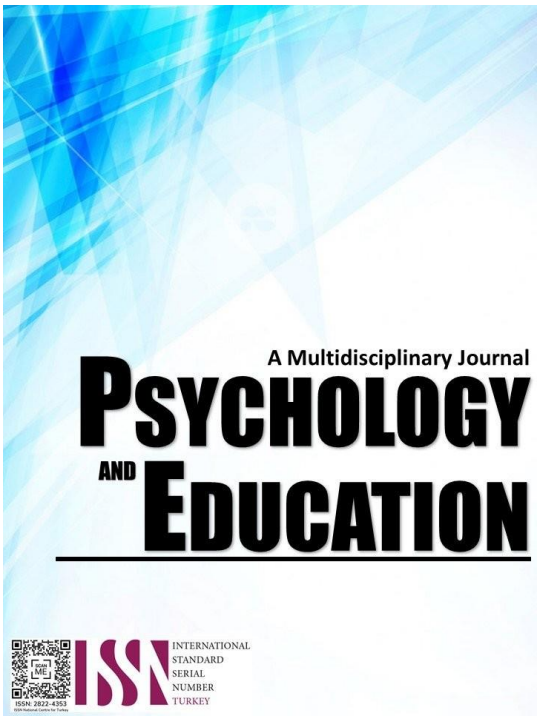
JUNIOR HIGH SCHOOL LEARNERS' SELF-CONCEPT, CHALLENGES, AND PERFORMANCE IN MATHEMATICS



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Research Article

Junior High School Learners' Self-Concept, Challenges, and Performance in Mathematics

Ismael M. Andam,* Omar Q. Hussein
For affiliations and correspondence, see the last page.

Abstract

The purpose of this study was to investigate the self-perception, difficulties, and mathematical performance of junior high school students at Datu Mitmug Memorial High School in Mapantao Lumba-Bayabao, Lanao del Sur, during the academic year 2022–2023. To investigate the association between these characteristics and junior high school students' mathematics performance, the study used a descriptive survey correlational methodology. Two hundred twenty-five learners in grades 7 through 10 made up the sample. The results showed that the students' overall proficiency in mathematics was satisfactory. Additionally, the students exhibited a positive self-concept in learning mathematics, particularly in the dimensions of learned, organized, and dynamic. Notably, the organized self-concept significantly influenced their performance in mathematics. Moreover, the study identified anxiety and lack of confidence as the main challenges faced by the learners, which significantly impacted their academic performance. As a recommendation, teachers were encouraged to implement positive reinforcement techniques in the classroom to address the mathematics learning gap and enhance students' self-concept. These interventions had the potential to improve students' performance and contribute to their overall mathematical achievement.

Keywords: *mathematics self-concept, challenges, academic performance, secondary learners*

Introduction

Mathematics is one of the most important subjects in the current curriculum because the nature of the subject is related to many fields or disciplines. Learners' performance in mathematics is one of the main concerns in mathematics education. In fact, it is seen as a critical issue in Philippine education.

The Program for International Student Assessment (PISA) of the Organization for Economic Cooperation and Development (OECD). As articulated in the DepEd Order No. 29. s. 2017 entitled "Policy Guidelines on System Assessment in the K-12 Basic Education Program" is aligned with "Sulong Edukalidad" which is its ongoing program to improve the quality of education in the country. PISA and National Achievement Test (NAT) are responsible for the outcome to inform policy decisions and reforms. Basically, it is a large-scale assessment on learners' performance. It aims to strengthen literacy and numeracy programs.

The significance of students' mathematics self-concept has drawn more attention as math teachers attempted to support students' mathematical literacy (Hannula, 2006; Pape & Smith, 2002). Individuals' views or perceptions about their mathematical prowess were frequently referred to as their mathematics self-concept. According to Bandura (1997), pupils who have greater levels of self-concept were more likely to be driven to study and to persevere when faced with difficult tasks. Bandura identified four main sources of self-concept: mastery experiences, vicarious experiences, social persuasion, and physiological states. Learners based most of their beliefs about their abilities on their mastery experiences. For example, learners who have repeatedly succeeded in previous mathematics subjects will most likely believe that they have the ability to succeed in future mathematics subjects. Learners have vicarious experiences when they watch role models who are similar to themselves who excel at specific tasks. Students will feel more confident in mathematics if they observe peers they consider as similar to themselves achieving in mathematics, even though this does not have the same impact on self-concept as mastery experiences. The last two sources make the smallest contributions to pupils' self-image. Encouragement from classmates, teachers, and parents—both positive and negative—is referred to as social persuasion. Physiological states refer to the student's physical state such as fatigue, pain, or nausea.

