

EFFECTS OF TEACHER'S STRATEGIES TO THE LITERACY AND NUMERACY SKILLS OF STUDENTS: AN EXPERIMENTAL STUDY

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ABSTRACT

The major goal of this experimental study was to see how effective the modern teaching strategies in literacy- Phonemic Awareness Daily Routine, Read Aloud, Word Wall, and strategies in numeracy- Cooperative Learning, Manipulatives, Differentiated Instruction compared to Traditional Teaching Method in enhancing literacy and numeracy skills among grade one students at Upper and Lower Mabini Elementary School. Using the modified Mother Tongue & Mathematics learning materials & tools, control and experimental groups underwent pretests, then intervention employed in given span of time, afterwards posttests were given to determine the effectiveness of the said teacher's strategies in developing the literacy and numeracy skills. The experimental group obtained the modern strategies while the control group obtained the traditional methods. Results stipulated a significant improvement in the experimental group's competency levels post-intervention, signifying the effectiveness of modern teaching strategies in developing literacy and numeracy skills of the first-graders. Moreover, both strategies in developing the literacy and numeracy skills showed effectiveness, but the said modern strategies in literacy and numeracy implied a nominally higher mean, showing its advantage. Thus, the outcome of this study recommends to utilize those strategies in teaching literacy and numeracy especially to the struggled learners. This finding suggests that in conducting a remediation to the learners, educators must explore strategies that are engaging to students rather than purely relying on teacher-centered methods. By incorporating these strategies, students can interact with their peers and make learning experiences meaningful and even fun.

Keyword: *experimental study, intervention, modern teaching strategies, traditional teaching method, literacy, numeracy*

1. INTRODUCTION

Literacy and numeracy skills are essential for gaining access to the larger curriculum since they are used in many parts of our life. Because reading and numeracy are utilized in so many parts of a person's life, achieving an adequate level of literacy and numeracy may substantially improve a learner's accomplishment. A child begins to read the world as soon as he or she is born, thinking clearly of what he or she sees, hears, and does. Parents, siblings, and extended family members assist the child in being active in the society and culture, as well as learning new methods of communication. This is the first step in developing reading abilities. A strong literacy and numeracy basis takes time to develop; it brings awareness to hearing, speaking, reading, writing and of course in numbers identification & solve simple math problems Harmonization of literacy and numeracy related programs is required to create more adequate teaching and learning (Zulu, 2021).

Further, In DepEd Order No. 12, Series of 2015, the Department of Education identifies that the underpinning of learning is in a child's early language, literacy, and numeracy skills. These skills, according to DepEd, do not develop naturally, and thus require careful planning and instruction. There is a need for children to have access to age appropriate and culturally-sensitive materials to help them develop the habits of reading, speaking, writing, and counting.

In Tanzania, Africa a study entitled: Exploring Literacy and Numeracy Teaching in Tanzanian Classrooms: Insights from Teachers' Classroom Practices was conducted by Mmasa (2016) indicated that there were serious literacy problems of literacy teaching in public primary schools where most the teachers do not have adequate skills of teaching literacy. Pupils in standard two about 64% cannot read, write and do simple numeracy while standard three about 54%. In addition, factors that contributed to literacy problem were pupils' late enrolment in standard one, shortages of teaching and learning resources, and parents' level of education, inadequate literacy teachers and teachers with poor literacy teaching skills. Teachers teaching literacy teaching needs professional learning in order improve their teaching skills.

A study was conducted in Los Banos, Laguna by Cardino and de la Cruz (2020) revealed that four teaching strategies including cooperative learning, deductive approach, inductive approach, and integrative approach, were found to have a significant influence on academic performance in mathematics. By understanding the learning styles of students, teachers will be guided in designing different strategies to help students enhance learning for their improved performance in numeracy.

Furthermore, in Kapalong East District, the researcher observes that some teachers teaching in Grade One are newly-hired teachers and new to teach Grade 1, who taught from higher grades for few years, so that is why they lack the necessary training, experience and expertise. It was also observed that some learners lack the numeracy and literacy skills needed to learn other levels or complexity, in reading and in simple problem solving. In this light, the researcher decided to conduct this study to determine the effectiveness of the strategies in teaching literacy and numeracy skills of the learners.

