

Perpend, Pair, And Partake (3ps) Strategy: A Collaborative Approach in Teaching Mathematics

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Abstract

Mathematics as a subject need to be learned comprehensively. Yet, the complexities of problem-solving cause difficulty and anxiety among students. With these, mathematics should be made easy to understand by giving more emphasis on teaching strategies to be used like the Perpend, Pair, and Partake (3Ps) a less lecture, more learner -centered and directed learning, and a much more relaxing way of instructional approach in teaching. This quantitative experimental research investigated the significant differences in achievement scores of the Grade 9 students of Abra State Institute of Sciences and Technology - Bangued Campus before and after the use of the 3Ps Strategy. The researcher utilized researcher-made test questionnaires (validity index = 4.67; KR20 reliability index = 0.90) to determine the achievement scores and *t*-Test for significant differences set at a 0.05 level of significance. Investigated data exposed a Fair level of achievement of both groups (Control and Experimental) before the use and revealed an excellent level of achievement in the experimental group after the use of the strategy (*t*-Stat = 4.137; *t*-prob = 0.000). The level of achievement of the student respondents after the use of the 3Ps strategy significantly improved, thus Perpend, Pair, and Partake (3Ps) Strategy is an effective strategy in improving the students' mathematics achievement.

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RATIONALE

Students today are the strongest agents of society because they hold the future. Hence, they should be armed with the necessary competencies in order for them to meet societal needs and wants. One of needs competencies that they need to develop is their mathematical ability. And learners should acquire an understanding of mathematical concepts, proficiency with skills, and a positive attitude toward mathematics in order for them to be successful in this modern technological era. Critical mathematics education as one of the philosophies of Sustainable Development in Education (SDE) be emphasized. In a mathematical world, mathematics is a part in the playground, mathematics is everywhere. In addition, it makes the world move because of the mathematical processes, skills, and concepts that contribute to the environment.

Widiati, I., & Juandi, D. (2019), In the field of mathematics education, Education for Sustainable Development is a means of developing students' arithmetical skills and abilities in solving as an Education for Sustainable Development based on the mathematical problems, namely in the social, economic, and environmental fields, so that they might support livelihoods in the the present reality and in coming generations. As further claimed by Barwell (2018), Understanding these post-normal circumstances, defining them, making predictions about how they will progress, and conveying about them all require serious mathematical understanding. Citizens should engage with mathematics at some level and grasp its role in making contemporary modernized ways of life feasible in opportunity to involve in democratic debates on how to respond to these concerns and establish more sustainable alternatives of life. Critical mathematics learning creates a basis for understanding about how mathematics teaching and learning might prepare future citizens to engage in post-normal science, focusing on the 'formatting power' of mathematics and the necessity of reflective knowledge.

However, in looking into the realities of mathematics education, there are some students who experience math anxiety in the traditional classroom. Sometimes math is associated with pain and frustration. Students' prior negative experiences in math class entail a lack of mathematics competence.

According to Ferrer L., (2010), mathematics is the toughest subject for young learners. So they feel awkward and afraid every time they encounter figures and problems. This is being supported by the study of Tobias, (1993), Math anxiety can lead to forgetfulness and a complete lack of self. Timed tests and the threat of public humiliation have long been acknowledged as factors of counterproductive pressure among the many learners, according to studies. Moreover, according to Tobias (1993), millions of adults are blocked from professional and personal opportunities because they fear on to perform poorly in mathematics.

Furthermore, it was observed that students easily get bored with solving pure numbers during their Math period. Mathematics has long been regarded as one of the most difficult courses to learn since it comprises of a collection of information and abilities that must be memorized or acquired by a diverse set of students.

The previously reported performance of the Philippines released last December 3, 2020 in the 2018 Programme for International Student Evaluation (PISA), a student assessment of 15-year-old learners across 79 nations conducted by the Organization for Economic Cooperation and Development, the country scored in the low 70s (OECD). Filipino students scored poorly in math and science, scoring 353 and 357 points respectively, compared to an OECD average of 489 in both areas. The country's average math score was 353 compared to the worldwide average of 489, making it the second-lowest in the world. The Dominican Republic was the only country with a higher score than Panama which the country is just critically and slightly higher than the two countries. This is a manifestation that Filipino learners have a deteriorating achievement in mathematics.

In the Philippines, education for every individual is mandatory. It is stipulated in the law that every child must be provided with a quality education. The Republic Act No. 896 establishes the Philippines' educational policy. Every parent, guardian, or other person in charge of a child is required to enroll that kid in a public school the day after his or her seventh birthday and to keep that child in school until the completion of basic education. Mathematics is a topic that is present in everyone's life, regardless of age or circumstance. As a result, its importance extends beyond the classroom and the school. As a result, mathematics as a school topic must be thoroughly studied with comprehensiveness as further stipulated in the Math Curriculum Guide Grades 1-10.

