

Teaching Practices and Teaching Strategies of Mathematics Teachers

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Abstract: *This study was conducted to identify the teaching practices of Mathematics teachers at Agusan National High School. The respondents were 382 students of all grade levels of Agusan National High school and 18 Mathematics teachers. Validated questionnaires were used for the students and teachers to verify their answers. Data were analyzed using frequency counts and percentages to determine the demographic profile of the respondents. The findings of the study show that out of the four-salient feature used by the researchers, the use of teaching strategies has the highest mean which shows that it is the common practice used at Agusan National High School. It was also found that mathematics teachers of Agusan National High School use the traditional method. With the result, researchers concluded that teaching strategy is more important in learning mathematics students. Researchers also recommended professional development such as attending seminars and pieces of training should be given more focus since it was a significant factor in influencing the teachers to report the use of multiple teaching methods.*

Keywords: Mathematics, Teaching Practices, Teaching Strategies

1 Introduction

In much modern usage, the words ‘teaching’ and ‘teacher’ are enfolded up with schooling and schools. One way of approaching the question ‘What is teaching?’ is to look at what those called ‘teachers’ do – and then draw out key qualities or activities that set them apart from others.

Teaching is the activities involved in facilitating or educating to impart knowledge or skills to learners, Shittu (2015). Teachers enter the teaching profession to impart their knowledge to cover almost every aspect of education which the students are expected to learn from a teacher and which the teacher will teach them using all the teaching techniques and aids available to teach. Teaching practices are a key

Mathematics education plays a vital and strategic role in the process of adopting education to the needs of rapid social and economic changes. Therefore, the teaching of mathematics is of great concern to every nation. According to Odili (2006), there are several problems, which seriously affect the teaching of mathematics and these are the: lack of curriculum integration, shortage of mathematics teachers, lack of instructional materials, poor classroom organization by teachers, lack of equipped mathematics laboratory for practical, overpopulation of students which may impede effective demonstration, teacher’s impatience and unpreparedness, poor remuneration of teachers. Yadav (2001), also identified some of the problems such as problems of planning and management, boring syllabus, teacher-centered approach, examination system, and the problem of motivation in mathematics teaching. Within the classroom, it depends upon every teacher to strive and to improve her/his teaching style to increase the number of children liking, and even loving mathematics. Ball, (2005) stated that some of the teaching practices in teaching mathematics include, ensuring that the mathematics curriculum is vertically and horizontally

influence on student learning - a desired outcome and primary goal of higher educational institutions. Teachers strive to meet the principles of practice to provide the best learning experience for their students.

Teaching mathematics to students can be challenging. Mathematics, as it is generally understood, plays a key role in shaping how individuals deal with the various spheres of private, social, and civil life. It allows us to make the sense of the world around us and to manage our lives. Using mathematics enables us to model real-life situations. It equips us with the skills we need to interpret and analyze information, simplify and solve problems, assess risk, and make informed decisions.

articulated, clearly identifying skills, concepts, and knowledge to be mastered, using manipulatives to develop an understanding of mathematical concepts, differentiating instruction through flexible grouping, individualizing lessons, using a load of assignments, and varying question levels, and using of experience and prior knowledge as a basis for building new knowledge.

Sabeen (2005) mentioned that using cooperative learning strategies and making a real-life connection, using scaffolding to make connections to concepts, procedures, and understanding are some of the teaching practices of the mathematics teacher. Johnson (2000) articulated also that adequate time, space, and materials to complete tasks, establish clear procedures and routines, inquiry and problem-solving-focused lessons, utilize student self-monitoring techniques, provide guided practice with feedback, conduct error analysis of student work, ensure assessment strategies are aligned with standards/concepts being taught, develop/provide instructional support materials such as curriculum maps and pacing guides.

Yet, to whatever level the teacher has succeeded in imparting the subject, he needs to know about it. Since teachers are the key factor in the teaching-learning process, the researchers were motivated to undertake a study on the teaching practices of a mathematics teacher at Agusan National High School. The researchers would like to know the teaching practices of the Mathematics teachers in Agusan National High School so that they were able to produce students with good mathematical skills. This research will help the schools by applying effective and efficient strategies in teaching mathematics.

2 Theoretical and Conceptual Framework

The Basic Education Curriculum in Mathematics at the Secondary Level advocates using a variety of teaching practices among which are practical work, discussion, problem-solving, investigations besides exposition and practice and consolidation, as well as cooperative learning (Department of Education 2002).

