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Self-Concept, Peer Pressure, and Teaching Strategies, and Their Influence on Students' Performance in Mathematics: A Cross-Sectional Study

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Abstract

This study aimed to determine the influence of self-concept, teaching strategies, and peer pressure on students' mathematics performance. The study utilized a descriptive-survey correlational design to explore the relationship between the independent variables to performance in mathematics across junior high school students' grade levels. The results revealed that the general performance in mathematics of the 224 students from Grade 7-10 is satisfactory. Also, the students' self-concept in mathematics is high, and more than half of them had often experienced varied teaching strategies employed by the teacher in their mathematics class. When grouped by grade level, only teaching strategies and peer pressure showed significant differences, while the students' performance and self-concept in mathematics did not show statistical differences. However, only peer pressure exhibited a significant influence on students'performance in mathematics. Hence, it is vital to be careful about the negative relationship of the variables. It is recommended that a comprehensive and thorough qualitative study be undertaken to supplement the results and have a deeper understanding of the association of the variables involved.

Keywords: education, self-concept, teaching strategies, peer pressure, performance in mathematics, cross-sectional study, Philippines

1. Introduction

Mathematics occupies a pivotal role in the development of students' cognitive aspects. It serves as a strategic key in honing students' limitless potential to survive in the real world. Certain qualities nurtured by mathematics are the power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability, and even effective communicative skills, which is essential in understanding the contents of other subjects such as science, economics, and social studies, and even music and arts. The ability to compute related to the power of technology and the ability of social organization, and the geometrical understanding of space-time, that is, the physical world and its natural patterns, show the role of mathematics in the holistic progress of students (Fatima, 2012; Biswas, 2015).

To help students learn mathematics, educators have been placing value on teaching strategies. Teaching strategies refer to the methods used to help students learn the desired course contents and achieve the lesson objectives (Armstrong, 2013). The instructional method is the specific activity that teachers and learners will do in the classroom, and an instructional strategy is what a teacher uses inside the classroom to achieve the objectives of a lesson (DepEd, 2016). These teaching strategies aid teachers

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in providing meaningful and practical learning experiences to students to take an active role in their education and make connections between learned concepts in class and real-life situations (Persaud, 2018).

In order to foster learning, teachers and students should help each other attain lesson objectives. Students must be aware of their responsibility in the teaching and learning process, especially in mathematizing the abstraction of mathematics. The students need to recognize their skills, ability, and interest in the subject, which refers to their self-concept in mathematics. Mathematics self-concept is defined as student ratings of their skills, ability, enjoyment, and interest in mathematics (Peteros et al., 2019). It is seen as an essential factor in mathematics education (Erdogan & Sengul, 2014). Self-concept is built upon perception. It is how students perceive themselves based on their knowledge over a lifetime of experience and the information they have gathered about their values, life roles, goals, skills, and abilities over time. Self-concept is somewhat a collection of beliefs about their nature, qualities, and behavior (Sicinski, 2019).

Meanwhile, promoting a safe and healthy social learning environment is another aspect undertaken in this study. Peer pressure involves direct and indirect social influences (Estrada & Vargas-Estrada, 2013). Similarly, it is when a person influences another person's thoughts or behavior (Poncelet, 2020). Peers influence people's lives, even if they do not realize it. They learn from each other just by spending time together. It is only human nature to listen to and learn from other people in their age group (Kidshealth, 2015). Furthermore, in reality, peer pressure is either a positive or negative influence that one peer, or a group of peers, has on another person. Positive peer pressure could lead to exposure to healthy lifestyles and become a positive role model. Likewise, peers can help each other develop new skills or stimulate interest in books, music, or extracurricular activities and build strong brain development pathways. However, negative peer pressure can encourage students to skip classes, steal, cheat, use drugs or alcohol, share inappropriate material online, or become involved in other risky behaviors causing them to neglect schoolwork and social activities (Hartney, 2020; American Academy of Child and Adolescent Psychiatry, 2018; Scholastic, 2008). The difference is all about the outcome. If the student's peers convince him/her to do something and it turns out to be healthy, the peer pressure is positive. However, if a student gets pressured into making unhealthy choices, then peer pressure is negative (Morin, 2019).

For the first time, the Philippines joined the Programme for International Student Assessment (PISA) of the Organization for Economic Co-operation and Development (OECD) in 2018, as part of the Quality Basic Education reform plan and a step towards globalizing the quality of Philippine basic education. PISA 2018 revealed that Filipino students achieved an average score of 353 points in mathematical literacy, which was significantly lower than the OECD average of 489 points. Furthermore, only 19.7% of Filipino students attained at least the minimum proficiency level (Level 2) in mathematical literacy, and among the participating ASEAN countries, the Philippines performed significantly behind. Across the 17 administrative regions in the Philippines, Region X is among the largest percentage proficiency below level 1 at 60.14 %, and only 0.17% of the students attained level 4 proficiency in mathematics literacy. Thus, the Department of Education recognizes the urgency of addressing issues and gaps in attaining the Philippines' quality of basic education (DepEd, 2019).

