suggesting clear positive impact of the instructional interventions.

The success of the interventions is validated by the rejection of the null hypothesis, which encourages educators to reevaluate and improve their methods to achieve long-term positive results. This discovery has significant ramifications for curriculum development, teaching strategies, and the continuous quest of excellence in math education for learners in Grade 3. This rejection denotes a statistically significant difference in the pre-test and post-test scores, suggesting that the Grade 3 learners math proficiency has been significantly impacted by the implemented interventions. The mean score obtained before the test and the mean score obtained after it indicate a significant improvement in overall performance. This positive difference is ascribed to deliberate efforts made during the instructional period rather than

being the mere product of chance. The choice to reject the null hypothesis emphasizes how successful the interventions were, indicating that teaching tactics, curriculum modifications, or extra help have all been successful in raising students' math proficiency.

The results in table 3 implied that the significant improvement in the students' arithmetic skills is indicated by the significant difference between their pre- and post-test results. It shows that intentional and successful teaching methods are what caused the changes in the learners' test results rather than chance. This interpretation has implications for ongoing teaching methodology improvement, and identifying effective components that can be repeated to maintain and improve math learners' achievement.

Keywords — Effectiveness   Performance   Grade 3 Learners   Mathematics

I.   INTRODUCTION

Developing and testing interventions that improve student outcomes has led to a renewed interest and support for research that tries to specify the relations between instructional variables and student achievement. That is, there is interest not only in identifying programs, policies, and practices that increase student outcomes, but also in specifying the underlying mechanisms that are associated with those outcomes. For example, instructional interactions between teachers and students are a defining characteristic of classroom instruction and a component carefully defined in many education interventions (Cohen, Raudenbush, & Ball, 2003; Pianta & Hamre, 2009).

One of the primary issues in assessing the effectiveness of any intervention is the possibility of selection bias. If the intervention group and the control group are not well-matched in terms of students' prior math abilities or other relevant characteristics, it can skew the results.

One of the pressing issues faced by our school, Omaganhan Elementary school is the highest percentage of non-numerates specially to those in the key stage 1. The results were based on the conducted a pre-assessment on the numeracy status of learners in key Stage 1 and 2 last September 2, 2022. The results create the impact also to the whole performance of the school in general which could lead to low percentage of the schools when it comes to assessing the Access and quality of the school performance. With this, the researcher is really need to take an action and address the problem raised. With all the necessary findings of the researcher, it is very right and fitting to conduct this study which focus on how the learners will improve their mathematical skills and later they will be independently creating big impact to the school as a whole.

This study was evaluated the effectiveness of Numeracy Intervention Activities to the test Performance of the Grade 3 Pupils in Mathematics in Omaganhan Elementary School in the Division of Leyte. The findings of the study were the bases for an Instructional Supervision Plan.

Specifically, it sought to answer the following questions:

1.   What is the test Numeracy performance of the Grade 3 pupils in Mathematics before the integration of numeracy intervention activities?

2.   What is the test Numeracy performance of the Grade 3 pupils in Mathematics after the integration of numeracy intervention activities?

3.   Is there a significant difference in the Numeracy performances of the Grade 3 pupils in Mathematics before and after the integration of numeracy intervention activities?

4.   What instructional supervisory plan can be proposed based on the findings of the study?

Null Hypothesis:

HO: There is no significant difference in the performances of the Grade 3 pupils in Mathematics before and after the integration of numeracy intervention activities.

