LEVEL OF NUMERACY SKILLS OF GRADE 7 STUDENTS OF LEGAZPI CITY NATIONAL HIGH SCHOOL (LCNHS): BASIS OF IMPLEMENTATION OF MATHEMATICS REMEDIATION PROGRAM

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Abstract

a. Title:
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d. Summary

The elementary pupils encountered various difficulties due to independent learning schemes, untrained learning facilitators at home, and no physical interaction with teachers. Hence, incoming Grade 7 for the school year 2021-2022, may experience low academic competence, especially in Mathematics subjects. This study aimed to determine the level of numeracy skills of students who need enhancement and intervention. The remedial classes are dependent on the numeracy test results. In addition, the posttest results can be a basis for determining the effectiveness of the materials and pedagogical approaches used in remedial classes. It can serve as an avenue for the institutionalization of the Mathematics Remediation Program in the Legazpi City Division.

This descriptive-quantitative research assessed the level of numeracy skills of grade 7 students of Legazpi City National High School which can be the basis of the implementation of the Mathematics Remediation Program. This study involved the entire population of Grade 7 of Legazpi City National High School who were identified as moderate and non-numerates for the school year 2022-2023.

The gathered data were analyzed using descriptive statistics particularly weighted, frequency (f), and percentage (%).

The objectives of this study include: (1) determine the level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School; (2) determine the effectiveness of the Teaching Resource Package for Grade 7 Mathematics Remedial Class in enhancing the numeracy skills and improving the proficiency level of the Grade 7 students, and (3) propose a remediation program to enhance the numeracy skills and improve the proficiency level of the students.

The level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School was based on the Pretest and Posttest MPL. The pretest was conducted during the opening of the school year 2022-2023. While the posttest was conducted during the fourth quarter of the said school year involving all the Grade 7 students. The findings of the study were as follows:

1. **Level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School**

The 14 sections composed of 516 Grade 7 students, were all not proficient as indicated by the average MPL of 9.53. It was indicated that none were highly numerate, and only two (2) sections were 100% moderate numerates. While all the rest were a combination of moderate numerates and non-numerates. Among those sections with non-numerates, K, SP, and G were the top 3 with the highest non-numerates with a percentage (%) of 43.59, 30.19, and 26.19 respectively.

2. Effectiveness of the Teaching Resource Package for Grade 7 Mathematics Remedial Class in Improving the numeracy skills of the Grade 7 Students

The posttest results showed that the Grade 7 students were non-proficient in Mathematics as revealed by the average MPL of 19.57 with an increase of 10.04%. Generally, none acquired a high proficiency level but the students improved to 100% moderate numerates showing an increase by 18.49%.

3. Proposed remediation program to improve the numeracy skills of grade 7 students

The Mathematics interventions principles were the STEPS which include:

Set-Up (review and practice of skills already mastered);

Teach (model and teach the new concept);

Engage (teacher-led practice with the new concept);

Practice (extended practice with the new concept); and

Show You Know (a quick check of skill progress/ mastery).

Based on these principles the **PAVS Program** was proposed by the researcher. The PAVS Program stands for Peer-assisted; Assessment-based; Visual (manipulatives, pictures, and graphs); and Systematic intervention. This remediation program aimed to enhance the numeracy skills and improve the proficiency level of the students in Mathematics.

Based on the findings, the following conclusions were derived:

1. The level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School was very low as indicated by the very low MPL. It showed that the majority of the students undergo a remedial class under moderate

numerates and the rest were provided with remedial classes for non-numerates. The low proficiency level was associated with the impact of distance education in numeracy skills development where modular learning substituted the presence of the teacher for two (2) consecutive years (Grades 5 and 6).

2. The Teaching Resource Package for the Grade 7 Mathematics Remedial Class was effective in enhancing the numeracy skills of the Grade 7 students from non-numerates to moderate numerates but not effective in enabling the students to become highly numerates. In general, the Teaching Resource Package for Grade 7 Mathematics Remediation Class is effective in enhancing the numeracy skills of Grade 7 but was not effective in improving the proficiency level of the students.

3. Based on the five (5) principles presented as set-up, teach, engage, practice, and show, the **PAVS** (Peer-assisted; Assessment-based; Visual, and Systematic intervention) **Program** was proposed. This Mathematics Remediation Program aimed to enhance the numeracy skills and improve the proficiency level of students in Mathematics fostering appropriate pedagogical approaches, strategies, intervention materials, and teacher's commitment

Based on the conclusions, the following recommendations were set forth:

1. The proficiency level and numeracy skills of elementary students can be measured so that appropriate intervention can be provided before entering high school. Likewise, upon taking the entrance exam in high school, numeracy skills can be measured for future reference.

2. The intervention materials for remedial classes can be quality-assured to make sure that they can be effective in improving proficiency levels and enhancing numeracy skills.

3. The proposed PAVS (Peer-assisted; Assessment-based; Visual, and Systematic Intervention) Program can be implemented in the upcoming school year 2023-2024. Its outcome can be assessed and can be a basis for program institutionalization.

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Context and Rationale

The COVID-19 pandemic caused abrupt changes in the human way of living around the world. The mode of learning had changed to distance learning. Distance learning is the only option to withstand the challenges in the delivery of learning among students amidst difficult situations to protect teachers and students (Fernando 2020).

In connection with distance learning, DepEd Order number 012 series of 2020 entitled “Adoption of the Basic Education Learning Continuity Plan (BE-LCP) for School Year 2020-2021 in the Light of the COVID-19 Public Health Emergency”, was implemented. It is a "package of education interventions that will address challenges brought about by the COVID-19 pandemic in the education sector. (DepEd.gov.ph). This implemented policy was adopted by the education institutions to sustain education for all.

Distance learning pertains to the method of learning where teachers and students meet remotely through the Internet, e-mail, mail, video chat, and other means of connecting virtually to have classes (Meriam-dictionary) or make use of modules and other learning materials. In the Philippines, distance learning is divided into different modalities. The learning modalities are classified into three types: Modular Distance Learning (MDL), Online Distance Learning (ODL), and TV/Radio-Based Instruction.

