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Cambodian Lower Secondary Students' Attitudes towards Mathematics: A Case Study a Remote School in Kandal Province

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Abstract: ***Mathematics is indispensable because it provides the groundwork for scientific understanding, research, and critical thinking. Enhancing students' mathematical skills creates numerous opportunities for personal growth, social contribution, and global impact. Mathematical skills motivate hard work in education and equip students with the tools and knowledge vital for diverse careers that ultimately advance human knowledge and improve society. In addition, mathematics is crucial for building mental strength, encouraging rational thinking, and enhancing the understanding of theory and content across various subjects. This study focuses on seventh - graders between 12 and 13 who were asked about their math skills. The results showed a lot of confidence, a good attitude, and a desire to solve problems. However, students also felt anxious and bored; therefore, teachers should focus on motivation and self - efficacy issues. The findings showed no difference in attitudes between male and female students. The two main aspects of their attitudes toward learning mathematics were that seventh - grade students generally had high efficacy and motivation. The future study relevant to this study should be used with more sample and mixed method.***

Keywords: secondary, mathematics, cognitive, attitudes, efficacy, science

1. Introduction

PISA 2021 emphasized the importance of eight 20th - century mathematical abilities essential for professional success: critical thinking, creativity, research, self - direction, information usage, systems thinking, communication, and replication (Maass et al., 2019). Mathematics is an indispensable tool in comprehending specific phenomena in the modern world (Mohamed & Waheed, 2011). It is a branch of pure science focusing on personal growth and self - awareness (Niss, 1994). Personal growth is crucial to maintaining mental health and dealing with difficulties, changes, and events (Büyükgöze, 2015). As students transition from middle to high school, they face various intellectual, social - emotional, and behavioral challenges. Several studies have examined factors that affect students' ability to cope with stress and other issues (Dyson and Renk (2006; Pritchard et al. (2007; Zhang et al., 2018). It is noteworthy that math anxiety can cause physical pain and affect the brain's symmetrical dorsal posterior insula area and the subcortical right caudate and left hippocampal areas, which manage thoughts and motivation (Samuel & Warner, 2021). Attitudes toward mathematics impact how it is taught and learned, and these attitudes are influenced by school structure, family, and individual attitudes toward school (Farooq & Shah, 2008).

Attitudes towards math in some students are negative and they believe it is pointless and irrelevant, and their dislike for the subject may be due to their mood rather than the other way around (Di Martino & Zan, 2011). Attitude formation is a result of internalized and automated emotional responses that produce moderately strong and stable feelings (McLeod, 1989a). Marshall (1989) suggested that attitudes develop through the network concept of human memory (Anderson, 1983, 1995). In this case, attitude refers to the recall of emotional memories that involve a neutral response (Agudelo - Valderrama, 2007). Attitudes towards math have been studied because of their assumed significance for learning math. However, demonstrating a clear link between a positive attitude and math success has yet to be fully achieved (Zan & Martino, 2007). Therefore, it is crucial to research teaching methods that can help students develop a more positive attitude towards math (Akinsola & Olowojaiye, 2008).

Attitude is a social behavior that encompasses a range of evaluative reactions, from positive to negative, depending on an individual's feelings and reactions (Wahyuddin, 2022, November). It is a crucial aspect of human identity that summarizes an individual's reactions to objects, such as love, hate, and disagreement (Mohamed & Waheed, 2011). According to Wahyuddin's (2022) research, Saifuddin Azwar, Ngalim Purwanto, Muhibbin Syah, and Karlinger have made significant contributions to the understanding of attitude as a manifestation of an individual's influence on social entities, a reaction to a stimulus, or an internal manifestation that affects objects, individuals, and commodities. Attitude is more cognitive and stable than emotion in affective science, as noted by Goldin et al. (2016), cited in Hwang & Son (2021). As Hwang and Son (2021) further explained, attitude refers to a psychological tendency of liking or disliking an idea, object, or entity. In mathematics education, attitude encompasses students' attitudes towards the subject.