II.   METHODOLOGY

Design. The study utilized the Quasi Experimental type of research Design to evaluate the effectiveness of numeracy intervention activities to the test performances of the Grade 3 pupils in Mathematics based on the different most essential learning competencies for the 2nd grading period in Omaganhan Elementary School. The findings of the study were the bases for an Instructional Supervisory Plan. The findings of the study were the bases for an Instructional Supervisory Plan. Quantitative analysis was used to determine the significant difference between the pre-test and post-test mean scores. In this study, the researcher was used the Summative Test Questionnaire in Mathematics based on the Self-learning Modules. The study was conducted for one month period in which there were at least 4 learning competencies which were divided per week. The participants for this study will be the grade 3 learners handled by the researcher. The main local of the study is Omaganhan Elementary School in Tabango North District in the Schools Division of Leyte. The assessment given to the respondents was carefully validated by the teacher-researcher himself which are the pretest and posttest test performances of the Grade 3 learners, the different steps in conducting the identified approach were undertaken in order to validate their performances before and after the implementation of numeracy intervention activities to the respondents. This study is mainly focus on the results of the different test validation to gather data: The pretest scores performance of the Grade 3 learners before the implementation of the numeracy intervention activities, The Posttest scores performance of the Grade 3 learners after the implementation of the numeracy intervention activities was also conducted as well as the significant difference of the pretest and posttest performances before and after the implementation of the numeracy intervention activities in the delivery of the most essential learning competencies in teaching Mathematics. In the Quasi- experimental research design, the researcher prepared the different materials which integrating numeracy intervention activities. The proposed instructional supervisory Plan was taken based on the findings of the study.

Sampling. There are 21 total number respondents who are included in the study. The respondents or the grade 3 learners were being identified and the primary means of reach is during the actual conduct of the study as well as during the gathering of data in the school where the study was conducted. Another way of contacting them are through cell phones of their respective parents.

Research Procedure. The researcher asked permission from the office of the Schools Division Office headed by our School Division Superintendent through Transmittal Letter. The same letter content was given to the Public-School District Supervisor, School Principal, and to the teachers whom the respondents are under their care. The research instruments used were the test questionnaires based on the most essential learning competencies in Mathematics which will focus on the 2nd   grading period. It was administered by the researcher to identify the performance level of the Grade 3 pupils which based on the numeracy performance which is also relative to their knowledge of the lessons. After the integration of the Explicit was be administered to attest whether the test performance of the grade 3 pupils is increased or not. Data were collated and submitted to appropriate statistical treatment.

The Approval and recommendation from the Office of the Schools Division Superintendent, as well as to the Assistant Schools Division Superintendent in Leyte Division being the Chairman of the Schools Division Research Committee through the Senior Education Program Specialist in Planning and Research. After the Approval of the Schools Division Research Committee, the Approved or endorsement letter from the body together with the approved letter of intent were forwarded to the Office of the Public School District Supervisor as well as to the office of the School principal in order to get full support on the conduct of the study as well as to get also approval from their end. The proposed title and design were submitted to the School Division Office for approval. Upon approval, the Division released endorsement to the District Office where the school is located. When the research was approved by the Schools Division Office and District Office, the researcher began the process of data gathering. Validation of the instruments through Experts such as the Master Teacher in Mathematics and in coordination with the school head and lastly to the Education Program Supervisor in Learning Resource was sought. Orientation of the participants was done. Answering and retrieval of the research tool followed. Tallying of results and treatment of data. Analysis and Interpretation of Data. The study was bases for a proposed instructional supervisory plan.

Ethical Issues. The right to conduct the study was strictly adhere through the approval of the Schools Division Superintendent, Public School District Supervisor as well as the approval of the School Principal where the study were conducted. Orientation of the respondents both the learners and the teachers including the School Principal was also done. In the orientation, specially to the parents and or guardian, the process of the study was discussed in order for them to know how and why the study will be done and to reiterate that this study is purely focus on the improvement of the performance of the Grade 3 learners. The need for other data that was needed in the study such as the performance of the school in general based on the different performance indicators, a written permission was sought to the principal confidentiality and anonymity and will be discussed requiring them not to write names on the tools and have to writer pseudonym instead.

Treatment of Data. The following statistical formulas were used in this study:

The quantitative responses were tallied and tabulated. The data was treated statistically using the following statistical tool.

Weighted Mean. This was utilized to assess the performance of the Grade 3 learners.