Modular distance learning refers to “individualized instruction” such as self-learning modules (SLMs) in print or digital format/electronic copy. While in online distance learning, the teachers serve as a facilitator, allowing students to actively

participate using electronic gadgets through the use of internet connections. In these types of learning delivery, students are expected to be independent and self-motivated. According to Gossenheimer, A. et al, in an article entitled, “Impact of Distance Education on Academic Performance in a Pharmaceutical Care Course”, cited that cognitive factors such as "learning experiences, academic performance, and distance class formats are comparable to those observed for campus-based classes". However, the satisfaction level of teachers and students is inconsistent. This is due to less accessibility to instructional materials; isolation from friends, classmates, and teachers; time management, and a learning environment not conducive to learning.

Furthermore, Aksan, A. (2021), stated that the new normal teaching-learning process affects students’ academic performance, especially in Mathematics. This is supported by Hasibuan, M.N. (2021) who cited that distance education resulted in the cancellation of proper learning assessments which have an impact on the psychological aspects of students and decrease the quality of students' skills. In addition, Dangle, R. and Sumaoang, J. (2020), also cited that the implementation of modular learning affects students’ academic performance since they encountered challenges such as limited resources, low preparedness, and communication-related problems.

On the other hand, elementary pupils also encountered various difficulties due to independent learning schemes, untrained learning facilitators at home, and no physical interaction with teachers. Hence, incoming Grade 7 for the school year 2021-2022, may experience low academic competence, especially in Mathematics

subjects. This statement is supported by Adu, K. et al. (2020) who cited that the poor academic performance and negative attitude of Grade 6 pupils toward Mathematics is influenced by the teaching styles and learning styles of the pupil. Hence, it is recommended that learning facilitators at home “should be trained to identify the different types of learning style exhibited by learners”. The acquired Mathematics skills of elementary pupils are reflected in their numeracy skills. These skills are assessed during the last week of the first month of the school year.

Numeracy skills are defined as the “ability to use, interpret and communicate mathematical information to solve real-world problems”. These include the ability to understand basic math like addition, subtraction, division, and multiplication. In particular, numeracy skills include basic knowledge of numbers, calculation skills, budgeting, interpreting mathematical information, understanding the relationships between numbers, understanding trends, and measurement and data analysis. In this study, numeracy skills refer to the capacity to use numbers, solve, and interpret problems, and explain how the given problem can be solved.

The conduct of the numeracy assessment is one of the various assessments stipulated in DepEd Order 055 s. 2016, known as Policy Guidelines on the National Assessment of Student Learning for the K-12 Basic Education Program. It defines assessment as the" process of measuring learners' progress in the attainment of learning standards and 21st-century skills. The result will be used to quantify the academic performance of students. The national assessment of student learning is a fundamental part of DepEd’s assessment frameworks which aims to monitor the Philippines education system; assess the effectiveness and efficacy of the

delivery of education services, using learning outcomes as indicators; provide information that will guide decisions on instructional practices; determine if learners met the curriculum standards; measure students aptitude and occupational interest for career guidance, and assess previous learning for placement, accreditation, and equivalency (Luistro, A., 2016).

The Department of Education aims to develop the student's numeracy skills that can be applied in various situations. To achieve this, critical thinking and problem-solving have to be highlighted in Mathematics instruction. Since numeracy skills are a foundation of learning Mathematics, the need to assess the student's numeracy skills is of great importance in enhancing the curriculum (RM 250 s.2021, Visayas Region).

The nationwide assessment is conducted since the school year 2016-2017 and will take effect until 2023-2024. In line with this, the Legazpi City National High School will conduct the numeracy assessment for the incoming Grades 7-10 for the school year 2022-2023, which will be administered to teachers using a learning activity sheet provided by the school. Results of the numeracy test will be classified as highly numerate which means no need to undergo remedial classes; moderate which requires the students to undergo enhancement classes; and non-numerate needs intervention lessons.

In line with this, the Legazpi City National High School grade 7 Mathematics teachers provide remedial lessons for students, depending on the needs of the students, but Mathematics Remedial Program was not implemented (SBM, 2021). Likewise, the Legazpi City Division has not Implemented Mathematics

Remediation Program for grade 7 students who are moderate numerates and non-numerates (Encisa, P., 2021).

This study aimed to determine the level of numeracy skills of students who need enhancement and intervention. The remedial classes are dependent on the numeracy test results. In addition, the posttest results can be a basis for determining the effectiveness of the materials and pedagogical approaches used in remedial classes. It can serve as an avenue for the institutionalization of the Mathematics Remedial Program in the Legazpi City Division.

The remedial program can result in better academic performance of students in Mathematics. A remediation program refers to the planned activities conducted by the concerned teachers to enhance and reinforce the Mathematics skills of students.

Moreover, this study is significant to teachers, learners, parents, policy-implementing bodies, and the school community. The findings of the study can be an avenue of providing students with proper enhancement and intervention in Mathematics. This can eventually improve the teaching and learning process in the new normal.

The national assessment of student learning for the K to 12 Basic Education Program of the Philippines aims to assess the effectiveness and efficiency of the delivery of education services using learning outcomes as indicators; provide information that will guide decisions on instructional practices; determine if learners are meeting the learning standards of the curriculum; measure students' aptitude

and occupational interest for career guidance; and masses prior learning for placement, accreditation, and equivalency (DO 55, S. 2016).

The assessments include Early Language, Literacy, and Numeracy Assessments to be administered at the end of Grade 3, stage 1, Grade 4-6, stage 2, and Grades 7-10, stage 3. While the Grades 11-12 will be given assessment tests similar to Grade 10 (Ledesma, M., 2021). This assessment aims to determine if the students met the learning standards in early language, literacy, and numeracy; Exit Assessments are to be administered in Grade 6, Grade 10, and Grade 12; Career Assessments to be administered in Grade 9 to assess learners' aptitudes and occupational interests for career guidance; Accreditation and Equivalency Assessment to be taken by out-of-school youth and adults to certify completion of elementary and secondary education; and Grade Level Placement Assessment for learners in special circumstances specified in Section 6 to determine their appropriate grade level in the formal system (DO 55, S. 2016).