Poor mathematics self-concept often decreases their motivation to learn. This eventually can lead to low mathematics achievement. Higbee and Thomas (1999) discovered that mathematics self-efficacy, along with other affective characteristics like test anxiety. The perceived use of mathematics affected students' mathematical performances in a study of college freshman enrolled in a developmental mathematics course. According to the findings of their study, certain students may not be able to understand mathematics if instructors only concentrated on teaching mathematical concepts. Teachers of mathematics must also consider psychological or attitude aspects that affect how students learn the subject.

With regards to mathematics education specifically, there were concerns that learning mathematics away from the school environment may undermine inquiry- based approaches to learning mathematics in several ways. First, as noted by Sullivan et al. (2020), explicit explanations followed by repeated practice were conducive to the use of video technology, specifically instructional videos that can be prepared in advance and shared through a web link. By contrast, inquiry-based approaches to learning mathematics required student-centered approach. Mathematically rigorous discussions were built around students' experiences of working on tasks. Such post-task discussions provided teachers with opportunities to highlight connections between mathematical ideas that emerged (Stein et al., 2008), as well as opportunities for students to learn from one another's strategies (Russo & Hopkins, 2017).

Such a discourse intensive approach to learning mathematics was likely to be dependent on synchronous in class facilitation. Second, teachers may either anticipate or respond to (potential) negative attitudes towards mathematics. Mathematics learning held by some adults in the home environment was therefore be less willing to pursue tasks that were open-ended. They involved students taking risks, and/ or having to navigate the "zone of confusion" (Clarke et al., 2014). In compliance with DepEd Order (DO) No. 8, s. 2013, this advisory was issued not for endorsement per DO 28, s. 2001, which is the Mathematical Society of the Philippines and the Department of Science and Technology-Science Education Institute will hold its 25th Philippine Mathematical Olympiad (PMO) this School Year 2022−2023. The PMO aims to 1. stimulate the improvement of mathematics education in the country by awakening greater interest in and appreciation of mathematics among students and teachers, and gaining insights into the level of mathematics learning; 2. identify and motivate the mathematically gifted; 3. identify potential participants to the International Mathematical Olympiad; 4. provide a vehicle for the professional growth of teachers; and 5. encourage involvement of public and private sectors in the concerted promotion and development of mathematics education.

In this area of the new normal, there was a crisis in the Philippine educational system that needed to be addressed (Cahapay, 2020). A similar warning had already been delivered to the community of math educators: "Mathematics Education and Life at Times of Crisis" was the theme of the 2017 Mathematics Education and Society conference. s. 8, of DepEd Order (DO).

A conference titled "Toward Incorporating Social Justice Issues in Mathematics Education: Sharing Teachers' Learnings" was being co-organized by the Department of the Ateneo de Manila University and the Philippine Council of Mathematics Teacher Educators (MATHTED) Inc. The conference was held from December 2 to 3, 2022, using a hybrid mode, which combined face-to-face and online modes.The Conference aims to 1. build capacity of teachers in the integration of social justice issues in mathematics education, 2. build a professional learning community among teachers, and 3. develop lesson examples. Now they know that these crises connected with the pandemic (Ezeibe et al., 2020) on social crises and (Banerjee, 2020) on the climate crisis in relation to the pandemic. But such warnings extended much further back. Steffensen (2017) emphasized how these issues were brought on by climate change and noted their significance for mathematics education. In order to explain the change in risks from natural disasters to disasters brought on by humans, Beck created the idea of "risk society" in 1992. They were aware that human activity amplified and sometimes even causes natural risks.

The purpose of this study was to determine the junior high school learners' self-concept, challenges, and performance in Mathematics. The study was conducted in Datu Mitmug Memorial National High School, Lumba Bayabao District, Lanao del Sur Division during SY 2022-2023. It is hoped that this study can generate data on the junior high school learners' self-concept, challenges, and performance in Mathematics. The researchers noted that mathematics is stressed like language, that it is a challenging topic for most students to succeed in, and that most students struggle with it when receiving face-to-face training. When students and teachers were not together in the past, there were many issues that pupils faced, including difficulties in the subject of mathematics. Through this study, it is hoped to get knowledge on the self-perception, difficulties, and mathematics performance of junior high school students.

