researchvision.us

Symmetria : Journal of Advanced Physics and Mathematical Review
Vol.1 | No. 1 | 2024 pp. 18–31 |ISSN: XXXX-XXXX

Mathematical Skills of Alternative Learning System(Als) Learners of Schools Division of Candon City

Trisha Lyn A. Garrino,[1]

[1] Ilocos Sur Polytechnic State College Tagudin, Ilocos Sur

E-mail: trishalyn.alcaide@deped.gov.ph

Submitted: 25-Nov, 2024
Accepted: 26-Nov, 2024
Published: 12-Dec, 2024

Vol. 1, **No.** 1, 2024.
10.62762/SJAPMR.2024.000000

***Corresponding author:**
Trisha Lyn A. Garrino[1]
trishalyn.alcaide@deped.gov.ph

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

http://creativecommons.org/licenses/by/4.0/

Open Access

Abstract

This study determined the Mathematical Skills of the Alternative Learning System (ALS) learners of the Schools Division of Candon City during the SY 2023-2024 and its relationship to their profile, study habits, and attitude towards Mathematics. The study used the descriptive-correlational research design and used 96 Junior High School learners as sample respondents. A 50-item teacher-made test and an adopted questionnaire were used to gather the needed data. Frequency count, percentage, mean, and Pearson r were the statistical tools used. It was found out that their study habits are not significantly related to their level of Mathematical Skills and their attitude towards Mathematics is also not significantly related to their level of Mathematical Skills. The findings recommend ALS teachers are encouraged to employ differentiated teaching methods that consider individual learner characteristics such as age, parental background, and socio-economic status; and parental involvement programs should also be implemented to better support learners' Mathematics education regardless of parents' educational background and programs addressing math-related anxieties and building confidence should be introduced; also positive reinforcement through timely feedback and celebrating small successes can help foster a more positive relationship with Mathematics.

Key words: Alternative Learning System, attitude towards mathematics, Mathematical Skills, study habits

Introduction

Problem solving is one of major aspect in Mathematics curriculum which required students to apply and to integrate many mathematical concepts and skills as well as making decision (Tambychick & Meerah, 2010). It helps students to experience on how to solve daily life problems by applying their mathematical knowledge and skill (Osman, et al., 2018). It helps them conquer the day-to-day challenges that they encounter. Mathematicians have always understood that problem-solving is central to their discipline because without a problem there is no mathematics (Klerlein & Hervey, 2022). When children tackle problems on their own, or

in a group, they become resilient, and learn to look at challenges from a fresh perspective making effective problem-solving skills contribute to a happier, more confident, and more independent" individuals (Mission Minded, 2020). Hence, it is important that every person is equipped with problem solving skills.

Meanwhile, Genio (2012) found out alarming decline in teachers' competencies, particularly their lack of mathematical mastery, is where the absence of quality in Mathematics instruction is most obvious. Similarly, Gumallaoi (2012) also stated that the lack of instructional materials and the teachers' failure to employ the proper methods and strategies contributed to the students' poor performance in Mathematics. A lot of research accounts support this idea over years.

During the first four years of teaching in ALS, the researcher observed that the ALS learners can hardly understand their lessons in Learning Strand 3 (LS3) Mathematical and Problem-Solving Skills. They can hardly even multiply and divide numbers. The consolidated result of the Functional Literacy Test (FLT) Pre-Test of the ALS learners of School Year 2021-2022 supports this idea with only 55.54% of the ALS Junior High School (JHS) learners got the answers correctly in the particular learning strand and has the lowest percentage compared to the other learning strands. The result of the lately consolidated FLT (Pre-Test) of ALS learners of School Year 2023-2024 still reveals that LS3 Mathematical and Problem-Solving Skills has the lowest percentage of learners who got the items correctly with 59.17%.

Based on these observations, the researcher attempted to carry out a study on the Mathematical Skills of learners of the Alternative Learning System of Schools Division of Candon City, which might aid in enhancing their abilities and performance.

Statement of the Problem

This research study was conducted to determine the mathematical skills of learners of the Alternative Learning System (ALS) in Candon City Division. Specifically, this research study sought to answer the following questions:

1. What is the profile of the ALS learners along?

a. age;

b. age of parents;

c. approximate monthly income of the family;

d. highest educational attainment of parents; and

e. occupation of parents?