To design constructivist classrooms, teachers must have faith in their mathematical abilities. They should view mathematics as enjoyable and beyond its utility. Teachers must comprehend the subject to explore ideas and discover new methods. However, many elementary and middle school teachers need more confidence in fundamental math concepts such as ratios and proportions (Beswick, 2006). The present study aims to explore the extent of the attitude of seventh - grade students toward mathematics. Additionally, it will investigate the relationship between gender and attitude towards mathematics among seventh - grade students.

Research Questions

The objective of this study is to address the following inquiries:

1) What is the extent of Cambodian grade 7 students' attitudes toward mathematics?
2) What are the similarities or differences in attitudes between male and female individuals when their positive self - efficacy and motivation are assessed using the Positive Self - Efficacy and Motivation (PSECMTM) test for males and females?
3) What are the similarities or differences in attitudes between male and female individuals when their negative self - efficacy and motivation (NSECMTM) are assessed?

2. Literature Review

Mathematics in educational curricula is crucial because it is fundamental in fostering economic prosperity and facilitating scientific advancements across various disciplines. Mathematics is a multidimensional field that underpins the advancement of science and technology. By incorporating mathematics into educational programs, students acquire fundamental skills necessary for their academic and professional growth (Mazana et al., 2019). Mathematics forms the foundation for scientific and technological knowledge in school education, and as technology advances, educational institutions prioritize STEM disciplines (Ly et al., 2022). Cambodia's Ministry of Education, Youth, and Sport emphasizes STEM subjects. However, many students need help with mathematics, citing monotony, demandingness, and lack of practicality, highlighting the need for improved pedagogical approaches (Ly et al., 2022). Mathematics is an indispensable field of scientific inquiry encompassing the study of numbers, measurements, space, and various quantities, and it assumes a fundamental role in daily life, extending its influence to diverse disciplines such as science, social studies, music, and art (Wijaya, 2022).

Mathematics is vital in facilitating sound decision - making and understanding the technological world around us (Fatima, 2012). The field of mathematics education is of significant importance globally since its primary objective is to cultivate essential skills like critical thinking among students. The National Council of Teachers of Mathematics (NCTM) Standards and the body of research literature in mathematics education aim to enhance and cultivate these proficiencies. However, there is a need to explicitly outline the specific components of mathematical learning necessary for fostering critical thinking in educational standards or existing research literature. Consequently, scholars in mathematics education have employed the concept of critical thinking in diverse settings to examine the cultivation of students' critical abilities (Sachdeva & Eggen, 2021). Despite instructors' assertions of authenticity and context - dependence, classroom presentations often alienate pupils from the topic of mathematics (Furthetti & Pekhonen, 2002 cited in Farooq et al., 2008).

Acquiring proficiency in mathematics can be challenging, making it difficult for many educators to develop effective instructional strategies. As previously mentioned, the emergence of technology - driven educational media has become a viable approach to facilitate students' acquisition of sufficient mathematical knowledge (Wijaya, 2022). The math education system in Cambodia faces various obstacles, including insufficiently qualified teachers, curriculum development, the creation of textbooks, instructional approaches, and the utilization of information and communication technology (ICT). The Cambodian Mathematical Society aims to enrich the existing curriculum, foster the integration of ICT, and cultivate active engagement in international mathematical competitions (Bicar & Gaylo, 2022). However, in recent decades, there has been a discernible need for more satisfactory standards in basic education, accompanied by minimal advancements. The government - administered National Learning Assessments (NLAs) reveal a consistent pattern of subpar performance in literacy and numeracy examinations. The latest NLA in 2015 revealed unsatisfactory academic performance among grade 3 students, as evidenced by an approximate 40 percent accuracy rate in mathematics and 41.5 percent in Khmer language. The national assessments conducted in 2007 revealed improved performance among grade 6 students in mathematics and Khmer reading. However, the percentage of accurate responses remained relatively stable for ten years. In 2017, the average scores for grade 6 students in mathematics and Khmer reading were recorded as 48% and 62%, respectively (Bhatta et al., 2022). Preparing for math situations can result in anxiety and negative thoughts regarding the inability to solve problems, making working on math concepts a more stressful task (Samuel & Warner, 2021). That is why one's attitude toward the subject is critical in instructing and learning mathematics, as it affects how well pupils perform in mathematics (Farooq et al., 2008).

