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# Cambodian Primary School Students' Attitudes towards Mathematics: A Case Study at Bun Rany Hun Sen Aknuwat Primary School in Takhmao Town, Kandal Province

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**Abstract:- Mathematics plays a crucial role in enhancing individuals' understanding of science, facilitating studying, and developing critical thinking skills. Mathematical practice fosters critical and creative thinking, improving comprehension of various topics and equipping individuals for work and daily life. This study aims to investigate the attitudes of grade 5 and 6 students towards mathematics, examining differences in attitudes between male and female students and within grade levels. The results reveal that male and female students exhibit comparable levels of concern with no significant differences in attitudes towards the subject. However, fifth-grade students demonstrate greater positive attitudes and self-confidence in mathematics than their sixth-grade counterparts. This difference is statistically significant (p-value < .05) and could be attributed to the educational transition from primary to lower secondary level. This finding should be taken into consideration by relevant parties. For future studies, we recommend a mixed-method approach with larger sample sizes.**

***Keywords:-*** *Primary, Mathematics, Cognitive, Attitudes, Efficacy, Science.*

## I. INTRODUCTION

The significance of eight mathematical competencies from the 20th century, namely critical thinking, creativity, research, self-direction, information utilization, systems thinking, communication, and replication, is highlighted in the PISA 2021 assessment (Maass et al., 2019). Math anxiety has been shown to have a significant impact on both physical and neural functioning. Samuel and Warner (2021) have demonstrated that math anxiety is associated with the activation of certain brain regions responsible for regulating cognitive processes such as thinking and motivation. Thus, it is important to recognize the potential physiological and neural consequences of math anxiety. Factors such as school structure, family dynamics, and personal attitudes towards education shape individuals' attitudes towards math, which in turn affect how math is taught and acquired (Farooq & Shah, 2008). Mathematics plays an important role in understanding and analyzing many events occurring in the contemporary world (Mohamed & Waheed, 2011). The field of mathematics is part of the discipline of pure science, with a specific emphasis on personal growth and self-awareness (Niss, 1994). The cultivation of personal development is critical for mental well-being and effective management of challenges, transitions, and occurrences (Büyükgöze, 2015).

Teachers need to know that how their students feel affects how well they learn and how they are taught. A recent study suggests that attitudes relate to how people view the world and act based on their choices for certain groups, ideas, and things (Rania, 2022; Kroeun, 2023). 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 et al., 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 et al.'s (2022, November) research, attitude is 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 refers to a psychological tendency of liking or disliking an idea, object, or entity and is more cognitive and stable than emotion in affective science (Hwang & Son, 2021). In the context of mathematics education, attitude encompasses students' attitudes towards the subject. Some students have unfavorable attitudes towards mathematics and see it as lacking purpose and relevance. It is possible that their aversion towards the topic is influenced by their mood, rather than the reverse relationship (Di Martino & Zan, 2011). Therefore, there is a need for a thorough study on instructional approaches that might facilitate the cultivation of a more favorable disposition among students towards mathematics (Akinsola & Olowojaiye, 2008).

To foster constructivist learning environments, teachers must first have a solid foundation in their own mathematical proficiency. Unfortunately, many elementary and middle school teachers lack confidence in their understanding of basic mathematical concepts (Beswick et al., 2006). This study seeks to assess the degree of math aversion among fifth and sixth-grade students. It also aims to investigate whether gender has an impact on students' attitudes towards math in these grade levels. Furthermore, the research will explore whether there are significant

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differences in mean scores between fifth and sixth-grade students regarding their attitudes towards mathematics.

➢ *Research Questions*

- *This Project Aims to Investigate the Following Questions:*

✓ To what extent of attitudes do students in grades 5 and 6 in Cambodia have towards mathematics?
✓ Is there a difference in attitudes towards mathematics between male and female students in grades 5 and 6 in Cambodia?
✓ If the attitudes of students in grades 5 and 6 in Cambodia were compared, would there be any difference in their attitudes towards mathematics?