2. What is the extent of practice of the study habits ALS learners?

3. What is the attitude of the ALS learners towards Mathematics?

4. What is the level of mathematical skills of the ALS learners along:

a. concepts and facts;

b. general skills;

c. thinking and reasoning; and

d. metacognition?

1. Is there significant relationship between the profile and the level of Mathematical Skills of the ALS learners along the considered dimensions?

2. Is there significant relationship between the study habits of ALS learners and their level of Mathematical Skills along the considered dimensions?

3. Is there significant relationship between the attitude of ALS learners towards Mathematics and their level of Mathematical Skills along the considered dimensions?

Hypotheses

This study adheres to the following hypotheses:

1. There is no significant relationship between the profile and the level of Mathematical Skills of the ALS learners along the considered dimensions.

2. There is no significant relationship between the study habits of ALS learners and their level of Mathematical Skills along the considered dimensions.

3. There is no significant relationship between the attitude of the ALS learners towards Mathematics and their level of Mathematical Skills along the considered dimensions.

Literature Review

The paper conducted by Alhajraf & Alasfour (2014) entitled The Impact of Demographic and Academic Characteristics on Academic Performance revealed that demographic profile which includes the student's age is significantly related to academic performance of business students.

In the study conducted by Magulod (2019), they spelled differences in their study habits of students in applied science courses when grouped according to academic standing in high school, writing skills, mothers' education, and test anxiety. Finally, there were significant relationships between learning styles, study habits and academic performance of students in applied science courses. Alavi and Toozandehjani (2017) concluded that having a background of the learning styles of students can enhance their learning and at the same time help students

strengthen self-actualization.

According to Marpa (2014), students with effective study habits are better able to select, analyze, critique, and synthesize information as well as perform other critical reflection abilities. Similarly, he claims that study habits are learning inclinations that allow students to work independently. (Svensson, Abel, Dalman, & Magnusson, 2011) noted that the main goal of study should be comprehension when describing strong fundamental study habits. One must focus on this for an extended period of time rather than moving quickly.

Effective habits of study include plan/place, a definite time table and taking brief of well-organized notes. The main goal of instruction is to enable students to learn, and the role of the teacher is to facilitate the learning process and help students develop study habits and the right attitude toward learning. Good study habits are "good asset to learners because they assist learners to attain mastery in areas of specialization and consequent excellent performance, while the opposite constitute constraints to learning and performance leading to failure."

Meanwhile, it is possible to view attitudes as mostly good. Similar to how a bad attitude toward Mathematics correlates with a negative emotional disposition, a positive attitude toward Mathematics indicates a positive emotional disposition toward the topic. These emotional tendencies influence a person's conduct because they make them more likely to perform well in subjects, they find enjoyable, confident in, or helpful. A study in Tanzania shows that initially students exhibit a positive attitude towards Mathematics, but their attitude becomes less positive as the students move forward to higher levels of education. A significant positive weak correlation between students' attitude and performance was established (Mazana, Montero, & Casmir, 2019).

It is crucial that students have the chance to apply the Mathematics they have learned to real-world scenarios, to solve a variety of challenging problems in original and creative ways, and to have a thorough comprehension of the subject matter. Additionally, students must cultivate a favorable attitude toward Mathematics and their own mathematical endeavors. Students gain confidence in their capacity to reason, choose approaches, apply knowledge, and defend their positions when they are given the chance to think, reason, and work mathematically (Peter, Bailey, Taylor, & Hunter, 2017).

Merrienboer (2013) investigated viewpoints on instruction and problem solving. It was found that problem solving should involve both structured and unstructured problem solving, as well as problem solving from the actual world. In the framework of multiple choice scientific problems, visual attention was examined by (Tsai, Hou, Lai, Liu, & Yang, 2012). Studies show that whereas incompetent problem solvers had trouble interpreting the situation, identifying pertinent details, and controlling their attention, proficient problem solvers focused more on

crucial elements.

Van Harpen and Presmeg (2013) investigated the relationship between students' understanding of mathematical material and their capacity to formulate mathematical problems. This study suggests that engaging in mathematical problem-posing activities promotes the growth of original mathematical ideas. Singer and Voica (2013) looked into the effects of problem solving on task design. This study offers strategies for improving instruction and can be applied to problem analysis and issue questioning to generate more pertinent problems for in-depth learning.