On the other hand, the numeracy test is not a diagnostic, summative, or formative test. However, it is designed to assess the mastery level of the students on the four (4) fundamental operations, addition, subtraction, multiplication, and division. On the conduct of this test, the school head will conduct orientation to the teachers and parents on how it will be administered (Ledesma, M., 2021).

The article entitled, “The Importance of Literacy and Numeracy Skills,” cited that numeracy is important in developing logical thinking and reasoning strategies in everyday activities. It is important in “solving problems involving numbers, time, patterns and shapes for situations like cooking, reading receipts, reading

instructions and even playing sport.” Further, a study conducted by Guhl, P. (2019), entitled, "The Impact of Early Math and Numeracy Skills on Academic Achievement in Elementary School", cited that "early math skills are a powerful predictor of academic success through elementary school." Hence, early math skills are the foundation of success in the future.

On the manner of assessment of numeracy skills, the article entitled, “Mathematics and Numeracy Assessment,” cited that school-based assessment contributes to developing the numeracy skills of the learner. The assessment in Mathematics and numeracy include: "feedback and reflection; student self-assessments; student portfolios; validated tools, anecdotal evidence, teacher moderated student assessment tasks; and student self-reflections, interests, and surveys." In addition, Gittens, C.A. (2015), in a study entitled, “Assessing Numeracy in the Upper Elementary and Middle School Years,” validated the numeracy skills of 197 Grade 8 students of a private school in California, USA. It utilized the Cognitive Abilities Test (CogAT) and Test of Basic Skills Mathematics test, both standardized academic achievement domain assessments. Results revealed that "there is a positive relationship with the students' self-reported creative problem-solving, diligence, systematicity, and fair-mindedness." The present study has the same bearing since it assessed the numeracy skills of students and utilized standardized assessment tools. However, it involved Grade 7 students and determined the remediation program appropriate for the students’ needs.

Furthermore, the study of Guinocor, M., et al. (2020), entitled, “Mathematics Performance of Students in a Philippine State University”, investigated the study habits and attitudes of 52 Education students of Cebu Technological University, Philippines. Data gathered were treated using frequency, simple percentage, weighted mean, Pearson r, and t-test. Results revealed that there is a significant positive high correlation between the study orientations of the students considering their academic performance in terms of their Graded Point Average (GPA) in Mathematics subjects. The present study is related since it also assessed the mathematics skills of students, and the data were treated using frequency distribution and percentages. However, it involved Grade 7 students, categorized the level of numeracy skills, and the correlation between performance and attitudes were not investigated.

Another study conducted by Capate, R. N., and Lapinid, M.R. (2015), entitled “Assessing the Mathematics Performance of Grade 8 Students as Basis for Enhancing Instruction and Aligning with K to 12 Curriculum,” determined the performance and difficulties of the Grade 8 students of the K-12 Mathematics in the least mastered competencies. It aimed to use the result as the basis for enhancing instruction and assessment. Results showed that the majority of the respondents are in the beginning level of achievement and half of the competencies were least mastered. Recommended strategies to improve instruction included needs assessment, more practice for automation, conducting review classes for mastery and retention, explicit instruction, and peer-assisted Mathematics instruction. The present study has the same bearing since it used the

assessment result in improving instruction in K-12 Mathematics. But it involved Grade 7 students, and the result was utilized to identify the students who will undergo remedial classes.

Similarly, the study by Callaman, R., and Itaas, E. (2020), entitled, “Students’ Mathematics Achievement in Mindanao Context: A Meta-Analysis,” analyzed the effect size of the factors on the student’s achievement in Mathematics. This causal-comparative research will be a basis for determining the student-related, teacher-related, and school-related factors that have -greatly influenced students’ Mathematics achievement involving 200 existing studies, utilizing, Hierarchical Linear Modeling (HLM). Results revealed that overall effect sizes have a small effect on Mathematics achievement. However, “mathematical skills, attitude, and self-efficacy are found to be the predictors of students’ mathematical achievement.” Further, it was concluded that the institution influences the student's mathematical achievements. It is recommended that educational institutions should regularly review the curriculum to address the learning gap, and teachers may utilize varied teaching strategies so that students would develop an interest and positive learning attitudes towards Mathematics. The present study is similar since it assessed the mathematics skills of students. But it does not involve the analysis of the existing studies, instead, it utilized the national assessment result to identify students who need remediation less, implement a remediation program, and a causal relationship between factors and students' achievement was not investigated.

The reviewed literature center on the assessment of mathematical skills and the enhancement of instruction, strategies of teachers, students' interests and attitudes, and factors that affect learning in Mathematics. None of the reviewed studies have utilized the school-level national numeracy skills result to identify students that need remediation classes such as enhancement and intervention to improve their numeracy skills. These are the gaps bridged by the present study.

The present study is anchored on Constructivism Theory. According to the Center for Educational Innovation (CEI), states that "Learners construct knowledge rather than just passively take in information. As they experience the world and reflect upon those experiences, they build their representations and incorporate new information into their pre-existing knowledge." According to this theory, learning depends on the type of instruction, teachers' competencies, type of assessment, and students' direct involvement in the learning environment.

The present study considered the acquired mathematics skills in the elementary grades as the baseline of the students' numeracy skills. Through the national numeracy assessment, the numeracy skills of the students acquired in stages 1 and 2 amidst the COVID-19 pandemic were revealed. The result can be a basis for conducting and establishing remedial classes in the new normal.