## II. LITERATURE REVIEW

Mathematics plays a foundational role in promoting economic development and enabling scientific progress across various fields (Mazana et al., 2019). It encompasses several dimensions and serves as a fundamental framework for scientific and technical knowledge in school education. With the increasing emphasis on STEM fields, educational institutions are placing greater importance on mathematics. However, many students find mathematics challenging due to factors such as perceived monotony, difficulty, and lack of practical application. These challenges highlight the need for enhanced instructional strategies, as emphasized by Ly et al. (2022). Mathematics involves the examination of numerical values, measures, spatial concepts, and various quantities, making it critical for everyday existence, and its impact extends across a wide range of fields, including science, social studies, music, and art (Wijaya et al., 2022).

Yadav (2019) claims that educational competences do not meet society's needs, resulting in gender gaps in enrollment, academic accomplishment, and employment. Furthermore, Samuel & Warner, 2021) found that working on math concepts becomes more stressful when students are prepared for math scenarios, which can cause anxiety and negative feelings about their incapacity to handle difficulties. The Cambodian mathematics education system requires well-trained instructors, curriculum reform, and ICT integration. To address these concerns, the Cambodian Mathematical Society promotes international math contests, curricular improvement, and ICT in math education (Bicar & Gaylo, n.d). In recent decades, Bhatta et al. (2022) have called for higher basic education standards due to poor reading and numeracy scores on government-administered National Learning Assessments. The 2015 NLA showed poor academic performance by grade 3 students, with only 40% accuracy in math and 41.5% correctness in Khmer language. In contrast, grade 6 students performed better in math and Khmer reading on the 2007 national examinations, although their accuracy rate remained unchanged for 10 years. The average grade scores for 2017 were also reported.

Hausmann et al. (2008) examined the gender gap in mathematics as a polarizing academic issue (cited in Fryer & Levitt, 2010). Hwang and Son (2021) conducted a study on cambodian students' math attitudes and academic performance and identified four math attitudes: severely negative, negative, neutral, and positive, using Singapore's Trends in International Mathematics and Science Study. Their findings showed that good attitudes toward mathematics, enjoyment of learning it, belief in its good outcomes, and confidence in their abilities lead to higher mathematics competency. The study also found gender differences in mathematics education that may affect female students' academic and professional careers. Similarly, Asante (2012) studied senior high school students' math attitudes in Accra, Ghana, with a focus on gender inequalities, using demographic data and the Attitudes Towards Mathematics Inventory to investigate 181 students from three schools. The study findings showed considerable attitude differences.

Adebule & Aborisade (2014) conducted a study on 600 senior secondary school students in Ekiti state, Nigeria, comparing male and female students' perspectives. The researchers used a math attitude scale and descriptive survey to reveal that there was no significant association between students' math views and gender, indicating that gender should not be a determining factor. Fryer and Levitt (2010) analyzed the evolution of a gender gap in mathematics in early US education. Girls lost more than two-tenths of a standard deviation relative to boys over the first six years of school, although there were no starting differences. All socioeconomic classes had a gender math disparity that was half the magnitude of the black-white test score gap at the same age. The study examined math investment, parental expectations, and biased examinations as causes for this disparity but found no support. The study also highlighted that Muslim countries have little or no gender gap in math despite women's poor status, challenging past conclusions tying the gap to gender equality. Else-Quest et al. (2010) conducted a study on the disparities in mathematical abilities between genders. The sample consisted of 493,000 adolescents aged 14-16 from 69 countries. The study revealed that males exhibited a greater level of interest in the subject matter. The observed gender disparities can be predominantly attributed to differential treatment within educational institutions, research positions, and legislative bodies. This study emphasizes the importance of empowering girls and women and advocating for gender equality as essential measures to effectively address disparities in math achievement.

The study conducted by Ayuso et al. (2020) investigated the perception of self-efficacy and test anxiety in mathematics among primary school students, focusing on gender disparities. The results showed that female students perceived themselves as inferior in math compared to their male counterparts and reported higher levels of test anxiety related to math examinations. As students advance in age, the gender disparities in self-efficacy become more evident, while test anxiety tends to escalate among all students. However, the study found that educators do not perceive any

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disparities in the levels of self-efficacy in mathematics between male and female students. The researchers suggest that addressing the negative perception of mathematics in girls during the early stages of education can help address the underrepresentation of women in STEM fields. Cvencek et al. (2021) found that first–grade girls had a strong negative implicit attitude toward math despite no gender differences in math grades or self-reported positivity. Math grades were significantly predicted by explicit measures, and implicit attitudes explained additional variance in boys. These findings suggest that children may have implicit and explicit attitudes that differ.