Moreover, to evaluate a student's understanding, comprehension, knowledge, or capability in a particular area, National Achievement Test (NAT) is annually administered in the Philippines. NAT is basically regarded and perceived by stakeholders to be the main tool in assessing the students' learning competency. It is an instrument of identifying most learned skills and non-mastered skills, and the result of this will serve as the vehicle for crafting future training and seminars (Phillipine Basic Education, 2013). The NAT results of Casisang National High in S.Y 2017-2018 revealed that the mathematics percentage score (MPS) of students in performance in mathematics is 29.38% only, far below the national target of 75%. Several factors might have caused the decrease of the NAT performance of students. This paves the way for the researcher to conduct this study to gather

information on the factors that have a possible bearing on the students' performance, which might help elevate the NAT results and address issues and gaps to improve the existing learning outcomes.

Hence, this study had sought to describe the level of students' performance in mathematics, perception of students on the strategies used by the teachers in teaching mathematics, self-concept in mathematics, the extent of students' peer pressure in learning mathematics and determinined the significant difference of the variables involved when students are grouped by grade level. Furthermore, the researcher was interested in determining the factors such as teaching strategies, self-concept in mathematics, peer pressure, and its influence on students' performance in mathematics.

2. Literature review

2.1. Self-Concept and Performance in Mathematics

Marsh (2014) summarizes research on the role of academic self-concept in educational settings and relates these results to broader issues in self-concept research. Accordingly, a positive self-concept is valued as a desirable outcome in many disciplines such as social, clinical, developmental psychology, and education. The study suggests that the attainment of a positive academic self-concept affects academic behaviors, academic choices, educational aspirations, and subsequent academic achievement. It is also likely that intervention programs that successfully produce short-term changes in skills and aptitudes will not have long-term effects unless concomitant changes exist in corresponding self-concept areas. This conforms to Marsh's (1990 b) longitudinal study who reported that grade averages were significantly affected by academic self-concept. Hence the results provided few defensible demonstrations of prior academic self-concept influencing subsequent academic achievement.

The studies of Marsh & Martin (2011) and Lee & Kung (2018) support the studies mentioned above. They found out that self-concept is not only an important outcome variable in itself, but it also plays a central role in affecting the increase of subsequent academic achievement and other desirable educational outcomes. Also, a study by Ghazvini (2011) showed a close relationship between academic self-concept and measures of academic performance. Academic self-concept powerfully and positively predicts general performance in mathematics. Thus, adequate and sufficient attention to self-concept is necessary throughout the educational process.

Furthermore, reciprocal effects were found between self-esteem, academic self-concept, and academic achievement when the learning environment was taken as potential moderators. Results showed that self-esteem is influenced by academic self-concept and vice-versa. Also, math academic achievement significantly impacted self-concept (Trautwein et al., 2006; Pajares & Schunk, 2001). Similarly, findings of the studies by Seaton et al. (2014) and Khalaila (2015) show that self-concept had significant reciprocal relationships with achievement. It was found out that a higher self-concept was directly related to greater academic achievement. With substantial evidence to support, the research suggests that motivated students and those with high academic self-concepts perform better academically.

Peteros et al. (2019) conducted a parallel study on the students' self-concept and academic performance in mathematics in Cebu City, Philippines. Results revealed that students had a moderate level of self-concept towards learning mathematics. No gender difference was found on the respondents' self-concept, which means that male and female students have the same level of self-concept when it comes to learning mathematics. Also, there was a significant relationship between self-concept and the respondents' academic performance in mathematics. Hence, it concluded that the students' self-concept should be improved because it contributes to their performance.

However, this result is contrary to Lee & Kung (2018) longitudinal study, which showed a significant gender variation with respect to math self-concept and mathematics achievement. Findings of Kvedere (2012) also showed that boys had significantly higher math self-concept than girls, whereas girls exhibited higher mathematics achievement than boys. However, the study of Awan, Noureen, & Naz (2011) reveals that significant gender differences were discovered that favored girls but concluded that self-concept is significantly related to academic achievement. Thus, Kamoru & Ramon (2017) suggest that teachers should develop in their students a positive self-concept towards mathematics, including good study habits and pleasant teaching experience to enhance higher self-concept.

The studies by Marsh (2014), Marsh (1990a, b), Marsh and Martin (2011), Ghazvini (2011), Lee & Kung (2018) found out that self-concept is closely related to performance in mathematics. They clarified how powerfully it predicts general performance in mathematics. However, the study of Pietsch et al. (2003) contradict this result, hence finding out that self-concept was not highly related to performance in mathematics. This contradiction triggered the researcher to shed more light and include self-concept as a factor in this study.

2.2. Teaching Strategies and Performance in Mathematics

According to Jalbani (2014), to use effective teaching strategies and methods for improved learning, great emphasis has been placed on the teachers by many researchers and educationists. The passage of time calls for the teachers to adapt teaching styles and methods to cope with the students' academic needs and deliver even complex and complicated content effectively while helping students generate interest and eagerness for more learning opportunities. The book of Sinay & Nahornick (2016) on effective instructional strategies discussed research-based instructional strategies in teaching mathematics that can help support and foster student development in mathematics. They suggested that mathematics classes need to encourage problem-solving, creativity, collaboration through inquiry-based learning, varied teaching strategies, and changing assessment methods.