Innovation, Intervention, and Strategy

On innovation, the least mastered competencies for grade 7 Mathematics were identified using the numeracy pretest result. Based on the least mastered competencies, two (2) Teaching Resource Packages for Grade 7 Mathematics Remedial Class were developed, one (1) for the moderate numerates and the

other one (1) is for the non-numerates Grade 7 students. Each teaching resource package was composed of three (3) lessons, five (5) activity sheets, three (3) worksheets, and three (3) assessments per quarter.

On intervention, the Teaching Resource Package for Grade 7 Mathematics Remedial Class was provided to the identified moderate and non-moderate students. It served as a supplementary learning material in Mathematics.

On strategy, the Mathematics subject teacher facilitated the provision of supplementary materials to the identified students. A weekly task was provided composed of a lesson plan, two (2) activity sheets, a worksheet, and an assessment. These supplementary materials were answered in two (2) weeks. These were checked by the teacher, recorded, and feedback was written on it and they were returned to the students. At the end of every quarter, a standardized test was given to the students to assess their mathematics learning skills. At this phase, another set of supplementary materials was provided to those who were identified as non-numerates and moderate numerates. Those who were identified as highly numerate were excluded from the remedial class.

Action Research Questions

This study assessed the level of numeracy skills of grade 7 students of Legazpi City National High School which can be the basis of the implementation of the Mathematics Remediation Program. Specifically, it sought answers to the following questions:

1. What is the level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School?

2. How effective is the Teaching Resource Package for Grade 7 Mathematics Remedial Class in enhancing the numeracy skills and improving the proficiency level of the Grade 7 students?
3. What remediation program may be proposed to enhance the numeracy skills and improve the proficiency level of grade 7 students of Legazpi City National High School?

Action Research Methods

a. Participants and other sources of information

The entire population of Grade 7 of Legazpi City National High School who were identified as moderate and non-numerates for the school year 2022-2023 were involved in this study. Involving all populations is known as a total enumeration of total population sampling. It is a type of purposive sampling technique where the entire population was examined. Those students who were categorized as moderate and non-numerates undergo an enhancement and intervention, respectively. These students were evaluated at the beginning and end of each quarter. Those who have achieved a highly numerates level were not included in the conduct of remedial classes.

b. Data Gathering Methods

The researcher utilized the pretest and posttest results of the unified numeracy test conducted every grading period utilizing the DepEd's standardized test materials. The test was administered by the teacher. Answer sheets were retrieved and checked. Based on the collected data, the numeracy level of the students was categorized into highly numerates, moderate numerates, and non-

numerates. Those identified under moderate numerate were given enhancement lessons, and those identified as non-numerate were provided with intervention materials. At the end of every grading period, a posttest was given to identify the numeracy level and the type of remedial lessons that will be conducted. Those who achieved a highly numerate level were excluded from taking remedial lessons.

c. Data Analysis

Descriptive statistics was utilized in this study. To treat the data obtained frequency and percentage distribution was used. To guide the researcher in determining the level of numeracy skills of the students, the following indicators were considered: Highly Numerates, the score is perfect, so, no enhancement is needed; Moderate Numerate, not perfect, enhancement is necessary; and Non-Numerate, the score is zero, so intervention is necessary. To determine the effectiveness in improving the numeracy skills of the learners taking remedial classes using the teaching resource package, MPL (Minimum Proficiency Level) adopted from the Bureau of Education Assessment (BEA) as cited by de la Fuente, J. (n.d) was used. Below is the Assessment Scale.

Levels of Proficiency	Mean Percentage Score
Highly Proficient	90 – 100
Proficient	75 – 89
Nearly Proficient	50 – 74
Low Proficiency	25 – 49
Nor Proficient	0 – 24

Discussion of Results and Reflection

This study assessed the level of numeracy skills of grade 7 students of Legazpi City National High School which can be the basis of the implementation of the Mathematics Remediation Program. The discussion presented the level of numeracy skills of Grade 7 Students of Legazpi City National High School; the effectiveness of the Teaching Resource Package for Grade 7 Mathematics Remedial Class in improving the numeracy skills of the Grade 7 students; and the proposed remediation program to improve the numeracy skills of grade 7 students of Legazpi City National High School.

1. Level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School

The level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School was based on the Pretest MPL. The pretest was conducted during the opening of the school year 2022-2023 involving all Grade 7 students. Other data were presented to support the gathered data.

In general, all students were not proficient and the majority were moderate numerates. These were supported by the data showing 14 sections composed of 516 students involved in the study, they were coded as A, B, C, D, E, F, G, H, I, J, K, L, SP, and ST. Based on the 25-item pretest results, the average highest score was 7.36, the average lowest score was 0.14, which shows that only two (2) sections get the lowest score of one (1), while the 12 sections get the lowest score of zero (0), and an average MPL (Mean Percentage Level) of 9.53 described as not proficient, which showed an average of 0% highly numerates, 81.51%

moderate numerates and 18.49% non-numerates. In particular, section ST has the highest MPL of 24.0, followed by Section A with an MPL of 22.26, both were described as not proficient but both were 100% moderate numerates. These were followed by section D with an MPL of 8.67 described as not proficient but 91.67% moderate numerates and 8.33% non-numerates. While section K has the least MPL of 4.41 described as not proficient, with 56.41% moderate numerates and 43.59% non-numerates. Table 1 shows the pretest results.