The concept of attitude encompasses multiple dimensions, specifically the cognitive, affective, and conative components, which are intricately interconnected. Cognitive expressions encompass individuals' beliefs regarding an attitude object, while affective expressions pertain to their emotional responses towards said object. Conative expressions, on the other hand, encompass individuals' behavioral intentions in relation to the attitude object. This perplexity emerges from the differentiation between the psychological and cognitive dimensions of the mind (Ruffell et al., 1998). The impact of attitudes towards mathematics on academic achievement is of paramount importance. However, empirical research indicates a noticeable decline in these attitudes, particularly among secondary school students, as observed within the context of the grading

system employed in the United States. This phenomenon is pronounced within the demographic of students aged 12–18 years, as indicated by prior scholarly investigations (Wen & Dubé, 2022). The teaching technique, the school system's support, the family, and students' views about school all influence students' attitudes toward mathematics (Farooq et al., 2008). The flexibility of attitudes over time may have a substantial influence on the educational achievements of pupils. A positive mindset has the potential to augment the process of acquiring knowledge and skills, while a negative mindset may impede the efficacy of learning and detrimentally influence one's performance. Hence, students' attitude plays a pivotal role in influencing their academic achievement in mathematics (Mazana et al., 2019). Syyeda (2016) states that three primary constituents constitute attitude: affect, cognition, and conduct. The present research used the ABC model and Walberg's theory of productivity to examine students' perceptions and attitudes toward mathematics. According to Walberg's thesis, each student's psychological characteristics and circumstances impact their cognitive, behavioral, and academic learning outcomes. This idea is significant in comprehending students' attitudes towards mathematics and their influence on academic achievement.

Hwang and Son (2021) conducted a study examining the correlation between students' attitudes towards mathematics and academic performance. The study utilized data from Singapore's Trends in International Mathematics and Science Study to identify four attitudes towards mathematics: extremely negative, negative, neutral, and positive. The study results revealed that students who exhibit positive attitudes towards mathematics, enjoy studying the subject, believe that learning mathematics will lead to positive outcomes, and have confidence in their mathematical abilities are more likely to achieve higher mathematics proficiency. Despite the crucial role of mathematics education in promoting gender equality and empowering women, annual reports on mathematical findings have revealed concerning trends wherein female students frequently experience disparities in specific domains, affecting their academic trajectories and professional pursuits. Yadav, 2019) found that the competencies acquired in educational institutions have limited relevance to the requirements of society in terms of productive members, resulting in gender disparities in enrollment, academic performance, and employment. Adebule & Aborisade (2014) reported that their research aimed to evaluate the opinions of 600 senior secondary school students in Ekiti state, Nigeria, with a specific focus on differentiating between male and female pupils. The study employed a descriptive survey design methodology and utilized a mathematics attitude scale. The findings of the study indicated that there was no significant association between students' attitudes towards mathematics and their sex, suggesting that sex should not be considered as a determining factor in shaping views.

Asante's 2012 study in Accra, Ghana, examined senior high school students' attitudes towards math, focusing on gender differences. The study involved 181 students from three schools, using demographic data and the Attitudes Towards Mathematics Inventory. Results showed significant differences in attitudes, indicating factors like school environment, teacher attitudes, teaching styles, and parental attitudes. Shah's (2023) research found that there was no significant link between how students felt and how well they did in math at the secondary level in AJ&K for both male and female students. Some studies found big differences, but other studies didn't find these differences. In spite of what most people think, male students did better in math, while female students were more motivated to do well. The study found that both male and female students did almost as well in statistics, even though how each gender feels about math didn't make a difference. Math is all about taking into account how men and women are different in how they work together and with others. A lot of new research shows that women are just as good at math as men, but they worry more and value themselves less. The study's goal is to find out if these kinds of differences between boys and girls are already present in young children (Mahpuza et al., 2022).