Meanwhile, the province of Abra suffers also low rankings in the regional math fairs. The drawback from 2017 up to 2019, out of 7 divisions which includes Benguet, Kalinga, Apayao, Mt. Province, Ifugao, Baguio, and Abra all from the Cordillera Region, Philippines. The division of Abra always ranks from 4th, 5th, and 6th places respectively in the past three years of fairs at the regional level.

Moreover, in the daily classroom setting, it has been observed that many children are anxious in the typical math classroom. These students avoid mathematics, not because of addition, subtraction multiplication, and division but because of the complexities of problem-solving. In some mathematics classes, the researcher observed that the learners belonging to the top 10 mostly participated during discussion. They were the only ones who volunteered to go to the board to solve the mathematical problem and compute. Since only a few of them participated, it resulted in low summative tests and poor performance. These observations and related facts presented that indeed there is a deteriorating quality of education specifically in mathematics education.

Therefore, Math should be made simple to grasp, and it should be part and parcel of everyday life. Students must engage in exploration, conjecture, and reasoning rather than repetitive study of rules and processes to learn mathematics. To make mathematics lessons enjoyable they must be presented in different ways like play-acting, cooperative groups, visual aids, hands-on activities, and technology. Hence, Dauran N., (2010), stressed that teachers must encourage their students to make many comparisons. Allow them to decide if they're given an object to be measured. Indeed, when an individual can read, communicate, and apply mathematics it is expected that an individual can provide substantial information as the basis for important decisions in life. Thus, appropriate mathematics strategies should be used inside the classroom during the teaching and learning process. This is being supported by the findings of Ancheta, A., (2012), that teachers must encourage their learners to learn math with the new methods and techniques and encourage them to change the way they view math. Moreover, Spikell (1993) discovered that active learners learn better than passive learners.

The above situation urges that there should be more emphasis on teaching methods which include fewer lectures, more students directed classes, and a relaxing mode of discussion. It is

then the Perpend, Pair, and Partake of the 3Ps strategy must be used. Perpend, Pair, and Partake is a group activity and it will be used in the teaching-learning process as a strategy to develop the problem-solving ability and computational skills of the students. It is assumed that it is an effective way of developing the mathematical ability of Secondary students, especially in problem-solving and computational skills. Poor-performing students will be paired with a student who is good in math and can understand the concept. This strategy is similar to collaborative or group activities where the pupils are grouped according to the assigned number that will be given to them by their teacher.

The goal of the study is to assist students improve improving overall mathematical skills. So, the researcher made an innovation in order for the students to learn to love and enjoy mathematics as their subject as well as to improve their mathematical ability of the students. With this strategy, the slow learners in the class will be paired with their classmates who can understand clearly the concept taught.

THEORETICAL FRAMEWORK

In the conduct of the study, the researchers were guided by the following research theories and studies. The study is framed to cooperative learning anchored to constructivist philosophy of education.

According to teachervision.com, cooperative learning, often known as small-group learning, is an educational technique in which groups of students collaborate on a common topic. The goal might be as basic as working together to solve a multi-step mathematical problem. Schoenfeld, A. H., & Kilpatrick, J. (2008), Math should be made meaningful in school by allowing students to explore mathematical concepts, relationships, and opportunities in actual circumstances. Learners should be educated in mathematical skills in the most interesting possible way, to use a variety of teaching and learning strategies in settings where they may utilize existing experience and abilities. Thus, a well-organized plan of activities is required for superior teaching-learning results. The students should be given things to work on so that they have something to do and share with their peers during group activities and presentations.

As per author of *The Power of Groupthink*, when people combine their knowledge, even the smartest individuals may be surpassed. For this article, researchers at the University of Illinois performed a study with 760 college students. They offered these pupils a code to break that put their arithmetic and reasoning abilities to the test; some students worked alone, while others worked in small groups. Because they build on one other's ideas, collaborative partners surpass even groups, making it much simpler to find accurate solutions.

There are numerous advantages to cooperative learning. As claimed by Panitz (2000), author of *Using Cooperative Learning in the Mathematics Classroom*, cooperative learning has various benefits for both students and instructors. When she interviewed her students after they had worked in groups, one of them responded to her question by expressing her lack of interest, anxiety, and dislike for math prior to the start of class, but after she had given them the opportunity to work in groups, the student claimed that it was a huge help in understanding

their learning materials and the various ways in which the problems given should be solved and discussed. Panitz, p.8, 2000.