Table 1

Pretest Results

Section	N	HS	LS	MPL	Level	HN (%)	MN (%)	NN (%)
A	39	13	1	22.26	NP	0	100	0
B	36	6	0	11.22	NP	0	86.11	13.89
C	38	6	0	6.74	NP	0	76.32	23.68
D	36	5	0	8.67	NP	0	91.67	8.33
E	26	5	0	5.54	NP	0	76.92	23.08
F	29	6	0	7.03	NP	0	82.76	17.24
G	42	10	0	4.95	NP	0	73.81	26.19
H	37	5	0	5.73	NP	0	81.08	18.92
I	37	5	0	6.05	NP	0	81.08	18.92
J	39	6	0	8.0	NP	0	79.49	20.51
K	39	5	0	4.41	NP	0	56.41	43.59
L	42	7	0	8.76	NP	0	85.71	14.29
SP	53	9	0	10.04	NP	0	69.81	30.19
ST	23	15	1	24.0	NP	0	100	0
Total/Average	**516**	**7.36**	**0.14**	**9.53**	**NP**	**0.00**	**81.51**	**18.49**

Legend: No. of Items:25; MPL-Mean Percentage Level; HN- Highly Numerate; MN-Moderate Numerate; NN- Non-Numerate, NP-Not Proficient

Results revealed that all the 14 sections composed of 516 grade 7 students, were all not proficient. It was indicated by the acquired average MPL of 9.53, showing a non-proficient result. It was indicated that none were highly numerate, and only two (2) sections have 100% moderate numerates. While all the rest were moderate numerates and non-numerates. Among those sections

with non-numerates, K, SP, and G were the top 3 with the highest non-numerates with a percentage (%) of 43.59, 30.19, and 26.19 respectively.

It can be implied that the Grade 7 students have a very low proficiency level and numeracy skills indicated by the very low MPL showing a not proficient level. It goes to show that the majority (81.51%) of the students undergo a remedial class under moderate numerates and the rest (18.49%) take the remedial classes for non-numerates. The low proficiency level was associated with the impact of distance education in numeracy skills development where modular learning substituted the presence of the teacher for two (2) consecutive years (Grade 5 and 6).

The study conducted by Almarashdi, H. and Jarrah, A. (2021), entitled "Mathematics Distance Learning amid the COVID-19 Pandemic in the UAE: High School Students' Perspectives" revealed that the students had an uncertain attitude towards their distance learning experience. Notably, students' most negative perceptions were of missing out on interaction with teachers and peers, as well as disapproving of the unfavorably long screen times. Furthermore, 78.3% of those polled had no preference for studying Mathematics online.

2. Effectiveness of the Teaching Resource Package for Grade 7 Mathematics Remedial Class in improving the numeracy skills of the Grade 7 Students

The effectiveness of the Teaching Resource Package for Grade 7 Mathematics Remedial Class in improving the numeracy skills of the Grade 7 students was based on the posttest results indicating MPL and its corresponding

proficiency level. The posttest was conducted during the fourth quarter of the school year involved.

In general, all students were not proficient and 100% moderate numerates. The same sections were involved in the posttest composed of 514 students. At this point, the average highest score was 10. 64 out of the 25-item test, and the average lowest score was 1.31. There were zero (0) highly numerates but 100% moderate numerates were acquired, which means a zero (0) non-numerate student. Table 2 shows the posttest results.

Table 2

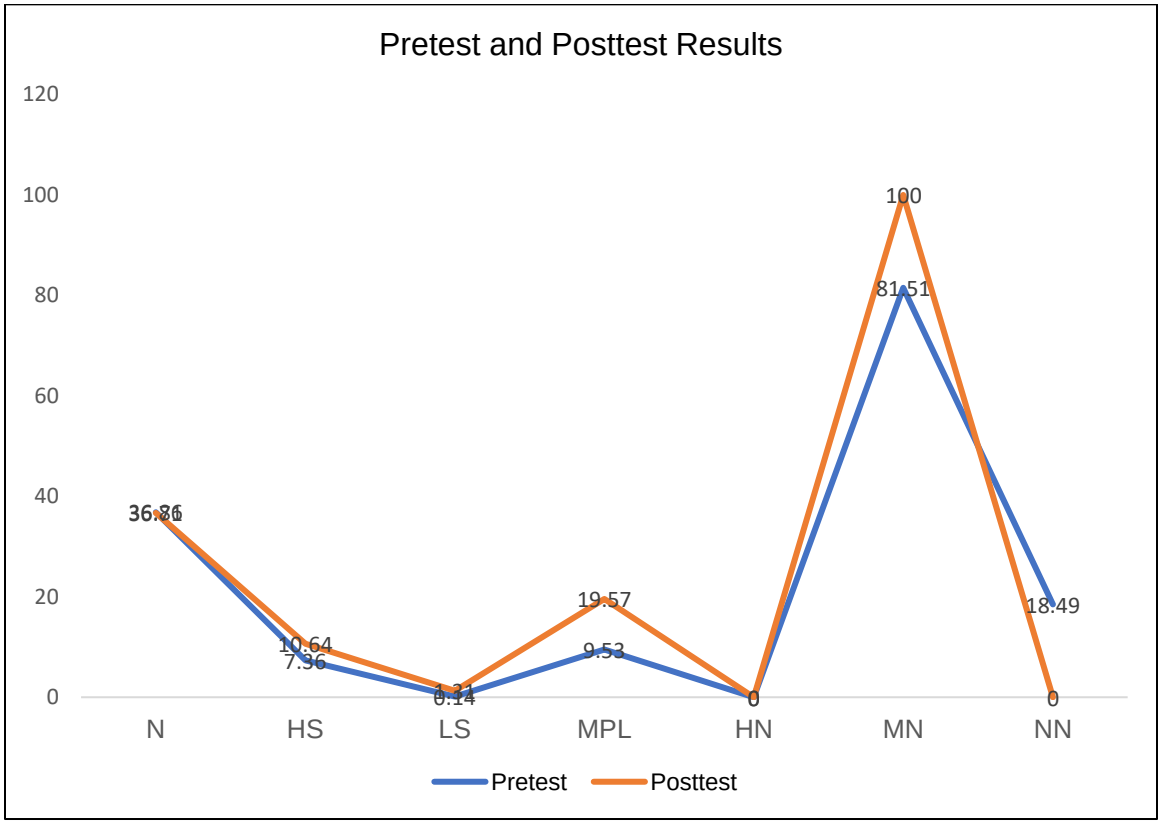
Posttest Results

Section	N	HS	LS	MPL	Level	HN (%)	MN (%)	NN (%)
A	39	17	2	39.76	LP	0	100	0
B	36	15		25.33	LP	0	100	0
C	38	11	1	25.68	LP	0	100	0
D	36	6	1	13.78	Np	0	100	0
E	26	10	1	18.23	NP	0	100	0
F	28	6	1	9	NP	0	100	0
G	41	10	4	26.24	LP	0	100	0
H	36	9	1	9.78	NP	0	100	0
I	37	10	1	8.43	NP	0	100	0
J	38	5	1	6.32	NP	0	100	0
K	39	6	1	12.92	NP	0	100	0
L	44	7	1	11.45	NP	0	100	0
SP	53	19	1	31.25	LP	0	100	0
ST	23	18	1	35.83	LP	0	100	0
Total/ Average	**514**	**10.64**	**1.31**	**19.57**	**NP**	**0**	**100**	**0**

