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Reality Pedagogy and the Numeracy Skills among Grade 10 Students

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Abstract

Aim: This study aimed to investigate the effects of using Reality Pedagogy with its seven C's, namely Cogenerative dialogues, Coteaching, Cosmopolitanism, Context, Content, Competition, and Curation, contributed to enhancing Numeracy Skills of Grade 10 students, specifically in the areas of Numbers (and number system), Handling Information, Operation and Calculation, and Shape, Space & Measures.
Methodology: A pre-experimental research design was utilized in order to accomplish the objectives of the study. To form the experimental group, cluster random sampling was employed, drawing from a heterogeneous class of grade 10 students comprising eight sections. The researchers specifically selected three sections, encompassing a total of 118 students. For data collection regarding students' perceptions of Reality Pedagogy implementation, a teacher-made survey form with 35 statements was utilized, employing a 4-point Likert scale. Additionally, equivalent pretest and post-test examinations were administered to evaluate the difference in performance before and after the experiment. Descriptive analysis was employed, utilizing mean and standard deviation, while the dependent t-test was utilized to ascertain significant differences between pretest and post-test scores and percentages. Moreover, Pearson r correlation was utilized to investigate the relationship between students' perceived Reality Pedagogy and their numeracy skills. Furthermore, to identify the affordances and constraints of Reality Pedagogy, students were prompted to engage in weekly reflections.
Results: The study found a significant improvement in the overall numeracy skills of the respondents as the mean difference between the pre-test and post-test scores is 4.75, indicating that this improvement is statistically significant. On the other hand, it was evident that a weak relationship existed between reality pedagogy and numeracy skills, as most of the correlation coefficients fell below 0.3.
Conclusion: There is a significant difference in the pre-test and post-test scores of the respondents. However, Shape, Space & Measures shows no significant difference. Furthermore, there is a significant relationship between Content and all construct of Numeracy Skills. Weak relationship was seen between variables.

Keywords: Numeracy Skills, Reality Pedagogy

INTRODUCTION

Education is critical for a person's long-term success. It is often regarded as the bedrock of society, bringing economic success, social stability, and political stability (Idris et al., 2012). As a result, former president Benigno Aquino signed the enhanced basic education act of 2013, popularly known as the "K to 12 Program", which adds a mandatory kindergarten year and two extra senior high school years to what was formerly a 10-year education program, making it a 12-year curriculum. The program's goal is to improve learners' fundamental abilities, develop more capable citizens, and prepare graduates for lifetime study and employment (DepEd, 2013). The spiral approach is one of the key upgrades in the new curriculum; using this strategy, students will be able to increase their mastery of mathematical skills and concepts. In addition, the revised curriculum highlighted those mathematics contents for Grade 7 to 10 provide a solid foundation for Mathematics in Grades 11 to 12. More importantly, it provides different

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principles to follow to make the teaching and learning of mathematics more effective. According to Kusmaryono (2014), mathematics is one of the scientific fields that has made major contributions to science and technological progress. Mathematics also helps students to improve mental discipline, critical thought, and analytical thinking skills, all of which are important qualities for making good decisions in everyday life. Furthermore, Kravitz (2013) added that mathematics is an essential ability that everyone should learn to succeed in life.

However, according to Loren et al. (2018), even though the standard way of teaching Mathematics is typically effective in addressing math problems, creating an alternative strategy demonstrates a deep knowledge of mathematical ideas. Not only it is necessary to produce new alternative strategies to improve student performance, but it is also necessary to minimize mathematics anxiety (Loren et al., 2018). Regarding this, Edmin (2016) introduced in his book an alternative and different approach to teaching, which he called Reality pedagogy. He defined it as " an approach to teaching and learning that has a primary goal of meeting each student on his or her cultural turf " (p. 27). He stated in his book that reality pedagogy meets its goals with a set of seven C's that students and teachers engage in together to improve teaching and learning, these Seven C's are the following: (1) cogenerative dialogue, discussions between a teacher and a group of students to improve classroom instruction; (2) coteaching, the transfer of teacher and student roles; (3) cosmopolitanism, where students have a role in how the class operates; (4) context, expanding the classroom outside of the school walls; and (5) content, where the teacher must acknowledge the limitations of his subject knowledge and work to develop his subject expertise with students; (6) competition, where groups of students compete with one another to succeed in class activities; (7) curation, which involves reflecting on practice that is most appropriate and valuable for teachers and teacher instructional preparation. According to Roode (2017) and Sunday et al. (2021), reality pedagogy is a method of teaching and learning that focuses on teachers acquiring an awareness of students' realities and utilizing this knowledge as the foundation for instruction. In addition, Mania-Singer (2017) stated that it emphasizes students' everyday experiences as an integral element of the learning process and acknowledges the importance of the place beyond the classroom. In addition, reality pedagogues/teachers think that for teaching and learning to occur, there needs to be a knowledge exchange between the student and the teacher (Roode, 2017). Thus, it fosters cooperation since another goal of reality pedagogy is to create an atmosphere where students are encouraged to reflect on and challenge the teaching and learning processes taking place in the classroom (Sirrakos et al., 2017). Mania-Singer (2017) also added that Reality pedagogy emphasizes a change in the power dynamics between instructors and students. Although the teacher continues to be the one who presents the material, the content is shaped by the students' cultural identities as well as their psychological, emotional, and intellectual requirements. As a result, Ramirez (2018) claims that Reality pedagogy has emerged as a strategy for addressing curricular difficulties, such as the need for learning to be an active process that necessitates a shift in the learner. This is accomplished through the learner's activities, including the results of those activities, and through reflection, and these could be achieved through Reality Pedagogy.

Numeracy is defined as the skills to acquire and use mathematical knowledge to meet the numerical standards of a variety of scenarios in everyday life (OECD, 2013). According to National Numeracy (2017), being numerate is defined as being able to use mathematics in practical settings. "The Essential of Numeracy," developed by the organization, is a set of skills necessary for everyone to make appropriate decisions in life. The four components that make up The Essentials of Numeracy are (1) Numbers (and number system), student skills to understand numbers all around us, know how the pattern and structures in the number system work, and how numbers relate to each other; (2) Handling Information, student skills to make sense of data and information presented in a variety of ways. It also involves solving probability; (3) Operation & Calculation, student skills to make confident and sensible choices about which methods to use in a given context and then to calculate accurately; and (4) Shape, Space & Measures, student skills to use measurement all the time and be able to measure lots of different things such as time, length, and temperature. Regularly solve problems using our knowledge of shape, space, and measures. Gigante (2020) also added that one of the key abilities that a student must acquire is numeracy. Students are taught the basic procedures for problem-solving and how to apply them in daily life from kindergarten through grade six. Being numerate means that you have the self-assurance to use fundamental operations and problem-solving to employ fundamental conceptions in comprehending complicated situations. Unfortunately, these abilities are not often fully learned in the classroom. As mentioned by Singh et al. (2021) in their study, numerous studies and analyses undertaken over the years show a decreasing pattern in both the speed and accuracy of students in both elementary and secondary schools when it comes to numeracy skills concepts. In addition, Aunio et al. (2015) wrote that the foundation for all future math subjects is numeracy thus, without a solid numeracy foundation, learners may struggle while learning increasingly difficult skills since they won't have anything to build on. Early

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arithmetic and numeracy abilities also comprise logical reasoning, problem-solving, and thinking skills (Aunio et al., 2015). Even though these skills appear straightforward, they are likely the most crucial ones a student may develop to support their future academic achievement (Guhl, 2019). As a consequence, the researcher came up with the concept of addressing such a problem by employing an alternative strategy such as using Reality Pedagogy in teaching Mathematics.