It was recommended that to improve students' mathematical abilities and attitudes towards mathematics, practitioners in education should incorporate the following instructional practices: create a supportive and engaging classroom environment, provide a strong mathematics foundation in the early years, teach for conceptual understanding and reasoning skills, promote problem-solving, encourage and support collaboration in math,have high expectations of all students, use technology in math teaching and learning, and provide ongoing and varies assessment. The study of Ntlanganiso (2019) revealed that teachers' employment of different teaching methods could positively impact quality learner-achievement. The study results indicated that early in the lesson, a learner-centered approach and different approaches to teaching yield greater learner participation. It makes lessons more exciting, and learners become more interested. Therefore, one can conclude that various teaching methods are essential factors that contribute to learners' commitment and achievement of results.

The findings of Muema, Mulwa, & Mailu 2018) established a positive correlation between teaching methods and students' achievement in mathematics. Teaching using ICT was strongly correlated to students' achievement compared to teaching by traditional methods. This indicated that teaching using ICT could improve learners' performance. As per reflection and review of the studies cited above, the researcher decided to do further work on the teaching strategies perceived by the students and explore whether these teaching strategies improved students' performance, as well as to describe and identify the frequency of the strategies used by the teachers in the school.

2.3. Peer Pressure and Performance in Mathematics

The study of Hoxby & Weingarth (2005) examined different ways in which peer effects work. They found out that the presence of a single low-aptitude student in a classroom does not deter the improvement of all other students in the class. Their study also

reveals that students tend to perform better in classrooms consisting of peers of slight ability themselves rather than with outliers. In contrast, students of the highest ability levels benefit from students of slightly lower abilities. A similar study was conducted by Burke & Sass (2013) and Goethals (2001), which revealed that lower ability students benefit more from interaction with students in the middle of the ability distribution than the outliers. Thus, suggesting that if a school wants to improve low-ability students' performance, they should be placed in classes with a peer of modestly higher ability. Likewise, students with high ability perform best when placed with other high-ability peers. It might be due to the effect of increased competition among students. The findings of these two studies have the potential to inform a number of education-policy debates. When assigning students to classrooms within schools, administrators and teachers may wish to bear in mind these study results (Todd, 2012; Winston & Zimmerman, 2004).

The study of Filade et al. (2019) revealed that peer groups have a significant influence on undergraduate students' academic performance. Also, there was a significant relationship between peer groups and the academic performance of students. It was clear from the findings that peers do have a relatively strong influence over students' daily functioning and academic achievement. Mosha (2017) examined the influence of peer groups on adolescent students' academic performance at secondary schools. It was concluded that a peer group had both negative and positive influences on adolescent students' academic performance. Positive influence contributed to adolescent students' academic performance, but not as expected. However, socialization was among the factors that raised students' self-awareness and cooperation. It was further established that peer relationships, socialization, environment, globalization, and drug use greatly influenced students' academic performance.

The studies of Korir & Kipkemboi (2014) and Olalekan (2016) revealed that in order to change students' performance positively, more attention should be devoted to their relationship with their classmates both in the classroom and outside. Hence, it was recommended that teachers understand that the peer group is an important factor in a child's learning and should use it to encourage learning in a study group. Also, teachers must neither be too strict nor too permissive to encourage a good teacher-student relationship. From the cited studies above, it can be concluded that peers have both advantageous and disadvantageous impact. Therefore, it should be given an important consideration in students' learning. Thus, extra efforts must be made by teachers, parents, and students to ensure that it is effectively used to improve learning.

3. Methodology

3.1. Research Design

The study utilized the descriptive (survey) correlational design in determining the answers to the research problem. It is the most appropriate design to use, since the goal is to establish a comprehensive summarization, in everyday terms, of specific events experienced by individuals or groups of individuals, and there is no pre-selection of study variables, no manipulation of variables, and no prior commitment to anyone's theoretical view of the target phenomenon (Lambert & Lambert, 2012). Moreover, a cross-sectional research design was utilized to describe the population with respect to an outcome interest. It is a type of research that can describe characteristics that exist in a community, but do not determine cause-and-effect relationships between different variables. The researchers record the information that is present in a population, but they do not manipulate variables. Furthermore, this method is often used to make inferences about possible relationships or to gather preliminary data to support further research and experimentation (Cherry, 2019).

3.2. Research Setting

This study was conducted at Casisang National High School, District Four, Division of Malaybalay City, Bukidnon, Philippines for the school year 2019-2020. The aforementioned institution is located at Avinca Village, Casisang, Malaybalay City, Bukidnon, Philippines. The school consists of Junior and Senior High School having 624 students with 287 boys and 337 girls. There are 18 classrooms, four for the senior high, ten for the junior, two computer laboratories, a cookery room and an electricity room.