Legend: No. of Items:25; MPL-Mean Percentage Level; HM- Highly Numerate; MN-Moderate Numerate; NN- Non-Numerate; NP-Not Proficient; LP-Low Proficient

In particular, six (6) sections out of 14 or 0r 42.86 acquired a low proficient level, while the rest remained non-proficient. Section A acquired the highest MPL of 39.76 followed by section ST with an MPL of 35.83 section SP with an MPL of 31.25, followed by sections G, C, and B, with MPLs of 26.24, 25.68, and 25.33, all described as low proficient. While among those who were non-proficient, section J acquired the least MPL of 6.32.

To establish the effectiveness of the Teaching Resource Package for the Grade 7 Mathematics Remedial Class, figure 1 shows the graphical presentation of the pretest and posttest results.



Legend: N- Average No. of Takers; HS-Highest Score; LS-Lowest Score; MPL- Mean Percentage Level; HN-High Numerate; MN-Moderate Numerate; NN- Non-Numerate

Figure 1. Pretest and Posttest Results

Results revealed that the average MPL acquired was 19.57 compared to the 9.53 pretest MPL, so an increase of 10.04% was noted. Generally, the post-test results showed that the Grade 7 students were still non-proficient in Mathematics despite the learning interventions provided during the first to fourth quarter of the school year 2022-2023. The intervention materials were composed of three (3) lessons, five (5) activity sheets, three (3) worksheets, and three (3) assessments per quarter (see Annex 5), making the students become all moderate numerates but none acquired a high proficiency level. It showed that the moderate numerates increased by 18.49% making them 100%.

It can be implied that the Teaching Resource Package for Grade 7 Mathematics Remedial Class was effective in enhancing the numeracy skills of the Grade 7 students from non-numerates to moderate numerates as indicated by the 100% moderate numerates and zero (0) percentage of non-numerates, but not effective in enabling the students to become highly numerates.

In addition, the Teaching Resource Package for Grade 7 Mathematics Remedial Class was partially effective in improving the proficiency level, since only six (6) sections improved from non-proficient to low proficient. While most of the students remained non-proficient. In general, the Teaching Resource Package for the Grade 7 Mathematics Remedial Class was not effective in improving the proficiency level of the students, but was effective in enhancing the numeracy skills of the students.

Arpilleda, A. (2021) in a study entitled “Strategic Intervention Material: A Tool in Enhancing Grade Nine Students’ Mathematical Performance” revealed that

the strategic intervention materials had a positive impact on mastering the identified least-learned competency, as evident from by the posttest results of the two groups. Thus, the school may conduct training, programs, and activities to improve teachers' skills in creating strategic intervention materials to assist students' needs, particularly in mastering the least learned competencies.

3. Proposed remediation program to improve the numeracy skills of grade 7 students

Based on the actual results and the literature that supports the findings of the present study, a remediation program is necessary to enhance numeracy skills and improve the proficiency level of the students. Warstillo, K. in an article entitled “How To Plan & Teach Math Interventions,” cited the following steps in the implementation of Mathematics interventions as STEPS: Set-Up (review and practice of skills already mastered); Teach (model and teach the new concept); Engage (teacher-led practice with the new concept); Practice (extended practice with the new concept); and Show You Know (a quick check of skill progress/ mastery).

In this regard, the **PAVS Program** was proposed by the researcher. The PAVS Program stands for Peer-assisted; Assessment-based; Visual (manipulatives, pictures, and graphs); and Systematic intervention. This program aimed to enhance numeracy skills and improve the proficiency level of students in Mathematics.

Pleasant, A. et al. (2016) in the article entitled “Strategies to Enhance Numeracy Skills” suggested that different types of visuals are more effective at

communicating various concepts. Line graphs are usually better than pie charts or bar graphs for explaining trends over time. While pie charts frequently demonstrate magnitude by comparing a portion to the whole. Also, the magnitude and change of a bar chart can be shown over time or across groups. Further, geographic comparison is possible with maps. And, pictographs or icon arrays can represent quantity while displaying a percentage of the total.

The authors emphasized that numeracy enables people from all walks of life to solve problems, whether they are mathematical experts or third-grade students. It can be agreed that being alive entails problems that must be solved. These could be entirely numerical, about a risk one doesn't understand, or about a social or cultural situation. It can be concluded that numeracy skills—both the ability to navigate numbers and the ability to successfully communicate numerical information—will be useful in a wide range of situations. Anyone can improve decision-making, efficiency, and outcomes such as health and quality of life by making numbers and their implications more understandable to more people.

According to Gowland, G. (2019) in an article entitled "5 Ways to Implement Numeracy into Your Lessons" cited that the intervention must be composed of games, real-world problems, challenges, target, time-bound, and reward, at this point, pedagogical approaches, strategies, intervention materials, and teacher's commitment are crucial in the successful implementation of the Mathematics Remedial Program.

Findings

The findings were based on the discussion of the following: the level of proficiency and numeracy skills; effectiveness of the Teaching Resource Package for Grade 7 Mathematics Remedial Class in improving the proficiency and enhancing the numeracy skills of the students; and the proposed remediation program to improve the proficiency level and enhance the numeracy skills of the students of Legazpi City National High School.