Alternative Learning System (ALS) is a system of learning that allows students to finish school faster while also shortening their experiences. Despite offering less fortunate individuals a chance, it also gives learners the opportunity to enhance their way of life.

Furthermore, the Alternative Learning System is a parallel learning system in the Philippines that offers a practical alternative to the present official school curriculum. When a person does not have or cannot access formal education in schools, ALS serves as a replacement. ALS encompasses both academic and informal sources of information and skills (Peralta, 2010). Many Filipinos are unable to attend and complete their education for a variety of reasons. Some students drop out of school, while others live in areas where there are no schools. It might also be due to a student/peer aspect, a teacher factor, the subject topic, the atmosphere, financial assistance, or anything else. Because every Filipino has the right to free basic education, the government established the ALS to give all Filipinos the opportunity to access and finish basic education in a way that suits their unique circumstances and requirements.

All of the aforementioned literature and studies give the researcher with invaluable insight and guidance via careful examination of the data and resources obtained. Likewise, the researcher was advised on the research design and statistical tools to be used.

Materials and Methods

This study employed a descriptive - correlation research design with a questionnaire checklist and teacher-made test as the major instrument. A descriptive correlational method refers to a type of study in which information is collected without making any changes to the study subject (Writer, 2015). Descriptive Statistics was used to analyze quantitative data. Sub – problem number 1 was treated with frequency count and percentage. Sub-problem numbers 2, 3, and 4 were treated with mean. Sub-problems number 5, 6, and 7 were treated using the Pearson Product Moment Correlation (Pearson r) through the Statistical Package for Social Sciences (SPSS).

This study used the validated and reliability tested researcher-made test in Mathematics to

measure and assess the skills of the ALS learners in solving mathematical problems. The 50-item teacher-made test was crafted and aligned to the current modules of ALS in Learning Strand 3-Mathematical and Problem Solving Skills. Five experts in the area of Mathematics validated the test using a 5-point scale with a mean of 4.4 described as Excellent. The test has a reliability of 0.72 described as Respectable. The test was administered to the randomly selected ALS learners of Candon City Division.

Results and Discussion

The data generated from the research instruments based on the objectives of the study as incorporated in the statement of the problem are hereby discussed.

Profile of Learners

The table shows that a great percentage of the respondent's father's highest educational attainment is on high school level, which marks as 23 (23.96%). This indicates that parental support has a negative impact on students' academic performance and cannot motivate them to study.

Table 1. Profile of the ALS Learners along Age, Age of Parents, Approximate Monthly Income of the Family, Highest Educational Attainment of Parents, and Occupation of Parents

Profile				
	f		%	
Age of Learner				
49-56	3		3.12	
41-48	2		2.08	
33-40	9		9.38	
25-32	13		13.54	
16-24	69		71.88	
Total	96		100.00	
Age of Parents	Father		Mother	
	f	%	f	%
69-77	2	2.08	2	2.08
60-68	20	20.84	15	15.63
51-59	26	27.08	23	23.95
42-50	36	37.50	40	41.67
32-41	12	12.50	16	16.67
Total	96	100.00	96	100.00
Approximate Family's Monthly Income	f		%	
20,001 and above	6		6.25	
15,001 – 20,000	6		6.25	
10,001 – 15,000	11		11.46	
5001 – 10,000	28		29.16	
Below 5,000	45		46.88	

Total	96		100.00	
Highest Educational Attainment of Parents	Father		Mother	
	f	%	f	%
Masteral Graduate	1	1.04	0	0.00
College Graduate with Masteral Units	0	0.00	1	1.04
College Graduate	4	4.17	9	9.38
College Level	7	7.29	4	4.17
Vocational/Technical	1	1.04	1	1.04
High School Graduate	21	21.88	19	19.79
High School Level	23	23.96	23	23.95
Elementary Graduate	20	20.83	18	18.75
Elementary Level	19	19.79	21	21.88
Total	96	100.00	96	100.00
Occupation of Parents	Father		Mother	
	f	%	f	%
Unemployed	23	23.96	60	62.50
Sideliner	3	3.13	4	4.17
Farmer	46	37.50	12	12.50
Vendor	4	4.16	4	4.17
Laborer	7	7.29	0	0.00
Carpenter	14	14.58	0	0.00
Driver	3	3.13	0	0.00
Family Business Manager	5	5.21	5	5.20
Barangay Official	0	0.00	3	3.13
OFW	1	1.04	8	8.33
Total	96	100.00	96	100.00

Legend: f – frequency

Meanwhile, a great percentage also of the respondents' mothers have attained a high school level of education with a frequency count of 23 (23.95%). This research indicates that mothers of the respondents are not highly educated and do not possess the motivation to encourage their children to pursue their education. This demonstrates that a mother's educational attainment has a big influence on her children's schooling.

