

## “LISUD SAB-TON”: DIFFICULTIES ENCOUNTERED BY SECONDARY LEARNERS IN MATHEMATICS

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### ABSTRACT

The aim of this study is to identify whether high school students encounter any difficulties in mathematics and reveal the reasons for such difficulties. The participants of the study from Baguio National School of Arts and Trades in Baguio District, Davao City, which was a descriptive case study based on qualitative understanding, were a total of 164 students, including 83 female students and 81 male students, fourteen (14) students were randomly interviewed. Only a few of the participants said they had no difficulties in math, whereas female and male students said they had difficulties in mathematics. Their thoughts about the reasons for such difficulties were analyzed by content analysis method. The findings obtained revealed that the difficulties encountered by the participants in mathematics were teacher-, content- and student-based. Female students stated that they intensely faced teacher-based difficulties, whereas male students stated that they faced content-based difficulties. It's expected that the results of this study may contribute to studies to be conducted to increase student success in mathematics education and provide ideas for further studies.

**Keywords:** Mathematics lesson, difficulties in mathematics, high school student, type of high school.

### 1. INTRODUCTION

Students' self-perceptions about their academic abilities are vital in their effort to adjust with their school tasks and responsibilities because these perceptions could influence the extent of efforts students to exert for their school tasks. Students who perceive that they are skillful in a particular subject would likely to perform well in that field than those who perceive to have low skills. The academic performance of students who have a lesser interest in doing the task would be negatively affected. On the other hand, students who have high self-concept on a particular subject likely aims to perform well in whatever related tasks are given to them. In turn, this brings positive effects on their performance in the subject. Thus, a high academic self-concept directly relates to better academic achievement.

In the Philippines, few kinds of literature discuss gender differences in the self-concept and performance of the students in mathematics. It is interesting to explore whether the findings of the previous studies are consistent or reflective with the students in this country. According to Capuno et al. (2019) that Filipino students' performance in Math needs to be improved as reflected in the 2016-2017 Global Competitiveness Report; in this, the Philippines ranked 79th out of the 138 participating countries in terms of the quality of Science and Math education. This report is consistent with the Department of Education's (DepEd) National Achievement Test (NAT) results, in which the Mean Percentage Score in Mathematics was 48.63% a score below the 50 percent requirement of DepEd. It is essential that factors affecting the performance of the students in Math are explored in order to address these concerns, neglecting to address these problems will worsen the situation of the country's educational development. To address these problems, an assessment of the status of the problem must start from the school level.

The students were observed to have adopted the societal stereotype that boys perform better in Math than girls. This is evident when tasks are given to the students, yet most girls would be hesitant to participate; they prefer that boys perform the tasks given to them. Other than that, if group activities are given, girls usually refuse to accept the responsibility of doing the activities assigned to them. Boys are usually delegated to do the tasks for the group. In this connection, boys are observed to be more confident in sharing their ideas and solutions to the class whenever they are asked to discuss their answers in front. If left unattended, this scenario will promote the perceptions that girls are inferior to boys when it comes to mathematics skills.

This study on the difficulties of learners in Mathematics will gather data through interviews of learners. The researcher decided to focus on grade 8 students and Math teachers of Baguio National School of Arts and Trades of Baguio District, Davao City.

This study explores the difficulties and reasons for such difficulties in Mathematics of the junior high students of a public high school in Baguio National School of Arts and Trades, Baguio District, Davao City. It answered the: learners' difficulties in mathematics; the reasons of the difficulties; and insights of teachers in improving the teaching of mathematics. The researcher conducts this study for the purpose of helping teachers in improving the teaching of mathematics.

This study was guided by the following questions:

1. What are the difficulties faced by learners in Mathematics?
2. What are the reasons for such difficulties of learners?
3. What are the insights of teachers to improve the teaching of Mathematics in the school?

Mathematics has had a critical importance in the scientific and technological development of today's world, but throughout the development process of humanity. For the solution of new problems caused by changes in our lives, there is a greater need more than ever for individuals who value mathematics, who have developed mathematical thinking skills, and who can use mathematics in modeling and problem solving (Department of Education, 2019). With mathematics education, people are growing up as individuals with high level mental skills, such as logical thinking, creative thinking, problem solving and decision making, can contribute significantly to individual and social development (Krueger & Lindahl, 2021). At this point, the importance of mathematics and certainly of mathematics lessons comes out.