In addition, William (2006) affirmed in her findings that collaborative groups had no trouble reporting to the class on what they had created as a group. A response quoted in her study, "When I was expected to work alone, I felt so alone and frustrated; I had no one to bounce ideas off of!" (William, 2006, p.195). A 12-year-old student in a math's lesson made this assertion. Their teacher, Williamson, author of *Group and Individual Work* (2006), shown that group work increased communication and made problem-solving more pleasurable for students. Half of the pupils worked together on the lesson as a group, while the other half worked alone. She noticed that collaborative teams were more confident and less annoyed with the content.

Colak (2015) is an American writer who investigated the effects of cooperative learning on students with varied learning styles and methodologies. When using the cooperative learning academic comparison technique, students exposed to cooperative and competitive learning styles both improved their problem-solving skills. Based on the belief that deep learners have the skills needed for effective problem solving, such as the ability to focus on key areas in order to solve an issue and the ability to recognize connections between a problem and relevant data. Aguanta et.al (2018) found out that students exposed to cooperative learning have significantly higher performance as to those who are exposed in terms of posttest and retention test scores. The group of students exposed had a higher attitude rating than the non-exposed group.

Furthermore, Valdez, et.al (2015) found that the experimental group did better than the control group in their study on *Developing Critical Thinking through Activity-Based and Cooperative Learning Approach in Teaching High School*. The majority of the experimental group students realized that the treatment encouraged them to think critically. Their preconceptions were rectified and decreased through hands-on experience. They also found that using an activity-based approach to teaching and learning is more engaging, enjoyable, and motivating.

As cited by Davidson, N., & Kroll, D. L. (1991) from the National Council of Teachers of Mathematics (NCTM, 1991), active learning and teaching, classroom conversation, as well as individual, small-group, and whole-group learning should all be encouraged in learning environments. Cooperative learning is an example of an educational arrangement that may be utilized to promote active student learning, which is a key aspect of mathematics learning that is widely endorsed by educators and academics. Tasks and issues to solve and complete might be assigned to students.

CONCEPTUAL FRAMEWORK

The paradigm was coined by the researcher which serves as the guide in the conduct of the study. The paradigm model shows the flow of the study in which the center intersection represents the Mathematics Learners under study pointing to the content learning areas. The

process is the use of student achievement division grouping technique to foster cooperative learning principles before employing the Perpend, Pair and Partake in teaching mathematics. The two arrows represent a direct causality on the level of Post- test along the content learning areas considered in the study which in turn leads to the following; 1. Increase participation of the respondents, 2. Higher mastery in the different content learning areas and 3. Improved level of Grade in Mathematics.