In a recent study, Carneiro, Meghir, and Parey (2014) expand on this idea. They discovered compelling evidence that the home environment and a child's educational success are influenced by the mother's education. This result means that majority of the ALS learners' mothers are unemployed but treasured education that is why they are still supporting the learners to achieve their goal and reach their dreams despite the challenges in life. Thus, it implies that no matter what your parents' occupation, if there is support, motivation and encouragement from them, their children will be motivated to study hard.

Study Habits of Learners

Table 2 presents the different study habits of the respondents is Highly Practiced as it has an overall mean of 3.55. It is also gleaned that setting study goals for themselves is highly

practiced with a mean of 4.00. It was followed by dedicating time for studying with a mean of 3.91 which is also highly practiced. Next to it is studying where it's quiet and with little distractions with a mean of 3.89 and it is highly practiced. This implies further that the ALS learners highly practice most of the study habits and setting study goals can be beneficial to every student because it can help an individual set their priorities, know what to do and focus on the strategy or techniques on how to reach their goals.

Indicators	Mean	DER
1. I set study goals for myself.	4.00	HP
2. I study where it's quiet with little distractions.	3.89	HP
3. I have all the supplies I need for my studies (ex. Pen, paper, etc).	3.41	HP
4. I take short breaks when I study.	3.74	HP
5. I put my notes in my own words to understand the material better.	3.55	HP
6. I study with a friend or a group.	2.92	MP
7. I complete and turn in all my assignments on time.	3.36	MP
8. I can tell the difference between materials I know really well and materials I don't know.	3.42	HP
9. I start studying days before I have to take a test or quiz.	3.30	MP
10. I dedicate time for studying.	3.91	HP
Overall Mean	3.55	HP

Legend: DER- Descriptive Equivalent Rating

HP – Highly Practiced

MP – Moderately Practiced

Research supports the idea that individuals have unique learning styles and that study habits may work differently for each student. For example, the Felder-Silverman Learning Style Model (FSLSM) highlights how students can have varied preferences across dimensions like visual or verbal, active or reflective, and sensing or intuitive, which significantly affect how they learn best (Magulod, 2019). Similarly, studies have shown that students' learning styles vary based on factors such as academic discipline, gender, and learning environment (Maya, Luesia, & Padilla, 2021). This underscores the fact that what works for one student may not be effective for another.

Attitude of Learners Towards Mathematics

Table 3 shows the attitude of the learner-respondents towards Mathematics.

Table 3. Attitude of ALS Learners Towards Mathematics

	Mean	DER
1. Mathematics is a very worthwhile and necessary subject.	4.24	SA
2. I want to develop mathematical skills.	4.14	A
3. I get a great deal of satisfaction out of solving a mathematical problem.	3.96	A
4. Mathematics is important in everyday life.	4.23	SA

5. Mathematics is one of the most important subjects for people to study.	4.31	SA
6. I have a lot of self-confidence when it comes to Mathematics.	3.15	N
7. I learn Mathematics easily.	2.96	N
8. I usually enjoy studying Mathematics at school.	3.27	N
9. Mathematics does not scare me at all.	3.05	N
10. I am able to solve mathematical problems without too much difficulty.	2.80	N
11. I like to solve new problems in Mathematics.	3.33	N
12. I believe studying math helps me with problem solving in other areas.	4.05	A
Over-all Mean	3.62	A

Legend: *DER- Descriptive Equivalent Rating*
SA – Strongly Agree
A – Agree
N – Neutral

The table shows that the ALS learners agree on the presented attitudes toward Mathematics with an over-all mean of 3.62. Amend to this; Mathematics is one of the most important subjects for people to study and is strongly agreed with a mean of 4.31. The context that Mathematics is a very worthwhile and necessary subject and is also strongly agreed by the learners with a mean of 4.24. Viewing Mathematics as important in everyday life is also strongly agreed with a mean of 4.23.