3.3. Participants of the Study

The target size included the 224 junior high school students of Casisang National High School for S.Y 2019-202, which has a total population of 504 students. The sample size in each grade level was computed using Slovin's (see in Adam, 2020) formula and represented using stratified random sampling.

Table 1: Sample Size Computation and Representation

Grade Level	Population Size	Sample Size	Numbers of Sections	Sample Size Per Section
7	130	58	3	19
8	152	67	4	17
9	128	57	3	19
10	94	42	2	21
Total	504	224	12	

3.4. Research Instruments

The study questionnaire was divided into five parts: the letter of intent; the brief profile of the students which includes name (optional), gender, grade level, the final grade in mathematics for school year 2019-2020; questionnaires for teaching strategies as perceived by the students of their mathematics teachers; a questionnaire for self-concept; and a questionnaire for peer pressure. The performance of the students was interpreted based on the present Department of Education (DepEd) grading scale which identified five levels of proficiency. It has been adopted and used since the implementation of K-12 curriculum. The assessment process is considered as holistic with an emphasis on formation development to ensure quality learning.

Table 2: Grade Range and Level of Proficiency

Grade Range	Level of Proficiency
90-100	Outstanding
85-89	Very Satisfactory
80-84	Satisfactory
75-79	Fairly Satisfactory

74 and below	Did Not Meet the Expectations

A 23-items questionnaire for teachers' teaching strategies which measured the students' perception on the strategies used by the teachers in teaching mathematics was adapted and modified from Ford (2018). The aforementioned questionnaire in this study obtained a Cronbach's alpha coefficient of 0.86 which is reliable to measure the said construct. Students' extent of answer for every statement was expressed in a 5-point scale. The five choices of response were: Always, Often, Sometimes, Seldom and Never. All the statements were positive and had a weighed score of 5, 4, 3, 2, and 1.

Moreover, the 30-item self-concept questionnaire for students towards mathematics as learned, organized, and dynamic was adapted from Kvedere (2012) and modified by Peteros et al., (2019). The scale in this study obtained a Cronbach's' alpha coefficient of 0.90 which is highly reliable in capturing the intended target measure. Students' degree of answer for every statement was expressed in a 4-point scale. The four choices of response were: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). All the statements were positive. The response in the positive statements has weighed score of 4, 3, 2, and 1.

Likewise, the questionnaire for peer pressure scale of students in learning mathematics was adapted from Esen (2003). The Peer Pressure scale is composed of 34 items and the test-retest correlation coefficient was found to be .82. Cronbach's alpha coefficients were also calculated .90 for the scale and in this study was 0.92. Considering the reliability results, it can be concluded that Peer Pressure Scale can be used for research study. Students' degree of answer for every statement was expressed in a 4-point scale. The four choices of response were: Completely True (CT), True (T), False (F), and Completely False (CF). All the statements were positive. The response in the positive statements has weighed score of 4, 3, 2, and 1.

3.5. Data Gathering Procedure

Permissions and informed consent from the concerned authorities were secured. Randomly selected students from Grade 7 to 10 were taken as respondents from their respective class sections. The students were instructed that participation was voluntary without any consequence for them. Students who volunteered were given parents' consent form and were told that all information would be kept strictly confidential and the data gathered will be used for research purposes only. The next day, students with approved parents' consent simultaneously took the test in their classroom during vacant periods. After answering the instrument, the researcher collected it. Data gathering lasted for a week.

3.6. Statistical Treatment

In order to describe students' performance in mathematics, determine the level of students' mathematics self-concept, peer pressure and perceived teachers' teaching strategies, descriptive statistics using mean and standard deviation were utilized. Moreover, to determine the significant difference in the performance in mathematics, teaching strategies, self-concept, and peer pressure of students when grouped by grade level, analysis of variance (ANOVA) was employed. Furthermore, statistical measure using the Person r product moment correlation was used to quantify the strength of relationship between the variables.

4. Results and Discussion

4.1. Performance of Students in Mathematics

The results of the frequency and percentage distribution of the students' performance in mathematics is presented in Table 3. It can be observed that only 14.73% of the students attained the outstanding level while 5.8% did not meet the expectations. Moreover, 20.98% of students fell at the fairly satisfactory level, 30.8% were at the satisfactory level, and 27.68% obtained a very satisfactory level. Furthermore, the students' general performance in mathematics is satisfactory, given the mean score of 83.36 with 5.966 standard deviation. This result was similar to the study of Peteros et al., (2019), who found out that students had a satisfactory performance in mathematics after three grading periods, which implied that students learned from the subject at a minimal level, and with that, there was a need to improve the students' performance in the subject.