T-Test for Mean Difference- This tool was used to calculate the significant difference of the test performance of the Grade 3 learners in Mathematics

III. RESULTS AND DISCUSSION

TABLE 1

PRE-TEST PERFORMANCE OF GRADE 3 PUPILS IN MATH

Score Range	Description	PRETEST	
		Frequency	%
17-20	Excellent	0	0
13-16	Very Good	0	0
9-12	Good	10	48
5-8	Fair	6	29
1-4	Poor	5	23
Total		21	100
Weighted Mean		7.19	Fair

Table 1 presents the pre-test performance of Grade 3 Learners in Mathematics Subject. The results of the study particularly on the pretest performance of the Grade 3 learners are merely focus on the different learning that they have gained from the things that they have experience while learning the subject particularly on the numeracy performance of the learners before they will be exposing to the different numeracy intervention activities that could help alleviate their performance in Mathematics.

Based on the table in table 1, the mathematics pre-test results for Grade 3 learners gives a detailed picture of how the scores were distributed in different categories. Significantly, the lack of learners in the Excellent and Very Good categories (17–20 and 13–16 score ranges, respectively) connotes that learners still have a long way to go in understanding basic math concepts. This points to a possible gap in the learners' prior knowledge of the subject or the need for more potent teaching techniques to engage and challenge learners at higher cognitive levels. On the other hand, 48% of learners fall into the Good category, which covers scores between 9 and 12. This shows that a sizable portion of the class has a fairly good understanding of math concepts, it is crucial to investigate the precise areas within this category where learners are succeeding and where they might need to improve. Furthermore, 29% of Learners fall into the Fair category (5-8 score range), which suggests that a sizable portion of students may be having difficulty with specific math curriculum components. It is essential to pinpoint the particular subjects or abilities in this category that present difficulties for the students. In order to improve this group of learner's comprehension and mastery of mathematics competencies, teachers might need to go over foundational concepts again, offer more assistance, or use different teaching strategies. There are 23% of the learners fall into the Poor category (1-4 score range), which is a worrying trend. These learners are having difficulty understanding basic math concepts, and their performance can be a sign of possible foundational knowledge gaps. In order to close the gaps in their knowledge and provide a stronger basis for future math learning, it is critical to respond to this group's needs as soon as possible with remedial techniques, individualized attention, and potentially differentiated instruction.

The results in table 1 implied that from the weighted mean of 7.19, which is in the Fair range, emphasizes the general trend toward this performance of the learners in mathematics competencies. This mean is a helpful indicator because it highlights the need of more job or work by the teacher to help improve the performance levels of all leaners in the class and meeting their individual needs. Furthermore, though majority of learners who fall into the Good category it was still indicated that they have a fair grasp of the foundational ideas in math. Still, a more thorough examination is needed to pinpoint particular advantages and disadvantages within this group. It is imperative to attend to the individual

needs of these learners in order to motivate them to reach greater accomplishment levels. It also emphasizes how critical it is to identify and develop each member of the group's unique talents in order to create a more welcoming and equal learning environment. To help students overcome particular obstacles, teachers can think about introducing interactive techniques, offering more resources, or implementing differentiated instruction. Moreover, to avoid further learning gaps, these students' challenges require immediate attention. It might take small-group interventions, one-on-one tutoring, or remedial programs to get these students up to speed and give them a strong foundation for continued mathematical learning. This mean emphasizes the need for group efforts to improve the class as a whole, with a particular emphasis on helping those in the Poor category and bringing those in the Fair category up to the Good level. These findings have ramifications outside of the classroom, highlighting the necessity of a multifaceted, cooperative approach to education. Collaboration between teachers, parents, and school administrators is necessary to establish a setting that understands and meets each learner's unique needs.

TABLE 2

POST TEST PERFORMANCE OF GRADE 3 PUPILS IN MATH

Score Range	Description	POST TEST	
		Frequency	**%**
17-20	Excellent	11	52
13-16	Very Good	10	48
9-12	Good	0	0
5-8	Fair	0	0
1-4	Poor	0	0
Total		21	100
Weighted Mean		**16.86**	**Excellent**

Table 2 presents the pre-test performance of Grade 3 Learners in Mathematics Subject. This result was based from the learnings or gaining mathematical skills by the respondents based from the things that they have gained after introducing to them the new strategy that somehow ignite their attention to learning the Mathematics competencies that were lasted for 4 weeks already.