The implication of this finding is that ALS learners agree on the different attitudes toward Mathematics and are open to learning it as one of the key subjects to improve their problem-solving abilities for everyday challenges. This suggests that even though they find Mathematics difficult to understand, they are still willing to learn it. Despite the struggles, many learners still exhibit a strong desire to improve and succeed in math through problem-focused strategies and effort (Russo & Minas, 2020).

Moreover, research also highlights that students are aware of the long-term benefits of mastering mathematical concepts, which encourages them to persist even when faced with difficulties Gafoor & Kurukkan's (2015). This willingness can be further supported by teachers providing real-life math problems that challenge students to understand and solve, fostering a mindset of perseverance and growth in the subject (Vidad, 2019).

Mathematical Skills of Learners

Table 4 reveals the level of Mathematical Skills of the learner-respondents along the four dimensions namely concepts and facts, general skills, thinking and reasoning, and metacognition.

Table 4. Level of Mathematical Skills of ALS Learners

Skill	Mean	DER
Concepts and Facts	5.17	FS
General Skills	4.61	FS
Thinking and Reasoning	6.65	FS
Metacognition	3.05	FS
Overall Mean Score:		19.49 (FS)

Legend: FS – Fairly Satisfactory

The table shows that the level of Mathematical Skill of the respondents is fairly satisfactory with an overall mean of 19.49. It is also seen on the table that the Mathematical Skill of the respondents in concepts and facts is fairly satisfactory with a mean of 5.17. Meanwhile, their general skill in Mathematics is 4.61 which is also fairly satisfactory. This implies that the ALS learners' level of Mathematical Skills is fairly satisfactory.

Correlation Analysis Between the Profile of the Learners and their Mathematical Skills

Table 5 presents the relationship between the profile of the learner-respondents and their Mathematical Skills along concepts and facts, general skills, thinking and reasoning, and metacognition.

Table 5. Relationship Between the Profile of the ALS Learners and their Mathematical Skills

Profile	Concepts and Facts	General Skills	Thinking and Reasoning	Metacognition	Overall
Age	-0.182	0.002	-0.139	-0.005	-0.122
Father's age	-0.105	0.006	-0.109	-0.056	-0.094
Mother's age	-0.107	0.035	-0.061	0.016	-0.047
Family Monthly Income	0.014	-0.063	0.177	0.219*	0.117
Highest Educational Attainment of Father	0.186	0.040	0.177	-0.023	0.147
Highest Educational Attainment of Mother	0.078	-0.084	0.141	-0.037	0.054
Occupation of Father	-0.013	-0.157	0.009	0.065	-0.035
Occupation of Mother	-0.123	0.023	0.123	0.091	0.048

*Legend: * - Significant @ .05 level of significance*

The result implies that age of the respondents has no effect or impact on their level of Mathematical Skills. Thus, there is no age requirement as long as you are willing to continue to learn and enhance your skills. Their parents' ages also have no effect on their level of Mathematical Skills. Hence, whatever the ages of their parents are, still they are able to support their children's education. Overall, the monthly income of their family has also no effect on their level of Mathematical Skills.

Research indicates that math performance is influenced by anxiety levels across different age groups, showing that older and younger students alike can experience similar impacts on their skills based on their emotional responses to math (Zhang, Zhao, & Kong, 2019). Moreover, the relationship between early numeracy skills and later achievement in mathematics suggests that foundational abilities established early on tend to predict mathematical performance better than demographic factors like age (Chang, 2023).

Correlation Analysis Between the Study Habits of the Learners and their Mathematical Skills

Table 6 shows the significant relationship between the study habits of the ALS Learners and

their Level of Mathematical Skills.