Research Questions

The study was to determine the junior high school learners' self-concept, challenges and performance in Mathematics at Datu Mitmug Memorial National High School, Lumba-Bayabao District, Lanao del Sur Division during the SY 2022-2023. Specially, this study answered the following questions:

1. What are the learners' self-concepts in Mathematics in terms of:
   1.1 learned,
   1.2 organized, and
   1.3 dynamics?
2. What is the learners' performance in Mathematics?
3. What are the challenges encountered by the learners in Mathematics?
4. Is there a significant relationship between the learners' self-concepts and the learners' performance in Mathematics?
5. Is there a significant relationship between the challenges encountered by the learners and the learners' performance in Mathematics?
6. What action plan can be designed based on the findings of the study?

Methodology

Research Design

Data were gathered for the study using a descriptive-correlational research approach. The respondents' self-concept and the difficulties they had with their academic achievement were described using a descriptive design. The correlation between the learners' self-concept and their performance as well as the significant association between the problems they faced and their performance were both determined using correlational research.

Respondents

The respondents of the study were junior high school learners of Datu Mitmug Memorial National high school during the SY: 2022-

2023.The respondents were identified using stratified random sampling and Slovins' formula was utilized to determine the appropriate number of respondents needed in the study from the total sample population of 225 respondents. Stratified proportional allocation sampling was used to determine the sample size in every grade level or stratum as shown in the table below:

Table 1. *Tabular Sample Population*

Grade Level	Grade 7	Grade 8	Grade 9	Grade 10	Total
Population size	161	132	127	96	516
Sample size	70	58	55	42	125

Instruments

In this study, standardized instruments were utilized by the researchers to gather all the data needed to answer the specific problems in the study. The researchers instrument consisted of three parts. Part 1 - The brief profile of the students which included name (optional), gender, grade, level, and the 2nd quarter grade of the students for the school year 2022-2023. The performance of the students was interpreted based on the present Department of Education (DepEd) grading scale which identified five levels of proficiency. It had been adopted and used since the implementation of the K-12 curriculum.

Grade Range and Level of Proficiency

Grade range	Level of Proficiency
90-100	Outstanding
85-90	Very Satisfactory
80-84	Satisfactory
75-79	Fairly Satisfactory
74 and below	Did not meet the expectation

Part 2 was a questionnaire adopted from Peteros et al. (2020) on the level of self-concept of the respondent towards mathematics as learned, organized, and dynamic. The scale in this study obtained a Cronbach's alpha coefficient of 0.787 which was reliable in capturing the intended target measure. Students' degree of answer for every statement was exposed in a 4-point scale. The four choices of response were: Strongly Agree (SA), Agree (A), Disagree (DA), and Strongly Disagree (SD). All the statements were positive. The response in the positive statements had a weighted score of 4, 3, 2, and 1.

Part 3 was a questionnaire adopted from D.K. May (2006) on the challenges encountered by the learners in mathematics. The instrument provided statements about how the learners dealt with the mathematics course. The aforementioned questionnaire in this study obtained a Cronbach's alpha coefficient 0.765 which was reliable to measure the said construct. Students' extent of answer for every statement was expressed in a 4-point scale. The four choices of response were: usually, Often, Sometimes, Seldom and Never; had weighted scores of 5, 4, 3, 2, and 1.

Procedure

A letter was distributed by the researchers with a recommendation obtained from the Dean of Graduate Studies and adviser. With the letter, the researchers proceeded to the office of the Schools Division Superintendent of Lanao del Sur Division I to ask permission to administer the research questionnaire to the learners. The research conducted an orientation to the respondents following the safety health protocol. The researchers explained how to answer the questionnaire. After answering the instrument, the researchers collected it. A record of the second quarter grades of the learners were requested from their advisers. The data was tabulated, organized, and analyzed based on the problems raised in the study.

Data Analysis

The following statistical tools were used in analyzing the data gathered; For problems 1 and 3, Mean and Standard Deviation was employed in determining the level of self-concept of the respondents towards mathematics as learned, organized, and dynamic and the challenges encountered by the learners in Mathematics. For problem 2, Frequency count and Percentage was used in determining the academic performance of the learners. For problems 4 and 5, multiple regression analysis was used to determine the relationship between the learners' self-concept and their performance and the relationship between the challenges encountered by the learners and their performance in mathematics.

Results and Discussion

Problem 1: What are the learners' self-concepts in Mathematics?

Table 1 shows the mean and standard deviation (SD) for ten self-concept statements related to mathematics learning, along with a total measure. The participants in the study were asked to indicate the extent to which they agreed or disagreed with each statement on a 4-point Likert scale. The mean scores range from 2.48 to 2.96, indicating that, on average, the participants agreed with the self-concept statements.