3. Methodology

Research Design

The methodology utilized for this research is quantitative. The study was carried out in a state school located in a remote area with a total of 458 students, among which 270 were girls studying in grades 7 to 9. The researchers selected only seventh–grade students from three classes, namely A, B, and C. In grade 7, there were 195 students, among which 98 were girls, representing 50.25% of the total students. Descriptive research is useful in the era of 'big data" as it helps organize data into meaningful categories that researchers can use to identify patterns and make informed decisions (Kroeun and Sophia (2023). To collect data for the study, the researchers employed a survey, utilizing a quantitative design. Quantitative research involves using tools and structured procedures to gather data in a systematic and objective manner.

Data Collection

The study was carried out among 80 seventh - grade students from classes A, B, and C, selected from a total of 195 students. The researchers utilized a survey that contained 18 questions to evaluate students' attitudes towards math and explore possible gender differences. The researchers employed SPSS version 22 to analyze the collected data. They used descriptive statistics, including the Likert scale, frequency, and percentages, and correlation analysis with correlation coefficient and P - value to interpret the results. The authors referenced Pimentel and Pimentel's (2019) study, which suggests that a five - point Likert scale is an appropriate tool for measuring attitudes towards mathematics.

Data Analysis

The authors of this paper utilized a questionnaire originally developed by Nicolaidou and Philippou (2003), which was subsequently modified for the purposes of this study. Prior to commencing data collection, the author diligently examined the contents of the questionnaire. A total of 80 students were requested to complete a survey consisting of 18 items, which aimed to assess their attitudes towards mathematics. However, the authors received only 68 responses. The questionnaire comprises three primary

sections. The initial section consisted of two components pertaining to demographic data. The subsequent section consisted of a total of eight items pertaining to the construct of self - efficacy (SE). Lastly, the third section comprises a total of ten items pertaining to individuals' attitudes towards mathematics, commonly referred to as ATM. The authors employed SPSS 22 to analyze quantitative data in order to ascertain the intensity of their attitudes towards English language acquisition. The study centered its attention on the various dimensions of attitudes and aimed to determine the mean and standard deviation for each individual item.

4. Findings and Discussion

Findings

English private students' demographic information

Table 1: Gender

Demographic	Value	N	Frequency %
Gender	Male	29	42.60%
	Female	39	57.40%
Total		68	100%

According to Table 1, out of the 68 participants, 29 were male students, accounting for 42.60% of the total, while 39 were female students, representing 57.40% of the total. The proportion of female students is 14.80% higher than that of male students.

Table 2: Age

Demographic	Value	N	Frequency %
Age	below 12 years old	3	4.40%
	12 - 13	40	58.80%
	14 - 15	22	32.40%
	Over 15 years old	3	4.40%
Total		68	100%

According to the data presented in Table 3, it can be observed that approximately 58.80% of the total student population falls within the age range of 12–13 years. Subsequently, it can be observed that three students, constituting approximately 4.40% of the total, fall within the age bracket below 12 years. This proportion is equivalent to the number of students who are above 15 years old (3=4.40%). Out of the total student population, 22 individuals, accounting for 32.40% of the sample, fall within the age range of 14 to 15 years.

Table 3: Students Self - Efficacy towards Mathematics

No.	Self - efficacy (SE)	N	M	SD	Min	Max
5	I usually can help my classmates when they ask me for help in problem - solving.	68	3.54	0.94	1.00	5.00
6	I can usually solve any mathematics problem.	68	3.44	0.85	1.00	5.00
1	I am one of the best students in Mathematics.	68	2.97	0.95	1.00	5.00
Total of Students' Self - efficacy (Strong self - belief)		68	3.32	0.91	1.00	5.00
2	I believe that I have a lot of weaknesses in Mathematics.	68	3.40	0.98	2.00	5.00
4	Mathematics is not one of my strengths.	68	3.16	1.09	1.00	5.00
7	I do not feel sure about myself in problem - solving.	68	3.16	1.09	1.00	5.00
8	When I start solving a mathematical problem, I usually feel that I would not manage to give a solution.	68	3.07	1.04	1.00	5.00
3	Compared to other students, I am a weak student in Mathematics.	68	2.78	1.05	1.00	5.00
Total of Students' Self - efficacy (Weak self - belief)		3.11	1.05	1.20	5.00	3.11

The second section of the questionnaire aimed to assess the level of self - efficacy of seventh - grade students in mathematics. This section included two categories for evaluating the students' strong beliefs and one for assessing their weak beliefs. According to the findings presented in Table 3, the students were found to actively participate in assisting their peers with solving mathematical problems (M=3.54, SD=.94). Furthermore, the study revealed that they could solve mathematical problems frequently, with a mean score of 3.44 and a standard deviation of 0.85. Additionally, some students were identified as the highest achievers in Mathematics but only occasionally (M=2.97, SD=.95).