## III. METHODOLOGY

➢ *Research Design*

The methodology utilized for this research is a descriptive method. The study was conducted in a government primary school situated in Takhmao Town, which is part of the Kandal Primary Teacher Training Center. Four classes of grade 5 and 4 classes of grade 6 were available, but the researcher only selected two classes from grade 5 and 2 classes from grade 6. The questionnaire was provided to 260 students in the four selected classes, but only 209 responded. Quantitative research is described by Stockemer et al. (2019) as work with hundreds or thousands of observations that quantifies and analyzes data using statistics or numerical data. According to Milligan et al. (2004), quantitative methods, such as statistics, allow us to explain things in numbers and determine how factors are related. Quantitative science, according to Borgstede and Scholz (2021), is the study of finding mathematical models for real-world events, with these models usually taking the form of functional relationships between factors. The hardest part of quantitative modeling is making precise measurements for these factors, which transforms their fundamental factual relationship structure into a number when measured.

➢ *Data Collection*

The study was conducted on 209 students from two classes in grade 5 and two classes in grade 6 at a government primary school in krong takhmao. To assess the students' attitudes towards math and explore any gender disparities, the researchers used an 18-item survey. The collected data were analyzed using SPSS version 22, and various descriptive statistical techniques, such as the Likert scale, frequency analysis, percentages, correlation coefficients, and P-values, were used to interpret the results. The study cited Pimentel and Pimentel (2019) research, which suggests that a five-point Likert scale is an appropriate tool for measuring individuals' attitudes towards mathematics.

➢ *Data Analysis*

The researchers utilized a survey instrument initially developed by Nicolaidou and Philippou (2003) and modified it to meet the study's specific objectives. Prior to data collection, the questionnaire's content was scrutinized. A total of 260 participants were invited to participate in the survey, which consisted of 18 questions designed to assess their attitudes towards mathematics. However, only 209 responses were collected. The questionnaire had three main components: the introductory segment included three questions about demographic information, the second part consisted of eight elements related to self-efficacy (SE), and the third component comprised ten elements related to academic task motivation (ATM) in mathematics. The researchers analyzed the quantitative data using SPSS 22 software and aimed to assess various aspects of attitudes by calculating the mean and variability for each item.

## IV. FINDINGS AND DISCUSSION

➢ *Findings*

No revision needed.

Table 1 Gender

| Demographic | Value | N | Frequency % |
|---|---|---|---|
| Gender | Male | 107 | 51.20% |
| | Female | 102 | 48.80% |
| Total | | 209 | 100% |

Table 1 indicates that among the 209 participants, 107 were male students, representing 51.20% of the total sample, while 102 were female students, accounting for 48.80%. The proportion of male students is slightly higher than that of female students by 2.40%.

Table 2 Age

| Demographic | Value | N | Frequency % |
|---|---|---|---|
| | below 10 years old | 3 | 1.40% |
| Age | 10 - 11 | 104 | 49.80% |
| | Over 11 years old | 102 | 48.80% |
| Total | | 209 | 100% |

Based on the statistics provided in Table 3, it is evident that about 49.80% of the whole student population is situated within the age bracket of 10–11 years. Following this, it is evident that a total of three students, or roughly 1.40% of the overall student population, belong to the age group below 10 years. Approximately 48.80% of the total student population, namely 120 individuals, are aged 11 years or older. Consequently, the majority of students fall between the age range of 10 to 11 years.

Table 3 Grade

| Demographic | Value | N | Frequency % |
|---|---|---|---|
| | 5 | 113 | 54.10% |
| Grade | 6 | 96 | 45.90% |
| Total | | 209 | 100% |

Table 3 indicates that 54.10% of the student population is enrolled in grade 5, which is 8.20% more than the number of students enrolled in grade 6 at the main government school.