Table 3. Mean, Standard Deviation, Frequency and Percentage Distribution of Students' Performance in Mathematics of S.Y. 2019-2020

Range	Proficiency Level	Frequency	Percentage (%)	$\bar{x}$	SD
90-100	Outstanding	33	14.73		
85-89	Very Satisfactory	62	27.68		
80-84	Satisfactory	69	30.80	83.36	5.966
75-79	Fairly satisfactory	47	20.98		
0-74	Did Not Meet the Expectations	13	5.80		
	Total	224	100		

4.2. Teaching Strategies Used by Mathematics Teachers

The Table 4 below shows the result of the students' assessment on the strategies used by their teachers in teaching mathematics. It can be seen that more than half or 54.02% of the respondents had often experienced varied teaching strategies employed by the teachers with a corresponding satisfactory rating. Besides, 10.71% of the students had always experienced varied teaching strategies while only from 3.13% to none had seldom or never experienced it. This result conforms with Sinay & Nahornick (2016) that mathematics classes need to promote problem-solving, creativity, collaboration, investigating, and fun through inquiry-based learning, varied teaching strategies, and ongoing and changing assessment methods.

Table 4. Mean, Standard Deviation, Frequency and Percentage Distribution of Students' Assessment in the Strategies Used by Their Teachers in Teaching Mathematics

Range	Responses	Frequency	Percentage (%)	$\bar{x}$	SD
4.21-5.00	Always	24	10.71		
3.41-4.20	Often	121	54.02	3.58	1.117
2.61-3.40	Sometimes	72	32.14		

1.81-2.60	Seldom	7	3.13
1.00-1.80	Never	0	0.00
	Total	224	100

Among the items, the statement "The teacher uses real-world problem-solving in our mathematics class" had the highest mean score of 4.03, followed by the statement "The teacher has alternative explanations for us in case the initial explanation is not understood in a mathematics class" with a mean score of 3.97. This indicates that students were often exposed to problems that can actually be found in the real world. Also, students were provided with different explanations by their teachers if they did not grasp the concepts right away.

On the other hand, the statement "We use computer-based technology in a mathematics class" had the lowest mean score of 2.70. This would tell that student sometimes used technology in their mathematics class. However, the statement, "The teacher provides us the opportunity to learn about and use technology," had a mean score of 3.41. This shows that the respondents' teachers had encouraged the use of the technology in their math class. This supports the study of Muema et al., (2018), who found out that the application of information computer technology was more strongly correlated to students' achievement than traditional teaching methods. Thus, it concluded that teaching using ICTs could improve learners' performance in mathematics and it is possible to recommend that schools' ICT resources be adequate for teachers and students to utilize them in the teaching-learning process.

In terms of cognitive activation (items 2, 3, 4, 6, 7, and 18), the respondents, on average, rated 'often'. This means that students were asked to reflect on mathematical problems, to decide on the procedures for solving complex problems, presented problems in different contexts, helped to learn from mistakes they had made, and were asked to explain how they solved a problem. This result coincides with Caro et al. (2016) study, which revealed that cognitive activation strategies were positively and consistently related to performance in mathematics across education systems.

The overall mean score was 3.58, which tells that the respondents' teacher often used varied teaching strategies and had given importance to these factors that contribute to learners' commitment and achievement of results. This outcome was similar to the study of Ganyaupfu (2013), which revealed that the teacher-student interactive method was the most effective teaching method, followed by the student-centered method, while the teacher-centered approach was the least effective teaching method. The study of Ntlanganiso (2019) also supports the result of this study, which revealed that teachers' employment of different teaching methods could positively impact the quality of learners' achievement.

4.3. Self-Concept in Mathematics

Table 5 presents the result of students' self-concept in mathematics. It can be observed that 66.52% of the students agreed that they have a high self-concept in mathematics, while only 8.04% strongly agreed that they have a very high self-concept. Conversely, 25.45% of the students have a low self-concept in mathematics, and none of them strongly disagreed that they have a very low self-concept in mathematics. This result was closely related to the findings of the New Zealand Ministry of Education for 2009 (Dench, 2010), which compared their students' mathematics self-concept to Asian countries using the thematic reports of PISA in 2003. It was found out that the students in New Zealand generally have higher opinions of their mathematics ability than students in any other country except the United States.

Table 5. Mean, Standard Deviation, Frequency and Percentage Distribution of Students' Self-Concept in Mathematics

Range	Responses	Frequency	Percentage (%)	$\bar{x}$	SD
3.25-4.00	Strongly Agree	18	8.04		
2.50-3.24	Agree	149	66.52		
1.75-2.49	Disagree	57	25.45	2.73	0.768
1.00-1.74	Strongly Disagree	0	0.00		
	Total	224	100		

In terms of self-concept, only the statement, "I am good at mathematics," had a mean score of 2.48. The reason might be that the students themselves were aware of their low abilities and skills in mathematics. Contrary to this, the statement "I learn mathematics quickly" has a mean score of 2.68, which would tell that the students have a high belief that they somehow possessed the abilities to learn mathematics. The statement "I am capable of getting a good grade in mathematics" with a mean score of 2.63 indicates that although they are not that good in math but still believe that they can do something to earn good grades in mathematics.

Likewise, among the items, "Even if the work in mathematics is hard, I can learn it," with a mean score of 3.00 would tell that the students have high hopes and positive thought that no matter how complicated the process in dealing with mathematics is, they will be able to learn it in time. Furthermore, the next statement, "Learning mathematics gives me meaning to do the tasks," had the second-highest mean score of 2.99 with a high rating. This would tell that the students take time to reflect on what they were learning in a math class and how to use it in the given activities.