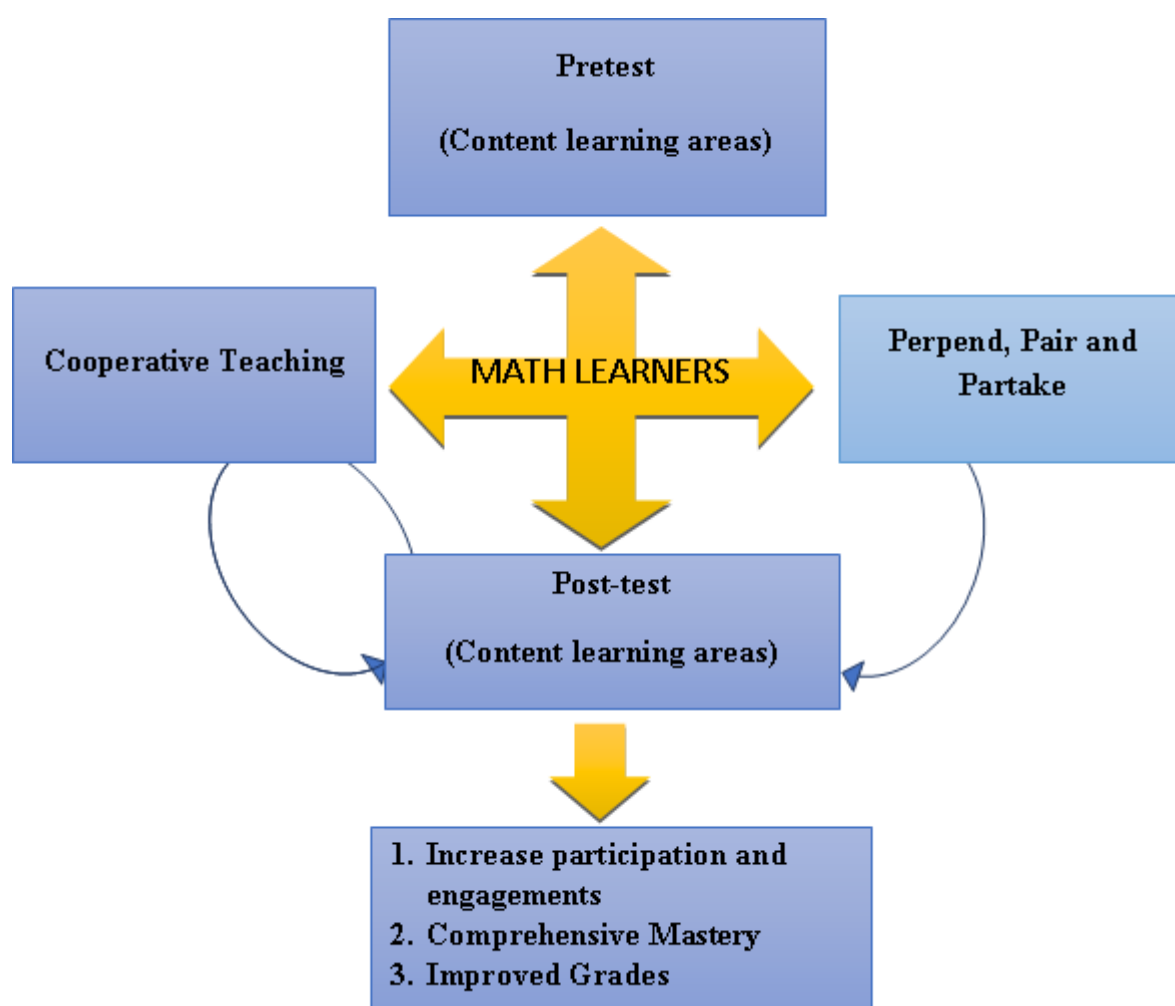


Figure 1. Research Paradigm

OBJECTIVES

This study aims to improve the level of performance and mathematical ability of the students in terms of problem-solving and computing skills through the use of Perpend, Pair and Partake.

Specifically, it seeks to answer the following questions:

1. Determine the level of mathematics achievement of the Control and Experimental Groups before using the 3Ps strategy in the teaching – learning process along;
 - a. Direct Variation
 - b. Inverse Variation

- c. Joint Variation and
 - d. As a whole.
2. Determine the level of mathematics achievement of the Control and Experimental Groups after using the 3Ps strategy in the teaching – learning process along;
- a. Direct Variation
 - b. Inverse Variation
 - c. Joint Variation and
 - d. As a whole.
3. Determine significant difference between the achievement level of the Experimental and Control group before the 3Ps strategy is being employed in the teaching- learning process.
4. Determine significant difference between the achievement level of the Experimental and Control group after the 3Ps strategy is being employed in the teaching- learning process.

HYPOTHESIS

The hypothesis of this study were as follows:

- 1. There is no significant difference between the achievement level of the Experimental and Control group before the 3Ps strategy is being employed in the teaching- learning process.
- 2. There is no significant difference between the achievement level of the Experimental and Control group after the 3Ps strategy is being employed in the teaching- learning process.

RESEARCH HIGHLIGHT

Research Design

The researcher utilized the quantitative design of research. Descriptive methods to determine the level of mathematics ability of the student respondents in the pre-test and the post-test. Furthermore, experimental method of investigation was used to determine if significant difference exist in the pre-test and post-test scores of the respondents before and after using perpend, pair and partake strategy in teaching mathematics.

Population and Sample

This study is conducted to the Grade 9 students of Abra State Institute of Sciences and Technology (ASIST) Bangued Campus who were enrolled for the school year 2019-2020. The population of the study are the 30 Grade 9 students of ASIST Bangued Campus who were enrolled for the school year 2019-2020. The population was first chosen via stratified convenience sampling and then divided into the control and experimental groups.

For each of the control and experimental groups, five students who were considered fast learners were assigned with ten others considered relatively slow learners. Within each group, five smaller groups with 3 members each (1 fast learner and 2 slow learners) were created.

Instrument.

The self-made test questionnaire consists of 30 problems about variations subdivided into the topics Direct Variation, Inverse Variation and Joint Variation with 10 problems each topic. Each of the worksheets is rated based on the number of correct answers over the total number. Each correct answer is given 1 point each.

Reliability. Because reliability is an important aspect in the development of the test, the 30-item test was pilot tested with the other Grade 9 students who are not respondents of the study.

To establish the internal consistency of the test, the Kuder-Richardson Formula 20 (KR20) was used to check the reliability of the questions. The test obtained a reliability index **0.9 at least** which is interpreted as "High Reliability". the test was therefore accepted for classroom use and testing purposes.