In conclusion, the study found that seventh - grade students, regardless of gender, had a positive attitude towards helping their peers with mathematics. They also believed in their ability to independently solve mathematical problems and potentially excel as top - performing mathematics students. However, the findings suggest that their level of confidence in learning mathematics was only moderate.

Next, the authors assessed the level of confidence seventh - grade students had in their math abilities. The results showed that while the students recognized their weaknesses in mathematics (M = 3.40, D = 0.98), they were confident in their potential to excel in the subject. However, some students reported not considering mathematics as a strength (M = 3.16, D = 1.09) and lacked confidence in problem - solving (M = 3.16, D = 1.09). Additionally, some students were uncertain about their ability to solve mathematical problems (M = 3.07, D = 1.04). Despite this, the study found that some students had the potential to excel as top - performing mathematics students (M = 2.78, D = 1.05) compared to their peers.

Table 4: Students' Motivation towards Mathematics (MTM)

No.	Self - efficacy (SE)	N	M	SD	Min	Max
16	Mathematics is useful for anyone's life.	68	4.13	1.16	1	5
17	I enjoy the struggle to solve a mathematical problem.	68	3.88	.86	1	5
9	I am interested in Mathematics.	68	3.59	1.05	1	5
18	I like problem - solving.	68	3.54	.80	1	5

11	I would study Mathematics if it were optional.	68	3.53	.98	1	5
12	Mathematics thrills me! It is my favorite subject!	68	3.26	.97	1	5
Total of items showing positive motivation towards mathematics		68	3.65	.97	1	5
13	I get anxious when doing Mathematics.		2.84	1.10	1	5
14	I do not like school Mathematics.		2.21	1.04	1	5
10	Mathematics is boring!		2.00	1.01	1	5
15	I detest Mathematics and avoid it all the time!		1.65	1.09	1	5
Total of items showing negative motivation towards mathematics			2.17	1.06	1	5

The questionnaire used to evaluate students' motivation towards mathematics comprised of ten items, which were divided into two parts. The first part included items 16, 17, 9, 11, and 12, and was utilized to assess students' high motivation towards learning mathematics. The second part, consisting of items 13, 14, 10, and 15, was used to evaluate students' negative attitude towards mathematics.

Table 4 shows that the 7th - grade students highly valued the usefulness of mathematics (M = 4.13, D = 1.16). They also reported finding enjoyment in the process of solving mathematical problems (M = 3.88, D = 0.86), showing interest in mathematical problems (M = 3.59, D = 1.05), and feeling happy when solving mathematical problems (M = 3.54, D = 0.80). Additionally, the students expressed a preference for mathematics as a subject to learn (M = 3.53, D = 0.98), with some even considering it their favorite subject (M = 3.26, D = 0.97). The 7th - grade students demonstrated a high level of motivation towards mathematics (M = 3.65, D = 0.971) overall.

In terms of negative motivation towards mathematics, the 7th - grade students reported a moderate level of anxiety when doing mathematics (M=2.84, D=1.10) and sometimes did not like the subject, possibly due to lack of motivation or boredom (M=2.21, D=1.04). However, the students did not find mathematics boring (M=2.00, D=1.01) nor did they detest or avoid mathematics lessons (M=1.65, D=1.09). Overall, the 7th - grade students reported a slightly negative motivation towards mathematics (M=2.17, D=1.06). This finding highlights the need for education stakeholders to address any factors that may be contributing to this negative motivation and find ways to improve students' experience and engagement with mathematics.