1.1 Research Questions

1. What is the level of literacy and numeracy skills of the students when measured in their pretest?
2. What is the level of literacy and numeracy skills of the students when measured in their posttest?
3. Is there a significant difference between the pretest and posttest mean scores of the control group in the level literacy and numeracy skills of students?
4. Is there a significant difference between the pretest and posttest mean scores of the experimental group in the level literacy and numeracy skills of students?
5. Is there a significant difference between the mean posttest scores of the control group and experimental group in the level of literacy and numeracy skills of students?

2. METHODOLOGY

2.1 Research Design

This study used the quasi-experimental research design. It used the scientific method to establish the cause and effect relationship among control-experimental group of variables. In quasi-experimental research design involves the manipulation of independent variable without random assignment of participants to conditions or orders of conditions (Shadish, Cook & Campbell, 2001). Further, the experimental group may or may not initially good in the pre-test but the post-test scores can be compared after the intervention that will be given to them.

The research flow to this was that the students were separated into two groups. By which the group A as the control group and the other group which was the group B being the experimental group, and it was done by non-random selection. The information as well as the data on this was acquired from the results of the validated researcher-made questionnaire, the pretest and posttest.

The class of 32 students, undergone a paper-and-pen pretest. The outcome of the pretest, both the control and experimental groups did not meet the expectation in literacy and numeracy pretests. After the pretest, students in Group B (experimental) were given an intervention in which they were taught in literacy through the strategies namely phonemic awareness daily routine, interactive read aloud and word wall and in numeracy through the strategies which were the cooperative learning, manipulatives and the differentiated instruction while Group A (control) was taught through traditional strategy which was purely lecture method. Wherein, both of these groups underwent a posttest via paper-and pen testing.

2.2 Subjects of the Study

The research subjects were the 32 Grade One students of Upper and Lower Mabini Elementary School for the S.Y. 2023-2024. This section was the only section in Grade One.

During the intervention, these students were exposed to various teaching strategies like letter identification and its sounds, syllabication, blending of letters, able to read and understand what he/she reads, those were the literacy skills that need to develop and these were done with the three strategies-phonemic awareness.

In numeracy lessons they need to learn more especially in number identification, adding the numbers, identify its position in a group and identifying the value of certain money coins or bills since mathematics are the harder for the first-grade level of elementary, they need more strategies to learn numeracy lessons and these were done with the specific strategies-cooperative learning, manipulatives and differentiated instruction.

For the purpose of this research, Grade One section was divided into two heterogeneous groups. There were 32 students in all, with 16 in the control group and the other 16 in the experimental group.

2.3 Research Instrument

The instrument in this study was a researcher-made questionnaire with 20 items for numeracy and another 20 items for literacy. This questionnaire was used for the pretest and posttest which was validated by experts identified by the Dean of the Graduate School. Table of specifications is prepared to show the distribution of the test questions based on the numeracy and literacy skills of the students.

To determine the effectiveness of the teaching strategies used by the teacher a pre-test was administered and after the intervention for three weeks, a post-test was administered to find out if there was an increase of the numeracy and literacy performance of the students.

2.4 Research Procedure

The Dean of Graduate School of the Assumption College of Nabunturan endorsed the researcher to the superintendent of Davao del Norte Division through letter. Once approved by the division superintendent, another letter was prepared for the school principal to allow the researcher to conduct this study.

The researcher administered the pre-test before the experimentation started, after administering the questionnaire, intervention followed using the identified teaching strategies used by the teacher. After three weeks of the intervention, the researcher administered the post-test. During the intervention the researcher recorded any activities conducted in the classroom and she analyzed the gathered data and discussion followed.

2.5 Statistical Treatment/Data Analysis

The data would be structured and compiled in order to produce readable results. In order to accurately analyze and interpret the various data collected in this study, SPSS was utilized and the following statistical tests were used:

Mean and Class Proficiency. These were used to determine the competency level of the two groups according to their pretest and posttest result.

Independent Sample T-test. This was used to compare the means of two groups.

3. RESULTS AND DISCUSSION

The results obtained from the collected and the subsequent analyses in a sequence corresponding to the problems presented. Data and preliminary information were also provided as basis of the computation and interpretations of the results.

3.1 Competency Level of the Pretest Scores of the Groups

Figure 1 shows the results of the competency level of the pretest scores of the control and experimental Group for Literacy.