Validity. Three (3) subject matter specialists were asked to check the validity of the questions used. After validation, the researcher incorporated their suggestions and recommendations made by the validators and determined the validity index of the test. The validity index computed is **4.6** which is interpreted as Very Much Valid, meaning that the test is accepted for classroom use.

Classroom Instruction

The 3Ps: Perpend, Pair and Partake Approach was **implemented** as follows:

The students are grouped according to their problem-solving and computational ability level. The fast learners who can understand the concepts were grouped with the slow learners, with the group composed of 3 members only so that, the "student-teacher" can properly assist his/her members. Moreover, this process was used during the discussion, application and enrichment part of the lesson. To reflect the Perpend, Pair, and Partake strategy in teaching, the researcher incorporated three specific classroom activities such as "**Listen and Understand**" or **PERPEND**, "**Teach Me**" or **PAIR** and "**It's my Turn**" or **PARTAKE**.

Each lesson is arranged in the following steps below with the allotted time for each step.

Experimental Group (3Ps; Perpend, Pair and Partake Strategy)	ALLOTTED TIME (Minutes)		Control Group (Lecture Method)
Clarification of the objectives, Presentation of the problem and Team formation (Perpend)	15	20	Presentation of the subject matter, discussion of the lesson and giving examples
Group Activity (Pair)	20	15	Boardwork
Evaluation (Partake)	10	15	Evaluation
Checking of papers and	10	10	Checking of papers and

discussion of solutions

discussion of solutions

This study is completed after 14 days with the following allotment of lessons.

Day 1: Administration of Pre-test

Day 2-5: Direct Variation

Day 6-9: Inverse Variation

Day 10-13: Joint Variation

Day 14: Administration of Post-test

The procedure for data collection of this study is divided into four (4) stages.

Stage 1 is communicating the conduct of this research to the school head. At this stage, the researcher asked permission from the school head to conduct the study with the selected respondents from the Grade 9 students of ASIST Bangued for the year 2020-2021. After the approval is granted and consent is obtained from the respondents, the researcher sought the assistance of involved teachers for the necessary schedules in the conduct of the study. The study was then subjected to review by the Ethics Review Board of the institution and provided clearance to proceed.

Stage 2 is the administrations of the diagnostic worksheets before the use of "Perpend, Pair and Partake". At this stage the researcher assessed the level of the mathematical ability of the respondents through the pre-test before the application of the teaching strategy. Afterwards, the researcher conducted the classroom instructions using the strategy perpend, pair and partake. The lesson plans incorporating the engagement of the strategy " served as the school head's basis in monitoring the adherence to the classroom instruction.

Stage 3 is the data collection process. , the teacher administers the post-test using the worksheets after 3 days of using the "Perpend, Pair and Partake Strategy". A post-test is administered after covering every topic in Grade 9 Mathematics learning content included in the study. The scores are tabulated, compared and analyzed by the researcher.

Stage 4 is the presentation, analysis and interpretation of data. At this stage the researcher consolidated the collected data taken from the results of the post-test. The researcher used the Microsoft excel or electronic spreadsheet and Mega Stat to get the mean score of the student respondents. After which, the collected data is tabulated so that the researcher can easily analyze the results of the study and can give appropriate interpretation for each of the research findings.

Analysis of Data

The main objective of this study is to determine if there is a significant increase in the math scores of the respondents after having gone through the perpend, pair, partake teaching strategy in S.Y 2020 -2021. Descriptive statistics were used to determine trends and further

analyze the data collected in this study. Specifically, weighted mean was used to determine the level of mathematical ability of the student respondent before and after the application of the. Moreover, it was used also to describe the validity level and reliability level of the researcher made questionnaires. Moreover, the T- test for two dependent sample means was used to determine any significant difference between the mathematics achievement of the student respondents before and after the use of the perpend, pair and partake strategy in teaching Grade 9 Mathematics. Level of significance was set at 0.01 and 0.05.

The following norms are established as basis for interpreting the level of mathematics achievement of the respondents, validity of questionnaires as well as its reliability.

Level of Mathematics Achievement

Norms:

Mean (X) Ranges

For 10 items	For 30 items	Descriptive Rating (DR)
8.00 - 10.00	24.00 - 30.00	Excellent
6.00 - 7.99	18.00 - 23.99	Very Satisfactory
4.00 - 5.99	12.00 - 17.99	Satisfactory
2.00 - 3.99	5.99 - 11.99	Fair
0.00 - 1.99	0.00 - 5.99	Poor

Level of Validity.

Point Value	Statistical Range	Descriptive Equivalent Rating
5	4.20-5.00	Very High Validity
4	3.40-4.19	High Validity
3	2.60-3.39	Moderate Validity
2	1.80-2.59	Low Validity
1	1.00-1.79	Very Low Validity

Level of Reliability.