The highest mean score was for the statement "Learning Mathematics gives me meaning to learn activities", followed by "Even if the

work in Mathematics is hard, I can learn it" and "I learn Mathematics quickly". These results suggested that the participants felt confident in their ability to learn mathematics and found it meaningful.

On the other hand, the lowest mean score was for the statement "In my Mathematics class, I understand even the most challenging work", indicating that the participants disagreed with this statement. This result suggested that the participants found some aspects of mathematics challenging and difficult to understand. The total measure score of 2.69 indicated that, overall, the participants had a positive self-concept in mathematics learning. The standard deviation values range from 0.39 to 0.70, indicating that the responses were fairly consistent for most statements. These findings suggested that although students typically have a good view of themselves when learning mathematics, they may have trouble with the more difficult concepts. Teachers can utilize this information to reinforce and develop students' already-existing positive self-ideas in mathematics learning while also offering additional support and resources for kids who might be having difficulty with difficult concepts. According to Ackerman et al. (2013), students who have a favorable view of themselves as mathematicians continue in school and complete their selected degree programs, which helped the school's student retention rate.

Table 2. *Learners' Organized Self-Concepts in Mathematics*

Organized	*Mean*	*SD*	*Description*
1. I usually do well in Mathematics.	2.77	.64	*Agree*
2. Mathematics is more enthusiastic for me than for a significant number of my schoolmates.	2.66	.72	*Agree*
3. I have dependably accepted that Mathematics is a standout amongst my best subjects.	2.58	.78	*Agree*
4. I get good marks in Mathematics.	2.57	.63	*Agree*
5. Mathematics is an easy subject to pass.	2.32	.75	*Disagree*
6. Mathematics is worth passing well.	3.00	.66	*Agree*
7. Mathematics help to find a new way of finding things.	3.00	.60	*Agree*
8. When I do Math, I feel confident that I have done it correctly.	2.67	.71	*Agree*
9. It takes me any longer to comprehend mathematics ideas than the average individual.	2.91	.72	*Agree*
10. When I have difficulties with Math, I know I can handle them if I try.	3.12	.69	*Agree*
Total Measure	2.76	.43	*Agree*

Note: 1.00-1.49 Strongly Disagree 1.50-2.49 Disagree 2.50-3.49 Agree 3.50-4.00 Strongly Agree SD-Standard Deviation

Table 2 presents the mean and standard deviation (SD) for ten self-concept statements related to organize self-concept in mathematics learning, along with a total measure. The participants in the study were asked to indicate the extent to which they agreed or disagreed with each statement on a 4-point Likert scale. The mean scores range from 2.32 to 3.12, indicating that, on average, the participants agreed with the self-concept statements. The highest mean scores were for the statements "Mathematics is worth passing well" and "Mathematics help to find a new way of finding things", indicating that the participants highly value mathematics and recognized its potential for innovative problem-solving. The statement "When I have difficulties with Math, I know I can handle them if I try" also had a high mean score, indicating that the participants felt confident in their ability to overcome difficulties in mathematics.

The statement "Mathematics is an easy subject to pass" had the lowest mean score, indicating that the participants did not agree with this claim. The participants' perceptions of mathematics as a difficult subject to pass, according to this result, may have an impact on their motivation and interest in the subject. With a total score of 2.76, the participants appeared to have a generally favorable and well-organized view of themselves as math learners. The standard deviation values range from 0.43 to 0.78, showing that most propositions had reasonably consistent responses. The findings implied that students regard mathematics highly and were aware of its capacity for creative problem-solving, which can be used to boost motivation and engagement in the subject. However, students' confidence may be impacted by the belief that mathematics was a difficult subject to pass, necessitating additional attention and resources from teachers. Given that the statement "When I have difficulties with math, I know I can handle them if I try" had a high mean score, it was possible that encouraging a growth mindset in kids' approach to learning mathematics may help them succeed. The self-perceived competency of a student in an academic domain in general was related to academic self-concept (Marsh & Craven, 2006).