In terms of self-concept, only the statement "Mathematics is an easy subject to pass" with a mean score of 2.27 has a low rating. It means that the students' disagreed with the idea that mathematics is an easy subject. The statement supported this, "It takes me any longer to comprehend mathematics ideas than the average individual," with a mean score of 2.67, which indicates that students were cognizant of themselves and others in learning mathematics ideas. However, the statements "I usually do well in mathematics" with a mean score of 2.63 and "When I do math, I feel confident that I have done it correctly" with a mean score of 2.58 would tell that students had a positive outlook on participating in mathematics activities.

Likewise, among the items, the statement "When I have difficulties with math, I know I can handle them if I try" had the highest mean score of 3.07. This indicates that no matter how numerous the students who think that mathematics is difficult were, they knew that they could do it if they gave it a try. Furthermore, the statements "Mathematics causes more enthusiasm in me than in a significant number of my schoolmates" with a mean score of 2.54 and "Mathematics is worth passing well" with a mean score of 2.76 would tell that there were students who diligently keep moving forward and later feel the worth of their perseverance in learning mathematics.

Regarding self-concept, the statement "I can do practically all the work in mathematics class if I do not give up" has the highest mean score of 3.11 with a high rating, which indicates that students were optimistic that they could do the tasks in mathematics. It might be because students were motivated to deal with mathematical problems. The statement "Mathematics is essential in the future" with a mean score of 3.09 was second to the highest. This could be a manifestation that the students

recognize the importance and role of mathematics in their future life. The students might also find out how mathematics would help them solve problems in their daily lives.

The statements "Mathematics improves my learning and retention capacities" with a mean score of 3.00, "Mathematics improves my understanding of other subjects" with a mean score of 2.89, and "Mathematics teaches me to think fast" with a mean score of 2.65, would tell that the students had these experiences on how mathematics gets them through. It might be because mathematics sharpens and hones their ability to think, understand, remember and reason out. Also, the statements "I am comfortable with mathematics" with a mean score of 2.71 and "I feel delighted when answering mathematics questions" with a mean score of 2.66 indicates that students love to study, learn and wrestle on mathematical problems. This contradicts the notion that most students do not like mathematics since they find it very difficult to comprehend and understand.

Among the statements dealing with self-concept, only the statement "My present knowledge of mathematical concept is high" with a mean score of 2.39 indicates that students' mathematical concepts were low. This shows that the students were aware of their ability and capability in mathematics. The overall mean score of the students' self-concept was 2.73, which indicates that the students have relatively high self-concepts in mathematics. The result was similar to the study of Peteros et al. (2019), who found out that students had a moderate level of self-concept towards learning mathematics.

4.4. Students' Peer Pressure

Table 6 presents the results of the students' peer pressure. It can be observed that 35.27% of the students had experienced a low level of peer pressure while 55.8% - a very low level. Considering the majority of the students, this shows that the students experienced a low level of peer pressure. On the other hand, only 8.93% of the students experienced a high level of peer pressure.

Table 6. Mean, Standard Deviation, Frequency and Percentage Distribution of Students' Peer Pressure

Range	Responses	Frequency	Percentage (%)	$\bar{x}$	SD
3.25-4.00	Completely True	0	0.00		
2.50-3.24	True	20	8.93		
1.75-2.49	False	79	35.27	2.73	0.768
1.00-1.74	Completely False	125	55.80		
	Total	224			

It can be observed that the statement to have the highest mean score of 2.24 was "I go home late to be with my friends," with a low rating. This would mean that some students agreed to have experienced it, but most of the respondents might go home early or go home late for reasons other than being with friends. The next statement, "Since I spend more time having fun with my friends, there is less time for studying math lessons," with the second highest mean score of 2.17, which was rated as low, indicates that students in some way learned how to balance their time between having fun with friends and doing math lessons. Furthermore, it would also imply that even if they spend more time with their friends, they still have a substantial amount of time learning mathematics lessons, which will eventually help them deepen their understanding of mathematics.

Moreover, the statement "Since my friends are not interested, I am not interested in math lessons" with a mean score of 1.64, which was rated very low, suggests that students were more likely not swayed by their friends in terms of interest in

mathematics lessons. Consequently, the students might be interested in mathematics lessons even though their friends are not interested. Likewise, it could also be that there were other reasons why students were not interested in their mathematics lessons. Besides, the statement "Since my friends carry it, I also carry tools such as knives, wedges &, etc. to a mathematics class" with a mean score of 1.72, which was rated very low, implies that students do not care to bring the tools as mentioned earlier (which distract them from learning) whenever their friends carry them. Contrarywise, they might carry such tools even without knowing that their friends were bringing them.