In the field of K-12 education, school administrators need to encourage teachers to pursue professional development, not only to ensure the best learning outcomes for their students but also to be more effective and satisfied in various other aspects of their work. Professional development programs can enable teachers to expand their knowledge base in different subject areas. The more professional development a teacher undergoes, the more knowledge and insight he or she gains (Cassidy, 2018).

Teacher education level refers to the highest educational degree obtained by a teacher. It specifies that highly qualified teachers must have a minimum of a bachelor's degree. However, because most of the teachers have a bachelor's degree, more recent studies have focused on whether teachers with a master's degree or greater have a significantly greater impact on student achievement (Greenberg et al., 2004). Teacher experience is the number of years a teacher has taught. Teacher experience is a topic of potential concern to policymakers as experienced teachers have more opportunities to teach higher level or advanced classes, and thus have higher achieving students in their classrooms.

Wenglinsky (2002) has suggested, a teacher cannot be determined to be qualified by checking his or her educational attainment or length of experience. Teachers influence students through their interactions with them, especially in the classroom. Thus, teacher education level and experience only represent a portion of the ability to manage the classroom efficiently and promote student achievement.

The teaching practices perceived to be most effective by mathematics teachers of schools identified as benchmarks in teaching and learning practices were: a hands-on experience that brings students to their fullest learning capacity because they depend on themselves, cooperative learning because they can share better knowledge when they

work in groups rather than when they work alone, and self-discovery because it enhances students' learning capability (Penano-Ho 2004).

The poor performance of students in math can be traced to the method used to teach math. The focus is on specific problems and not on building the foundations necessary for understanding higher-level math. These foundations can only be built with a mathematics program that teaches concepts and skills and problem-solving (Daro, 2006). The teaching strategy is one of the salient features in teaching practices because teaching strategy is to make it easier to implement a variety of teaching methods and techniques and to help students take more responsibility for their learning and enhance the process of teaching for learning.

The assessment strategy is another salient feature in teaching practices, because assessment strategy is an integral part of instruction, as it determines whether or not the goals of education are being met and it is a key component of learning because it helps students learn. Assessment strategies can be classified as diagnostic, formative, or summative. How teachers use assessment in their instruction is a major variable in determining student achievement (Romberg 2000).

The use of instructional materials appears to increase mathematics achievement and improve student attitudes toward mathematics. The utilization of instructional materials helps students understand mathematical concepts and processes, increases thinking flexibility, provides tools for problem-solving, and can reduce math anxiety for some students. Teachers using instructional materials must intervene frequently to ensure a focus on the underlying mathematical ideas, must account for the "contextual distance" between the instructional materials being used and the concept being taught, and take care not to overestimate the instructional impact of their use (Johnson 2000).

Enhancement/ Intervention Activities are the last salient feature that it is a specific program or set of steps to help a child improve in an area of need. Teachers have a responsibility to ensure all students have opportunities to participate in mathematical activities focused on their shared experience. Student needs to be based on a shared task rather than a textbook reading to ensure the mutuality of the experience Nuthall (2004).

With these, the researchers want to know what practices are used by the school in improving their mathematics performance that can also be used by other schools which cannot be easily and adequately equipped with textbooks, curriculum guidelines, and laboratories as well as other types of educational service.

Conceptual Framework

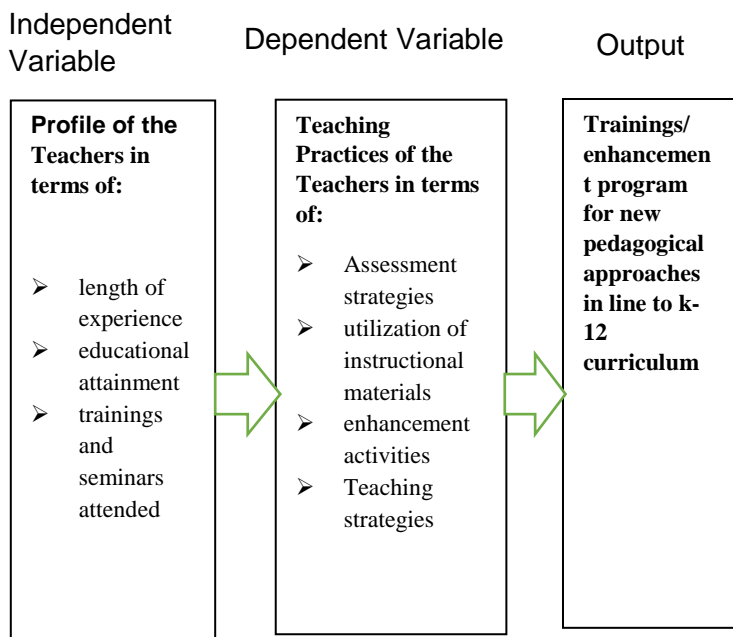


Figure 1. A Schematic Diagram showing the interplay of independent variables, dependent variables, and output of the study.