Table 3. *Learners' Dynamic Self-Concepts in Mathematics*

Organized	*Mean*	*SD*	*Description*
1. I can do practically all the work in Mathematics class if I do not give up.	3.21	.59	Agree
2. Mathematics improves my understanding of other subjects.	2.88	.56	Agree
3. Mathematics improves my learning and retention capacities.	2.96	.64	Agree
4. I feel delighted when answering Mathematics questions.	2.80	.59	Agree
5. Mathematics is suitable for all students.	2.77	.77	Agree
6. Mathematics encourages me to apply detailed steps to solve my problems.	2.84	.65	Agree
7. Mathematics makes me think fast.	2.78	.77	Agree
8. My present knowledge of mathematical concept is high.	2.48	.71	Disagree
9. Mathematics is essential in the future.	3.14	.72	Agree
10. I am comfortable in Mathematics.	2.67	.75	Agree
Total Measure	2.85	.40	Agree

Note: 1.00-1.49 Strongly Disagree 1.50-2.49 Disagree 2.50-3.49 Agree 3.50-4.00 Strongly Agree SD-Standard Deviation

Table 3 shows the learners' dynamic self-concepts in Mathematics. The mean score for the total measure was 2.85 with a standard deviation of .40, indicating that the learners had a positive dynamic self-concept in Mathematics. Out of the ten statements, nine were in the agreed category, while only one fell in the disagree category.

The students concurred that mathematics could help them comprehend other subjects better (statement 2), that it could help them acquire and retain information better (statement 3), and that it could help them solve issues more thoroughly (statement 6). Additionally, they concurred that math helped them think quickly (statement 7), was appropriate for all kids (statement 5), and would be crucial in the future (statement 9).

The learners, however, did not agree that their current level of mathematical concept knowledge was high (statement 8). In addition, the average score for the statement "I am comfortable in mathematics" (statement 10) is 2.67, which was within the acceptable range but was substantially lower than the average for the other statements.

The implication of these results was that the learners had a positive dynamic self-concept in Mathematics, which could have a positive impact on their learning outcomes. They believed that studying mathematics would increase their capacity for learning and memory, as well as their ability to solve problems quickly. But given how little they now know about basic mathematical ideas, there was room for development in their knowledge and comprehension of the topic. These findings could be used by educators and teachers to create learning interventions that concentrated on enhancing students' mathematical literacy and boosting their self-assurance in the topic. According to Ackerman et al. (2013), students who have a favorable view of themselves as mathematicians continue in school and complete their selected degree programs, which helped the school's student retention rate.

Table 4. *Consolidated Findings of the Learners' Dynamic Self-Concepts in Mathematics*

Self-Concepts	*Mean*	*SD*	*Description*
Learned	2.69	.39	Agree
Organized	2.76	.43	Agree
Dynamic	2.85	.40	Agree
Total Measure	2.77	.35	Agree

Note: 1.00-1.49 Strongly Disagree 1.50-2.49 Disagree 2.50-3.49 Agree 3.50-4.00 Strongly Agree SD-Standard Deviation

The consolidated findings of the learners' self-concepts in mathematics show that all three dimensions of self-concept, namely, learned, organized, and dynamic had a mean score above 2.5, indicating that the students generally had positive self-concepts in mathematics. The mean score of the total measure was 2.77, which was also above 2.5, indicating that the students had an overall positive self-concept in mathematics.

The highest mean score was in the dynamic dimension, which meant that students felt positive about the ongoing development of their mathematical abilities and the relevance of mathematics to their academic and personal goals. This was a positive finding since a dynamic self-concept can motivate students to persist in their learning and overcome challenges.

The learned and organized dimensions of self-concept also have mean scores above 2.5, indicating that students had positive beliefs about their abilities in mathematics and felt organized in their approach to learning the subject. However, the mean score for the organized dimension was slightly higher than the mean score for the learned dimension, indicating that students may be more confident in their organizational skills than in their mathematical abilities.

Overall, the findings suggested that the students had a positive self-concept in mathematics, which could have important implications for their motivation, engagement, and achievement in the subject. These positive self-concepts could be used by parents and teachers to promote students' learning and motivate them to continue their education and find professions in math-related fields. Additionally, educators might use these data to create solutions for arithmetic students who might have a poor view of themselves. Achievement in mathematics was positively correlated with one's mathematical self-concept (Lee & Kung, 2018).

Problem 2: What are the learners' performances in mathematics?