Pretest	No. of students	Mean	Class Proficiency	Competency Level
GROUP A (CONTROL)	16	7.00	35.00%	Did Not Meet Expectation
GROUP B (EXPERIMENTAL)	16	7.75	38.75%	Did Not Meet Expectation

Fig -1: Competency Level of the Pretest Scores of Control and Experimental Group for Literacy

The figure above shows the level of performance of the students before the study of the two groups. Each group has 16 learners as subjects of the study. The class proficiency shows that the experimental group got 38.75%, and the control group has 35.00%, but both groups did not meet expectation level. Both groups show compatibility as to their level of competence in terms of literacy.

Figure 2 shows the results of the competency level of the pretest scores of the control and experimental Group for Numeracy.

Pretest	No. of students	Mean	Class Proficiency	Competency Level
GROUP A (CONTROL)	16	8.43	42.20%	Did Not Meet Expectation
GROUP B (EXPERIMENTAL)	16	8.93	44.70%	Did Not Meet Expectation

Fig -2: Competency Level of the Pretest Scores of Control and Experimental Group for Numeracy

The figure above shows the level of performance of the students before the study of the two groups. Each group has 16 learners as subjects of the study. The class proficiency shows that the experimental group got 44.70%, and the control group has a competency level of 42.20% but both groups did not meet expectation level. It was revealed that the level of competency in numeracy of the two groups was the same they have almost the same class proficiency.

In the pretest scores of control and experimental group in both literacy and numeracy, both got low mastery level of the subject since their class proficiency was below 50% based on the result. This implies that the teacher needs to use strategies in teaching literacy and numeracy that can help the students to enhance these two skills and at the same time can enjoy the learning process. There are many strategies for effective learning in literacy and numeracy that can ensure effective achievement outcome. Teaching is all about participation. It requires bravery. It's about mercilessly removing what's broken, what doesn't fit, no matter how tough it was to do so. It is about accepting that teaching is a medium that can do some things exceptionally well. The teaching life is the life of the explorer, the creator, constructing the classroom for free exploration (Faculty Focus, 2021).

3.2 Competency Level of the Posttest Scores of the Groups

Figure 3 shows the results of the competency level of the posttest scores from the control and experimental group for Literacy.

Posttest	No. of students	Mean	Class Proficiency	Competency Level
Group A (Control)	16	13.13	65.65%	Fairly Satisfactory
Group B (Experimental)	16	16.25	81.25%	Very Satisfactory

Fig -3: Competency Level of the Posttest Scores of Control and Experimental Group for Literacy

The figure shows the level of performance of the students after the study of the two groups. The competency level shows that the experimental group has the very satisfactory level with 81.25% class proficiency and the control group has fairly satisfactory level with 65.65% class proficiency. This result proves that, the phonemic awareness daily routines, interactive read aloud and word wall strategy is more effective than the traditional strategy in developing literacy skills.

Figure 4 shows the results of the competency level of the posttest scores from the control and experimental group for Numeracy.

Posttest	No. of students	Mean	Class Proficiency	Competency Level
Group A (Control)	16	13.63	68.13%	Satisfactory
Group B (Experimental)	16	16.06	80.30%	Very Satisfactory

Fig -4: Competency Level of the Posttest Scores of Control and Experimental Group for Numeracy

The figure shows the level of performance of the students after the study of the two groups. The competency level of the experimental group has 80.30% class proficiency which is categorized as very satisfactory. While, the control group has 68.13% class proficiency and interpreted as satisfactory. This result proves that, the strategies cooperative learning, manipulatives and differentiated instruction are more effective than the traditional strategy in developing numeracy skills.

Based on the result of the posttest of the control and experimental group both groups got above mastery level of the subject since their class proficiency was above 50%. However, the experimental group outperformed the control group, this implies that strategies that teacher used for the 3-weeks span of teaching literacy and numeracy lessons to them have a greater impact on the performance of the students compared to traditional strategy which was purely lecture method. These were based on the strategies in developing literacy skills: Phonemic Awareness as described by Carruth & Bustos (2006), Read Aloud expounded by Burkins & Croft (2010) and Word Wall as stated by Jasmine, J. & Schiest, P. (2009). Furthermore, strategies for developing numeracy skills: Cooperative learning as cited by Tukur, M.Y. et al (2019), Manipulatives as referred by Tjandra, C. (2020), and Differentiated Instruction as explained by Aguhayon, H. et al (2023), these modern teaching methods reveals more prominent than those traditional teaching methods as noted by Serroukh, S. & Serroukh, I (2022).