Based on the importance of mathematics, countries compare their students' mathematics achievement and the level of their mathematics education with those of other nations and try to decide what kind of innovations should be done. For this, some international and national evaluations that measure students' mathematics achievements are made. For example, the results of international studies, including Trends in Mathematics and Science Study (TIMSS) and Program for International Student Assessment (PISA), show that students' success in mathematics is lower than the average of Organization for Economic Co-operation and Development (OECD) (Beaton et al., 2019; Guzel & Berberoglu, 2020; Mullins et al., 2019). In Monitoring and Evaluation of Academic Knowledge study on eight grade students, about one sixth of them showed a performance below the level of basic mathematics skills.

In addition, after high school, students need to get a good result in the university entrance exams in order to reach the university education they want. Mathematics is used as a screening tool in such exams conducted in many countries (Martin et al., 2020). This situation increases the importance of mathematics education students receive at high school and before (Beaton et al., 2019). However, in view of the results of university entrance examination, mathematics achievement is not at the desired level. The first stage of the two-stage exam is the Basic Proficiency Test that all candidates have to take. There are 40 mathematics questions in that exam. The net average score from mathematics test of approximately two million three hundred thousand candidates who took the exam in 2020 was 5.556. The Field Proficiency Test, which is the second stage, also contains 40 mathematics questions. The net average score from the mathematics test of approximately one million six hundred seventy thousand candidates who took the exam in 2020 was 7.584. These results indicate that there are some problems in mathematics education.

Mathematics curriculum is prepared by the Department of Education. The Education Department makes arrangements and updates in mathematics curriculum at all levels in the light of developed countries' mathematics curricula and experiences with mathematics education. Currently, two different high school mathematics curricula are in use. One is the mathematics curriculum with 216 lesson hours per annum in use at all levels in Science High Schools. Mathematics curriculum for 9th and 10th grades in other high schools. 11th and 12th graders can choose one from two different mathematics curricula. One of these is the mathematics curriculum with 216 lesson hours in use at all levels in Science High Schools. The other is the mathematics curriculum with 72 lesson hours per annum prepared for students who don't plan to receive a math-based education in future.

Current mathematics curriculum is intended to not only improve the students' knowledge of mathematical concepts and operations but also impart skills such as problem solving, reasoning and association to the students. The Department of Education is responsible for preparing mathematics textbooks according to the curriculum, printing of such textbooks, and distributing them to students free of charge.

Teaching contents of a curriculum to students includes two stages: the first involves creation of textbooks in accordance with the curriculum. The second stage involves conveying of the lesson by a mathematics teacher to students in accordance with the mathematics curriculum (Ozer & Sezer, 2019). In addition to this, a mathematics teacher is expected to support students academically and emotionally, arouse their interest in mathematics and positively improve their attitude to mathematics (Leon et al., 2019; Opdenakker & Van Damme, 2019; Yu & Singh, 2019). It is known that a mathematics teacher's having good classroom management helps students to pay attention to a math lesson (Wilson et al., 2019). It is also noteworthy that the person who still mainly speaks and is more active in mathematics lessons is the mathematics teacher (Hiebert et al., 2019).

Naturally, the student factor cannot be ignored in the success of an educational activity. Students' own academic self-perceptions, attitudes towards mathematics lesson, math anxiety and whether they have future plans affect their academic performance (Bonne & Johnston, 2019; Kalaycioglu, 2019). It is known that the student's positive academic

perception and seeing himself / herself as a good student in mathematics lesson have a positive effect on his/her academic success (Chiu & Xihau, 2019; Dweck, 2020; Ramdass & Zimmerman, 2019).