Table 5. *Learners' Performance in Mathematics*

Grade Range	*Proficiency Level*	*F*	*%*	*Mean (SD)*
90-100	Outstanding	21	9.3	
85-89	Very Satisfactory	50	22.2	81.81 (5.61)
80-84	Satisfactory	74	32.9	*Satisfactory*
75-79	Fairly Satisfactory	68	30.2	
60-74	Did Not Meet the Expectation	12	5.3	
Total		225	100.0	

Table 5 presents the learners' performance in Mathematics based on their grade range. The proficiency level of the learners was categorized into Outstanding, Very Satisfactory, Satisfactory, Fairly Satisfactory, and Did Not Meet the Expectation. The table showed that 9.3% of the learners fell under the Outstanding category, while 22.2% were classified as Very Satisfactory. Nearly one-third of the learners (32.9%) fell under the Satisfactory category, while 30.2% and 5.3% were categorized as Fairly Satisfactory and Did Not Meet

the Expectation, respectively. The mean score of the learners in Mathematics was 81.81, with a standard deviation of 5.61. The learners' academic performance fell under the Satisfactory range, based on the mean score. The results indicated that the majority of the learners had a good command of Mathematics, as most of them fell under the Satisfactory and Very Satisfactory categories.

The results implied that the learners' academic performance in Mathematics was moderate, and there was a need for improvement to achieve better proficiency levels. The research findings also indicated that the school should take steps to improve the students' mathematical abilities and knowledge. To assist the students to improve their academic performance in mathematics, teachers should create and apply instructional strategies that should meet the different learning needs of the students. Additionally, students who fell into the category of Did Not Meet the Expectation might need additional attention and support to boost their math ability. According to McLeod (1992), the idea that a learner's attitude toward a subject or activity affected how well they performed or succeeded in arithmetic was the basis for the overall association between attitude and achievement.

Table 6 presents the challenges encountered by the learners in mathematics. The data were gathered using a Likert scale ranging from "never" to "usually." The mean score of all indicators was 2.62, indicating that learners often faced these challenges. The top five challenges reported were "I worry that I will not be able to do well on mathematics tests", "I get tense when I prepare for a mathematics test", and "I worry that I will not be able to get a good grade in my mathematics subject", "I believe I can complete all of the assignments in a mathematics subject", and "I believe I will be able to use mathematics in my future career when needed". These results indicated that learners struggled with test anxiety and worry about their mathematics performance.

Problem 3: What are the challenges encountered by the learners in Mathematics?

Table 6. *Challenges Encountered by the Learners in Mathematics*

Challenges Encountered	*Mean*	*SD*	*Description*
C1. I feel confident enough to ask questions in my mathematics class.	2.54	.80	Often
C2. I get tense when I prepare for a mathematics test.	2.83	.81	Often
C3. I get nervous when I have to use mathematics outside of school.	2.60	.85	Often
C4. I believe I can do well on a mathematics test.	2.59	.75	Often
C5. I worry that I will not be able to use mathematics in my future career when needed.	2.74	.90	Often
C6. I worry that I will not be able to get a good grade in my mathematics subject.	2.94	.83	Often
C7. I believe I can complete all of the assignments in a mathematics subject.	2.65	.78	Often
C8. I worry that I will not be able to do well on mathematics tests.	2.84	.86	Often
C9. I believe I am the kind of person who is good at mathematics.	2.31	.89	Seldom
C10. I believe I will be able to use mathematics in my future career when needed.	2.90	.84	Often
C11. I feel stressed when listening to mathematics instructors in class.	2.40	.79	Seldom
C12. I believe I can understand the content in a mathematics subject.	2.60	.76	Often
C13. I believe I can get an outstanding grade “90-100” when I am in a mathematics subject.	2.12	.95	Seldom
C14. I get nervous when asking questions in class.	2.60	.93	Often
C15. Working on mathematics homework is stressful for me.	2.59	.83	Often
C16. I believe I can learn well in a mathematics subject.	2.80	.81	Often
C17. I worry that I do not know enough mathematics to do well in future mathematics subject.	2.68	.86	Often
C18. I worry that I will not be able to complete every assignment in a mathematics subject.	2.78	.83	Often
C19. I feel confident when taking a mathematics test.	2.39	.75	Seldom
C20. I believe I am the type of person who can do mathematics.	2.52	.78	Often
C21. I feel that I will be able to do well in future mathematics subject.	2.66	.75	Often
C22. I worry I will not be able to understand mathematics.	2.71	.85	Often
C23. I believe I can do mathematics in a mathematics subject.	2.57	.72	Often
C24. I worry that I will not be able to get an outstanding grade “90-100” in my mathematics subject.	2.64	1.03	Often
C25. I worry that I will not be able to learn well in my mathematics subject.	2.78	.90	Often
C26. I get nervous when taking a mathematics test.	2.81	.83	Often
C27. I am afraid to give an incorrect answer during my mathematics class.	2.81	.81	Often
C28. I believe I can think like a mathematician.	2.15	1.02	Seldom
C29. I feel confident when using mathematics outside of school.	2.36	.86	Seldom
Total Measure	2.62	.36	Often