Based from the table 2 results, it was revealed and shows that the Grade 3 learners' Math post-test results show a significant increase in overall achievement. There has been a noticeable change in the distribution of scores, with 52% of learners now falling into the Excellent category (17–20 score range). This impressive rise indicates a significant improvement in the comprehension and application of mathematical ideas. If a large percentage of students fall into the Excellent category, it means that their progress has been greatly aided by targeted interventions, well-executed curriculum, or both. On the other side of the coin, 48% of the learners are belong to the Very Good category (score range of 13–16) also which also shows a significant presence. Given that almost the whole learners now perform in the top two performance categories, this highlights the beneficial effects of the interventions even more. The fact that there are no learners in the lower categories (Good, Fair, and Poor) is an impressive accomplishment that suggests the post-test results have successfully raised the general math performance level of Grade 3 learners. Although learners' performance has improved as a result, this also calls for a closer look at the elements that led to this concentration. The performance of the learners before and after the instructional period can be reliably compared because the post-test total frequency of 21 learners matches that of the pre-test. This highlights the consistency and efficacy of the instructional strategies used throughout the course and supports the positive trend seen in the frequency distribution. Moreover, the math post-test

results for Grade 3 learners show a remarkable shift in the direction of excellence, with most students receiving Excellent or Very Good ratings. When learners in the lower performance categories are absent, it indicates that the intervention was successful in raising overall performance and removing instances of lower-level achievement. The math post-test results for Grade 3 learners, as shown in Table 2, show a notable increase in overall performance over the pre-test. There has been a noticeable change in the distribution of scores; most learners are now classified as Excellent or Very Good. There has been a significant increase in the Excellent category (scores 17–20) from zero in the pre-test to 52% in the post-test. This impressive development points to efficient instructional techniques, focused interventions, or curriculum modifications that have raised learners' understanding of complex mathematical ideas. On the other hand, 48% of the learners receiving scores in the Very Good range (13–16), the presence of students in this group further confirms the upward trend. This result indicates that a sizable segment of the Grade 3 learners consistently and admirably understands math concepts. The post-test results show that the Fair and Poor categories in the pre-test have mostly changed to Excellent and Very Good, indicating that the interventions were successful in closing learning gaps and pushing students to higher achievement levels. The absence of learners in the Good, Fair, and Poor categories (9–20) is particularly noteworthy as it highlights how effective the post-test interventions were in raising the achievement levels of the entire class.

This finding implies that the tactics used in the interim between the pre- and post-tests not only addressed particular areas of weakness but also challenged and encouraged students generally, producing a learner that primarily performs well in math. This mean highlights the overall achievement of the Grade 3 learners and is a reliable indicator of the central tendency of scores. It suggests that the majority of learners are not only doing well academically but also understanding math concepts exceptionally well, demonstrating the efficacy of the interventions. In addition to reflecting better academic results, the transition from Fair and Poor categories to primarily Excellent and Very Good sets the stage for future success in higher grades. In order to maintain the positive trajectory in math education going forward, educators must simultaneously be alerted to address any lingering issues and recognize and celebrate this group's accomplishment. The data indicates a positive transformation in the learners' math proficiency and a promising trajectory for their academic journey.

TABLE 3

TEST OF DIFFERENCE BETWEEN THE SCORES IN THE PRE-TEST AND POST-TEST OF GRADE 3 PUPILS IN MATH

Aspects	Test Scores		Computed T	Critical T	Decision	Interpretation
GRADE 3 Pupils in Math	Pre	7.19	1.344	0.821	Reject H_o	Significant
	Post	16.86				

Table 3 presents the test of difference between the scores in the pre-test and post-test of Grade 3 in mathematics subject which was lasted for 4 weeks from the implementation of the intervention to the lessons being delivered. These results are the manifestation to identify whether this intervention is effective or not based from the pretest and posttest performance as well as their significant difference.