Range	Descriptive Equivalent Rating
0.90-1.00	Very High Reliability
0.70-0.89	High Reliability
0.40-0.69	Substantial Reliability
0.20-0.39	Definitely Reliability
0.19 or less	Negligible Reliability

RESULTS AND DISCUSSIONS

Problem 1: What is the level of mathematics achievement of the Control and Experimental Groups during the Pre-test?

The level of mathematics achievement of the respondents during the pre-test is shown in Figure 1. As presented in the table above, the respondents performed best along the Direct Variation content Learning Area as evidenced by the means of both group which is 4.13 and described as Satisfactory. On the other hand, it can also be seen that along the other two content learning areas both groups are found to have Fair level of performance.

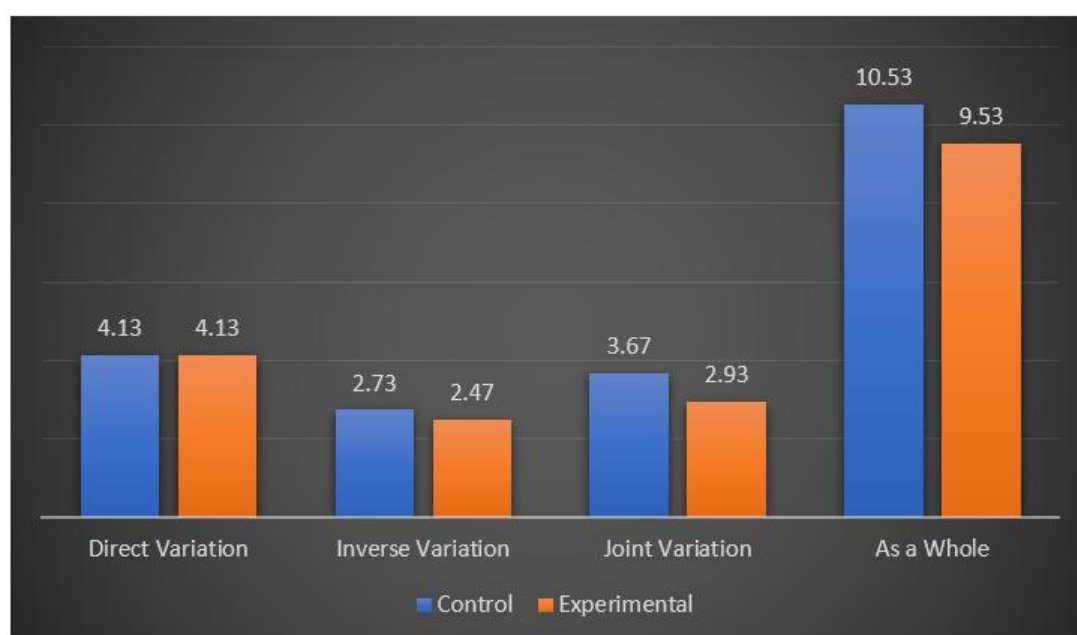


Figure 1. Level of Mathematics Achievement of the Control and Experimental Groups during the Pre- test.

Norms:

<i>Mean (X) Ranges</i>		<i>Descriptive Rating (DR)</i>
<i>For 10 items</i>	<i>For 30 items</i>	
8.00 - 10.00	24.00 - 30.00	Excellent
6.00 - 7.99	18.00 - 23.99	Very Satisfactory
4.00 - 5.99	12.00 - 17.99	Satisfactory
2.00 - 3.99	5.99 - 11.99	Fair
0.00 - 1.99	0.00 - 5.99	Poor

Along Inverse Variation, the control and experimental groups have the means 2.73 and 2.47 respectively. While on Joint Variation both groups have the mean ratings of 3.67 and 2.93 respectively. Along the following level of achievement in the content learning areas being considered in the study it can be seen in the result that if taken as a whole, the level of achievement in mathematics of the respondents from both groups falls on a Fair level of achievement as evidenced by the means from the control and experimental groups, 10.53 and 9.53 respectively.

Problem 2: What is the level of mathematics achievement of the Control and Experimental Groups during the Post-test?

Figure 2 shows the level of mathematics achievement of the respondents. It is revealed that during the post test, both groups have an increased level of achievement but of different categories. The control group performed Very Satisfactory with a mean rating of 20.00 while the experimental group have the mean rating of 24.20 which fall on an excellent descriptive rating.