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Table 4 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. | 209 | 3.48 | 1.21 | 1.00 | 5.00 |
| 6 | I can usually solve any mathematics problem. | 209 | 3.29 | .978 | 1.00 | 5.00 |
| 1 | I am one of the best students in Mathematics. | 209 | 3.18 | 0.87 | 1.00 | 5.00 |
| **Total of Students' Self-efficacy (Strong self-belief)** | | 209 | 3.32 | 1.02 | 1.00 | 5.00 |
| 2 | I believe that I have a lot of weaknesses in Mathematics. | 209 | 3.01 | 1.05 | 1.00 | 5.00 |
| 7 | I do not feel sure about myself in problem-solving. | 209 | 2.87 | 1.12 | 1.00 | 5.00 |
| 8 | When I start solving a mathematical problem, I usually feel that I would not manage to give a solution. | 209 | 2.79 | 1.09 | 1.00 | 5.00 |
| 4 | Mathematics is not one of my strengths. | 209 | 2.65 | 1.10 | 1.00 | 5.00 |
| 3 | Compared to other students, I am a weak student in Mathematics. | 209 | 2.64 | 1.01 | 1.00 | 5.00 |
| Total of Students' Self-efficacy (Low self-belief) | | 209 | 2.79 | 1.07 | 1.00 | 5.00 |

Based on Table 4, the survey assessed the level of self-efficacy of grade 5 and 6 mathematics students, which was divided into two categories: strong and weak beliefs. As shown in Table 4, the students had a moderate level of belief that they could work well with mathematics (M = 3.32, D = 1.02). They were able to help their classmates with math problems often (M=3.48, D=1.21), but sometimes faced difficulty solving math problems on their own (M=3.29, D=.97). However, they only moderately considered themselves as the best mathematics students (M=3.18, D=0.87).

The study proceeded to assess the self-efficacy of grade 5 and 6 students towards their math abilities. Surprisingly, the students at Bun Rany Hun Sen Aknuwat Primary School, which is a school for teacher trainees doing their teaching practicum, still moderately believed that they could work well with mathematics (item 2, M = 3.01, D = 1.05). However, they also showed uncertainty when faced with mathematical problems (item 7, M = 2.87, D = 1.12) or managing mathematical solutions (item 8, M = 2.79, D = 1.09). Item 4 (M = 2.65, D = 1.10) revealed that the students acknowledged that mathematics was not one of their strengths. In addition, they perceived themselves as weak in mathematics compared to their peers (item 3, M = 2.64, D = 1.01). Overall, the students had low self-efficacy in learning mathematics (M = 2.79, D = 1.07) and need to increase their confidence in their mathematical abilities.

Table 5 Students' Motivation towards Mathematics (MTM)

| No. | Motivation towards mathematics (MTM) | N | M | SD | Min | Max |
|---|---|---|---|---|---|---|
| 16 | Mathematics is useful for anyone's life. | 209 | 4.33 | .94 | 1 | 5 |
| 17 | I enjoy the struggle to solve a mathematical problem. | 209 | 3.89 | 1.01 | 1 | 5 |
| 9 | I am interested in Mathematics. | 209 | 3.75 | 1.15 | 1 | 5 |
| 11 | I would study Mathematics if it were optional. | 209 | 3.66 | 1.00 | 1 | 5 |
| 18 | I like problem-solving. | 209 | 3.43 | 1.12 | 1 | 5 |
| 12 | Mathematics thrills me! It is my favorite subject! | 209 | 3.33 | 1.28 | 1 | 5 |
| Total of items showing positive motivation towards mathematics | | 209 | 3.73 | 1.08 | 1 | 5 |
| 13 | I get anxious when doing Mathematics. | 209 | 2.69 | 1.12 | 1 | 5 |
| 14 | I do not like school Mathematics. | 209 | 2.02 | 1.11 | 1 | 5 |
| 10 | Mathematics is boring! | 209 | 1.97 | 1.14 | 1 | 5 |
| 15 | I detest Mathematics and avoid it all the time! | 209 | 1.56 | 1.08 | 1 | 5 |
| Total of items showing negative motivation towards mathematics | | 209 | 2.06 | 1.11 | 1 | 5 |

The survey utilized to evaluate the motivation of students towards mathematics comprised of two sections and 10 questions. The first section (items 16, 17, 9, 11, 18, and 12) measured the strong inclination of students to engage in mathematics studies. The second section (items 13, 14, 10, and 15) assessed the unfavorable disposition of students towards mathematics.