In the Philippines, few kinds of literature discuss gender differences in the self-concept and performance of the students in mathematics. It is interesting to explore whether the findings of the previous studies are consistent or reflective with the students in this country. According to Capuno et al. (2019) that Filipino students' performance in Math needs to be improved as reflected in the 2016-2017 Global Competitiveness Report; in this, the Philippines ranked 79th out of the 138 participating countries in terms of the quality of Science and Math education. This report is consistent with the Department of Education's (DepEd) National Achievement Test (NAT) results, in which the Mean Percentage Score in Mathematics was 48.63% a score below the 50 percent requirement of DepEd. It is essential that factors affecting the performance of the students in Math are explored in order to address these concerns, neglecting to address these problems will worsen the situation of the country's educational development. To address these problems, an assessment of the status of the problem must start from the school level. The students were observed to have adopted the societal stereotype that boys perform better in Math than girls. This is evident when tasks are given to the students, yet most girls would be hesitant to participate; they prefer that boys perform the tasks given to them. Other than that, if group activities are given, girls usually refuse to accept the responsibility of doing the activities assigned to them. Boys are usually delegated to do the tasks for the group. In this connection, boys are observed to be more confident in sharing their ideas and solutions to the class whenever they are asked to discuss their answers in front. If left unattended, this scenario will promote the perceptions that girls are inferior to boys when it comes to mathematics skills.

This study is anchored on the Self-concept theory, as discussed by Sincero (2019), which mentioned three aspects of self-concept. First, Self-concept is learned. Individuals develop the self-concept and can be changed, which the surrounding environment affects (Zimmerman, 2019). This is a result of the contacts with different individuals through socialization. Likewise, when students observed from the societal stereotype that boys are better than girls in Math, they tend to develop the concept based on what is perceived by society to be true to them.

Second, the self-concept is organized. One may look at him in different ways, but there is one perception that will help the individual organize these perceptions. When beliefs of individuals are consistent with what he is, there is a tendency that this belief would stay on the person and thus it would be tough to change this perception though it is possible to change this. Students who think that they are useful in Math and perform well in the subject would likely develop a positive self-concept towards the subject. However, when one finds Math a problematic subject and results of exams and performances are weak, they would likely to think that they could not perform well in the subject. The stereotyping on the skills of the students could reinforce this thinking.

Third, the self-concept is dynamic. As individuals experience different situations in life, his beliefs may change depending upon what kind of situation he experiences and how they respond to these experiences. The reactions of an individual are dependent on how they perceive themselves in a given situation wherein there is the tendency to let go of things that are not consistent to them and hold on to the things that would reflect oneself and helpful in developing a more favorable personal being. The students' experience in school is significant in molding their self-concept towards any academic subject, especially in subjects wherein most students find this subject challenging. Allowing the students to have a pleasant experience in Math would help eliminate the gender gap between the students' performance in Math. This could also assist in promoting a positive self-concept towards the subject regardless of gender. Teaching strategies that eliminate students' gap in performance could help improve students' performance in school.

Moreover, this study is also anchored on the gender intensification theory by Hill and Linch (2018) as cited in Priess-Groben and Linberg (2019) which suggests that girls and boys experience increased pressure to conform to culturally sanctioned gender roles during adolescence. Individuals form their identity based on their experiences and expectations of the environment from them. Adolescents start to develop such feelings as they socialize with other people. Once they can identify and organize their perceptions on their being, they will try to assess if their perceptions are consistent with whom they are. Societal stereotype plays a significant role in molding the identity of adolescents like the gender-role stereotype, which can affect the academic self-concept of the students (Cheryan et al., 2019).

High school students tend to develop their own identity in school and act accordingly on what is expected from them. This situation is relevant to the school responsibilities and tasks that students may encounter in school. If students develop their self-concept towards the subject, they will identify their perceived limitations and strengths of the subject. Hence, they perform tasks according to their perceived capabilities. The stereotype that Math is for males are commonly observed in schools (Nosek et al., 2020). In this connection, teachers need to establish strategies that are eliminating gender gaps in terms of the self-concept and performance of the students in Math.