The statements "My friends pressure me to skip mathematics classes", "My friends pressure me to do many things I don't want" and "Since my friends enter, I also secretly enter porn sites on the Internet using cellphone or computer" have the same mean score of 1.69 which were rated as very low. This would tell that the students strongly disagreed that their friends have something to do with missing mathematics classes, doing things they do not want and watching porn sites. Somehow, if they happened to do it, the reason might be something other than their friends' impact. Moreover, the statements "Since my friends' cheat in the math exams, I cheat" and "I engage in fights so that my friends see that I am not afraid" have also the same mean score of 1.67, which were rated as very low, which implies that students do not cheat in their maths exams and participate in fights. Conversely, it would also suggest that students might cheat in math exams even if their friends are not cheating and engage in fights, not because of their friends, but they were just strong enough to handle it.

Among the statements, there were two to have the least mean scores recorded. These were the statements "I try too because people at my age have sexual experiences" and "My friends pressure me to ask my family to buy a car and then take it without permission and travel with them" with a mean score of 1.45, which were rated as very low, which suggests that the students did not have any sexual experience and do not press their parents to purchase a car for the benefit of their friends. Alternatively, the students might have already had some sexual experience before their friends and their families do not have any financial means to buy a car since most of the students in the school belong to poor families.

The overall mean score of students' peer pressure was 1.76, indicating that direct and indirect social influences on students were low. This result did not conform with the studies by Goethals (2001), Hoxby & Weingarth (2005), and Burke & Sass (2013), who examined different ways in which peer effects work, which may probably deal with different cultures. Hence, the presence of peers in our study did not either deter or stimulate student's improvement in mathematics class.

4.5. Self-Concept, Teaching Strategies, Peer Pressure and Performance in Mathematics across Different Grade Levels

The self-concept, the teaching strategies used by the teachers, peer pressure, and performance in mathematics were compared across different grade levels. In terms of students' performance in mathematics across grade levels shown in Table 6, the same level of performance can be observed among the different grade levels, which is satisfactory, thus showing no significant difference regarding their performance in mathematics. This implies that the students' performance in mathematics cannot be linked to their standing grade level. Correspondingly, the students' level of understanding, abilities, and skills in mathematics across grade levels were not too strayed.

Although students in higher years are expected to perform better than in lower years, the current spiral progression curriculum and how the mathematics subject courses are designed in a high school setting should be considered in interpreting this result. As students progress to the next grade level, the mathematics subjects' degree of complexity also increases, situating students to deal with problems with different levels of difficulty. Thus, the finding supports that there is no significant difference result in terms of students' performance in mathematics across grade levels. But there is still not enough evidence that would

support this result, since there are a number of factors that might directly or indirectly influence their performance in mathematics besides the variables considered in this study.

Table 7. Test for Difference in Mathematics Performance across Grade Levels

Grade Level	Mathematics Performance Mean	Description	F-value	Significance
G7	84.32	Satisfactory	2.394	0.069
G8	84.26	Satisfactory		
G9	82.44	Satisfactory		
G10	81.86	Satisfactory		

*Significant at $p < 0.05$ alpha level

Meanawhile, self-concept refers to students' personal beliefs about their academic abilities or skills (Trautwein et al., 2009) and a knowledge representation that contains knowledge about us, including our beliefs about our personality traits, physical characteristics, abilities, values, goals, and roles, as well as the knowledge that we exist as individuals (Jhangiani, & Tarry, 2014). There is no significant difference across grade levels in students' self-concept in mathematics, as shown in Table 7. All have a high description of self-concept, and the mean scores of each level do not vary much from each other.

Table 8. Test for Difference in Self-Concept across Grade Levels

Grade Level	Self-Concept Mean	Description	F-value	Significance
G7	2.74	High	0.095	0.963
G8	2.74	High		
G9	2.72	High		
G10	2.71	High		

*Significant at $p < 0.05$ alpha level

This result contradicts Erdogan and Sengul (2014) study, which revealed a statistically significant difference between elementary school students' mathematics self-concept levels based on their grade levels. Furthermore, Ayodele (2011) and Kamoru & Ramon (2017) suggest that teachers should develop their students' positive self-concept towards mathematics, including good study habits and pleasant teaching experiences to enhance higher self-concept and better performance in mathematics.

In terms of students' perception of their teachers' teaching strategies, it was revealed that there is a significant difference across grade level, as shown in Table 8. Among the grade levels, grade 10 has the highest mean score of 3.79, while grade 7, 8 & 9 have somewhat alike means score values. Furthermore, it can be observed that across grade levels, all have an often description

of their experience on the varied teaching strategies used by their teachers with a satisfactory rating. Hence, teachers' application of different teaching methods can have a positive impact on the quality of learner achievement (Ntlanganiso, 2019). Besides, hard work, combined with efficient strategy use, can lead to success in the classroom (Meltzer et al., 2001).

With the significant results shown in Table 8, it can be inferred that mathematics teachers in the school varied teaching strategies across grade levels to elicit the students' understanding of mathematical concepts supported by their perception in this study. Consequently, the study results are aligned with Sinay & Nahornick (2016) and support Jalbani (2014) that teachers should adapt teaching styles and methods in teaching to cope with the academic needs of their students and deliver even complex and complicated content effectively while helping students generate interest and eagerness for more learning opportunities.