According to the data shown in Table 5, it can be seen that students in the 5th and 6th grades had a strong appreciation for the practicality of mathematics, with a mean score of 4.33 and a standard deviation of .94. Additionally, the participants indicated a sense of pleasure in engaging with mathematical problem-solving tasks, with a mean score of 3.89 and a standard deviation of 1.01. Furthermore, they expressed a keen interest in the field of mathematical education, as shown by a mean score of 3.75 and a standard deviation of 1.15. Furthermore, the students conveyed a predilection for mathematics as a field of study in the event that they were compelled to choose from a range of courses to pursue (M = 3.66, SD = 1.00). Mathematics is often regarded as a preferred topic by individuals, with a mean rating of 3.43 and a standard deviation of 1.12. The participants exhibit a level of enthusiasm in acquiring knowledge, as shown by a mean score of 3.33 (SD = 1.28). In summary, the study found that the students in the 5th and 6th grade had a very high degree of motivation in relation to their mathematical education, with a mean score of 3.73 and a standard deviation of 1.08.

The findings indicate that students in the 5th and 6th grades exhibited a moderate degree of anxiety (M=2.69, SD=1.12) and occasional disinterest in mathematics, maybe stemming from insufficient motivation or feelings of boredom (M=2.02, SD=1.11). The data indicates that the students exhibited a very low level of boredom in mathematics, as seen by a mean score of 1.97 and a standard deviation of 1.14. Furthermore, the students did not demonstrate any strong feelings of dislike or avoidance towards mathematics sessions, as indicated by a mean score of 1.56 and a standard deviation of 1.08. In general, the students in the 5th and 6th grades expressed a somewhat unfavorable inclination towards mathematics, with a mean score of 2.06 and a standard deviation of 1.11. Nevertheless, this discovery emphasizes the need for education stakeholders to acknowledge and tackle any elements that might potentially contribute to this adverse motivation, and devise strategies to enhance students' involvement and satisfaction in the field of mathematics.

Table 6 The Comparison of Students' High Self-Efficacy + Positive Motivation with Students' Low Efficacy + Negative Motivation

Table 6.1 Compared Mean of Students' High Self-Efficacy + Positive Motivation with Students' Low Efficacy + Negative Motivation

| One-Sample Statistics | | | | |
|---|---|---|---|---|
| | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| PSEC&MTM | 209 | 3.59 | .699 | .04841 |
| NSEC&MTM | 209 | 2.47 | .648 | .04487 |

(PSEC&MTM) = positive self-efficacy + motivation towards mathematics, as determined by items 5, 6, 1, 16, 17, 9, 11, 18, and 12.

(NSEC&MTM) = negative self-efficacy+ motivation towards mathematics, as indicated by items 2, 7, 8, 4, 3, 13, 14, 10, and 15.

Table 6.2 Difference between (PSEC&MTM) and (NSEC&MTM)

| One-Sample Test | | | | | | |
|---|---|---|---|---|---|---|
| | Test Value = 0.05 | | | | | |
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| PSEC&MTM | 73.29 | 209 | .000 | 3.548 | 3.4532 | 3.6441 |
| NSEC&MTM | 53.95 | 209 | .000 | 2.421 | 2.3326 | 2.5095 |

Based on the findings shown in Table 6.1, it can be observed that the students in grades 5 and 6 demonstrated a noteworthy level of self-efficacy and motivation in relation to their engagement with mathematics, with a mean score of 3.59 and a standard deviation of 0.69. The study showed that the participants exhibited a relatively low degree of anxiety (M=2.47, SD=0.64) in relation to their engagement with mathematics. Additionally, the authors conducted a more detailed analysis of the comparison between (PSEC&MTM) and (NSEC&MTM) and observed a statistically significant difference between the two groups ($p < 0.05$). This implies that while the students had a positive attitude towards learning and demonstrated a strong willingness to grasp mathematical concepts, other factors contributed to unfavorable self-efficacy and motivation. It is essential for educators to address these aspects to ensure optimal learning outcomes for students in mathematics.