The main purpose of this study is to identify what are the teaching practices of the teachers at Agusan National High School in teaching mathematics. How they engage their students with mathematics-related activities or programs so that this can be used by other schools as a basis for teaching mathematics. In this study, there is no significant difference between the teacher’s perception and the student’s perception.

This study selected the Agusan National High School and the respondents are all the mathematics teachers using Total Sampling and Grade 7 to Grade 10 students will be collected using Stratified Random Sampling through Sloven’s Formula. This study will be conducted at Agusan National High School. The study was delimited only to mathematics teachers and from Grade 7 to Grade 10 selected students. The study determined only the teaching practices of a mathematics teacher at Agusan National High School.

3 Methodology

The researchers used the descriptive method. Descriptive research is used to obtain information concerning the current status of the phenomenon to describe what exists concerning the variables or conditions in the situations. This research approach is used when this integration provides a better understanding of the research problem than either of each alone. This method of research is concerned with the development of students through the practices used by the teachers that are being applied.

This study was conducted at Agusan National High School, Butuan City. The area of the study can be reached using multicabs, motorcycles, and tricycles. Figure 2 shows the location Map of the study.

The population of the study involved eight thousand two hundred seventy-seven (8277) from Grade 7 to Grade 10 students who were enrolled in Agusan National High School. The total sample size of three hundred eighty-two (382) was determined using Sloven’s Formula. Table 1 shows the population and respondents of the study.

This study used Stratified Random Sampling in selecting the students while Total Sampling was used for the teachers.

Stratified random sampling is a method of sampling that involves the division of a population into smaller groups known as strata. In stratified random sampling, the strata are formed based on members’ shared attributes or characteristics.

Table 1. Population and Respondents of the Study

Year Level	Population	Sample Size
Grade 7	2216	103
Grade 8	2007	92
Grade 9	2033	95
Grade 10	2021	92
Total	8277	382

The instrument used in this study is a survey questionnaire. The primary aim of the questionnaire is to identify the teaching practices of the mathematics teachers at Agusan National High School. It is composed of four parts namely; teaching strategies, assessment strategies, utilization of instructional materials, and enhancing activities towards Mathematics.

Questions for the students were based on the questions of the teachers. Its purpose is to check if the answers of the teachers and the students coincide.

The researchers visited Agusan National High School during school days to distribute validated questionnaires to each Mathematics teacher and another set of validated questionnaires was given to the selected students of grades 7 to grade 10.

In conducting this study, the researchers followed certain procedures. Chose a certain title and defend it to the panel members until it was approved. The researchers have consulted many professors that they think are helpful for the study. In preparing the instruments, a questionnaire was a principal tool in gathering the data. The researchers wrote a request letter to the principal of the school to ask permission for the pilot testing. The researchers personally distributed the

pre-survey questionnaire to the selected respondents through simple random sampling. Here, a clear explanation of the purpose of the study was indicated. Confidentiality was given to assure cooperation and to avoid inhibitions from the respondents in accomplishing the questionnaire. Validating the instrument. After the distribution was the validation of the pre-survey questionnaire. It was analyzed and interpreted through the data gathered and formulate the conclusions and recommendations of this study.

3.1 Scoring and Quantification of Data

The data gathered was analyzed using mean and range. The researchers computed the mean of the responses of the students and the Math teachers in each statement.

For the study, the following scoring and quantification were used:

A. Teaching Strategies

Mean Ranges	Verbal Description	Scale
3.5 – 4.0	Always	4
2.7 – 3.4	Sometimes	3
1.6 – 2.6	Rarely	2
1.0 – 1.5	Never	1

Assessment Strategies

Mean Ranges	Verbal Description	Scale
3.5 – 4.0	Always	4
2.7 – 3.4	Sometimes	3
1.6 – 2.6	Rarely	2
1.0 – 1.5	Never	1

B. Utilization of Instructional Materials

Mean Ranges	Verbal Description	Scale
3.5 – 4.0	Always	4
2.7 – 3.4	Sometimes	3
1.6 – 2.6	Rarely	2
1.0 – 1.5	Never	1

C. Intervention/ Enhancement Activities

MEAN RANGES DESCRIPTION	VERBAL SCALE	SCALE
3.5 – 4.0	Always	4
2.7 – 3.4	Sometimes	3
1.6 – 2.6	Rarely	2

1.0 – 1.5	Never	1
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3.2 Statistical Treatment

This study used the frequency count and percentages to determine the demographic profile of the respondents. The weighted mean was used to identify the teaching strategies of mathematics teachers. T-test for the significant difference between the student's perception and the teachers' perception of mathematics teaching strategies.