Table 5: The comparison of students' strong belief + positive motivation with students' weak belief + negative motivation

Table 5.1: Compared mean of students' strong belief + positive motivation with students' weak belief + negative motivation

One - Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
PSECMTM	68	3.49	.50255	.06094
NSECMTM	68	2.69	.66767	.08097

(PSECMTM) = positive self - efficacy+ motivation (items 5, 6, 1, 16, 17, 9, 8, 11, and 12)
(NSECMTM) = negative self - efficacy+ motivation (item 2, 4, 7, 8, 3, 13, 14, 10, 15). No revision needed.

Table 5.2: Difference between PSECMTM and NSECMTM

One - Sample Test						
	Test Value = 0.05					
	t	df	Sig. (2 - tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PSECMTM	56.476	67	.000	3.44183	3.3202	3.5635
NSECMTM	32.681	67	.000	2.64608	2.4845	2.8077

According to Table 5.1, the grade 7 students had moderate confidence and motivation towards learning mathematics (M=3.49, D=50). Meanwhile, when testing their anxiety and boredom of learning mathematics, they reported a moderate level of anxiety (M=2.69, D=.66). The authors further analyzed the difference between PSECMTM and NSECMTM, and found a significant difference between the two (p=.00 lower than.05). This suggests that while the students had a positive attitude towards learning and were motivated to learn mathematics, there were also factors contributing to negative self - efficacy and motivation. It is important for educators to address these factors to help students fully benefit from learning mathematics.

Table 6: Compared mean between male and female students

Table 6.1: Compared mean between male and female students of PSECMTM

T - Test

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
PSECMTM	Male	29	3.4330	.54218	.10068
	Female	39	3.5356	.47338	.07580

Table 6.2: Different attitude between male and female students of PSECMTM

Levene's Test for Equality of Variances						95% Confidence Interval of the Difference	
F	Sig.	t	df	Sig. (2 - tailed)	Std. Error Difference	Lower	Upper
.304	.58	- .83	66	.40	.12351	- .34926	.14394
		- .81	55.58	.41	.12602	- .35516	.14984

Table 6.1 reveals that the male students scored (M=3.43, D=.54), which is slightly lower than the female students (M=3.53, D=.47). However, the mean scores were very similar. Similarly, Table 6.2 indicates that there was no significant difference between male and female students' attitudes towards PSECMTM (P=.58, >.05). Therefore, both boys and girls are likely to have positive beliefs and motivation toward learning mathematics.

Table 6.3: Compared mean between male and female students of NSECMTM

T - Test

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
NSECMTM	Male	29	2.6130	.77700	.14428
	Female	39	2.7578	.57615	.09226

Table 6.4: Different attitudes mean between male and female students of NSECMTM

Levene's Test for Equality of Variances						95% Confidence Interval of the Difference	
F	Sig.	t	df	Sig. (2 - tailed)	Std. Error Difference	Lower	Upper
2.83	.09	- .883	66	0.38	0.16398	- 0.47221	0.18259
		- .846	49.48	0.40	0.17126	- 0.48888	0.19926

According to Table 5.1, the grade 7 students had moderate confidence and motivation towards learning mathematics (M=3.49, D=50). Meanwhile, when testing their anxiety and boredom of learning mathematics, they reported a moderate level of anxiety (M=2.69, D=.66). The authors further analyzed the difference between PSECMTM and NSECMTM and found a significant difference between the two (p=.00 lower than.05). This suggests that while the students had a positive attitude towards learning and were motivated to learn mathematics, there were also factors contributing to negative self - efficacy and motivation. Educators need to address these factors to help students fully benefit from learning mathematics.

5. Discussion

The study focused on seventh - grade students and found that the majority of them, 58.80%, were between the ages of 12 and 13, while 32.40% were between 14 and 15. The study aimed to assess the confidence levels of these students in their math skills, and the results indicated that they actively engaged in problem - solving activities and performed well in this academic area, sometimes even exceptionally. Additionally, the study found that these seventh - graders had positive attitudes towards math, enjoyed solving problems, and were interested in math as a subject. Math was their favorite subject and the one they enjoyed learning the most, indicating a high level of motivation to do well in it. Although male students scored lower than female students, both genders had similar mean scores and attitudes towards PSECMTM, indicating a positive belief and motivation to learn math. However, the study also found that students in grade 7 had average levels of confidence and motivation to learn math but also average levels of anxiety and boredom. There was a significant difference between PSECMTM and NSECMTM, highlighting the need to address low motivation and self - efficacy. The study recommends that teachers address these issues to help their students benefit fully from learning math.