3.3 Significant difference between the mean scores of the pretest and posttest mean scores of the students in control group

Figure 5 shows the results of the paired t-test use to compare the achievements of the students in the control group for Literacy.

	Mean	P-Value	Decision
PRETEST	7.00	0.000	Significant
POSTTEST	13.13		

Fig -5: Comparison of the Achievement of the Students in the Control Group for Literacy

The figure shows the comparison of the achievements of the students belonging in the Group A (control). The result of the pretest has a mean of 7.00 and the posttest mean is 13.13. The result of the computation is that the p-value is 0.000 which is less than 0.05 level of significance. Therefore, the null hypothesis is rejected and it proves that there was a significant difference between the gain scores of the pretest and posttest of the literacy skill of the students in control group.

Figure 6 shows the results of the paired t-test use to compare the achievements of the students in the control group for Numeracy.

	Mean	P-Value	Decision
PRETEST	8.43	0.000	Significant
POSTTEST	13.63		

Fig -6: Comparison of the Achievement of the Students in the Control Group for Numeracy

The figure shows the comparison of the achievements of the students belonging in the Group A (control).. The result of the pretest has the mean 8.43 and the posttest mean is 13.63. As a result, the p-value is 0.000 which is less than 0.05 level of significance. This signifies that there was a significant difference between the pretest and posttest results in the numeracy level skill of the students in the control group. Therefore, the null hypothesis is rejected.

The comparison of student achievements in the control group led to rejection of the null hypothesis, indicating a significant difference in achievement levels with the traditional teaching strategy- purely lecture method. Ecole Globale (2020) stated that traditional method evaluates the learning and retaining capacity of a child. It analyses how much of the provided material or syllabus has been acquired by the student. It also helps educators or teachers to compare the performances of different students but it limits a student's potential, hence, this method cannot be deemed to be a very creative and effective one.

3.4 Significant difference between the mean scores of the pretest and posttest mean scores of the students in the experimental group

Figure 7 shows the results of the paired t-test use to compare the achievements of the students in the experimental group for Literacy.

	Mean	P-Value	Decision
PRETEST	7.75	0.000	Significant
POSTTEST	16.25		

Fig -7: Comparison of the Achievement of the Students in the Experimental Group for Literacy

The figure shows the comparison of the achievements of the students belonging in the Group B (experimental). It indicates that it has a mean rating of 7.75 in the pretest and a mean of 16.25 in the posttest. The results indicate that the p-value is 0.000 which is less than 0.05 level of significance. Therefore, the null hypothesis is rejected and it proves that there is a significant difference between the gain scores for pretest and post-test of the experimental group when using the modern teaching strategies.

Figure 8 shows the results of the paired t-test use to compare the achievements of the students in the experimental group for Numeracy.

	Mean	P-Value	Decision
PRETEST	8.93	0.000	Significant
POSTTEST	16.06		

Fig -8: Comparison of the Achievement of the Students in the Experimental Group for Numeracy

The figure shows the comparison of the achievements of the students belonging in the Group B (experimental). It indicates that the mean rating of the pretest is 8.93 and posttest is 16.06. The p-value is 0.000 which is less than 0.05 level of significance. This suggests that there is significant difference between the gain scores or achievement of the students in numeracy therefore, the hypothesis is rejected.

These results have implications to the achievement of students as it indicates positiveness when utilizing either the traditional teaching strategy- lecture method or modern teaching strategies for developing literacy and numeracy skills of students. However, educators often rely on traditional way of teaching or teaching methods, which may not be advantageous for 21st-century learners, initiating alternative approaches to enhance learning engagement and make positive changes. According to Akinouglo and Tandogan (2006), regardless of the approaches considered, the learners learned according to their own needs and pace that's why they were introduced to different teaching styles matching to their diverse learning styles, and so that is why the different teaching approaches and strategies that foster learner-centered way produced better outcomes.

3.5 Significant difference between the posttest mean scores of the students in control group and the experimental group

Figure 9 shows the results of the computations to compare the achievements of the students between the control and experimental groups as reflected on their posttest scores for Literacy.