As a mathematics educator, the researcher agrees that one of the problems that the education system faces today is the increasing number of non-numerate students. In addition, according to OECD (2019), even adults perform poorly in numeracy, PIAAC's survey findings of Adult Skills suggest a significant portion of adults, between 30% and 60% in middle-income countries and 10% to 40% in high-income countries, have poor or very low levels of numeracy ability. The data is concerning because, according to the OECD (2013), as the global economy grows increasingly dependent on skills, countries with lower skill levels run the risk of losing their competitiveness.

Therefore, teaching alternative strategies, like using Reality Pedagogy, in teaching mathematics plays an essential role in improving students' numeracy skills and it must be given adequate attention. Loren et al. (2018) also stated that it would be beneficial to conduct experimental studies to better understand the effectiveness of different alternative strategies in mathematics. In addition, Edmin (2016) wrote in his book that when urban students are engaged in the subject matter and the classroom community, which is one of the main concepts of Reality Pedagogy, then academic achievement will follow. Similarly, Ramirez (2018) claims that using Reality Pedagogy is beneficial for students' performance since it helps to improve academic performance. Taher (2012), also mentioned in her study that with the implementation of reality pedagogy, students may increase their sense of self-efficacy and provide a setting for peer support and social acceptability. This gave motivation and excitement to the researcher to determine the effect of using Reality Pedagogy on numeracy skills among grade 10 students. Moreover, the researcher has not yet come across a study using Reality Pedagogy specifically in improving the numeracy skills of students.

Research Questions

This study determined the effects of reality pedagogy on students' numeracy skills.

Specifically, it sought to answer the following research questions:

1. How do the students perceive the implementation of reality pedagogy in terms of:
    1.1 Cogenerative dialogues;
    1.2 Coteaching;
    1.3 Cosmopolitanism;
    1.4 Context;
    1.5 Content;
    1.6 Competition; and
    1.7 Curation
2. What is the mean performance of students' numeracy skills before and after the exposure to the reality pedagogy in terms of:
    2.1 Number (and number system);
    2.2 Handling Information;
    2.3 Operation & Calculation; and
    2.4 Shape, Space & Measures
3. Is there any significant difference in the student's numeracy skills before and after exposure to the reality pedagogy?
4. Is there any significant relationship between the students' perceived reality pedagogy and students' posttest numeracy skills?
5. What are the affordances and constraints of reality pedagogy to enhance numeracy skills?

Hypothesis

Given the stated research problem, the following hypotheses were tested on 0.05 level of significance:

Hypothesis 1: There is no significant difference in the student's numeracy skills before and after exposure to the reality pedagogy.

Hypothesis 2: There is no significant relationship between the students' perceived reality pedagogy and students' posttest numeracy skills.

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METHODS

Research Design

The pre-experimental research design meets the study's goals; thus, researchers used the research design as its method. To be more specific, the study is classified as a pre-experimental research design with a one-group pretest and posttest configuration. In a one-group pretest and posttest design, a single group is assessed or examined not only after being exposed to a procedure but also before it by using a pretest. The success of the study will be determined by comparing the pretest and the posttest performance. In this research, reality pedagogy is the independent variable that is presumed to influence the dependent variable which is the numeracy skills of the students.

Population and Sampling

This study was conducted at a public secondary school in the Division of Quezon from February to March 2023 (five weeks implementation) with 118 respondents. The respondents are selected through the cluster random sampling technique.

Instrument

The researchers evaluated the students' numeracy skills using an equivalent pre and posttest to determine the difference before and after the experimentation. The pretest was a standardized numeracy test adopted from the Division of Quezon, while the posttest was a teacher made test which was validated by experts in the field. Each test consisted of 50 multiple-choice items. To measure students' perceptions on the implementation of Reality Pedagogy, the researchers also used a teacher-made 4-point Likert scale survey form, which consists of 35 statements. A pilot test was conducted on the survey questionnaire to check its reliability. The data from randomly chosen participants were collected for the pilot test, and SPSS was used to provide descriptive statistics. Furthermore, to identify the affordances and constraints of Reality Pedagogy, students were prompted to engage in weekly reflections.

Data Collection

The researchers conducted the experimentation during the start of the third quarter of the school year 2022-2023. The experimentation run for 5 weeks, after the respondents were exposed to the experiment, the students answered the survey questionnaire about implementing the reality pedagogy and then finally answered the post-test. After the experimentation, the researchers collected the data and then give it to their statistician for the processing of statistical treatment data. The result given back by the statistician was sent to the Statistics Center of Laguna State Polytechnic University for analysis and then after 7 – 10 days sent it back to the researchers for interpretation.

Treatment of Data

In response to the presentation of the descriptive data on the pretest and posttest scores performance of the student-subjects regarding the effect of reality pedagogy on the students' numeracy skills, a dependent t-test was used to determine if the variables being compared are significantly different. On the other hand, Pearson product-moment correlation was utilized to determine the relationship between the perceived reality pedagogy and students’ numeracy skills after the experimentation. Moreover, the researchers used a 4-point Likert scale to measure and interpret students’ perceptions regarding using reality pedagogy in improving numeracy skills.

Ethical Considerations

To perform this study, the researcher followed a standard procedure. After receiving an approval from the research adviser, the researcher completes chapters one (1) to three (3) of the research papers and presents them to a group of panelists for proposal defense. Upon approval, the paper was forwarded to the office of the Dean of the College of Education. Then, the researcher seeks permission from the School Division Superintendent, followed by the Public School District Supervisor, and then Principal of the school to conduct the study. Moreover, for ethical considerations, the researcher observed the confidentiality of the subject’s test results as well as their personal information. All the information was treated as confidential in compliance with the Data Privacy Act. of 2012.