Table 7 Compared Mean between Male and Female Students

Table 7.1 Compared Mean between Male and Female Students of (PSEC&MTM) T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **Gender** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| (PSEC&MTM) | Male | 107 | 3.66 | .71006 | .06864 |
| | Female | 102 | 3.52 | .68510 | .06784 |

Table 7.2 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 |
| .171 | .68 | 1.466 | 207 | .144 | .14156 | -.04887 | .33199 |
| | | 1.467 | 206.96 | .144 | .14156 | -.04870 | .33182 |

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Based on the findings in Table 7.2, male students scored an average of 3.66 with a standard deviation of 0.71, while female students scored an average of 3.52 with a standard deviation of 0.68. Although there were some variations in the scores, there was no significant difference between attitudes towards (PSEC&MTM) for male and female students (P=.68, >.05), as presented in Table 7.2. This suggests that both male and female students exhibit positive attitudes and motivation towards mathematics, and gender does not appear to play a role in their perceptions.

Table 7.3. Compared Mean between Male and Female Students of NSEC&MTM

T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **Gender** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| NSEC&MTM | Male | 107 | 2.47 | .6370 | .06158 |
| | Female | 102 | 2.46 | .663 | .06573 |

Table 7.4. Different Attitudes Mean between Male and Female Students of NSEC&MTM

| **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 |
| .123 | .726 | .128 | 207 | .898 | .08998 | -.16591 | .18889 |
| | | .128 | 205.362 | .899 | .09007 | -.16609 | .18908 |

Based on the results from Table 7.3 and 7.4, the 5th and 6th grade students, regardless of gender, exhibited moderate self-efficacy and motivation towards mathematics learning, with males having an M=2.47 and D=.63, and females having an M=2.46 and D=.66. Additionally, both male and female students expressed similar levels of anxiety towards learning mathematics. The study found no significant difference in attitudes towards efficacy or motivation between male and female students (P=.72, >.05).

Table 8 Compared Mean between Male and Female Students

Table 8.1 Compared mean between grade 5 and grade 6 students of (PSEC&MTM) and (NSEC&MTM)

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **Classes** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| PSEC_MTM | Grade 5 | 113 | 3.66 | .62272 | .05858 |
| | Grade 6 | 96 | 3.51 | .77635 | .07924 |
| NSEC_MTM | Grade 5 | 113 | 2.38 | .55073 | .05181 |
| | Grade 6 | 96 | 2.57 | .73661 | .07518 |

(PSEC&MTM) refers to positive self-efficacy and motivation towards mathematics, as measured by items 5, 6, 1, 16, 17, 9, 11, 18, and 12. On the other hand, (NSEC&MTM) represents negative self-efficacy and motivation towards mathematics, as measured by items 2, 7, 8, 4, 3, 13, 14, 10, and 15.

Table 8.2 Different Attitudes Mean between Grade 5 and Grade 6 Students of (PSEC&MTM)

| **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 |
| 7.87 | .006 | 1.575 | 207 | .117 | .09681 | -.03842 | .34328 |
| | | 1.547 | 181.293 | .124 | .09854 | -.04200 | .34686 |

Table 8.3 Different Attitudes Mean between Grade 5 and Grade 6 Students of (NSEC&MTM)

| **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 |
| 5.794 | .017 | -2.208 | 207 | .028 | .08922 | -.37290 | -.02113 |
| | | -2.158 | 173.472 | .032 | .09130 | -.37722 | -.01681 |

Based on Table 8.1, it can be observed that 113 grade 5 students had a more positive attitude towards learning mathematics than grade 6 students (M=3.66>M=3.51). Additionally, grade 5 students exhibited less negative self-efficacy in mathematics compared to grade 6 students (M=2.38<M=2.57). Table 8.2 revealed that the difference in attitudes towards learning mathematics was significant between grade 5 and grade 6 students with a p-value of .006, indicating that grade 5 students had a more positive attitude towards learning mathematics. Moreover, Table 8.3 showed that there was a significant difference in anxiety levels between grade 5 and grade 6 students with a p-value of .017,

indicating that grade 5 students had lower levels of anxiety towards learning mathematics. The findings in Table 7.1 suggest that the educational transition from primary to lower secondary level may affect students' confidence and attitudes towards mathematics, which should be considered by educational stakeholders.