Posttest	Mean	P-Value	Remarks
Group A (Control)	13.13	0.000	Significant
Group B (Experimental)	16.25		

Fig -9: Comparison of the Achievement of the Students between the Control and Experimental Group for Literacy

The figure shows the level of performance of the students after the study of the two groups. An independent t-test was used to determine the difference between the posttest of both groups for literacy. The mean indicates that Group A (Control) got 13.13 and Group B (Experimental) got 16.25. The P-Value is 0.000 less than 0.05, indicating that it is significant. Therefore, the null hypothesis was rejected and there was a significant difference of the achievement of the students in literacy between the control and experimental group as reflected on their posttest scores.

Figure 10 shows the results of the computations to compare the achievements of the students between the control and experimental groups as reflected on their posttest scores for Numeracy.

Posttest	Mean	P-Value	Remarks
Group A (Control)	13.63	0.000	Significant
Group B (Experimental)	16.06		

Fig-10: Comparison of the Achievement of the Students between the Control and Experimental Group for Numeracy

The figure shows the level of performance of the students after the study of the two groups. An independent t-test was used to determine the difference between the posttest of both groups for numeracy. The mean indicates that Group A (Control) got 13.63 and Group B (Experimental) got 16.06. The P-Value is 0.000 less than 0.05, indicating that it is significant. Therefore, the null hypothesis was rejected and there was a significant difference of the achievement of the students in numeracy between the control and experimental group as reflected on their posttest scores.

Comparing the achievements of students in the control and experimental groups, the null hypothesis was rejected, indicating a significant difference in their posttest scores. The experimental group, which utilized the modern teaching strategies, for literacy such as Phonemic Awareness Daily Routines, Read Aloud and Word Wall, and for numeracy – Cooperative Learning, Manipulatives and Differentiated Instruction as intervention which would emphasize that students performed better academically. According to Awgichew (2022) based on the major finding tentatively it can be concluded that lack of supplementary materials, low socio-economic status of children's family, and low parental support affected the implementation and functionality of L&N curriculum in first cycle primary schools. So, concerned stakeholders (GOs, NGOs, educators and higher education institutes or teacher institutions) need to determine those fundamental problems to realize L&N curriculum in authentic manner, advance instructional process, and enrich the learning environment. Thus, the aforementioned-strategies used by the teacher were of great help to lead students in enhancing their literacy and numeracy skills better.

4. CONCLUSIONS

The competency level of both the control and experimental groups at the beginning of the experiment were equivalent as stipulated in the computation of their class proficiency in their pretest scores.

The competency level of the students in the experimental group after the experiment was significantly different. Therefore, the interference of the use of strategies in literacy – phonemic awareness daily routines, read aloud and word wall, and for numeracy – cooperative learning, manipulatives and differentiated instruction were effective. Performance of the students in both the control and experimental groups in literacy and numeracy improved using the various strategies in developing literacy and numeracy skills, respectively. The results showed that both approaches-the modern and traditional teaching methods employed by the teacher in teaching literacy and numeracy were effective in the learning processes in just three weeks period, but the modern teaching strategies introduced resulted higher mean than the traditional way-lecture method. Thus, those modern teaching strategies in developing literacy and numeracy skills were more effective than the traditional teaching strategies.

Based on the conclusions derived from the findings of the study, the following recommendations are hereby presented:

1. There is a need for Grade One teachers to improve the literacy skills and numeracy skills of the students for these are the basic skills that need to learn in Elementary since Grade One is the foundation to develop more on literacy and numeracy concepts. This could be done through the different strategies such as phonemic awareness daily routines, read aloud and word wall in literacy, while for numeracy teachers can employ the strategies- cooperative learning, through manipulatives and differentiated instruction so that students can engage and enjoy the learning process and for better understanding of the numeracy concepts.
2. Grade One teachers must be creative during the teaching-learning process in a way that students can actively participate and engage all throughout the classroom activity for better understanding and easy to grasp ideas even they are diverse in learning styles. Through hands-on activities or by learning while doing, these could be a better way in motivating the students to get involved and would lead to better performance.
3. The School Administrators or School Heads should encourage and support the Grade One teachers using the various strategies especially some of the strategies need resources to purchase the materials in the classroom, and would not come from teachers' pocket solely.
4. The use of these strategies in literacy – Phonemic Awareness Daily Routines, Read Aloud and Word Wall, and for numeracy – Cooperative Learning, Manipulatives and Differentiated Instruction are greatly recommended for future researchers to implement for it has relevant effect to the achievement or performance level of the students.

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