Table 9. Test for Difference in Teaching Strategies across Grade Levels

Grade Level	Teaching Strategies Mean	Description	F-value	Significance
G7	3.50	Often	3.325	0.021*
G8	3.51	Often		
G9	3.59	Often		
G10	3.79	Often		

*Significant at p<0.05 alpha level

A significant difference was found on students' peer pressure across grade levels, as shown in Table 10. Among the grade levels, grade 9 has the lowest mean score of 1.55, rated as very low, while others have a low score. The result implies that students' peer pressure across grade levels has various effects on their academic performance (Moldes et al., 2019). However, since students experience low to very low peer pressure, it is hard to determine whether they experience positive or negative peer pressure (Mosha, 2017). This outcome conceded with Delp (2011) that experts agree that peers can influence each other's academic performance, but it does not agree on the extent and variables of that influence.

Table 10. Test for Difference in Peer Pressure across Grade Levels

Grade Level	Peer Pressure Mean	Description	F-value	Significance
G7	1.91	Low	5.815	0.001*
G8	1.77	Low		
G9	1.55	Very Low		
G10	1.82	Low		

*Significant at p<0.05 alpha level

Moreover, the significant results indicate that students experienced from 'less peer pressure' to 'no experience of peer pressure' at all across grade levels. The grade 9 mean score of 1.55 suggests that students who belong to this level cannot be easily influenced by peers. Hence, this would support the study by Winston and Zimmerman (2004), who posit that stronger students

do impact their peers and actually help improve the overall academic performance of the peer group. With that, in order to positively change students' performance, more attention should be devoted to their relationship with their classmates both in the classroom and outside (Korir & Kipkemboi, 2014; Olalekan, 2016).

4.6. Self-Concept, Teaching Strategies and Peer Pressure and and Its Relationship to Performance in Mathematics

Table 11 summarized the correlation of performance in mathematics and the independent variables using a series of Pearson r product-moment correlation. The results revealed that only peer pressure from three independent variables (self-concept, teaching strategies, and peer pressure) was found to be significantly correlated, with $p<0.05$, to performance in mathematics on three grade levels (Grade 7, 8, 10), while the rest are not significantly correlated. The data show that peer pressure of Grade 7, 8, and 10 had a magnitude of low to moderate negative relationship to performance in mathematics given statistical results of -.272, -0.465, and -.392, respectively. Logically, this indicates that the lower the peer pressure, the higher the performance in mathematics.

Table 11. Relationship Between Performance in Mathematics and other Variables Across Grade Levels

Performance in Mathematics	Self-Concept			Teaching Strategies			Peer Pressure	
	Pearson r	p-values	Mean	Pearson r	p-values	Mean	Pearson r	p-values
Grade 7 Level Mean= 84.32	0.065	0.316^N	2.74	-0.040	0.383^N	3.50	-0.272	0.020^*
Grade 8 Level Mean=84.26	0.097	0.216^N	2.74	-0.097	0.215^N	3.51	-0.465	0.000^*
Grade 9 Level Mean=82.44	-0.044	0.371^N	2.72	0.078	0.281^N	3.59	-0.145	0.141^N
Grade 10 Level Mean=82.86	0.073	0.322^N	2.71	0.209	0.092^N	3.79	-0.392	0.005^*

*Correlation is significant at $\alpha = 0.05$, ^{N}Correlation not significant at $\alpha = 0.05$

Moreover, the data provide support to the study by Pietsch et al. (2003), who found that self-concept was not highly related to performance in mathematics. Contra wise, the results of the study did not substantiate the study of Marsh (1990a), Marsh & Martin (2011), and Lee & Kung (2018) that self-concept increase subsequent academic achievement and other desirable educational outcomes, and powerfully and positively predicts general performance in mathematics (Ghazvini, 2011), have significant reciprocal relationships with achievement (Trautwein et al., 2006; Pajares & Schunk, 2001), directly related to greater academic achievement (Seaton et al., 2014; Khalaila, 2015) and have a significant relationship to students' performance in mathematics (Peteros, 2019). Conversely, this study did not support the findings of Muema et al. (2018), who established that there is a positive correlation between teaching methods and students' achievement in mathematics.

5. Conclusion and Recommendations

Based on the findings of this study, it can be concluded that students' general performance in mathematics is satisfactory. Also, the respondent students had often experienced varied teaching strategies in their mathematics. Furthermore, the students' self-concept in mathematics is high while peer pressure is low. When grouped by grade level, the students' performance and self-concept in mathematics did not show statistical differences. On the other hand, varied teaching strategies in mathematics were experienced by the students across grade levels. Moreover, peer pressure, self-concept in mathematics, and teaching strategies all showed association with students' mathematical performance. However, only peer pressure exhibited a significant influence on performance in mathematics in our study. Hence, it is vital to be cautious about the negative association between peer pressure and performance in mathematics, since less peer pressure indicates greater performance in mathematics. It is recommended that further investigation should be carried out to determine the most effective teaching strategies that would effectively increase students' performance in mathematics. Perception of the educators on the use of varied teaching strategies should be further explored to capture the side from the lens of the teachers. A qualitative study on student's peer pressure may be undertaken to have a deeper understanding on the negative association and supplement the result of this study.

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