Based on the analysis and discussions, the following findings were revealed:

4. Level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School

The 14 sections composed of 516 Grade 7 students, were all not proficient as indicated by the average MPL of 9.53. It was indicated that none were highly numerate, and only two (2) sections were 100% moderate numerates. While all the rest were a combination of moderate numerates and non-numerates. Among those sections with non-numerates, K, SP, and G were the top 3 with the highest non-numerates with a percentage (%) of 43.59, 30.19, and 26.19 respectively.

5. Effectiveness of the Teaching Resource Package for Grade 7 Mathematics Remedial Class in improving the numeracy skills of the Grade 7 Students

The posttest results showed that the Grade 7 students were non-proficient in Mathematics as revealed by the average MPL of 19.57 with an increase of 10.04%. Generally, none acquired a high proficiency level but the students improved to 100% moderate numerates showing an increase by 18.49%.

6. Proposed remediation program to improve the numeracy skills of grade 7 students

The Mathematics interventions principles were the STEPS which include:

Set-Up (review and practice of skills already mastered);

Teach (model and teach the new concept);

Engage (teacher-led practice with the new concept);

Practice (extended practice with the new concept); and

Show You Know (a quick check of skill progress/ mastery).

Based on these principles, the **PAVS Program** was proposed by the researcher. The PAVS Program stands for Peer-assisted Assessment-based Visual (manipulatives, pictures, and graphs); and Systematic intervention. This program aimed to enhance numeracy skills and improve the proficiency level of the students in Mathematics.

Conclusions

Based on the findings, the following conclusions were derived:

4. The level of proficiency and numeracy skills of Grade 7 Students of Legazpi City National High School was very low as indicated by the very low MPL. It showed that the majority of the students undergo a remedial class under moderate numerates and the rest were provided with remedial classes for non-numerates. The low proficiency level was associated with the impact of distance education in numeracy skills development where modular learning substituted the presence of the teacher for two (2) consecutive years (Grades 5 and 6).

5. The Teaching Resource Package for the Grade 7 Mathematics Remedial Class was effective in enhancing the numeracy skills of the Grade 7 students from non-numerates to moderate numerates but not effective in enabling the students to become highly numerates. In general, the Teaching Resource Package for Grade 7 Mathematics Remedial Class is effective in enhancing the numeracy skills of Grade 7 but was not effective in improving the proficiency level of the students.

6. Based on the five (5) principles presented as set-up, teach, engage, practice, and show, the **PAVS** (Peer-assisted; Assessment-based; Visual, and Systematic intervention) **Program** was proposed. This program aimed to enhance the numeracy skills and improve the proficiency level of students in Mathematics fostering appropriate pedagogical approaches, strategies, intervention materials, and teacher commitment

Recommendations

Based on the conclusions, the following recommendations were set forth:

4. The proficiency level and numeracy skills of elementary students can be measured so that appropriate intervention can be provided before entering high school. Likewise, upon taking the entrance exam in high school, numeracy skills can be measured for future reference.

5. The intervention materials for remedial classes can be quality-assured to make sure that they can be effective in improving proficiency levels and enhancing numeracy skills.

6. The proposed PAVS (Peer-assisted; Assessment-based; Visual, and Systematic Intervention) Program can be implemented in the upcoming school year 2023-2024. Its outcome can be assessed and can be a basis for program institutionalization.

Action Research Workplan

The Gannt chart below shows the graphical representation of the research calendar. This type of bar chart shows the start and finish dates of research essentials such as tasks and provisions to be done.

ACTIVITIES	SY: 2022-2023											
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Pre-Implementation 1. Gather Data/Evaluation -3 weeks												
2. Design Questionnaire/ Survey-2 weeks												
3. Set the dates and time to administer the research 2-weeks												
4. Letter Request-1 week												
Implementation Proper 1. Conduct the actual study-4 weeks												
2. Administer the Questionnaire/Survey 4weeks												
3. Monitor the modules or any methods used for student learning-3 weeks												
4. Sign the agreement for student learning if the subject is the student 2-weeks												
Post Implementation 1. Check on students' performance if the subject is the student-4 weeks												
2. Administer evaluation report-3 weeks												
3. Follow-up/Research/Review (If needed)- 3 weeks												
4. Completion Dissemination												

Dissemination and Advocacy

The findings of this study were disseminated through the School In-Service Training (INSET) and other research venues (local, national, or international). For the INSET presentation, a Workshop on the Development of a Teaching Resource Package for Grade 7 Mathematics for Remedial Class will be proposed. Through this workshop, the teacher-participants are expected to enhance their basic

computer skills, development of instructional materials for Mathematics, harvest lessons, and development of Mathematics remedial lessons, activity sheets, worksheets, and assessments for the moderate and non-numerate students.

During the workshop preliminaries, a presentation of the research findings on numeracy was disclosed by the researcher. The significance of the findings was highlighted in connection with the workshop which was actively participated by the Mathematics, Science, and English teachers.

The workshop was held in the online session room, it covered the (1) Revisiting ICT Basics. The teacher-participants worked on the basic use of computer technology, harvested lessons, strategies, activities, worksheets, and templates to enhance the instructional materials, and utilized social media platforms, and (2) Development of intervention and enhancement lessons, activity sheets, worksheets, and assessments for the 1st-4th quarter for moderate and non-numerate students. This session allowed teachers to make interesting, effective, and simplified instructional materials that can be done at home.