Teachers are responsible in providing students with equal opportunities to learn in school which is stipulated in the “No Filipino Child Left behind Act of 2008” which aimed to protect and promote the right of the citizens to quality education and to take appropriate steps to make such education accessible to all. One way of providing quality education is to provide equal opportunities for children to be educated regardless of sex, ethnicity, race, religion, and the like. Thus, it is necessary that teachers eliminate stratification inside the classroom in order to minimize the individual differences of the students. The goal of the teachers is to allow students to achieve maximum learning inside the classroom by facilitating learning. With the gender differences in Mathematics, learning of the inferior gender will be affected, and similar effects could happen on their counterparts. That is why the teachers can promote healthy competition based on individual skills and abilities and not by groups

According to Tully and Jacobs (2020), the gender gap in Mathematics has been an exciting research topic over the decades because the continuous development of technology could affect women’s involvement in terms of career and economic opportunities. Mathematics is perceived to be an essential requirement when one pursues mathematically oriented courses such as Science, Engineering, and Technology in college. However, men still outnumbered women in these areas. This is due to the perception that Math is for males.

Several studies also revealed that there is a consistent gender difference in self-concept wherein males are found to have higher self-concepts in Mathematics than females. This gender differences in academic self-concept also explain the gender differences in preferred tasks and career choices. This concept explains the gender intensification theory that gender-role become more critical when they conform to the gender-role stereotypes in society. Thus, females have a more negative concept on male-related domains such as Mathematics in the same way that males have a negative concept on female-related domains like Arts (Nagy et al., 2020).

Dramanu and Balarabe (2019) cited that self-concept is multifaceted, hierarchical, organized and structured, descriptive and evaluative, stable, and yet increasingly situation specific. Moreover, academic self-concept is an evaluation of the perception of students based on their experience and interpretation of the events that they experience in school which leads to the formation of specific attitudes, feelings, and perceptions about one’s intellectual and academic abilities based on the academic scenario.

In the study of Guay et al. (2020), which aimed to investigate the self-concept of the students, they found that students who have high academic self-concept have higher grades because they are more motivated to perform well in school. However, students who have low self-concept avoid school tasks because they consider these as threats, which led them to have poor performance.

Timmerman et al. (2019) examined the relationship between the Math self-concept and Math achievement of the 108 twelve to 14-year-old students from a secondary school in the Netherlands. They found that there is a significant positive correlation between Math self-concept and achievement of the students in all four domains of Math, such as measurement, relations, numbers, and scale. Furthermore, the regression analysis showed that Math self-concept was significantly accounted for in the variance of Math scores of the students.

Kamoru and Ramon (2019) investigated the relationship between self-concept and Math achievement of 200 senior secondary school students from Ibadan Metropolis using random sampling. Students were asked to answer the 20-item Math Self Concept Questionnaire and took a 30-item multiple choice Math Achievement Test. Results uncovered that there was no noteworthy distinction in gender for Math self-concept. Furthermore, there was a significant positive correlation between the self-concept and the Math achievement of the students. Thus, they suggested that teachers should develop a positive self-concept of the students towards Mathematics and provide a pleasant teaching experience in order to enhance higher self-concept and better performance of the students in Mathematics.

The sex differences of the students in self-concept and academic performance in Math among the Russian High School students, there was a sex difference in the Math achievement of the students were in girls had higher grades compared to boys (Else-Quest et al., 2020). Moreover, according to Preckel et al. (2019) that girls had higher self-concept than boys on Math tests, but boys perform better in the test compared to their counterparts.

Cvencek et al. (2019) studied the gender identity, Math -gender stereotypes, Math self-concepts, and Math achievement of Singaporean elementary students. Students were asked to answer the Child Implicit Association Tests (Child IAT) and the standardized Math achievement test. Results showed that Math self-concepts were positively related to Math achievement. There was a significant correlation between stronger Math self-concept and stronger Math-gender stereotypes for boys but a weaker Math self-concept for girls. Lastly, Math-gender stereotypes were significantly related to Math achievement.

Dramanu and Balarabe (2019) examined the relationship between self -concept and the academic performance of Junior High School students in Ghana. Students were asked to complete the self-concept questionnaire and answer the Math achievement test. Results uncovered that there was a critical connection between results revealed that there was

a significant relationship between self-concept and academic performance of the students. Further, a significant difference between the self-concept of the urban and rural high school students has also observed wherein urban high school students had higher scores.