The findings are similar to the study on Singapore's Trends in International Mathematics and Science. Hwang and Son's 2021 study found that students who have a positive attitude toward mathematics, enjoy the subject, believe in its positive outcomes, and believe in their abilities are likelier to do better in math. Similarly, based on a descriptive survey design and a mathematics attitude scale, Adebule and Aborisade's 2014 study of 600 senior secondary school students in Nigeria found no significant link between their attitudes toward mathematics and their sex. This suggests that sex should not be a factor in shaping views. The research by Farooq and Shah (2008) asked 685 tenth graders from ten public and private schools how they felt about math. Findings showed that how students felt about math affected how well they did and how interested they were in learning it. However, this study differs from that of Asante (2012), who looked at how senior high school students in Accra felt about math and found differences between boys and girls. These attitudes were caused by things like the school environment, teachers' attitudes, the way they taught, and parents' attitudes. Teachers and other essential people should hold conferences and seminars for students, parents, teachers, and school administrators to encourage good attitudes.

6. Conclusion

Mathematics is a crucial component of human societies as it provides a fundamental instrument that propels progress and fosters development. It enables intricate computations, technological advancements, societal structuring, and spatial - temporal geometry. The utilization of this tool is of utmost importance in comprehending abstract ideas and constructing coherent inferences, rendering it an indispensable component of both daily existence and contemporary civilization. Additionally, mathematics is not only essential in school but also necessary for many people's daily work. In today's complex world, science and technology are crucial for promoting human knowledge and addressing global challenges. Understanding the importance of mathematics in science is vital for success in various subjects.

7. Recommendation

A study has found that while seventh - grade students have a positive attitude towards helping their peers with mathematics and believe in their ability to independently solve mathematical problems, their level of confidence in learning mathematics is only moderate and they report a slightly negative motivation towards mathematics. To address these issues, the authors recommend that education stakeholders address factors contributing to negative self - efficacy and motivation to help students benefit fully from learning mathematics. Additionally, educators propose various strategies such as fostering self - confidence,

encouraging inquiry and comprehension of mathematical concepts, providing opportunities for real - world problem - solving, and cultivating a positive mindset. Parents should avoid negative discussions regarding mathematics and instead promote the development of resilience. It is crucial to ensure the provision of math mentors to support students as required. These strategies are frequently employed in mathematical modeling, facilitating students in addressing real - world challenges. The findings are similar to the study on Singapore's trends in international mathematics and science, which recommends that teachers address these issues to help their students benefit fully from learning math.

To address the issues of negative self - efficacy and motivation towards mathematics in seventh - grade students, educators propose various strategies. These include fostering self - confidence, encouraging inquiry and comprehension of mathematical concepts, providing opportunities for real - world problem - solving, and cultivating a positive mindset. Additionally, teachers can prepare engaging tasks, school administrators can provide educational resources and professional development programs, and parents and teachers can provide accurate feedback. Teachers can also adjust tasks based on student performance, making math fun, accurate, and practical, which boosts students' confidence and understanding. It is crucial for parents and teachers to raise awareness of mathematics' value in their present and future lives, emphasizing its significance in various fields of study and professional endeavors. These strategies are frequently employed in mathematical modeling, facilitating students in addressing real - world challenges. The findings are similar to the study on singapore's trends in international mathematics and science, which recommends that teachers address these issues to help their students benefit fully from learning math.

To ensure that students receive appropriate support, teachers should be aware of their students' attitudes towards mathematics. It is crucial for teachers to assess these attitudes and provide necessary support to promote a positive outlook. One possible tool for assessing student attitudes is the TIMSS surveys. However, further research should be conducted to identify factors contributing to negative attitudes towards math so that interventions can be developed to foster a positive attitude and improve students' overall performance.

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