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RESULTS and DISCUSSION

The Students' Perception of the Implementation of Reality Pedagogy

Table 1: Reality Pedagogy in terms of Cogenerative dialogues

Indicators	Mean	SD	VI
1. I had an opportunity to talk and expressed my ideas with my groupmates and teacher which helped me boost my confidence.	3.18	.608	Observed
2. I had an opportunity to talk and expressed my ideas with my groupmates and teacher which helps me develop a positive relationship with them.	3.24	.518	Observed
3. Having an opportunity to discuss with my teacher and groupmates the teaching and learning process helps me deeply understand the lesson.	3.25	.526	Observed
4. Having an opportunity to discuss with my teacher and groupmates the teaching and learning process helps to improve the output or performance of our group.	3.33	.571	Observed
5. I had an opportunity to talk and expressed my ideas with my groupmates and teacher which helped me boost my confidence.	3.33	.540	Observed
Overall	**3.27**	**.349**	**Observed**

***Legend**: 1.0-1.49 (Rarely Observed); 1.50-2.49 (Sometimes Observed); 2.50-3.49 (Observed); 3.50-4.0 (Always Observed).*

In Table 1, the students' perceptions of the implementation of Reality Pedagogy were recorded, particularly with regards to cogenerative dialogues. It's noteworthy that all indicators received an "Observed" result, with an overall mean of 3.27 and a standard deviation of 0.349. These results indicate that most students preferred and experienced engaging in dialogues with their classmates and teacher to enhance classroom instruction.

This was observed during the five-week implementation of Reality Pedagogy. The teacher set a heterogeneous group of students with varying academic levels every Monday to engage in cogenerative dialogues with their peers. Each group formed a circle and engaged in conversations to master the assigned topic and develop a plan of action to execute their coteaching. The students expressed hesitation towards collaborating with unfamiliar peers at first, but with the teacher's consitent encouragement, they gradually began contributing ideas. Over time, they developed specific plans to enhance the classroom based on their individual perspectives and requirements. The teacher ensured that each student's perspectives were valued, and a set of simple rules or reminders were provided, such as equal participation and respect for every voice. Additionally, the group had the opportunity to discuss ways to improve their teaching with the teacher. Cogeneratives could also occur outside of traditional classroom lessons, such as before class, during lunch, or during recess. The teacher encouraged them to apply cogeneratives outside of the classroom settings as well.

Emdin (2016) notes that this kind of discussion builds a good relationship between the teacher and students since they discuss what they see that can help improve the instruction. Borges (2016) also suggests that the teacher-student relationship in science classrooms shifted from adversarial to cooperative when Reality Pedagogy tools were introduced.

Table 2: Reality Pedagogy in terms of Coteaching

Indicators	Mean	SD	VI
1. I acted as a teacher in the classroom.	2.75	.797	Observed
2. Having an opportunity to act like a teacher during class discussions allows me to share my talent/s in the class.	3.03	.698	Observed
3. Having an opportunity to experience being a teacher helped me boost my confidence.	3.14	.644	Observed
4. Teaching the lesson with my classmates helped me deeply understand the content of the lesson.	3.09	.555	Observed
5. Working with my groupmates during our presentation helped me build a positive relationship with them.	3.31	.562	Observed
Overall	**3.06**	**.437**	**Observed**

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***Legend**: 1.0-1.49 (Rarely Observed); 1.50-2.49 (Sometimes Observed); 2.50-3.49 (Observed); 3.50-4.0 (Always Observed).*

According to the data, a majority of the respondents rated Reality Pedagogy's coteaching principle as "Observed" with an overall mean of 3.06 and a standard deviation of 0.437. Coteaching is not merely about taking over the teacher's role in the classroom; it also involves allowing students to demonstrate their skills and talents, such as those of athletes, beatboxers, or dancers (Emdin, 2016). By allowing students to showcase their talents through coteaching, they perceive that the school values what they bring to the classroom. However, students must demonstrate that their gifts are valuable enough to teach, learn, and practice in the classroom, and that is precisely what this group of students accomplished by showcasing their talents through coteaching.

For example, one group of students incorporated an online game called "Call of Duty" to teach multiplication and division of decimals. Another group used a human calculator to calculate the product and quotient of integers, while another employed an application game to enhance their computing operation skills. There was even a group of students that created their own lyrics for a song to remember the sign of a number when calculating the operation of integers. These are only a few examples of the creativity students display when encouraged and given the opportunity to teach and understand a topic in their unique way.

During coteaching, students are not only responsible for preparing and delivering the lesson but also designing assessments and grading their classmates. The teacher observed that most students enjoy doing this and that most groups offered different kinds of prizes, making almost every student eager to participate in their assessment. The teacher observed each student's teaching, taking note of any effective strategies the students used that could be useful in his/her teaching. One of the teacher's observations was that when students are allowed to teach or facilitate in the classroom, it boosts their confidence, which, in turn, increases their engagement with the content. Similarly, Marzocchi and Kressler (2017) noted that student involvement in coteaching can raise students' confidence and sense of ownership over their learning, ultimately enhancing the relevance of the curriculum.

Table 3: Reality Pedagogy in terms of Cosmopolitanism

Indicators	Mean	SD	VI
1. I set classroom rules for my classmates.	2.85	.712	Observed
2. I had an opportunity to be part of how the classroom operates, like taking roles.	3.14	.543	Observed
3. I became more engaged with the lesson when I am given a role during classroom discussions.	3.06	.589	Observed
4. Designing and operating classroom rules improved my sense of responsibility.	3.08	.564	Observed
5. I cooperated when my classmates are the ones who facilitated the classroom discussion.	3.21	.552	Observed
Overall	**3.07**	**.364**	**Observed**

***Legend**: 1.0-1.49 (Rarely Observed); 1.50-2.49 (Sometimes Observed); 2.50-3.49 (Observed); 3.50-4.0 (Always Observed).*

In Table 3, one can find an intriguing insight into the students' perceptions of reality pedagogy's implementation in relation to cosmopolitanism. This principle is concerned with how learners perceive their unique role in shaping the classroom's dynamics. A closer look at the table reveals that the majority of students responded with an "Observed" on the implementation of cosmopolitanism, with an overall mean of 3.07 and a standard deviation of 0.364. But what does cosmopolitanism look like in practice?

During the experiment, the students were given various responsibilities to fulfill, such as having a designated class monitor to check attendance every day in every subject's class and assigning different groups of students to clean the classroom before and after class daily. It was observed that to ensure the students' consistency in performing their daily routines, they must receive some recognition for their work, such as additional points or verbal praises. As Emdin (2016) pointed out, cosmopolitanism is a crucial element in engaging students with academic subjects as it allows them to feel like active participants in the classroom rather than passive visitors. By playing such roles, students are encouraged to interact more deeply with the content, which has a positive impact on their learning.