Lee and Kung (2019) explored the relationship between Math self-concept and Math achievement of the Junior High School Taiwanese students using structural equation modeling. They found that there was a considerable gender contrast concerning the student's Math self-concept and Math achievement. Boys showed a higher self-concept than girls, but girls had higher Math achievement than boys. Similarly, Ajogbeje (2020) investigated the relationship between self-concept and academic achievement of the 450 secondary students in Ekiti State using multiple regression analysis. Results uncovered that there was a critical connection between self-concept and Math achievement. It also revealed that moderate self-concept could predict Math achievement.

The theories and literature that are discussed in this section provide the framework of the conduct in this study. The interplay of self-concept and Math achievement was also explored to provide meaningful information on the findings of the previous studies regarding these variables.

## 2. METHODOLOGY

This study was based on qualitative understanding aiming to identify the difficulties encountered in mathematics by students and their opinions about the reasons for such difficulties. A qualitative study is a research method that the researcher can use when searching for an answer to a descriptive question (Gay et al., 2019). Bryman (2019) describes a basic qualitative study as a detailed and intense analysis of a certain subject, whereas Miles and Huberman (2019) describe it as an examination of a phenomenon that has taken place in a certain context. This study aimed to describe the difficulties faced by students in mathematics lesson, if any, and their opinions about the reasons for such difficulties, while depicting whether there are differences in their thoughts with respect to the type of school they attend.

After reaching an agreement on the conceptual categories, the researcher and the expert individually matched the responses in data collection tools with conceptual categories and compared the results. As a result of the first comparison, it was seen that 14 answers were coded in different categories. As a result of re-examining the different results, it was seen that the sentences of these participants were written so that they could be evaluated in more than one category, and a consensus was reached on 9 answers. Since no consensus was reached on 5 answers which were evaluated differently, the reliability coefficient, which was calculated according to Miles and Huberman's (201) qualitative 4) formula "reliability = {number of agreements/ (total number of agreements + disagreements)}", was 96.57%.

The examples that are thought to represent best each conceptual category obtained as a result of the study are given in the findings section without changing the statements of the students. Thus, the study results' validity was supported by the students' answers in the data collection tool.

The participants were students from Baguio National School of Arts and Trades in Baguio District, Davao City. The high school was selected from various social and economic regions to increase diversity. The school grade 8 were 164 students, 83 were female and 81 were male students.

According to the mathematics curriculum, the students can continue to receive the mathematics curriculum of Science High Schools after 10th grade if they want to. Students who wish to receive social science-based education can choose basic level mathematics curriculum at 11th and 12th grades. This manifests itself at the grade levels of the students participating in the study. Out of 164 students, fourteen (14) students were randomly chosen as actual participants and were interviewed. Teachers' sentiments were also taken down because of their insights.

The researcher used a data collection tool developed by himself to collect data of the study. The open-ended questions intended to find out the difficulties encountered by the participants in mathematics and their opinions about such difficulties. With the open-ended questions, it was aimed to enable the participants to express their thoughts freely (Creswell, 2019). A data collection tool was drafted and two experts of mathematics education were asked to provide their opinions. The data collection tool, developed using the experts' opinions, was applied on 14 students in the high schools selected for the study. As a result of the pilot study, it was seen that the students perceived the demographic questions and the open-ended question in the data collection tool in accordance with their purpose. As a result of the expert opinions, it was decided that the final version of the open-ended question would be "Please write down any difficulties you've encountered in mathematics and your opinions about the reasons for such difficulties."

The research data were collected. Data collection procedure was applied during students' regular courses. In each classroom where the data collection tool was applied, students were briefed about the study, and it was explained that participation was on a voluntary basis and that the students who did not want to participate in the study did not have to answer the distributed forms. Participants were reminded not to write any personal information such as name or

student number on the data collection tool. Finally, it was stated that all the data kept confidential, and the researcher would use the study results for scientific work.

Content analysis method was employed to analyze data during the analysis of the open-ended question. The data obtained in the content analysis were categorized to reach sub-themes and themes. During the creation of conceptual categories, first, the researcher and an expert experienced in qualitative research prepared a draft about the conceptual categories by reading the answers to the open-ended question in the data set. Then, by working on both drafts, a consensus was reached on conceptual categories.