4 Presentation, Analysis, and Interpretation of Data

4.1 Profile of the Mathematics Teachers

Table 2 Percentage and Frequency Distribution of the Profile of the Participants by Length of Experience

Length of Experience	Frequency	Percentage
Below 5 years	2	11.11
6 - 10 years	7	38.89
11 - 15 years	1	5.56
Above 15 years	8	44.44
Total	18	100.00

Table 2 displays the length of experiences of the mathematics teachers in Agusan National High School. The data revealed that about 44% of the teacher was more than 15 years of teaching experience. It can be inferred that about half of the teachers were experienced in teaching mathematics. Kini and Podolsky (2016) state that teaching experience is positively associated with student achievement gains throughout a teacher's career. The gains from experience are highest in teachers' but continue for teachers in the second and often third decades of their careers. As teachers gain experience, their students are also more likely to do better on other measures of success. More experienced teachers confer benefits to their colleagues and the school as a whole, as well as to their students.

Table 3 Percentage and Frequency Distribution of the Profile of the Participants by Educational Attainment

Educational Attainment	Frequency	Percentage
Bachelor's degree holder	1	5.56

Bachelor's degree holder with Master's units	12	66.67
Master's degree holder	5	27.78
Total	18	100.00

Table 3 displays the educational attainment of the mathematics teachers in Agusan National High School. The data revealed that more than half of the teachers have earned bachelor's degrees with master's units. It can be inferred that the teachers with master's qualifications have a better understanding of pedagogy, allowing them to continually improve their teaching strategies. Abe and Adu (2013) state that the quality of education in a nation could be determined by the quality of its teachers. The most important factor in improving students' achievement is by employing seasoned qualified teachers in all schools.

Table 4 Percentage and Frequency Distribution of the Profile of the Participants by the Number of times per year of training/Seminars

Number of times per year of Training/Seminars	Frequency	Percentage
Below 2 per year	9	50.00
3 - 4 per year	8	44.44
Above 5 per year	1	5.56
Total	18	100.00

Table 4 shows the number of times per year of training/seminars attended by Mathematics teachers in Agusan National High School. The data revealed that 50% of the teachers attended below 2 seminars per year. It can be inferred that half of the teachers were trained in teaching mathematics. According to Moyle (2007), the reason or belief behind training and developing teachers is that it improves the teacher's capabilities, e.g. makes it possible for them to incorporate new and emerging technologies related to education into their teaching, which in turn will help students in enhancing their learning.

4.2 Practices of Mathematics Teachers

Table 5 Weighted Mean Distribution of the Teaching Practices in Mathematics of the Participants by Teaching Strategies

Teaching Strategies	Weighted Mean	Description
1. I review the previous lesson in the new one.	3.72	Always

2. I plan a variety of assessment strategies for most math activities and tasks.	3.50	Always
3. When students are working on math problems, I put more emphasis on the process followed rather than getting the correct answer.	3.33	Sometimes
4. I take students' prior understanding into account when planning instruction.	3.72	Always
5. I demonstrate the solutions to a math problem to the whole class.	3.89	Always
6. I explain the solutions to a math problem to the whole class.	3.67	Always
7. I let my students work individually on mathematics exercises, problems, investigations, or tasks.	3.18	Sometimes
8. I let my students work in pairs or small groups on math exercises, problems, investigations, or tasks.	3.33	Sometimes
9. I let my students apply mathematics topics to real-life situations.	3.22	Sometimes
10. I use effective motivation for the lesson.	3.39	Sometimes

Total	3.50	Always
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Table 5 represents the mean perception of teachers toward their teaching strategies. The overall mean score of 3.50 illustrates that teachers always consider what teaching strategies to be used in teaching mathematics. The highest mean is 3.89 states that teachers always demonstrate the solutions to a math problem to the whole class. Vygotsky's sociocultural theory of cognitive development states that we learn through our interactions and communications with others. Le Roux & Le Roux (2004) state that mathematics study material should include activities that respond to a problem-solving approach rather than rote learning. Mathematics teachers believed that effective teaching involved showing learners mathematical procedures followed by the learner's use and practice of that procedure (D'Ambrosio, 2006). The lowest mean is 3.18 it also states that teachers sometimes let their students work individually on mathematics exercises, problems, investigations, or tasks. The table also shows that 5 out of 10 statements were interpreted as always. This signifies that teachers review their previous lesson to the new one, plan a variety of assessment

strategies for most math activities and tasks, take students' prior understanding into account when planning instruction, demonstrate the solutions of a math problem to the whole class, explain the solutions of a math problem to the whole class. The five remaining statements were interpreted as "sometimes" since the mean score is less than 3.50. This means that teachers consider these statements in conducting different teaching strategies. The data also imply that the teachers of Agusan National High School still use the traditional way of teaching since the first six statements show that it is more on the teacher taking charge of the class and the next four are for the students.