Overall, the results of this study suggest that implementing cosmopolitanism as a part of reality pedagogy can lead to more engaged and invested learners who feel like they have an essential role to play in shaping the

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classroom culture. These findings have important implications for educators seeking to promote a more participatory and inclusive learning environment.

Table 4: Reality Pedagogy in terms of Context

Indicators	Mean	SD	VI
1. I learned best when I can relate to the topic.	3.51	.566	Always Observed
2. I participated in discussion and activity that is connected to my community culture.	3.18	.533	Observed
3. I am comfortable when my teacher/classmates value my culture.	3.31	.580	Observed
4. I deeply understand the lesson when the community I belong to is involved in the discussion.	3.12	.616	Observed
5. I deeply understand the lesson when the community I belong to is valued in the discussion.	3.22	.541	Observed
Overall	**3.27**	**.412**	**Observed**

Legend*: 1.0-1.49 (Rarely Observed); 1.50-2.49 (Sometimes Observed); 2.50-3.49 (Observed); 3.50-4.0 (Always Observed).*

In Table 4, the researchers presented the students' perceptions of how Reality Pedagogy was implemented in the classroom, focusing specifically on the aspect of context. The results showed that the majority of the indicators were rated as "Observed," with an overall mean of 3.27 and a standard deviation of 0.412. This approach to teaching goes beyond merely discussing where students come from; it aims to bring the community into the classroom without physically leaving the school grounds.

During the experiment, the teacher discovered that Mang Dose's ice cream, located near the school, was a favorite dessert among the class. As an application of the lesson on permutation, the teacher brought in six different flavors of ice cream and asked the students how many orders they could make if they were planning to buy some. This activity exemplifies the use of Context in teaching, as it shows students how the math they are learning can be applied in their daily lives. In addition, during coteaching, students demonstrated their diverse interests, further emphasizing the importance of Context in education. By integrating this approach into their teaching, educators send a message to both the community and their students that the school values and respects the cultural practices of its surroundings. This involvement of the community in classroom discussions has a positive impact on students' motivation to learn, as noted by Hubert (2014), who found that contextualizing mathematics within students' cultural practices can aid in developing their mathematical identities. Rubel (2017) also added that contextualizing math can often spark students' interests and serve as a bridge between formal and informal knowledge.

Therefore, teachers must establish routines that involve learning about their students' interests, daily activities, heritage, and home languages to effectively relate mathematics to their lives (e.g., Emdin, 2016; Vomvoridi-Ivanovi, 2012). By doing so, teachers can foster a learning environment that is engaging, relevant, and culturally responsive, ultimately promoting students' success and growth.

Table 5: Reality Pedagogy in terms of Content

Indicators	Mean	SD	VI
1. I shared my idea/s about the content with my teacher and classmates.	3.16	.704	Observed
2. I solved problems in a variety of ways.	2.99	.768	Observed
3. I asked questions or researched when I am curious about the topic.	3.18	.700	Observed
4. I worked alongside my classmates and teacher because this motivates me to work harder in understanding the content.	3.08	.557	Observed
5. I exchanged ideas with my classmates and teacher because this helped me improve the output of my work.	3.16	.584	Observed
Overall	**3.11**	**.470**	**Observed**

Legend*: 1.0-1.49 (Rarely Observed); 1.50-2.49 (Sometimes Observed); 2.50-3.49 (Observed); 3.50-4.0 (Always Observed).*

In Table 5, the researchers examined the students' perceptions of the implementation of reality pedagogy in terms of content. The indicators showed an "Observed" rating, indicating that the implementation of content in classroom discussions was successful. The overall mean was 3.11 with a standard deviation of 0.470. As noted by

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Emdin (2016), effective content delivery is not simply about teachers delivering information as experts. Instead, teachers should express vulnerability to engage students and make the learning process more active. In this study, the teacher started the implementation of reality pedagogy by explaining to the class the importance of numeracy. To improve the teaching and learning process, the teacher suggested that the class be divided into groups to discuss the content together instead of just listening to the teacher. As the students and teacher collaborated and posed questions on how to enhance the learning experience of the topic, they developed stronger bonds and positive relationships. It appears that the students preferred exchanging ideas with their classmates and teacher in improving the teaching process. Emdin's (2016) approach involves creating areas in the classroom where the teacher can review the content with students, which encourages collaborative exploration of the content and makes the teaching and learning process more active.

Thus, the implementation of reality pedagogy, particularly in terms of content, was successful in engaging students and making the learning process more active. This may be due to the teacher's vulnerability and collaborative approach to teaching, which helped students develop stronger bonds with their classmates and teacher. These findings have important implications for teachers and policymakers looking to promote effective teaching practices in the context of numeracy education.

Table 6: Reality Pedagogy in terms of Competition

Indicators	Mean	SD	VI
1. I compete with my classmates.	2.67	.848	Observed
2. I joined competitions because these served as my motivation to study.	2.85	.761	Observed
3. I had an opportunity to compete as a group rather than as an individual.	3.01	.660	Observed
4. I had an opportunity to showcase my talent in a group class activity that encouraged me to participate more.	3.15	.636	Observed
5. I had an opportunity to showcase my talent in a group class activity that allows me to compete with other groups.	2.94	.658	Observed
Overall	**2.93**	**.452**	**Observed**

***Legend**: 1.0-1.49 (Rarely Observed); 1.50-2.49 (Sometimes Observed); 2.50-3.49 (Observed); 3.50-4.0 (Always Observed).*

Table 6 depicted the perceptions of students regarding the implementation of Reality Pedagogy concerning competition. In this study, competition refers to groups of students competing with each other to achieve success in their class activities. All the indicators led to an interpretation of "Observed," with an overall mean of 2.93 and a standard deviation of 0.452.

At the start of the experiment, the teacher announced that there would be one winning group at the end of their co-teaching. To determine the winner, the teacher used criteria that valued creativity, and each group had to compete against the others as a team by showcasing what they had created. Many student groups demonstrated their creativity through games that piqued their interest, as the teacher observed. Interestingly, most students preferred to compete as a group rather than individually. However, students who found the lesson easy for them expressed a desire to compete as individuals. Emdin (2016) noted that the competitive process allows students to showcase their unique abilities and talents, with the subject matter serving as the class's focal point rather than its primary motivator. Communities often value students struggling in academic areas like reading and writing for their untapped talents and skills.

Overall, the use of competition in Reality Pedagogy seemed to engage students and motivate them to work together as a team while demonstrating their creativity and unique talents. These findings highlight the potential of Reality Pedagogy as an effective teaching approach that enhances students' learning experiences.