Based on the data obtained as a result of the co-work of the expert and the researcher, the themes were named as (1) teacher-based, (2) content-based, and (3) student-based difficulties. The theme of teacher-based-difficulties consisted of the following sub-themes: s/he aims to complete the subject, s/he has rote-learning based educational approach, s/he makes it difficult to learn, his/her classroom management is poor, s/he does not use different methods. The theme of content-based-difficulties consisted of the following sub-themes: too many rules and formulas, requiring memorizing, detailed subjects, a high number of subjects and the level of subjects are above the level of students' knowledge. The theme of student-based- difficulties consisted of the following sub-themes: I don't have enough time for review, I don't like math, my previous knowledge is incomplete, I don't study regularly and I don't believe I will succeed.

This study uses content analysis in deciphering and interpretation of its collected data. Content analysis is a research tool used to determine the presence of certain words, themes, or concepts within some given qualitative data (i.e. text). Using content analysis, researchers can quantify and analyze the presence, meanings and relationships of such certain words, themes, or concepts. As an example, researchers can evaluate language used within a news article to search for bias or partiality. Researchers can then make inferences about the messages within the texts, the writer(s), the audience, and even the culture and time of surrounding the text.

### 3. RESULT

#### Difficulties faced by learners in Mathematics

It is clear that the difficulties encountered by the participants in mathematics are primarily teacher-based, followed by content-based, and student-based difficulties. However, female learners stated that the difficulties they encounter in mathematics are primarily teacher-based, whereas male students emphasized that the difficulties are content-based. Student-based difficulties ranked last by both students from the school.

When the sub-themes are listed according to the response frequencies of female and male students; the answers of female students; "S/he aims to complete the subject", "Too many rules and formulas" and "S/he has rote-learning based educational approach" are in the top three. On the other hand, according to the answers of the male students; "Doesn't have enough time for review", "Too many rules and formulas" and "S/he makes it difficult to learn" sub-themes take the first three places.

#### Reasons for difficulties of learners in Mathematics

Most of the students perceive mathematics as a difficult subject owing to a number of reasons some of which includes aversive teaching methods, lack of family basic assistance, lack of motivation, and awareness of usability of mathematics in daily life. These were some of the compelling grounds that triggered us to conduct this study.

#### Insights of teachers to improve the teaching of Mathematics in the school

Based on the findings of this study, there is an immediate need to sensitize both parents and siblings on a family setting, to adopt a numeracy culture, where children and their parents will be working hands in hands in order to solve day to day mathematical problems, elder brothers/sisters can highly help their fellow siblings in doing mathematics exercises and homework after school and at home, thereafter developing their self-efficacy and real-world contexts.

Sibling in addition to parental contribution has been identified as one of the motivating factors for their children's enjoyment of mathematics as parental dedication and support for their children's dedication and their obligation to school's parent-teacher interactions/meetings can help in raising the learners' performance not only in mathematics but other subjects as well.

It is also important to sensitize serving teachers and trainee teachers on the effective implementation of learner-centered methods of teaching. Both teachers and students who participated in this study are aware of the various real-life applications of mathematics including, but not limited to increase in learners' critical thinking and problem-solving skills, innovation and creativity, and learners' ability to cope with the modern world of science and technology. In this regard, teachers need to step up their efforts towards identifying where mathematics is pertinent and translating applied to mathematical problems as they interact with learners in the classroom. Findings of this study also suggest that caring teachers enable students to enjoy learning mathematics.

Lastly, there is a call for the government to prepare and administer mathematics test and call students on a national wide level to compete in order to motivate students to like and learn mathematics effectively. Since this research has

been conducted in one part of the country intending to generalize the findings, the researchers based on the findings recommend that further studies should be conducted on the wider range of the country for more generalization and comparison and early numeracy practice within siblings' boost mathematics insight from family setting to a community as a whole.