Table 6 Weighted Mean Distribution of the Teaching Practices in Mathematics of the Participants by Assessment Strategies

Assessment Strategies	Weighted Mean	Description
1. I communicate with the student's parents about student achievement regularly as well as about the math program.	3.44	Sometimes
2. I facilitate a class of students engaged in hands-on/project-based work.	3.17	Sometimes
3. I talk about their reasoning or thinking in solving a problem.	3.62	Always
4. I assign math problems that can be solved in different ways.	3.62	Always
5. I let my students solve word problems from a textbook or worksheet.	3.65	Always
Total	3.50	Always

Table 6 displays the perception of teachers toward their assessment strategies. The overall mean of 3.50 implies that teachers always consider different factors in doing the assessment. The highest mean is 3.65 which falls in statement 5 which tells that the teachers always let their students solve word problems from a textbook or worksheet. While the lowest mean is 3.17 which also tells that the teachers sometimes facilitate a class of students engaged in hands-on/project-based work. To develop a sound understanding of mathematics with their learners, teachers need to continually update their existing teaching methods and assessments. Innovative teaching approaches can enable learners to link mathematics and statistics to real life and prepare learners to be investigators and problem solvers. Learners are expected to apply their knowledge to develop new perceptions and skills and to apply mathematical reasoning to problems to have the capacity to participate in today's and tomorrow's economy (Kilpatrick, Swafford & Findell, 2014).

Table 7 Weighted Mean Distribution of the Teaching Practices in Mathematics of the Participants by Utilization of Instructional Materials

Utilization of Instructional Materials	Weighted Mean	Description
1. I use the textbook as a resource rather than the primary instructional tool.	3.22	Sometimes
2. I use calculators/computers for drills and practice.	2.67	Sometimes
3. I present information using manipulative (chalkboard, whiteboard, projector)	3.44	Sometimes
4. I show appropriate representation (pictures, concrete objects, symbol sets, etc.) in teaching mathematics.	3.17	Sometimes
5. I used kind of manipulative teaching tools to engage students in the hands-on learning of mathematics.	3.28	Sometimes
Total	3.16	Sometimes

Table 7 represents the mean perception of teachers towards the utilization of instructional materials. Having an overall mean of 3.16 implies that teachers consider the use of instructional materials in teaching Mathematics. The table shows that the highest mean is 3.44 which tells that teachers sometimes present information using manipulatives (chalkboard, whiteboard, projector) while the lowest mean is 2.67 which states that teachers sometimes use calculators/computers for drills and practice. This implies that teachers of Agusan National High School sometimes include the utilization of instructional materials in teaching Mathematics. Using of books, chalk and board are still common materials in teaching Mathematics. This shows that not all times calculators are important in solving or dealing with different mathematics problems. Johnson (2000) suggests that when applied appropriately, the use of instructional materials appears to increase mathematics achievement and improve student attitudes toward mathematics. The utilization of instructional materials helps students understand mathematical concepts and processes, increases thinking flexibility, provides tools for problem-solving, and can reduce math anxiety for some students. In addition, Sabeen and Bavaria (2005) suggest that the development of practical meaning for mathematical concepts is enhanced through the use of manipulatives. They further suggest that the use of manipulatives must be long-term and meaningfully focused on mathematical concepts.

Table 8 Weighted Mean Distribution of the Teaching Practices in Mathematics of the Participants by Intervention/ Enhancing Activities

Intervention/ Enhancing Activities	Weighted Mean	Description
1. I train individuals using an explicit, well-designed program or practice that is a match to a student's needs.	3.11	Sometimes
2. I increase the amount of academic learning time for a student in an area of targeted need.	3.28	Sometimes
3. I use structure organizers that give students a better understanding of reading, interpreting, and solving word problems in mathematics.	3.06	Sometimes
4. I establish independent math centers in the classroom where an individual or small group of students can work for at least 15 minutes several times a week.	2.72	Sometimes
5. I explain to the student the real-life application of learning the concept and give concrete examples and opportunities to apply these concepts.	3.39	Sometimes
Total	3.11	Sometimes