TRAINING DESIGN

Workshop on the Development of a Teaching Resource Package for Grade 7 Mathematics for Remedial Class

*Participants**: Mathematics Teachers/other subject teachers*** *Target Date**: July 2023***				
Objective 1:				
	Course Outline	***# of Hrs.***	***Training Description***	***Media***
Revisiting ICT Basics	Course outline: • basic skills using a computer • basic use of ICT facility • developing and harvesting instructional materials	2	This basic ICT course is ideal for teachers in developing intervention lessons. It will cover the basics of using a computer including basic use of the word, excel, and the internet, and harvesting of instructional materials in Mathematics	ICT Facility
Objective 2:				
Development of Intervention and enhancement lessons, activity sheets, worksheets, and assessment for the 1st-4th quarters for moderate and non-numerate	• *Revisit Mathematics Grade 7 topics using CG/MELCs* • *Design instructional materials and lesson plans with ICT integration for each least mastered competency* • *Finalize the teaching package through peer evaluation and critiquing*	*6*	*This workshop will help grade 7 Math teachers to be equipped with enough knowledge and skills on the presentation of remediation lessons using different teaching strategies with the ICT integration appropriate for each least mastered competency*	*ICT Facility, Curriculum Guide/ Book, MELCs*
NOTE: Evaluation and critiquing can be done virtually.				
TOTAL TIME: 8 hours				

WORK Matrix
Workshop on the Development of a Teaching Resource Package for Grade 7 Mathematics for Remedial Class

ACTIVITIES	PERSONS INVOLVED	TIME FRAME	MEANS OF VERIFICATION
Preparation of project proposal	School Head Proponent Math Teachers	April 2023	Approved Project Proposal and Memorandum
Proposing for the Venue	School Head, School Research Coordinator Proponent Math teachers	May 2023	Approved Venue
Meeting with the School Heads District Research Committee, school research committee to present the plan and discuss the concept of the workshop		June 2023	Minutes of the meeting
Follow-up, finalization meeting, and presentation of the plan			
Submission of project proposal to the Division	School Head, proponent		Received Copy of Proposal
Preparation of program, certificate, venue, invitation of resource person/s	Proponent, Working Committee	July 2023	Program Certificate
Presentation of research findings Workshop on the Development of a Teaching Resource Package for Grade 7 Mathematics for Remedial Class	Regional Research Committee Division Research Coordinator, School Head, PSDS, School Research Committee, proponent, Values Ed Teachers, and Department Heads		Approved proposal Program Documentation Accomplishment Report
Evaluation of Activity Awarding of certificates			Evaluation tool accomplished by concerned persons

FINANCIAL PLAN

Workshop on the Development of a Teaching Resource Package for Grade 7 Mathematics for Remedial Class

ACTIVITY	RESOURCES	EXPENSES (Php)
Workshop on the Development of a Teaching Resource Package for Grade 7 Mathematics for Remedial Class	Free Venue 2 Snacks, 1 Lunch x P300.00/pax Plus 3 support staff	Venue with meals for 1 day and other Miscellaneous Expenses 10 pax x 1-day x 300.00/pax **3,000.00**
	Amenities: - Tarpaulin for a backdrop - Sound System - Multi-Media/Projector - Miscellaneous expenses	**1,000.00**
	Supplies: 10 pcs. Certificate of Recognition 10 pcs. Certificate Jacket A4 size 1 pack of specialty paper 8 ½ x 13 size 1 ream of long bond paper 8 ½ x 13 size	250.00 250.00 250.00 250.00 **1,000.00**
	GRAND TOTAL	**5,000.00**

Monitoring and Evaluation Tool

Name:_____Position:_____
No. of Years as Math Teacher_____ School:_____
District: _____ Date of Observation: _____

KRA/Indicators	MOV	Yes	No	Remarks
A. Pre-assessment of the conceptual understanding of grade 7 students				
• Prepared pretest	Pretest with TOS and answer key			
• Conducted the pretest	Compilation of answered pretest			
• Assisted and guided the respondents	Hands-on data collection			
	Personally, assisted respondents			
• Identified the least learned competencies	List of least learned competencies			
Total Yes or No				
B. Instructional Support /Strategies				
Provided instructional support and assistance				
1. Prepare IMs and use varied strategies	Diagram/process flow or flow chart in place or displayed			
	Schedules of classes			
	Lists of strategies, IMs, and pedagogies used			
2. Ensure completeness of instructions and IMs	Checked sources of printed modules			
	checklist of the master list of instruction per learning area			
3. Ensure development and provision of supplementary materials	compilation/inventory			
4. Enhance the IMs based on the student's performance	List of least learned competencies and the corresponding IMs			
	Validated learner's packet			
Total Yes or No				
C. Post-Assessment				

1. Conducted posttest	Post-test with TOS and Key answers			
1. Collaborated with teachers, parents, and learners on the effectiveness of learner's packet	List of teachers and learners/parents Minutes/reports			
	Copy of checked learner's packet materials			
2. Analyze data and results	Statistically treated data			
	Analysis and findings			
Total Yes or No				
D. Presentation of Learning Support/Planning of Training Workshop				
Provided and ensured assessment of learning support				
1. Monitor and ensure preparation and administration of summative Assessment and Performance Tasks	Checklist of checked summative test/performance tasks of teachers			
2. Provide guidance and Technical assistance to teachers on the preparation of TOS as a basis in constructing summative test items; preparation of IMs and LAS	Accomplishment report on SLAc/TA on the assessment conducted			
3. Conduct Seminar-Workshop	Accomplishment report			
No. of Yes or No				

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Financial Report (Budget Source: BERF)

The expenses were related to the research proposal preparation, revision process, data collection, data treatment, discussion, printing, and bookbinding, It encompasses the detail of the expenses of the research process, which include the necessity of school supplies, travel expenses, food expenses, and other incidental expenses.

ACTIVITY	CASHOUT	BALANCE
Basic Educational Research Fund (BERF) Facility Grant		15,000
Proposal		
Preparation of research proposal, Revision Processes	250	14,750
Travel to ROV for the submission of a revised copy	250	14,500
Travel to ROV to get MOA and submission of MOA Travel from home to Bonot, Legazoi City, Law Firm for Notary and back	750	13,750
Data Collection		
School Supplies	500	13,250
Travel Expenses	1,000	12,250
Food and Drinks	1,000	11,250
Data Analysis		
Internet Load	1,500	9,750
Food and Drinks	500	9,250
Printing Expenses	1200	8.050
Bookbinding Expenses		
Bookbinding fee	2,000	6,050
Travel Expenses	350	5700
Seminar-Workshop	5000	700
Miscellaneous expenses	700	0
Total	**15,000**	**0**