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STRESS COPING STRATEGY, TEST-TAKING-STRATEGY AND THE PERCEIVED LEVEL OF MATHEMATICAL SKILLS IN MATHEMATICS IN THE MODERN WORLD (MMW)

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ABSTRACT

This study aimed to determine the significant effect of the Stress Coping Strategy and Test Taking Strategy on the Perceived level of Mathematical Skills of students in Mathematics in the Modern World at Agusan del Sur State College of Agriculture and Technology (ASSCAT). There was a total of 169 respondents, which were comprised of BSEd-Mathematics, BSEd-Science, BSEd-English, and BEEd students, which were identified through a proportional stratified random sampling technique. The researchers utilized various data gathering tools, including questionnaires from the studies of Oliva, Ricablanca, Bacus, and Moneva (2019) for Coping Strategy, Bicak (2013) for Test Taking Strategy, and Cornillez, Jordan, and Yocte (2020) for the Perceived level of Mathematical Skills in MMW. The statistical tools used were mean, Pearson Product-Moment Correlation, and Multiple Regression analysis. The result of the study showed that the level of coping strategy and test-taking strategy were all described as high, and the level of mathematical skills was described as good. Furthermore, the result revealed that there was a strong positive relationship between the coping strategy and the test-taking strategy, which correlates to the level of mathematical skills of students in MMW. In addition, it was found that the Coping Strategy and Test Taking Strategy can significantly affect the level of Mathematical Skills of Students and can be summarized by a model Y= 0.500X1 + 0.357X2.

KEYWORDS: *Stress coping Strategy, Test Taking Strategy, Perceived Level in Mathematical Skills, Predictive -Correlation, Philippines*

INTRODUCTION

Mathematics in the Modern World (MMW) is one of the new general education courses offered at the tertiary level. It aims to provide students with a broader range in developing individuals' intellectual, technical, ethical, and practical competencies (Taban, Tactay & Martinez,2023). With that, mathematical skills are crucial in learning Mathematics in the Modern World subject. It trained students with the necessary mathematical knowledge and skills to become competent and excellent graduates (Cornillez, Jordan & Yocte, 2020). Additionally, mathematical skills must be acquired by the students as they form the foundation for learning mathematics and correspond directly to each student's future and success in life (Pitogo & Oco,2023). However, poor foundational mathematics skills are one of the major concerns in the Philippines. The foundational mathematics skills of Filipino students continued to decline between 2003 and 2019 in the country and it was discovered that not all higher-grade students master the skills that are taught (Igarashi & Suryadarma, 2023).

The students must acquire foundational mathematics skills to manage difficulties and make necessary connections within the content material or fully understand higher-level mathematical concepts (Wriston,2015). Therefore, stress-coping strategies may contribute to understanding students' engagement with mathematics to increase mathematical skills (Goller, 2022). Understanding strategies and gaining self-knowledge, in the form of awareness, help students to control such difficulties (Nisbet & Shucksmith,2017). Moreover, according to a Philippine study of Oliva et al., (2019) that, there is enhancement of their mathematical skill in math if they cope with the problems. Providing strategy instructions would help students alleviate their concerns, study materials effectively, and perform well on tests (Hong, Sas & Sas, 2006). Thus, the test-taking strategy also affects mathematical skills. Students who are familiar with test-taking strategies are better able to demonstrate their knowledge and skills in the subject being tested. Test-taking strategies also improve the overall validity of test scores, as scores reflect students' knowledge more accurately and serve as a basis to determine if students have effectively acquired the necessary mathematical skills (Peng, Hong & Mason, 2014).

Several studies have been conducted on mathematical skills. Cornillez, Jordan, and Yocte (2020) found a strong connection between students' perceptions of the importance of mathematical skills and their actual level of mathematical skills. Additionally, Apino and Retnawati (2017) mentioned that developing various mathematical skills equips learners with the ability to think logically, analytically, systematically, critically, innovatively, and creatively, as well as the ability to cooperate. In addition, a study conducted by Repollo, Burlado, and Doronio (2024) at Agusan del Sur State College of Agriculture and Technology, Trento Campus, found that the level of mathematical skills is

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moderately satisfactory, with an average score of 2.50, equivalent to the range of 80-82%. After conducting a thorough review, it is evident that there is limited literature on the interplay between mathematical skills, stress-coping strategies, test-taking strategies, and perceived levels of mathematical skills in the modern world on the Main Campus of Agusan del Sur State College of Agriculture and Technology. Therefore, this study aims to address the gap by examining the effects of stress-coping strategies and test-taking strategies on the level of mathematical skills among students enrolled in MMW during the post-pandemic era.