Table 7: Reality Pedagogy in terms of Curation

Indicators	Mean	SD	VI
1. I reflected on my performance for my improvement.	3.30	.528	Observed
2. I annotated what I saw from the video recorded and use it for future needs.	3.11	.596	Observed
3. I deeply understand the lesson when I reviewed the previous discussion. (Watching the video lesson)	3.22	.557	Observed

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4. I practiced and applied what I have learned from my previous reflection.	3.19	.569	Observed
5. I learned more about the topic when my classmates and teachers shared and discussed what they saw in the video and suggest improvements.	3.31	.580	Observed
Overall	**3.23**	**.370**	**Observed**

***Legend**: 1.0-1.49 (Rarely Observed); 1.50-2.49 (Sometimes Observed); 2.50-3.49 (Observed); 3.50-4.0 (Always Observed).*

In terms of curation, the students' perception of Reality Pedagogy implementation was examined, and the results were quite promising. As Table 7 showed, all indicators were marked as "Observed," indicating that the students reflected on their performances or activities. The overall mean was 3.23, with a standard deviation of 0.370. This result suggested that most students were engaging in the practice of curation or reflecting on their learning experiences.

To facilitate this process, the teacher employed a weekly routine of recording each group performance or coteaching every Friday. The following Monday, the class watched and studied the video to identify practices that might negatively affect their connections with their classmates. In addition, the teacher asked some students to share their insights on what they saw in the video and to suggest improvements for themselves and the teacher. Finally, the teacher asked students to write their reflections on a piece of paper. The practice of Co-generative dialogues complemented this process, as students and teachers discussed what they saw and suggested improvements. According to Emdin (2016), this approach is crucial in creating an inclusive classroom environment where students and teachers collaborate to enhance learning. This idea was supported by a study conducted by Sunday et al. (2021), which claimed that as teachers and learners watch films from previous lessons to reflect, they learn more about one another and the content. Likewise, according to Sirrakos et al. (2017), reality pedagogy is to create an atmosphere where students are encouraged to reflect on and challenge the teaching and learning processes taking place in the classroom.

Overall, the implementation of Reality Pedagogy, specifically in terms of curation, has shown to be an effective way of improving students' learning experiences. By promoting reflection and dialogue, teachers can help students engage with the material and build stronger connections with their peers.

The Students' Mean Performance in Numeracy Skills before and after the exposure to the Reality Pedagogy

Table 8: Mean performance of the students in numeracy skills before and after the exposure to the reality pedagogy

Numeracy Skills	Reality Pedagogy					
	Before			After		
	Mean	SD	VI	Mean	SD	VI
Number	84.29	6.198	Satisfactory	88.67	7.920	Very Satisfactory
Handling Information	74.90	9.641	Poor	82.64	8.795	Satisfactory
Operation & Calculation	80.94	8.245	Fair	86.33	7.915	Very Satisfactory
Shape, Space & Measures	79.41	7.957	Fair	78.86	7.559	Fair
Overall	80.18	6.508	Satisfactory	84.92	6.93	Satisfactory

***Legend**: 75 and below (Poor); 76-80.99 (Fair); 81-85.99 (Satisfactory); 86-90.99 (Very Satisfactory); 91-100 (Outstanding)*

Based on the given data, it is seen that the respondents' mean scores for all four numeracy skills (Number, Handling Information, Operation & Calculation, and Shape, Space & Measures) improved after their exposure to reality pedagogy except for Shape, Space & measures. It is also interesting to note that the respondents' performance in Handling Information improved the most, followed by Operation & Calculation, and Number. Overall, the respondents' mean scores improved from "satisfactory" (80.18) to "very satisfactory" (84.92) after their exposure to reality pedagogy. This suggests that reality pedagogy was effective in improving the students' numeracy skills, but there is still room for improvement in certain areas.

Before the experiment began, the students had to take a standardized pretest numeracy exam provided by the division of Quezon. The researchers adopted this exam for his study. The test consisted of 13 questions that covered various topics such as arranging numbers, understanding Roman numerals, knowing the place value of

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decimal numbers, and converting decimals to fractions and percentages. It also included understanding mathematical phrases and verbal phrases. These topics were already taught during their elementary years, and it was expected that the grade 10 students had already mastered them.

As the pretest results came in, it was no surprise that most of the students scored high in the Number (and Number System) component. This section included the topics mentioned earlier and was composed of 13 questions. Some of the questions were so easy that almost all of the students were able to provide the correct answers. For example, when asked about finding the largest between a given set of decimal numbers, 106 out of 118 students chose the correct answer. Similarly, when asked about the concept of translating numbers into verbal phrases, 109 out of 118 students provided the correct answer. It was clear that the students had a solid foundation in the topics covered in the pretest. This was expected as these were basic concepts taught during their elementary years. However, it was also important to note that while the students performed well in the pretest, it did not necessarily indicate their overall proficiency in numeracy. The experiment would provide a more comprehensive assessment of their skills and understanding in this area.

After conducting the experiment, a posttest was administered in the form of a numeracy exam. The test was created by the teacher and was designed to be equivalent to the pretest. The topic of the posttest was centered around permutations, combinations, and probability, which were the main lessons taught during the third quarter of grade 10. The exam consisted of questions in the component of Number and Number System. The majority of the questions were aimed at testing the students' understanding of the different presentations of probability, such as decimal form, fraction form, and percentage. For example, one question asked students to determine the decimal equivalent of a coin toss probability of 1/2. The exam provided answer choices, and most students demonstrated their mastery of the concept by answering correctly. A total of 113 out of 118 students provided the correct answer to this question. However, some questions in the exam were more challenging. For instance, one question asked students to identify the possible outcomes when spinning a six-edged spinner and landing on an even number. This question proved tricky, and only ten out of 118 students provided an incorrect answer. Overall, the posttest provided valuable insights into the students' understanding of probability and demonstrated their ability to apply their knowledge to real-world scenarios. The majority of students demonstrated a strong grasp of the concepts taught in the third quarter of grade 10, which is a promising sign for their future academic success.

The Handling Information component was a crucial part of the students' assessment. It included a variety of questions that aimed to test the students' ability to understand and interpret data. From interpreting statistical data from news articles to calculating time and distance based on vehicle speed, and understanding discounts in a store, the questions were designed to evaluate the students' knowledge of the data that surrounds us. Unfortunately, the overall interpretation of this category, during their pretest, was deemed "poor". One of the questions in this category asked forty-five students about their favorite subjects in school. Eight students chose Filipino, five chose Science, four chose Math, and seven chose Araling Panlipunan. The question was meant to determine how many students did not choose English, Math, Science, or Araling Panlipunan as their favorite subject. The options were provided, and out of the 118 students who attempted this question, only 56 answered correctly. Another question required students to calculate the fare for a student riding a passenger jeepney for 4.5 km, based on a fare matrix that indicated a minimum fare of ₱9.00 for up to 5 km. Out of 118 students, only 39 (33%) answered correctly. Additionally, a question asked students to calculate the distance a car traveling at an average speed of 60 kph would cover in two hours and forty-five minutes. Shockingly, only 45 out of 118 students (38%) answered correctly. These results were concerning since the Handling Information component aimed to evaluate concepts that junior high school students should already be familiar with. The students' poor performance highlighted a gap in their understanding and interpretation of data, which is an essential skill in today's information age. It is crucial for students to develop these skills to make informed decisions and navigate the complex world of information.