Note: 1.00-1.49 Never 1.50-2.49 Seldom 2.50-3.49 Often 3.50-4.00 Usually

On the other hand, the lowest five challenges reported were "I believe I can get an outstanding grade '90-100' when I am in a mathematics subject", "I feel confident enough to ask questions in my mathematics class", "I feel stressed when listening to mathematics instructors in class", "I feel confident when taking a mathematics test", and "I believe I am the kind of person who is good at mathematics". These results suggested that learners lack confidence in their ability to perform well in mathematics, and they feel stressed and anxious in mathematics classes. These challenges can have significant implications for learners' academic performance in mathematics. Math performance might suffer from anxiety and lack of confidence, which can also have an impact on future career decisions. In order to overcome these difficulties, educators must foster a welcoming and encouraging learning atmosphere where students were encouraged to ask questions and were given chances to practice and develop their mathematical abilities. Additionally, teachers can help students overcome their arithmetic issues by employing a variety of strategies included teaching problem-solving

techniques, making mathematics more applicable to students' daily lives, and giving feedback that highlights students' abilities. Stuart (2000) argued that teacher, peer, and family attitudes toward mathematics may either positively or negatively influence learners' confidence in mathematics

Problem 4: Is there a significant relationship between the learners' self-concept and their learners' performance in Mathematics?

Table 7. *Multiple Regression Analysis of Relating Academic Performance by Learners' Self-Concepts*

Predictors	*Unstandardized Coefficients* *B*	*S.E.*	*Standardized Coefficients* β	*t-value*	*p-value*	*Remarks*
(Constant)	53.34	2.06		25.84***	.000	Significant
Learned	1.56	.84	.11	1.85	.066	Not significant
Organized	8.54	.94	.65	9.09***	.000	Significant
Dynamic	.25	.89	.02	.28	.781	Not significant

Note: $R^2 = .547$ *ANOVA for Regression:* $F_{(3,221)} = 88.932$***, *p<.001* ***p<.001

Table 7 shows the results of a multiple regression analysis examining the relationship between academic performance and learners' self-concepts. The predictors in this analysis included learned, organized, and dynamic self-concepts. The results showed that the organized self-concept was a significant predictor of academic performance (β = .65, p < .001), indicating that learners who viewed themselves as organized tended to perform better academically. The learned self-concept was not a significant predictor of academic performance (β = .11, p = .066), indicating that the extent to which learners believe that they can learn does not have a significant effect on their academic performance. Finally, the dynamic self-concept was also not a significant predictor of academic performance (β = .02, p = .781). The R2 value of .547 indicated that the predictors in this model explained approximately 54.7% of the variance in academic performance. The ANOVA for the regression was significant (F(3,221) = 88.932***, p < .001), indicating that the model was a good fit for the data.

The results of this analysis suggested that the organized self-concept was an important factor in predicting academic performance. Academic performance was more likely to be improved in learners who perceived themselves as organized. These findings had significant ramifications for parents and teachers because they indicated that helping students become more organized may boost their academic achievement. Additionally, the non-significant effects of the acquired and dynamic self-concepts implied that learners' assessments of their adaptability and flexibility and their ideas about their capacity to learn may not be as crucial for academic achievement as previously believed. Overall, these findings suggested that promoting a sense of organization among learners may be an effective strategy for improving academic performance. According to Khoo and Ainley (2015), the attitudes of students were developed over time and would have a significant effect on the students' performance in math.

Table 8 shows the results of a multiple linear regression analysis that examined the relationship between academic performance and challenges encountered by learners. The analysis included six predictors: C1 (I feel confident enough to ask questions in my mathematics class), C11 (I feel stressed when listening to mathematics instructors in class), C9 (I believe I am the kind of person who is good at mathematics), C15 (Working on mathematics homework is stressful for me), C25 (I worry that I will not be able to learn well in my mathematics subject), and C29 (I feel confident when using mathematics outside of school).

Problem 5: Is there a significant relationship between the challenges encountered by the learners and their academic performance?