Table 8 displays that teachers do not consider many interventions/ enhancing activities in teaching mathematics since all of the five factors have an overall mean of 3.11. The table indicates that the highest mean is 3.39 which shows that teachers sometimes explain to the student the real-life application of learning the concept and give concrete examples and opportunities to apply these concepts. It also presents that the lowest mean has a mean value of 2.72 which reports that teachers sometimes establish independent math centers in the classroom where an individual or small group of students can work for at least 15 minutes several times a week. Effective strategies for differentiating mathematics instruction include rotating strategies to appeal to students' dominant learning styles, flexible grouping, individualizing

instruction for struggling learners, compacting (giving credit for prior knowledge), tiered assignments, independent projects, and adjusting question level (Computing Technology for Math Excellence, 2006). Bayazit and Gray (2004) found that teaching practices that differ qualitatively will produce qualitatively different learning outcomes. They concluded that using real-life situations to convey mathematical problems might help students develop a conceptual understanding of the topic. Nuthall (2004) suggested that teachers have a responsibility to ensure all students have opportunities to participate in mathematical activities focused on their shared experience. Student needs to be based on a shared task rather than a textbook reading to ensure the mutuality of the experience. In addition, Lövgren (2007) suggested teaching mathematics in an outdoor-activities in which he believes that teachers will motivate the students more in this particular approach than solving problems in textbooks, thus offering new ways to introduce and work with mathematical concepts. This approach does not aim at replacing traditional mathematics teaching. He said that it should rather be interpreted as a complementary method to be used at the discretion of the mathematics teacher in combination with other teaching methods.

4.3 Identified Teaching Practices by the Students to their Mathematics Teacher:

Table 9 Weighted Mean Distribution of the Student's Perceptions of Teaching Practices in Mathematics of the Participants by Teaching Strategies

Teaching Strategies	Weighted Mean	Description
1. My teacher reviews the previous lesson for the new one.	3.41	Sometimes
2. My teacher plans a variety of assessment strategies for most math activities and tasks.	3.27	Sometimes
3. My teacher is working on math problems, and put more emphasis on the process followed rather than getting the correct answer.	3.22	Sometimes
4. My teacher takes our prior understanding into account when planning instruction.	3.19	Sometimes

5. My teacher demonstrates the solutions to a math problem to the whole class.	3.55	Always
6. My teacher explains the solutions to a math problem to the whole class.	3.62	Always
7. My teacher let us work individually on mathematics exercises, problems, investigations, or tasks.	3.28	Sometimes
8. My teacher let us work in pairs or small groups on math exercises, problems, investigations, or tasks.	3.96	Always
9. My teacher let us apply mathematics topics to real-life situations.	3.92	Always
10. My teacher uses effective motivation for the lesson.	3.19	Sometimes
Total	3.46	Sometimes

Table 9 shows the perception of students toward their teacher's teaching strategies. With an overall mean of 3.46 students perceived that their teachers are sometimes using different teaching strategies in teaching Mathematics. The highest mean is 3.96 states that their teacher always lets them work in pairs or small groups on math exercises, problems, investigations, or tasks. Vygotsky's sociocultural theory stated that we learn through our interactions and communications with others. Vygotsky said our social environments influence the learning process. He suggested that learning takes place through the interactions students have with their peers, teachers, and other experts. Consequently, teachers can create a learning environment that maximizes the learner's ability to interact with each other through discussion, collaboration, and feedback. Moreover, teaching strategies perceived to be most effective by mathematics teachers of schools identified as benchmarks in teaching and learning practices were: a hands-on experience that brings students to their fullest learning capacity because

they depend on themselves, cooperative learning because they can share better knowledge when they work in groups rather than when they work alone, and self-discovery because it enhances students' learning capability (Penano-Ho 2004). The lowest mean of 3.19 states that their teacher sometimes takes their prior understanding into account when planning instruction and sometimes uses effective motivation for the lesson. The table also shows that 4 out of 10 statements were interpreted as always. This signifies that in teaching strategies students can see that their math teacher sometimes reviews the previous lesson to the new one, plans for integration of a variety of assessment strategies into most math activities and tasks, work on math problems, put more emphasis on the process rather than getting the correct answer, and let the students work individually on mathematics exercises, problems, investigations, or tasks., investigation or tasks sometimes. Since the overall mean is interpreted as always, this implies that students agree that their teacher commonly used the traditional way of teaching Mathematics.