In the area of posttest in Handling Information component, there was a question that asked the students about their favorite type of movie. The question was presented in the form of a graph, which showed the responses of 20 students. Specifically, the question was, "What is the probability of students who like watching an action movie?". To solve the problem, the students had to analyze and interpret the data presented in the graph. Only after grasping the information and understanding the question, they could solve it. Interestingly, 89 out of 118 students, which is equivalent to 75% of the students, answered the question correctly. In addition to this, there was another question that tested the students' understanding of probability. The question was about finding probability of heads landing up when and then flipping it again. The answer options were given and out of the 118 students, 80 of them answered the question correctly, which translates to 68%. It is worth noting that these types of questions require a solid foundation in probability and critical thinking.

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The Numeracy skills assessment consisted of four components, and the Operation & Calculation was the third. It was a crucial part of the assessment as it tested the students' arithmetic computation abilities. During the pretest, the students were given a series of questions that aimed to assess their numeracy skills. Unfortunately, the students encountered difficulties, particularly with a word problem question that required comprehension before proceeding to solve it. As a result, the pretest score was "fair." One of the questions in the pretest was about converting currency. It asked the students to calculate how much $17 would be in Philippine pesos, given that $1 was equivalent to ₱51. Out of 118 students who took the test, only 64 students (54%) answered correctly. Another question was about computing discounts in a store and finding the amount to pay, given the discount. The question was designed to test their problem-solving skills. However, only 61 out of 118 students (52%) answered correctly, indicating that most of them struggled with the concept of discounts. Finally, the assessment included a question that required finding the product of decimal numbers. This question was designed to test their understanding of decimal operations. Fortunately, 76 out of 118 students (64%) answered correctly, indicating a better understanding of decimals among the students.

In the recent posttest, there was a noteworthy improvement in the rating of the Operation & Calculation component. The evaluation tested the students' proficiency in selecting the correct operations and executing calculations accurately. The exam consisted of questions such as computing the factorial of a number. Surprisingly, a remarkable 86% of students, specifically 101 out of 118, were able to provide the correct answer to this question. Furthermore, there was another question that tested the students' ability to determine the possible ways a set of people could be seated around a circular table. It was quite impressive that 92% of the students, which is equivalent to 108 out of 118, answered this question correctly. The students' outstanding performance in these exam segments is worth acknowledging. They have shown a remarkable understanding of the topic and demonstrated their abilities in performing complex calculations accurately. This is a significant milestone that deserves appreciation and recognition, as it is a clear indication of their commitment and dedication to their studies.

In the assessment of Numeracy skills, there was a particular component that caught the attention of the students - the Shape, Space & Measures category. The students seemed to have found this section "fair" in the pretest, despite it only having eight items, the smallest number of questions in the exam. This section aimed to test the students' understanding of measurements, their capacity to convert units, and their knowledge of geometric shapes. One of the items in this category presented a challenge to the students, as only 50% of them answered it correctly. The question required them to determine the largest number among a set of numbers with different units. Another item that drew the students' attention was a question that asked them to identify the fraction that represented the shaded portion of the largest triangle in the given polygon. This question proved slightly easier, with 56% of students answering it correctly. Overall, the students' performance in the Shape, Space & Measures component provided insight into their numerical abilities, particularly in measurements and geometric shapes. Despite the challenges, the students appeared to have taken the exam with enthusiasm and were keen on learning from their mistakes.

The Shape, Space & Measures which is the only component of numeracy skills that remain the same which has an interpretation of "fair". It had various sample questions to test the students' knowledge. One of the questions in the posttest was about the number of possible polygons that could be formed from four distinct points on a plane, with no three points collinear. Unfortunately, only 23% of the total examinees, which was 27 out of 118 students, answered this question correctly. Another question under this component was about a tennis ball that was dropped from a height of 20 feet. After the ball hit the floor, it rebounded to 50% of its previous height. The examinees were asked how high the ball would rebound after its third bounce in inches. This question proved to be more challenging as only 10% of the total examinees, which was 12 students, answered it correctly.

The Significant Difference in the Student's Numeracy Skills before and after exposure to the Reality Pedagogy

Table 9: Significant difference in the student's numeracy skills before and after exposure to the reality pedagogy

Numeracy Skills	Pre-Test		Post-Test		Mean Difference	t	df	Sig. (2-tailed)
	Mean	SD	Mean	SD				
Numbers	84.29	6.198	88.67	7.920	4.381	6.139	117	.000
Handling Information	74.90	9.641	82.64	8.795	7.737	9.186	117	.000
Operation & Calculation	80.94	8.245	86.33	7.915	5.390	7.620	117	.000

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Shape, Space & Measures	79.41	7.957	78.86	7.559	-.551	-.596	117	.552
Overall	80.18	6.508	84.92	6.93	4.74576	9.510	117	.000

Table 9 presents the results of a study examining the numeracy skills of respondents before and after a reality pedagogy aimed at improving their skills. The numeracy skills are divided into four categories: Numbers, Handling Information, Operation & Calculation, and Shape, Space & Measures.

The results show that there is a significant improvement in the overall numeracy skills of the respondents as the mean difference between the pre-test and post-test scores is 4.75, indicating that this improvement is statistically significant. Further analysis reveals that there are significant improvements in three out of the four categories of numeracy skills. The mean difference between pre-test and post-test scores for the Numbers, Handling Information, and Operation & Calculation categories are 4.38, 7.74, and 5.39 respectively. This indicates that the pedagogy was successful in improving the respondents' numeracy skills in these areas. However, the Shape, Space & Measures category shows no significant difference in the pre-test and post-test scores as the mean difference is -0.551, indicating that the pedagogy did not have a significant impact on this category of numeracy skills.

The first component of Numeracy Skills, which is Number (and Number System), showed a drastic improvement in the students' results. It was not surprising for the researchers as they had already learned these topics during their elementary days. Nevertheless, administering a pretest was necessary to establish a baseline for their numeracy skills before conducting the experiment. The posttest revealed that the students had a good understanding of probability, particularly in different forms of presentation. The exam served as a good measure of their mastery of the lessons learned during the third quarter of grade 10.