In response to the challenges in mathematics education in the Philippines, it became necessary to explore potential solutions to this issue. The study aimed to investigate how coping strategies and test-taking approaches impact the development of mathematical skills in the modern world (MMW) during the post-pandemic era.

Research Questions

The primary purpose of this study was to determine the significant effect of the Coping Strategy and Test-Taking Strategy on the Acquired Mathematical Skills among the Students in Mathematics in the Modern World (MMW) at Agusan del Sur State College of Agriculture and Technology. Specifically, this study intends to answer the following objectives:

1. to describe the level of Stress Coping Strategy in terms of:
   1.1 Content;
   1.2 Skills; and
   1.3 Attitudes.
2. to assess the level of Test-Taking Strategy in terms of:
   2.1 Time management;
   2.2 Item analysis;
   2.3 Distracter Selection; and
   2.4 After test.
3. to assess the Perceived Level of Mathematical Skills of Students in MMW;
4. to determine the significant relationship between Stress Coping Strategy and Perceived Level of Mathematical Skills;
5. to determine the significant relationship between the Test-Taking Strategy and the Perceived Level of Mathematical Skills; and
6. to determine the significant effect of the Stress Coping Strategy and Test-Taking Strategy on the Perceived Level of Mathematical Skills.

METHODS

This study used a quantitative research design, specifically the predictive-correlational technique, to investigate the significant effect of the Coping Strategy and Test-Taking Strategy on the Perceived level of Mathematical Skills of Students in Mathematics in the Modern World (MMW) in Agusan del Sur State College of Agriculture and Technology. This study design seeks to forecast future results by analyzing the relationships between variables. This study surveyed 1st and 2nd-year College of Teacher Education (CTE) students from BSEd-English, BSEd-Science, and BSEd-Mathematics and BEED students of Agusan del Sur State College of Agriculture and Technology, Bunawan, Agusan del Sur, Philippines. The sample size was determined using Slovin's Formula and proportional stratified sampling techniques. This study used three questionnaires: the Stress Coping Strategy (Oliva, Ricablanca, Bacus, & Moneva, 2019), the Test-Taking Strategy (Bicak, 2013), and the Perceived Level of Mathematical Skills (Cornillez, Jordan, & Yocte, 2020). The researchers obtained permission from the college president's office to conduct a study at Agusan del Sur State College of Agriculture and Technology. Data was collected from 1st year and 2nd year students from the College of Teacher Education during the first semester of the Academic Year 2023-2024. The survey was conducted using survey questionnaires, and the researchers personally administered the survey to ensure that respondents understood the main purpose and confidentiality was assured. The data was analyzed using tools like mean, Pearson's Product-Moment Correlation, and multiple regression analysis to attain the following objectives of the study

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Geographical Map

RESULT AND DISCUSSION

Level of Stress Coping Strategy

Table 1 reveals that students show a high level of Coping Strategies in terms of Content, Skills, and Attitudes, with a mean value of 3.12. This indicates that students effectively deal with challenges in learning mathematics by using various strategies. In addition, the overall standard deviation is 0.43 implies a relatively tight clustering around the mean, which is less than one denoting that the respondents have ratings that are practically almost the same. Students demonstrate a high level of coping skills by effectively utilizing strategies including seeking social support, positive reappraisal, confronting coping, and planful problem solving to overcome struggles in learning mathematics. Some of these strategies include seeking social support, positive reappraisal, confronting coping, and planful problem-solving (Kalamazh & Tymoshchuk,2023).

Table 1. Level of Stress Coping Strategy

Coping Strategy	Mean	SD	Description
Content	3.10	0.49	High
Skills	2.96	0.52	High
Attitudes	3.30	0.43	Very High
Overall Mean	**3.12**	**0.43**	**High**

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Level of Test-Taking Strategy

Table 2 connotes that the level of Test-taking Strategy obtained a value of 3.07, indicating a high level of test-taking strategy usage. This suggests that incorporating these effective strategies can greatly enhance students' exam performance and contribute to their overall academic success. In addition, the overall standard deviation is 0.45 implies a relatively tight clustering around the mean, which is less than one denoting that the respondents have ratings that are practically almost the same. Students employing very high-level test-taking strategies, including reading all options, selecting the best one, and demonstrating strong meta-cognitive skills, are associated with positive learning outcomes and testing performance. Moreover, students utilizing high-level test-taking strategies aim to quickly answer questions using the provided information and then assess if the obtained score meets their target (Rivai,2019).