Table 10 Weighted Mean Distribution of the Student's Perceptions of Teaching Practices in Mathematics of the Participants by Assessment Strategies

Assessment Strategies	Weighted Mean	Description
1. My teacher communicates with the student's parents about student achievement regularly as well as about the math program.	3.02	Sometimes
2. My teacher facilitates a class of students engaged in hands-on/project-based work.	3.15	Sometimes
3. My teacher talks about their reasoning or thinking in solving a problem.	3.36	Sometimes
4. solved in different ways.	3.33	Sometimes
5. My teacher let us solve word problems from a textbook or worksheet.	3.34	Sometimes
Total	3.24	Sometimes

Table 10 shows the perception of students toward their teacher's assessment strategies. With the overall mean of 3.24 students perceived that their math teachers sometimes consider the use of assessment strategy in teaching mathematics. The table also shows that all the statements were interpreted as "Sometimes" which means that students

see that teachers consider the different types of assessment during their class. The table presents that the highest mean is 3.36 which tells that their teacher sometimes talks about their reasoning or thinking in solving a problem. The table also implies that the teacher just sometimes gives the parents involvement in the achievements of the students to be more participative during class since it has the lowest mean of 3.02. Clark (2008) suggests that the use of a variety of teaching and assessment methods can stimulate learners' achievement while pointing to the importance of specifying success criteria and learning intentions in any assessment setting.

Table 11 Weighted Mean Distribution of the Student's Perceptions of Teaching Practices in Mathematics of the Participants by Utilization of Instructional Materials

Utilization of Instructional Materials	Weighted Mean	Description
1. My teacher uses the textbook as a resource rather than the primary instructional tool.	3.00	Sometimes
2. My teacher uses calculators/computers for drills and practice.	2.47	Sometimes
3. My teacher presents information using manipulatives (chalkboard, whiteboard, projector)	3.23	Sometimes
4. My teacher shows appropriate representation (pictures, concrete objects, symbol sets, etc.) in teaching mathematics.	2.98	Sometimes
5. My teacher uses kind of manipulatives as teaching tools to engage students in hands-on learning of mathematics.	3.10	Sometimes
Total	2.96	Sometimes

Table 11 shows the mean perception of students towards the utilization of instructional materials in teaching math. The highest mean is 3.23 which tells that their teacher sometimes presents information using manipulatives (chalkboard, whiteboard, projector). The lowest mean score is 2.47 which falls in statement number 2 which is the use of calculators/ computers for drills and practice. With an overall mean of 2.96 students perceived that their teachers sometimes

consider the utilization of instructional materials in teaching math. It also indicates that students agree that the commonly used instructional materials in teaching Mathematics are still the use of textbooks, chalk, and board for the topic to be more understandable to them. Using materials enables students to see and manipulate representations, equipment, or diagrams. The use of materials differs from the more experiential "hands-on" orientation where equipment was used to keep students actively engaged (Higgins 2005). Teachers using instructional materials must intervene frequently to ensure a focus on the underlying mathematical ideas, must account for the "contextual distance" between the instructional materials being used and the concept being taught, and take care not to overestimate the instructional impact of their use (Johnson 2000). According to Anhalt (2006), an extensive understanding of pedagogy may improve one's ability to plan lessons that use a variety of materials and better meet the needs of one's students.

Table 12 Weighted Mean Distribution of the Student's Perceptions of Teaching Practices in Mathematics of the Participants by Intervention/Enhancing Activities

Intervention/Enhancing Activities	Weighted Mean	Description
1. My teacher train individual using an explicit, well-designed program or practice that is a match to a student's needs.	3.09	Sometimes
2. My teacher increases the amount of academic learning time for a student in an area of targeted need.	3.14	Sometimes
3. My teacher uses structure organizers that give students a better understanding of reading, interpreting, and solving word problems in mathematics.	3.33	Sometimes
4. My teacher establishes independent math centers in the classroom where an individual or small group of students can	3.01	Sometimes

work for at least 15 minutes several times a week.				
5. My teacher explains the real-life application of learning the concept and gives concrete examples and opportunities to apply these concepts.	3.31	Sometimes		
Total	3.18	Sometimes		

Table 12 displays the perception of students toward intervention/ enhancing activities used by their teachers in teaching math. The table shows an overall mean of 3.18 which implies that students sometimes see their teacher having some intervention and enhancing activities in teaching math in the classroom. The highest mean is 3.33 which falls in statement 3 which states that their teacher sometimes uses structure organizers that give students a better understanding of reading, interpreting, and solving word problems in mathematics. While the lowest mean is 3.01 which tells that their teacher sometimes establishes independent math centers in the classroom where an individual or small group of students can work for at least 15 minutes several times a week. The teacher as a mathematician has a specific responsibility to embody, experience, and exhibit mathematical inquiry to create an environment in which students can also experience mathematics problems (Barton, 2009).