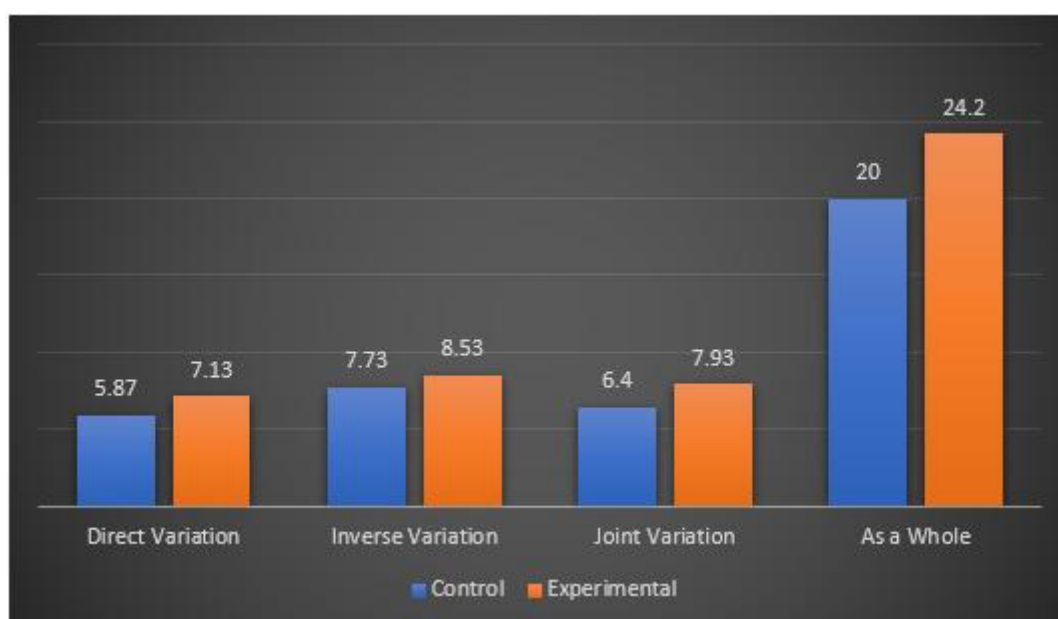


Figure 2. Level of Mathematics Achievement of the Control and Experimental Groups during the Post -test.

Norms:

Mean (X) Ranges

	For 10 items	For 30 items	Descriptive Rating (DR)
	24.00	-	
	8.00 - 10.00	30.00	Excellent
	6.00 - 7.99	18.00	- Very

	23.99	<i>Satisfactory</i>
	12.00	-
4.00 - 5.99	17.99	<i>Satisfactory</i>
2.00 - 3.99	5.99 - 11.99	<i>Fair</i>
0.00 - 1.99	0.00 - 5.99	<i>Poor</i>

The very satisfactory performance of the control group is being backed up by their achievement as evidenced along the individual content learning areas considered in this study where both respondents achievement in inverse and joint variation yields to a “Very Satisfactory” level. On the other hand, the excellent performance of the experimental group is also backed up by the respondents’ achievement on Inverse Variation which also fall on an excellent level of achievement. This means that after using the 3Ps strategy in the teaching learning process, the level of achievement of the respondents levelled up to the excellent category. This further implies that this type of strategy tends to aid students lack of learning math.

Objective 3: Is there a significant difference between the achievement level of the Experimental and Control group before the 3Ps strategy is being employed in the teaching- learning process?

Deducing from the table presented in the above table, it reveals that there are no significant differences between the level of achievement of the control and experimental groups taken singly along the content learning areas and as a whole before the 3ps strategy is being employed in the teaching – learning process. This finding was supported by the t-computed value of 1.029 which is insignificant even at 0.05 level. This is being backed up by the t-computed value along Direct Variation, Inverse Variation and Joint Variation with the indexes 0.023, 0.564 and 1.153 respectively which all are found insignificant at 0.05 level.

Table 1. T-test Showing Significant Differences on the level of mathematics achievement between the Control and Experimental Groups during the Pre-test.

Learning Areas	Means		D	t-value	t-crit	t-prob	Decision
	Control	Experimental					
Direct							
Variation	4.13	4.14	0.01	0.023	1.76	0.653	Accept Ho
Inverse							Accept Ho
Variation	2.47	2.73	0.27	0.564	1.76	0.291	
Joint Variation	2.93	3.67	0.73	1.153	1.76	0.134	Accept Ho
As a whole	9.53	10.53	1.00	1.029	1.76	0.160	Accept Ho

Legend:

* - Significant at 0.05 level

** - Significant at 0.01 level

This means that both level of achievement of groups before using the strategy have no differences. This implies that both groups considered as respondents in this study are relatively equal in terms of capability and achievement along the content learning areas and as a whole.