Table 2: Level of Test-Taking Strategy

Test Taking Strategy	Mean	SD	Description
Time Management	2.85	0.54	High
Item Analysis	3.15	0.56	High
Distracter Selection	3.27	0.54	Very High
After Test	3.04	0.56	High
Over-all mean	**4.14**	**0.45**	**High**

Perceived Level of Mathematical Skills in MMW

The Perceived level of Mathematical Skills of Students in MMW obtained a mean of 2.96, indicating a good level of mathematical skills among the students. This suggests that the students have a good grasp of mathematical concepts in the modern world. In addition, the overall standard deviation is 0.62 implies a relatively tight clustering around the mean, which is less than one denoting that the respondents have ratings that are practically almost the same. Acquiring good mathematical skills promotes critical thinking, reasoning, and creativity, which in turn helps students excel in mathematics education (Ellvan & Edig,2022).

Table 2: Perceived Acquired Level of Mathematical Skills in MMW

Perceived Level Mathematical Skills in MMW	Mean	SD	Descriptive Level
1. I can identify the Fibonacci sequence.	3.31	0.65	Very Good
2. I can identify patterns in nature and regularities in the world.	3.10	0.66	Good
3. I can articulate the significance of mathematics in human life.	3.18	0.69	Good
4. I can determine the significance of mathematics in predicting the behavior of nature and phenomena in the world.	3.18	0.69	Good
4. I can determine the significance of mathematics in predicting the behavior of nature and phenomena in the world.	2.92	0.67	Good
5. I can explain the nature of mathematics as a language.	2.85	0.72	Good
6. I can calculate sets, functions, relations and binary operations.	2.99	0.64	Good
7. I can use some basic concepts of elementary logic such as connective, quantifiers, negations, and variables.	3.15	0.65	Good
I can use a calculator properly to solve mathematical and statistical problems.	3.29	0.64	Very Good
9. I can find connections between mathematical ideas.	3.01	0.63	Good
10. I can reflect on my mathematical reasoning.	2.91	0.69	Good
11. I can prove a given conjecture.	2.68	0.69	Good
12. I can justify my answer to my given solution.	3.01	0.67	Good
13. I can apply the given for solving problems in multiple contexts.	2.91	0.66	Good
14. I can develop my conjecture.	2.77	0.51	Good
15. I can use various forms of reasoning to problem solve.	2.92	0.69	Good

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16. I can use appropriate inductive and deductive reasoning.	2.92	0.68	Good
17. I can use appropriately Polya's 4-steps in solving real-world problems.	2.71	0.50	Good
18. I can use different mathematical strategies in solving.	2.89	0.76	Good
19. I can solve real-world problems related to simple interests.	2.98	0.71	Good
20. I can solve real-world problems related to compound interest.	2.96	0.68	Good
21. I can solve real-world problems related to credit cards and consumer loans.	2.81	0.71	Good
22. I can explain the difference between data, information, and variables.	3.04	0.70	Good
23. I can determine the appropriate level of the measurement scale of a given variable.	2.79	0.67	Good
24. I can construct different graphical presentations appropriate to a given data set.	2.76	0.68	Good
25. I can calculate the measures of central tendency (mean, weighted mean median, and mode) of a given data set.	3.24	0.68	Good
26. I can calculate the measures of dispersion (range, variance, and standard deviation) of a given data set.	3.17	0.73	Good
27. I can calculate the correlation between two variables.	2.99	0.55	Good
28. I can calculate the linear regression between variables.	2.85	0.64	Good
29. I can distinguish the use of correlation and linear regression.	2.85	0.62	Good
Overall Mean	**2.96**	**0.63**	**Good**

Relationship between Stress Coping Strategy and the Level of Mathematical Skills in MMW

With regards to the relationship between Stress Coping Strategies and the Perceived level of Mathematical Skills of Students in MMW. The overall computed r-value is 0.702, which signifies a positive strong correlation, and a p-value of .000, which means highly significant. This result indicates that there is a significant correlation between the Coping Strategy and the acquired level of mathematical Skills in MMW since the p-value is lower than 0.05, the level of significance set in this study. The result implies that any variance in the level of Coping Strategy has a corresponding variance in the Perceived level of Mathematical Skills of Students in MMW. This result supports the study of Yosa, Amir, and Wardana, (2020) which found that there is a positive relationship between stress coping strategies and the mathematical skills of students. Therefore, students with inadequate mathematical skills and difficulties in learning mathematics can significantly improve through coping strategies.

Table 4. Significant Relationship between Coping Strategy and the Acquired Level of Mathematical Skills in MMW.