Table 6. Relationship Between the Study Habits of the ALS Learners and their Mathematical Skills

	r-value	p-value	Interpretation	Decision
Concepts and Facts	-0.013	.901	NS	Accept Ho
General Skills	0.068	.510	NS	Accept Ho
Thinking and Reasoning	0.101	.327	NS	Accept Ho
Metacognition	0.152	.141	NS	Accept Ho
Overall	0.106	0.303	NS	Accept Ho

Legend: NS – Not Significant @ .05 level of significance

The study habits of the respondents are not significantly related to their level of Mathematical Skills as confirmed by the r-value of .259 and a p-value of .098 which means the null hypothesis was accepted. The result means that every individual has his or her own coping mechanism on how to study Mathematics. Some study habits may not apply in general to the individual differences of the students. Maybe the study habits that are effective to one student cannot be suitable or appropriate to others. This suggests that each student approaches math challenges differently based on their coping style (Skaalvik, 2018).

Correlation Analysis Between the Attitude of the Learners Towards Mathematics and their Mathematical Skills

Table 7 reveals the significant relationship between the attitude of the ALS Learners towards Mathematics and their Level of Mathematical Skills. This result implies that each and every learner has different views or attitudes towards Mathematics.

Table 7. Relationship Between the Attitude of the ALS Learners Towards Mathematics and their Mathematical Skills

	r-value	p-value	Interpretation	Decision
Concepts and Facts	0.104	.314	NS	Accept Ho
General Skills	0.127	.217	NS	Accept Ho
Thinking and Reasoning	0.110	.286	NS	Accept Ho
Metacognition	0.042	.685	NS	Accept Ho
Overall	0.134	0.195	NS	Accept Ho

Legend: NS – Not Significant @ .05 level of significance

Studies have found that while students' attitudes toward math (such as anxiety, enjoyment, or confidence) influence their engagement, they do not necessarily predict their mathematical performance. A meta-analysis highlights that students can still perform well in math even if

their attitudes are neutral or even slightly negative, suggesting that skills and knowledge acquisition may operate independently from emotional or attitudinal factors (Zhang, Zhao, & Kong, The Relationship Between Math Anxiety and Math Performance: A Meta-Analytic Investigation, 2019).

Conclusion

Based from the findings, the following are the conclusions drawn:

1. The ALS learners of Candon City Division possess varied characteristics in terms of age, age of their parents, monthly income of their families, highest educational attainment of their parents, and occupation of their parents.
2. The diverse attitudes that the learners have towards Mathematics is commendable.
3. The learner's level of Mathematical Skills is not impressive and thus needs improvement.
4. Overall, the profile of the learners does not appear to impact their Mathematical Skills; however, family income may play a role in shaping their metacognitive abilities in Mathematics, pointing to a possible area for targeted intervention.
5. The relationship between the study habits of the learners and their level of Mathematical Skills is not significant.
6. There is no significant relationship between the learners' attitude towards Mathematics and their level of Mathematical Skills.

Recommendations

The following are the recommendations offered based on the findings and conclusions of the investigation.

1. ALS teachers are encouraged to employ differentiated teaching methods that consider individual learner characteristics such as age, parental background, and socio-economic status.
2. While learners demonstrate commendable study habits, workshops on advanced study techniques like time management and problem-solving strategies are recommended.
3. To maintain learners' commendable attitudes toward Mathematics, ALS teachers should focus on positive reinforcement. Counseling or motivational workshops can help learners with negative attitudes build confidence and reduce Mathematics anxiety.
4. ALS teachers should develop intervention programs including remedial classes and tutoring with regular assessments for individualized support.
5. Since family income influences metacognitive skills, it is advised to provide additional support to low-income families such as tutoring services and learning materials.
6. Although the relationship between study habits and Mathematical Skills is not significant, teachers should regularly evaluate and guide learners in improving their study routines.
7. Programs addressing math-related anxieties and building confidence should be introduced. Positive reinforcement through timely feedback and celebrating small successes can help foster a more positive relationship with Mathematics.

REFERENCES

Alavi, S., & Toozandehjani, H. (2017). The Relationship Between Learning Styles and Students' Identity Styles. Open Journal of Psychiatry, 90-102.

Carneiro, P., Meghir, C., & Parey, M. (2014). Maternal Education, Home Environments, and the Development of Children and Adolescents. Journal of the European Economic Association, 123-160.

Cerbito, A. F. (2020). Comparative Analysis of Mathematics Proficiency and Attitudes Toward Mathematics of Senior High School Student. International Journal of Scientific and Research Publications, 211-219.

Genio, M. T. (2012). Turn Mathematics to Interesting Discipline. The Modern Teacher, 146.