### Analysis

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Although mathematics education is very important in shaping of a person's future, when the difficulties faced by high school students in mathematics were examined, it was found that the participants think necessary care is not devoted to mathematics teaching. The number of students who think that mathematics teachers aim to complete the curriculum on time rather than teach mathematics was significantly high. Particularly the students have difficulties in terms of high school mathematics teachers' teaching. They indicated that their mathematics teachers do not promote interest or positive attitude toward mathematics. The participants thought that mathematics lessons contain too many subjects, rules and formulas, however, they also expressed that they did not regularly review and devote adequate time to mathematics. These findings also suggest that there is a common perception among students that mathematics lessons are mostly lessons where rules and formulas are taught to solve certain types of questions. This does not conform to the purposes of mathematics curriculum prepared by the Department of Education (DepEd).

In the current study, some students ascribed the difficulties they had in mathematics to their teachers. Mathematics teachers can be supported by in-service training and provided with means to improve classroom management, teaching methods, and similar subjects. Such trainings may also include activities which can be implemented to enhance the students' attitudes towards mathematics positively. Apart from this, it will be useful to reflect on what needs to be done to train prospective teachers who are educated in mathematics teaching programs as people who like mathematics and teaching mathematics. In order to remedy the discrepancies in the learning of topics, the schools should run supplementary help sessions throughout the school year and during the summer. If a teacher thinks that a student is not up to par on a topic being covered in class, that student should immediately be given extra help along with regular classes to ensure that the topic is learned in a timely fashion. Thus snowballing of the gaps in a student's background could be avoided. As a student's mathematical knowledge becomes compatible with his/her grade level academic self-concept and attitude towards mathematics would increase. Based on high school mathematics teachers' thoughts, a study can be conducted on the difficulties students face in mathematics. Thus, the differences between the opinions of teachers and students on this subject can be investigated. Another study could be done by using mathematics classroom videos about selected mathematics topics, to research mathematics teaching process. Furthermore, by conducting projects with the support of the Department of Education to investigate how to better teach various mathematical subjects to students, it can be determined which methods and examples motivate students to learn mathematics and help them better learn subjects, and implementation of such methods and examples in schools can be facilitated.

## 4. DISCUSSION

Teaching Mathematics should center on the depth of the contents that provide relevant and different focus and weight of competencies to fit students' vocational needs. One way is by teaching the subjects exclusively for a specific group of students. Thus, other topics/ competencies which are less relevant, as well as those which have been previously

taken already, shall be taught in a quicker pacing if cannot be disregarded. Teaching Guides in Mathematics developed by CHED and PNU, as well as Learning Materials for students shall be reproduced and completely distributed to all public and private schools across the country given the diversity of schools and teachers. This will provide teachers with readily available and credible instructional resources on hand. School administrators shall ensure a one-on-one ratio of student and textbook in Mathematics.

The DepEd computerization program (DCP) shall be strengthened by investing on provisions of licensed software packages such as SPSS and computer algebra systems (CAS) as well as training along with the hardware which could be useful for Mathematics. In this way, mathematical tools will be upgraded and modernized to transform Mathematics into a better avenue in meeting the challenges of the 21st century.

Since performance tasks account for the largest percentage in the grading system, 50% for the core subject and 45% for the specialized subject, appropriate performance-based activities in Mathematics along with the corresponding rubrics or scoring guide shall be provided and suggested by the DepEd and/or other authority.

Teachers should exhaust all efforts in employing effective teaching and assessment strategies, and appropriate instructional resources in Mathematics to fit lessons in the functional skills and college readiness standards foundational skills articulated by DepEd and CHED, respectively.

Schools are encouraged to adopt Placement Test as part of admission for incoming Senior High School Students. The purpose is to determine the level of understanding of a prospective JHS student in Mathematics.

DepEd should adopt its own Curriculum Framework for Junior High School Mathematics which shall undergo regular evaluation where teachers teaching JHS Mathematics shall be part of. Constructive feedback from other stakeholders shall also be considered to be a basis for a revision of or an amendment to the existing curriculum. The curriculum evaluation shall include aspects on but not limited to curriculum content, teaching strategies, instructional resources, and assessment strategies. National Trainings for teachers shall then follow at least 2 months before the new features of the curriculum will be implemented.

Similar studies on the teaching of Mathematics may be conducted by other researchers to either support or refute the findings of this study.

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