Among all the components of Numeracy Skills, Handling Information had the highest mean difference score. The pretest revealed a need for improvement in the students' ability to handle information and interpret data as the verbal interpretation of its mean was "poor." The low scores suggested that more emphasis needed to be placed on teaching these skills in the classroom. In the posttest, the result shifted from "poor" to "satisfactory," likely due to coteaching, which focused on topics such as verbal phrases to mathematical phrases and solving word problems. These skills were crucial in handling information since most of the questions required comprehending the problem before solving it. Overall, the Handling Information component was a test of the students' analytical and problem-solving abilities.

The pretest indicated that students found it challenging to apply their arithmetic knowledge to word problems, resulting in lower pretest scores. However, the correct responses to the questions provided a glimmer of hope that the students could perform better with proper guidance and assistance. The result of the students' improvement in their performance in the posttest could be attributed to their intensive practice and hard work. The teacher's approach of reality pedagogy and the effectiveness of the course materials also played a crucial role in the students' success. The teacher showed different alternative ways to solve the problems and encouraged students to explore and discover other techniques to solve them. This approach was one of the applications of reality pedagogy, which aimed to let students explore the content of the lesson.

Lastly, Shape, Space & Measures was the only component of Numeracy Skills that did not show a significant difference. Despite having a relatively small number of questions in this section, it proved to be challenging for many students. In fact, it had the lowest average score and a negative mean difference. The questions required students to apply their knowledge of geometry and measurements to real-world scenarios. Many struggled with unit conversions and identifying the correct shapes of polygons. Based on the teacher's observation, the concept of Shape, Space & Measures was rarely taught at the secondary level when it came to probability. The higher level of probability was where the concepts of Shape, Space & Measures were taught. However, despite the difficulties encountered, the students persisted and tried their best to answer the questions. The teacher was impressed with their determination and commitment to learning. They took note of the areas where the students struggled and made it a point to focus on those in the future to ensure their success. Overall, the Shape, Space & Measures component was a crucial part of the numeracy exam, testing students' ability to apply mathematical concepts in practical situations.

In summary, the study demonstrates that the numeracy skills of the respondents have improved significantly after the reality pedagogy approach. The pedagogy was successful in improving the skills related to Numbers, Handling Information, and Operation & Calculation categories, but it did not have a significant impact on the Shape, Space & Measures category. Similarly, a study by Sunday et al. (2021) concluded that students who experienced the reality pedagogy approach learn better during math class. So, they recommend that mathematics teachers should be encouraged to use Reality Pedagogy approaches to teach mathematics.

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Table 10: Relationship between the Students' perceived Reality Pedagogy and Students' Posttest Numeracy Skills

Reality Pedagogy	**Numeracy Skills**				
	Numbers	Handling Information	Operation & Calculation	Shape, Space & Measures	Overall
Cogenerative dialogues	.109	.166	.152	.159	.124
Coteaching	.041	-.099	.016	.048	-.060
Cosmopolitanism	.065	.066	.039	.175	.029
Content	.306**	.268**	.275**	.071	.281**
Context	.086	.138	.148	.119	.124
Competition	-.065	-.044	.004	.035	-.056
Curation	.112	.119	.153	-.005	.088

***Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).*
Verbal Interpretation of r-values: +1.0 Perfect positive +/- association +0.8 to +1.0 Very strong +/- association +0.6 to +0.8 Strong +/- association +0.4 to +0.6 Moderate +/- association +0.2 to +0.4 Weak +/- association 0.0 to +0.2 Very weak +/- or no association

According to the results, it was evident that a weak relationship existed between reality pedagogy and numeracy skills, as most of the correlation coefficients fell below 0.3. However, a significant positive relationship was observed between Content and all areas of numeracy skills. Cogenerative dialogues, Cosmopolitanism, Context, and Curation exhibited positive relationships with certain numeracy skill categories, although the coefficients remained relatively weak (around 0.1 or lower). This suggested that these teaching strategies might have some impact on specific numeracy skill areas, but the impact was not substantial enough to draw definitive conclusions. Contrarily, Coteaching and Competition displayed negative relationships with certain numeracy skill components. However, the coefficients for these teaching strategies were also weak, indicating that their influence on specific numeracy skill areas was relatively minor.

Borges (2016) conducted a study where the tools of reality pedagogy were implemented over a two-year period. It is important to note that the limited implementation duration of five weeks may have had a significant impact in conducting this study. The researchers relied on the article by Emdin, a prominent advocate of reality pedagogy, as well as other relevant studies that employed this approach. It is worth mentioning that the researchers did not have direct access to consult with an expert and solely relied on the article and related studies to conduct the research.

In summary, the study implies that there exists a weak relationship between teaching strategies and numeracy skills. However, Content demonstrated a significant positive correlation with all components of numeracy skills, suggesting that teaching strategies emphasizing the application of Content may be more effective in enhancing students' numeracy skills.

The Affordances and Constraints of Reality Pedagogy that Enhance Numeracy Skills

Reality Pedagogy, also known as "culturally responsive teaching," is a teaching approach that aims to connect with students' experiences, cultures, and backgrounds to enhance their learning experience (Emdin, 2016). Here are some possible affordances and constraints of Reality Pedagogy in enhancing numeracy skills based on the reflection papers of the respondents:

AFFORDANCES

"Get engaged, stay engaged, and watch your learning soar!": Reality Pedagogy offers various games, and alternative ways of learning that make numeracy skills more engaging and enjoyable for students. For example, using Pinoy Henyo games, app games, or quiz bee with prizes, can motivate students to participate and learn more. The reflection of the students described a preference for implementation of activities that foster engagement. Some of the students like Student A, B, and C stated:

> ***Student A:*** *Mas nageenjoy po ako sa klase kapag may palaro at pa-prizes. Naeexercise na ang katawan ko, nageenjoy at natututo pa. Sana po sa mga susunod na klase ay palaging ganun.*

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Student B: *Super enjoy po yung quiz bee na may papremyo at human calculator na talagang nabanat ang buto ko. Nagustuhan ko din po yung tinuro nila na alternative way kung pano mag-add at mag-subtract ng decimals.*

Student C: *Masaya yung app tungkol sa integers, magagamit ko kahit nasa bahay ako. Saka yung quiz bee dahil involve lahat ng kaklase ko kaya lahat sila ay nagpaparticipate.*

"Stay connected and have fun learning!": The use of singing, dancing, and culturally relevant activities, such as "Integers song" or "Hephep Hooray games," can create a connection between the students' experiences and the numeracy skills being taught, which can enhance their retention and understanding. Student D and E, respondents of the study, had the following to say:

Student D: *Namemorize ko po ulit yung "same sign add and keep" na tinuro samin nung grade 7 pa kami. Nakatulong po ito para marecall ko ulit ang addition at subtraction of integers, dahil nahihirapan po talaga ako sa operation of integers. Saka nagustuhan ko din po yung pasayaw nila naniconnect pa nila sa lesson.*