Magulod, G.C. Jr. (2019). Learning Styles, Study Habits and Academic Performance of Filipino University Students in Applied Science Courses: Implications for Instruction, Journal of Technology and Science Education JOTSE, 184-198

Maya, J., Luesia, J. F., & Padilla, J. P. (2021). The Relationship Between Learning Styles and Academic Performance: Consistency Among Multiple Assessment Methods in Psychology and Education Students. MDPI, 1-18.

Mazana, M. Y., Montero, C. S., & Casmir, R. O. (2019). Investigating Students' Attitude Towards Learning Mathematics. International Electronic Journal of Mathematics Education, 207.

Osman, S., Che Yang, C. N., Abu, M. S., Ismail, N., Jambari, H., & Kumar, J. A. (2018). Enhancing Students' Mathematical Problem-Solving Skills Through Bar Model Visualisation Technique. International Electronic Journal of Mathematics Education, 273-279.

Russo, J., & Minas, M. (2020). Student Attitudes Towards Learning Mathematics Through Challenging, Problem Solving Tasks: "It's So Hard–In a Good Way". International Electronic Journal of Elementary Education, 215-225.

Electronic Sources

Alhajraf, N. M., & Alasfour, A. (2014, March). The Impact of Demographic and Academic Characteristics on Academic Performance. Retrieved from Research Gate: https://www.researchgate.net/publication/314914494_The_Impact_of_Demographic_and_Academic_Characteristics_on_Academic_Performance

Chang, I. (2023, May 24). Early Numeracy and Literacy Skills and their Influences on Fourth-Grade Mathematics Achievement: A Moderated Mediation Model. Retrieved from Springer Open: https://largescaleassessmentsineducation.springeropen.com/articles/10.1186/s40536-023-00168-6

Cooper, K., & Stewart, K. (2020, November 4). Does Household Income Affect Children's Outcomes? A Systematic Review of the Evidence. Retrieved from Springer Link: https://link.springer.com/article/10.1007/s12187-020-09782-0

Cornillez, E. E., Jordan, L. A., & Yocte, J. M. (2020, November). Perceived Importance and Level of Mathematical Skills Among Math and Non-Math Major Students in Mathematics in the Modern World. Retrieved from Research Gate:

https://www.researchgate.net/publication/353605765_Perceived_importance_and_level_of_mathematical_skills_among_math_and_non-math_major_students_in_mathematics_in_the_modern_world

Department of Education. (2019, May). Alternative Learning System K to 12 Basic Education Curriculum. Retrieved from Department of Education: https://www.deped.gov.ph/about-als/

Department of Education. (n.d.). ALS – Frequently Asked Questions. Retrieved from Department of Education: https://www.deped.gov.ph/als-frequently-asked-questions/#:~:text=The%20Alternative%20Learning%20System%20(ALS,pathways%20to%20complete%20basic%20education.

Klerlein, J., & Hervey, S. (2022). Mathematics as a Complex Problem-Solving Activity. Retrieved from Generation Ready: https://www.generationready.com/white-papers/mathematics-as-a-complex-problem-solving-activity/

Mission Minded. (2020, March 19). Why is Problem Solving Important in Child Development. Retrieved from Marlborough: https://www.marlborough.org/news/~board/health-and-wellness/post/why-is-problem-solving-important-in-child-development#:~:text=Solving%20problems%20means%20making%20choices,challenges%20from%20a%20fresh%20perspective.

Peter, M., Bailey, J., Taylor, M., & Hunter, P. (2017). Strengthening Mathematical Thinking and Reasoning Proficiency. Retrieved from The University of Wakaito: https://www.waikato.ac.nz/research/institutes-centres-entities/institutes/wmier/research/projects/strengthening-mathematical-thinking-and-reasoning-proficiency/

Van Harpen, X. Y., & Presmeg, N. C. (2013, May). An Investigation of Relationships Between Students' Mathematical Problem-Posing Abilities and their Mathematical Content Knowledge. Retrieved from JSTOR: https://www.jstor.org/stable/23434200

Zhang, J., Zhao, N., & Kong, Q. P. (2019, August 7). The Relationship Between Math Anxiety and Math Performance: A Meta-Analytic Investigation. Retrieved from Frontiers in Psychology: https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2019.01613/full