	Level of Mathematical Skills		
	r-value	**p-value**	**Remarks**
Coping Strategy	0.70	0.00	Highly Significant

Relationship between Test-Taking Strategy and the Acquired Level of Mathematical Skills in MMW

As to the relationship between Test-taking Strategies and the level of Mathematical Skills of Students in MMW. The overall computed r-value is 0.668, which signifies a strong positive correlation, and a p-value of 0.000, which means highly significant. This result indicates that there is a significant correlation between the taking Strategy and the Acquired Mathematical Skills since the p-value is lower than 0.05, the level of significance set in this study. The result implies that any variance in the level of Test-Taking Strategy has a corresponding variance in the level of Acquired Mathematical Skills. Test-taking strategies jointly do have a significant relationship on the students' mathematical skills. It is recommended to adopt test-taking strategies to measure and evaluate the extent of the mathematical skills of the students(Igwe & Orluwene, 2019).

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Table 5. Significant Relationship between Test-Taking Strategy and the Level of Mathematical Skills in MMW.

	Level of Mathematical Skills		
	r-value	**p-value**	**Remarks**
Test Taking Strategy	0.69	0.00	Highly Significant

Multiple Regression Analysis in determining the significant effect of Stress Coping Strategy and Test-Taking Strategy on the Perceived Level of Mathematical Skills

The result of the regression analysis shows that the Coping Strategy and Test Taking Strategy can significantly affect the Acquired Mathematical Skills of Students because their p-value of 0.000 is lower than 0.05, the level of significance set in this study. The equation is summarized as $Y = 0.50\ X_1 + 0.357\ X_2$ where Y is the Perceived Level of Mathematical Skills, X_1 refers to the Stress Coping Strategy and X_2 refers to the Test-Taking Strategy. This implies that if researchers held another variable as constant, every 1 unit increase in two independent variables will have a corresponding 0.500 and 0.357 unit increase in the Acquired Mathematical Skills of Students in MMW. Moreover, based on the r^2- value, the independent variables in this study can only contribute 55.5% to the dependent variable. This further implies that the remaining 44.5% are not covered in this study. Students in a Mathematics course highlight the significance of coping mechanisms like technological skills and positive attitudes in overcoming struggles and improving students' mathematical skills. Different test-taking strategies on exam performance, indicate that satisfaction with performance and specific coping strategies can predict students' grades (Ristic & Zlatkovic, 2021).

Table 6. Multiple Regression Analysis in determining the significant effect of Coping Strategy and Test-Taking Strategy on the Level of Mathematical Skills in MMW.

Variables	**Level of Mathematical Skills**			
	Unstandardized Coefficient	**t**	**p-value**	**Remarks**
Constant	0.31	1.66	0.10	Not Significant
Coping Strategy	0. 50	6.37	0.00	Highly Significant
Test Taking Strategy	0.36	4.81	0.00	Highly Significant
r^2	**0.56**			
F	**103.62**			
p	**0.000**			

CONCLUSION

Based on the findings of the study, the following conclusions were drawn: First, the level of Coping Strategy was evident. Second, the level of the Test-Taking Strategy was often observed. Third, the level of the Acquired Mathematical Skills of the students in MMW was good. It is concluded any variance in Coping Strategy and Test Taking Strategy has a corresponding variance in the level of Mathematical Skills of Students in MMW. Lastly, Coping Strategy and Test Taking Strategy has a corresponding effect on the level of Mathematical Skills and can be summarized by a model $Y = 0.500X_1 + 0.357X_2$ which implies that if researchers held another variable as constant, every 1 unit increase in two independent variables will have a corresponding 0.500 and 0.357 unit increase in the level Mathematical Skills of Students in MMW.

Recommendation

Based on the results of this study, the following recommendations were drawn:

1. The administrators, as catalysts for institutional advancement, can provide insights to initiate strategies, policies, and practices that create a conducive learning environment promoting mathematical success.
2. Mathematics teachers can improve their teaching methods by customizing their approaches to better assist students who are struggling with learning. They can use different strategies such as motivation, teaching effective test-taking techniques, and making activities more interesting and applicable to help improve students' math abilities. This will also contribute to developing math skills for practical use, as discussed in this study.
3. Furthermore, students can use a variety of strategies to improve their math skills and do well in their math classes and future careers. They can use stress-coping and test-taking strategies such as seeking help, reviewing examples, and eliminating wrong answers. These strategies can help students improve their math skills and

succeed academically.

4. Researchers can gain insights and information on how stress-coping strategies and test-taking strategies affect the mathematical skills of students in MMW. The result of this study may serve as their reference to conduct relevant studies.

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