Student E: *Relate po ako dun sa hephep hooray dahil lagi po namin yun nilalaro sa bahay kaya masaya at nagenjoy po ako.*

"Don't just sit there, get activate and learn!": Reality Pedagogy emphasizes student-centered approaches such as passing the ball game, playing games like Snake and ladder, and human calculator, which can foster active learning and help students develop problem-solving skills. Student F and G, a respondent, stated:

Student F: *Gusto ko po yung ginawa ng grupo nila Hanna, nagkaroon po sila ng passing the ball with music para malaman kung sino ang sasagot, masaya po at nakakakaba po. Gusto ko din po yung snake ang ladder na ginawa nila kaya lang po ay bitin, medyo kinulang po sa oras pero overall naman po ay masaya at energetic.*

Student G: *Yanung saya pagod po nung human calculator at ang galing po nila dahil nalabas ang tamang sagot kapag tinapakan ang equa sign. Enjoy po at narecall ko po ulit jung pano mag multiply ng decimals.*

CONSTRAINTS

"Expand your mind, break the limits of limited learning.": Some of the activities described in the reflection papers, such as video presentation and traditional teaching/activities, may not challenge students' numeracy skills sufficiently. This could limit their development of more complex mathematical concepts and problem-solving strategies. Student H, I and J, respondents of the study, conveyed the following sentiment that explained how they felt about these activities:

Student H: *About po sa ginawa nilang video presentation, para po sa akin ay hindi po sya maganda dahil hindi na po sila nagexplain, I mean po ay ni-play lang po nila yung video tas hindi na po sila nagexplain. Hindi po nila natanong ang mga kaklase namin kung naunawaan ba nila ang pinanuod nila.*

Student I: *Wala pong bago sa ginawa nila, basta lang po sila nagexplain kung pano magdevide ng decimals tapos pasagot na agad sa papel. Hindi po sya masaya, mas-ok po sana kung may pagames sila or quiz bee.*

Student J: *Ok naman po yung video presentation na ginawa nila dahil may story, kaya lang po ay may mga kaklase ako na hindi interesado dahil po siguro ay basta lang sila nanunuod. Wala pong nagtatanung sa kanila kung natutunan ba nila ng kanilang napanuod.*

"Master your minutes, conquer your studies!": While using different activities that enhance engagement, it may also take more time to cover the same content. This can be a constraint for teachers who need to cover a specific curriculum in a given time frame. Student K and L, a respondent, mentioned:

Student K: *Overtime po sila, sobrang haba po ng kanilang activity. Dapat po sana ay na-manage nila ng mas-maayos ang kanilang discussion at pagames.*

Student L: *Yun pong guidelines na ginawa nila para sa games ay hindi kayang matapos sa loob ng 30 minutes, kaya po sobra sobra sila sa oras. Hindi na po nakapag present yung ibang grupo.*

"Culture is not a costume, appropriateness is key.": While incorporating culturally relevant activities can enhance learning, it is also essential to ensure that these activities are culturally appropriate and sensitive. Some activities may be offensive or exclusionary to some students, which can hinder their engagement and learning experience. Some respondents like student M and N, felt like they are not belong to the activities and here are their responses:

Student M: *Yung pagamit po nila ng app sa activity nila, hindi po sya pede sa lahat dahil hindi naman po kami lahat ay may cellphone. Kaya po kami ay nanunuod nalang sa kanila.*

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Student N: *Hindi ko po naindihan yung activity nila na "call of duty" dahil hindi naman po ako naglalaro nun, sabi po aking mga kaklase ay online games daw po yun na barilan. Next time po sana ay yung makakarelate ang lahat.*

Overall, the study found that Reality Pedagogy can be an effective approach to enhancing numeracy skills. Previous research supports this conclusion Sunday et al. (2021) described reality pedagogy as a teaching and learning method that centers on teachers understanding their students' realities and using that knowledge to inform instruction. Mania-Singer (2017) emphasized the importance of students' everyday experiences and the significance of the learning environment beyond the classroom. Reality pedagogues believe that teaching and learning require a knowledge exchange between the teacher and student (Roode, 2017).

In addition to enhancing numeracy skills, reality pedagogy fosters cooperation and encourages students to reflect on and challenge the learning processes in the classroom (Sirrakos et al., 2017). Mania-Singer (2017) also noted that reality pedagogy promotes a change in power dynamics between instructors and students, with the content of the material shaped by students' cultural identities and individual needs. Ramirez (2018) claimed that reality pedagogy has emerged as a strategy for addressing curricular difficulties, such as the need for learning to be an active process that involves a shift in the learner, accomplished through reflection and active participation. These previous studies support the idea that reality pedagogy can be an effective approach to enhancing numeracy skills through engaging, culturally sensitive, and rigorous instruction that fosters active learning and connection.

Summary, Conclusions, and Recommendations

This study aimed to investigate the effects of using Reality Pedagogy with its seven C's, namely Cogenerative dialogues, Coteaching, Cosmopolitanism, Context, Content, Competition, and Curation, contributed to enhancing Numeracy Skills, specifically in the areas of Numbers (and number system), Handling Information, Operation and Calculation, and Shape, Space & Measures. The pre-experimental research design was employed to achieve the study's objective. Using cluster random sampling, the participants were selected from three groups, comprising a total of 118 students at the school where the research was conducted. The study employed a teacher-made 4-point Likert scale survey form with 35 statements to collect data on students' perceptions of the implementation of Reality Pedagogy. Additionally, equivalent pretest and posttest examinations were administered to determine the difference in performance before and after the experiment. The descriptive analysis involved the use of mean and standard deviation, while the dependent t-test was used to determine significant differences between pretest and posttest scores and percentages. Furthermore, the study also used Pearson r correlation to examine the relationship between perceived Reality Pedagogy and students' numeracy skills. The study found a significant improvement in the overall numeracy skills of the respondents after the implementation of reality pedagogy. On the other hand, a weak relationship between reality pedagogy and numeracy skills among the students was found.

Based on the findings and conclusions, the researchers recommends that the future researchers may investigate the impact of reality pedagogy on other grade levels and other topics in Mathematics to determine its effectiveness in enhancing student learning outcomes. Mathematics teachers may consider implementing reality pedagogy in their classroom instruction to enhance students' numeracy skills. They may also use a variety of teaching strategies and activities that align with the principles to enhance student engagement and learning outcomes. However, they may also ensure that the activities are challenging enough to develop students' mathematical concepts and problem-solving strategies. Finally, mathematics teachers may also be aware of the affordances and constraints of reality pedagogy to maximize its effectiveness. They may carefully consider the time management and cultural appropriateness of the activities used and ensure that they align with students' learning needs and interests.

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