Table 8. *Multiple Linear Regression Analysis of Relating Academic Performance by Challenges Encountered*

Predictors	*Unstandardized Coefficients* *B*	*S.E.*	*Standardized Coefficients* β	*t-value*	*p-value*	*Remarks*
(Constant)	80.85	1.82		44.55	.000	Significant
C1. (I feel confident enough to ask questions in my mathematics class.)	2.07	.42	.30	4.97	.000	Significant
C11. (I feel stressed when listening to mathematics instructors in class.)	-1.65	.41	-.23	-4.07	.000	Significant
C9. (I believe I am the kind of person who is good at mathematics.)	1.25	.39	.20	3.21**	.002	Significant
C15. (Working on mathematics homework is stressful for me.)	-1.10	.39	-.16	-2.81**	.005	Significant
C25. (I worry that I will not be able to learn well in my mathematics subject.)	-.92	.35	-.15	-2.66**	.008	Significant
C29. (I feel confident when using mathematics outside of school.)	.93	.39	.14	2.37*	.019	Significant

Note: $R^2 = .375$ *ANOVA for Regression:* $F_{(6,218)} = 21.82$ ***, *p<.001* ***p<.001 **p<.01 *p<.05

The results indicated that all six predictors significantly predicted academic performance. Learners who feel confident enough to ask questions in their mathematics class (C1) and those who feel confident when using mathematics outside of school (C29) tended to perform better academically. On the other hand, learners who felt stressed when listening to mathematics instructors in class (C11), those who found working on mathematics homework stressful (C15), and those who worried that they would not be able to learn well in their mathematics subject (C25) tended to perform worse academically.

These findings revealed that students' attitudes and perceptions about mathematics had a significant impact on their academic achievement. Students who approached mathematics with a good attitude and who were confident in their skills typically performed better than those who approached mathematics with worry and anxiety. Therefore, it was essential for educators to encourage students as they gained confidence in their skills, reduce tension and anxiety, and help learners established good attitudes toward mathematics. According to Moenikia and Zahed-Babelan (2010), students' attitudes about mathematics had an impact on how well they succeeded in the subject how often they engaged in the subject.

Problem 6: What action plan can be designed based on the findings of the study?

Firstly, addressing learners' anxiety and stress in mathematics classes should be a priority. Teachers can incorporate various techniques. This reduces learners' anxiety levels, such as creating a safe and positive learning environment, using instructional strategies. These are student-centered, engaging, and providing students with opportunities for collaborative learning. Moreover, teachers can identify students who are struggling with anxiety. They can also provide them with extra support and resources, such as counseling services. Secondly, the findings suggested that learners lack confidence in their ability to perform well in mathematics. To address this issue, teachers can design instructional activities that focus on developing students' self-efficacy beliefs and encouraging them to take risks in learning mathematics. Moreover, teachers can provide learners with feedback that is specific and meaningful. This helped build students' confidence in their ability to learn and perform well in mathematics.

Last but not least, the outcomes of the multiple regression analysis showed that a number of difficulties students have in mathematics classes, such as feeling stressed out when listening to instructors and doing assignments, had a major impact on their academic performance. Teachers could address these issues by encouraging students to ask questions and seek assistance when they were having difficulties by fostering an open and encouraging learning environment. Teachers could also givere students individualized instruction and assessments that take into account each student's unique learning preferences and requirements. Thus, the action plans to address the issues identified in this study should focus on creating a positive and supportive learning environment that encourages learners to engage in the learning process, build their confidence in their ability to learn and perform well in mathematics and provide them with the necessary support and resources to overcome the challenges they encounter. The positive perceptions of students in learning mathematics could help develop a positive attitude towards the subject, which will, in turn, lead to better performance. In contrast, the negative perceptions of students towards the subject would also contribute to their low performance in the subject (Bayaga & Wadesango, 2014).

Conclusion

Based on the study's findings, it can be said that students have a good self-concept about learning mathematics as something that can be learned, organized, and dynamic across all three dimensions of self-concept. The ordered self-concept of learners, however, was one of the three characteristics of self-concept that significantly contributed to predicting academic achievement. Additionally, the majority of students had an overall grade that was considered satisfactory. It was also shown that the majority of students reported feeling stressed and anxious while learning mathematics, which had an impact on their academic performance. Hence, it was crucial for educators to help learners develop positive attitudes towards mathematics subjects to reduce stress and anxiety and provide support to help learners build confidence in their abilities.

Based on the findings and conclusions made, the study had the following recommendations to offer: Teachers should implement positive reinforcement techniques in the classroom. School administrators should provide training opportunities for teachers in using differentiation strategies to address diverse learning needs. Parents should cooperate and learn from teachers in implementing positive reinforcement techniques for their children. The future researcher should explore studies on learners' self-concept, challenges and performance in mathematics effective for different types of learners.

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Affiliations and Corresponding Information

Ismael M. Andam
Datu Mitmug Memorial National High School
Department of Education – Philippines

Omar Q. Hussein, PhD
St. Peter's College – Philippines