4.4 Results between the Teacher and Students' Perceptions:

Table 13 t-test Results between the Teacher and Students' Perceptions on Mathematics Teaching Practices

Variables	Mean	N	Std. Deviation	Sig. (2-tailed)	Decision
Teacher's Perception	3.34 28	18	0.29 07	0.0 0	Significant

Student's Perception	3.25 88	381	0.30 10
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Table 13 above shows the results between the teacher and students' perceptions of mathematics teaching practices. It revealed that the student's perception and teachers' perceptions differed significantly with a value of 0.000. Thus, students' observation of the teaching practices of their teachers is different from their teacher's perception of their teaching and the use of instructional materials. It also indicates that the use of books, chalk, and board are still the common materials that are used by teachers in conducting Mathematics classes. Teachers just sometimes consider the use of other instructional materials such as calculators/ computers and mathematics learning games. Thus, the utilization of instructional materials helps students understand mathematical concepts and processes, increases thinking flexibility, provides tools for problem-solving and can reduce math anxiety for some students Johnson (2000). Researchers also found that teachers' and students' perception of intervention/ enhancing activities coincides that teachers sometimes using different intervention/ enhancing activities in teaching Mathematics. Lövgren (2007) suggested teaching mathematics in an outdoor-activities in which he believes that teachers will motivate the students more in this particular approach than solving problems in textbooks, thus offering new ways to introduce and work with mathematical concepts.

5 Conclusion

The main purpose of this study is to identify what are the teaching practices of the teachers at Agusan National High School in teaching mathematics. How they engage their students with mathematics-related activities or programs so that this can be used by other schools as a basis for teaching mathematics. Furthermore, it tried to find out whether the teaching practices of mathematics teachers were related to the four salient features of instruction, namely (1) teaching strategies; (2) assessment strategies; (3) utilization of instructional materials; and (4) enhancement/intervention activities.

The researchers conducted the study using descriptive method research. Validated questionnaires were given to three hundred eighty-two (382) students from Grade 7 to Grade 10 using stratified random sampling and another set of validated questionnaires was given to each mathematics teacher in Agusan National High School. The data of the respondents were gathered, analyze, and interpreted through frequency count and percentages to determine the demographic profile of the respondents. The weighted mean was used to identify the teaching strategies of mathematics teachers. T-test for the relationship between the student's

perception and the teachers' perception of mathematics teaching strategies.

About half of the teachers were experienced in teaching mathematics. The most experienced teachers had taught above 15 years while the least experience had taught below 5 years. It implies that the teachers were experienced in the service based on the length of their teaching experience. About 2/3 of the teachers has earned bachelor's degree with master's units. It implies that they were equipped in teaching mathematics. And also, half of the teachers have attended below 2 seminars per year. It can be inferred that the teachers were trained in teaching mathematics.

The findings also showed that teachers need to build up their repertoire of teaching strategies, assessment strategies, utilization of instructional materials, and enhancement/intervention activities which would help them to enhance the learning experiences of their learners.

Based on the findings of the study, it has shown that teachers who attend training and seminars are more likely to cite several assessment methods than those who do not. This is an illustration of the value of attending professional development programs to encourage teachers to attend more training, these should ideally be carried out at the places where teachers work so that they can learn while they practice and can be supported as they try to implement more progressive teaching methods. This study furthermore brought a new understanding that teachers' tendencies to use different teaching strategies, assessment strategies, utilization of instructional materials, and enhancement/ intervention activities differ according to their length of experience, educational attainment, and training/ seminar attended. This means that all teachers of the same length of experience, educational attainment, and training/ seminar attended do not have the same pedagogical knowledge in teaching and learning.

Generally, teachers should be encouraged to improve their way of teaching by moving beyond a reliance on teacher-led instruction. More particularly, training and seminars are needed to help mathematics teachers manage the wider and more relevant mathematics curriculum so that learners can be mathematically literate when they leave school (Wessels, 2008)

Further, researchers found out that the student's perceptions and teachers' perceptions have differed significantly. Thus, students' observation of the teaching practices of their teachers is different from their teacher's perception of their teaching and the use of instructional materials. It also indicates that the use of books, chalk, and board are still the common materials that are used by teachers in conducting Mathematics classes. Teachers just sometimes consider the use of other instructional materials such as calculators/ computers and mathematics learning games. Researchers also found out that teachers' and students' perception of the intervention/ enhancing activities coincides that teachers sometimes use different intervention/ enhancing activities in teaching Mathematics.

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