This is in consonance to the study of Gamit, A. , Antolin, J. and Gabriel, A. (2017) in their study on the effects of cooperative learning in enhancing the performance level of grade-10 mathematics students in Talavera National High School in the Philippines when they found out that both groups have no significant difference in terms of their performances before the intervention is integrated in the teaching-learning process.

Objective 4: Determine significant difference between the achievement level of the Experimental and Control group after the 3Ps strategy is being employed in the teaching- learning process?

It can be seen on the table that the overall mean difference of the control and the experimental group mean rating is 4.20. This means that there is a significant difference between the pre-test and post-test mean scores after the students had been exposed to the 3Ps strategy. The null hypothesis is therefore rejected for it yields to a t-value of 4.137 with the t probability of 0.00.

Table 2. T-test Showing Significant Differences on the level of mathematics achievement between the Control and Experimental Groups during the Post-test.

Learning Areas	Means		D	t- value	t- crit	t-prob	Decision
	Control	Experimental					
Direct Variation	5.87	7.13	1.27	2.244*	1.76	0.021	Reject Ho
Inverse Variation	7.73	8.53	0.80	1.445	1.76	0.085	Accept Ho
Joint Variation	6.40	7.93	1.53	4.766**	1.76	0.000	Reject Ho
As a whole	20.00	24.20	4.20	4.137**	1.76	0.000	Reject Ho

Legend:

* - Significant at 0.05 level

** - Significant at 0.01 level

Looking on the specifics by learning content area along direct variation, the experimental mean rating (7.13) is greater than the control mean rating (5.87) which gives the difference of 1.27 whose t-value is 2.244 and t-probability of 0.021. This means that it is safe to reject the null hypothesis. On inverse variation, the difference is just 0.80 which is based from the mean rating from the control and experimental groups with the mean index of 7.73 and 8.53 respectively. This yields to a t – value of 1.445 and t-probability of 0.085 which in turn making our null hypothesis being accepted. Subsequently, on joint variation the student respondents obtained a mean difference of 1.53 whose t-value is 4.766 and t-probability of 0.000. This

would lead to rejection of the null hypothesis. On the topics covered in this study it only means that there is a significant difference of the control and experimental groups in terms of their mathematical achievement after the 3Ps Strategy; Perpend, Pair and Partake is used in the teaching-learning process.

This is in consonance to the study of Aguanta et.al (2018) when he found out that students exposed to cooperative learning have significantly higher performance as to those who are exposed in terms of posttest and retention test scores. The group of students exposed had a higher attitude rating than the non-exposed group. It also holds true to the study of Gamit, A. et.al (2017) in their study on the effects of cooperative learning in enhancing the performance level of grade-10 mathematics students in Talavera National High School in the Philippines when they found out that both groups have a significant difference in terms of their performances after the cooperative teaching intervention is integrated in the teaching-learning process. Furthermore the study of Salam, A. et.al (2015, after three weeks of intervention, it was shown that the TGT experimental group students had achieved a significant learning outcome than the lecture based control group students.

Meanwhile, even if along inverse variation is not found to have a significant difference in terms of achievement level, it is safe still to say that students gained better scores after their exposure to the 3Ps; Perpend, Pair and Partake strategy. Hence, the 3Ps approach is effective in teaching the Grade 9 mathematics thus, slow learners find it more convenient when they were working in groups specifically the scheme used in the 3Ps strategy.

CONCLUSIONS AND IMPLICATIONS

Based on the analyzed data of the study, the following conclusions are derived. The mean rating of the pre-test and post-test are comparable after the exposure of the 3Ps strategy. The performance of the students exposed to 3Ps strategy has improved. Students exposed to 3Ps strategy are motivated to obtain high scores.

The 3Ps: Perpend, Pair, Partake strategy is an effective strategy in improving the students' performance. It can bring about a significant improvement in students' performance and higher achievement as well.

Based on the conclusion drawn, the following recommendations are proposed; the 3Ps: Perpend, Pair, Partake strategy could be used to motivate students for a more interactive learning. It promotes active student engagement during lecture. The use of 3Ps: Perpend, Pair, Partake strategy could be used in classroom instruction because it helps the students understand the lesson better as they discuss with their peer.

Mathematics teachers should exert more efforts in improving the students' mathematics performance and strategies in teaching such as 3Ps: Perpend, Pair, Partake strategy. This strategy could be used in classroom instruction because the teacher receives a real-time feedback as to the state of students' understanding. School administrators should give priority

to the instructional programs of the school so that teachers are guided accordingly to the implementation of the curriculum. The 3Ps: Perpend, Pair, Partake strategy could be used in other subject areas in order to improve the academic performance of the students since holistic learning is vital in every discipline and parallel studies could be undertaken in other areas.

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