Based on the results in table 3, A notable and constructive change in overall performance is shown by the examination have shown, the test of difference between the scores in the pre-test and post-test of Grade 3 learners in math. The null hypothesis (Ho) is rejected because the computed t-value of 1.344 is greater than the crucial t-value of 0.821. This rejection suggests that there was a statistically significant difference in the students' pre-test and post-test

results, proving that the interventions that were put in place had a major and beneficial effect on their math proficiency. The mean score of 7.19 on the pre-test and the mean score of 16.86 on the post-test demonstrate a significant improvement in performance during the course of the instruction. The computed t-value supports the positive difference, indicating that the strategies, interventions, used during 4 weeks implementation have improved the learners' math skills in a way that is statistically significant. This finding has positive impact for the efficiency of the interventions and instructional strategies used to meet the various needs of the Grade 3 learners. The choice to reject the null hypothesis indicates that deliberate efforts made during the instructional period are what caused the observed change in scores, rather than chance. Additionally, it promotes a reflective approach by asking teachers to pinpoint and duplicate effective aspects of their teaching strategies in order to maintain and improve math learners achievement. It was suggests clear positive impact of the instructional interventions.

The success of the interventions is validated by the rejection of the null hypothesis, which encourages educators to reevaluate and improve their methods in order to achieve long-term positive results. This discovery has significant ramifications for curriculum development, teaching strategies, and the continuous quest of excellence in math education for learners in Grade 3. This rejection denotes a statistically significant difference in the pre-test and post-test scores, suggesting that the Grade 3 learners math proficiency has been significantly impacted by the implemented interventions. The mean score of 7.19 obtained before the test and the mean score of 16.86 obtained after it indicate a significant improvement in overall performance. This positive difference is ascribed to deliberate efforts made during the instructional period rather than being the mere product of chance. The choice to reject the null hypothesis emphasizes how successful the interventions were, indicating that teaching tactics, curriculum modifications, or extra help have all been successful in raising students' math proficiency.

The results in table 3 implied that the significant improvement in the students' arithmetic skills is indicated by the significant difference between their pre- and post-test results. It shows that intentional and successful teaching methods are what caused the changes in the learners' test results rather than chance. This interpretation has implications for ongoing teaching methodology improvement, and identifying effective components that can be repeated to maintain and improve math learners' achievement.

IV.   CONCLUSION

Based from the results of the study on the integration of the numeracy intervention Activities in the delivery of the most essential learning competencies in Mathematics particularly is significantly effective in improving the numeracy performance of the Grade 3 pupils. Moreover, it the integration of the numeracy intervention materials could assist the learners specially to those learners who are identified as non-numerates learners or those learners who have known skills on the different mathematical basic operations..

V.   RECOMMENDATIONS

The researcher offered the following recommendations to improve the performance of the Grade 3 learners in Mathematics.

1. The proposed instructional supervisory plan should be the basis of both teachers and school head during the teaching and learning process as well as giving of technical assistance.

2. The Education Program Supervisors should provide a mechanism for routinely checking on the application of numeracy interventions in classrooms. They should have the ability to offer focused assistance to educators, guaranteeing compliance with intervention techniques and pinpointing opportunities for enhancement.

3. The school head should give the teachers the chance to continue their professional development so they can become more knowledgeable about numeracy intervention techniques and resources. They should attend different Training courses, workshops, and cooperative learning opportunities that can help equip educators with the knowledge and abilities needed to successfully incorporate interventions into their teaching methods.

   School heads play a pivotal role in championing the integration of numeracy intervention materials. They should provide leadership by fostering a school culture that values and prioritizes numeracy interventions. Advocacy efforts can include communicating the benefits to teachers, students, and parents.

4. The teachers should develop their teaching skills in the delivery of the most essential learning competencies specially in teaching chemistry by attending training workshops that could help enhance their teaching and can help them address the different learning needs.

5. The Public School District Supervisor should motivate teachers to use differentiated teaching strategies that meet the needs of students with a range of learning styles and skills. A more individualized learning experience is ensured by customizing numeracy interventions to each student's needs, which maximizes the impact on test performance.

6. parents should promote parental engagement by providing workshops or information sessions on the importance of numeracy interventions. They should actively participate in their child's learning process and reinforce numeracy skills at home. The involvement of parents is crucial for reinforcing concepts introduced in the classroom and supporting test performance.

7. In relation to the abovementioned, the researcher is giving the authority to those future researchers to conduct the same study to validate the veracity of the results.

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