## V. DISCUSSION

The study highlights the importance of mathematics in acquiring scientific knowledge, promoting learning, and developing critical thinking skills, which are essential for personal and professional growth. The analysis of 5th and 6th grade students' attitudes towards mathematics in Cambodia reveals that there is no significant difference in attitudes between male and female students. However, the results indicate that 5th-grade students have a more positive attitude and higher confidence in mathematics than 6th-grade students. This could be due to the educational transition from elementary to lower secondary level, which may impact students' confidence and attitudes towards mathematics. The study recommends using a mixed-method approach and increasing the number of participants to enhance the robustness and generalizability of the findings.

Farooq and Shah (2008) conducted a study using questionnaires to assess the perspectives of 685 tenth-grade students attending public and private institutions regarding mathematics. The research findings indicate that students' attitudes towards mathematics significantly impact both their academic performance and level of engagement with the subject. However, the results of this study contradict the investigation carried out by Asante (2012) on senior high school students in Accra regarding mathematics, which identified disparities based on gender. Several factors influenced the aforementioned viewpoints, including the educational environment, instructors' attitudes, training methods, and parents' attitudes. Therefore, educators and stakeholders should organize conferences and seminars to foster positive attitudes among school administrators, parents, children, and instructors. A study by Hwang and Son (2021) consistent with the Trends in International Mathematics and Science Study in Singapore revealed a significant correlation between students' favorable perceptions of mathematics, their enjoyment of the subject, their belief in its beneficial consequences, their self-assurance in their capabilities, and their scholastic performance in mathematics. Similarly, Adebule and Aborisade (2014) conducted a descriptive survey methodology and a mathematics attitude scale to investigate the correlation between gender and attitudes toward mathematics among 600 senior secondary school students in Nigeria. The findings of the current study show no statistically significant correlation between the gender of students and their attitudes toward mathematics, implying that gender should not influence the formation of perspectives. Mathematics is essential for comprehending scientific concepts, facilitating the learning process, and honing analytical reasoning. A mathematics degree provides individuals with fundamental competencies that are indispensable in both professional and everyday life. The investigation of the attitudes of fifth and sixth graders toward mathematics indicated no statistically significant differences between the attitudes of males and females. In contrast, sixth-grade students exhibited a lower degree of optimism and self-confidence in relation to mathematics than fifth-grade students. The temporal correlation between the transition from primary to lower secondary education may account for this. Subsequent investigations are advised to employ a mixed methods approach and augment the sample size.

## VI. CONCLUSION

The study revealed that although both male and female students in grades 5 and 6 demonstrated a positive attitude and motivation towards mathematics, they lacked confidence in their ability to learn the subject. Moreover, sixth-graders had a lower level of optimism and self-assurance compared to fifth-graders. The study found no significant difference in attitudes between male and female students. The authors suggest that further research using a mixed-methods approach and a larger sample size is necessary. Mathematics is a fundamental tool that enables progress and development in society, making it essential for everyday life. Understanding the significance of mathematics in science is crucial for achievement in various disciplines.

## RECOMMENDATION

The study found that fifth and sixth-grade students possess a favorable attitude towards helping their classmates with mathematics, but have moderate self-efficacy and are marginally motivated in their ability to learn the subject. To optimize their learning experience, the authors recommend measures such as modifying factors that contribute to low self-efficacy and motivation, promoting practical problem-solving skills, cultivating self-confidence, and assigning math mentors. These strategies are consistent with international trends in Singapore's mathematics and sciences and can enhance students' self-efficacy and motivation in mathematics. Additionally, educators may provide resources and feedback, and adjust assignments based on student performance. To ensure intellectually engaging assignments, educators must understand the perspectives of their students regarding mathematics. Mathematical modeling can be utilized to resolve pragmatic challenges. While TIMSS surveys can assess attitudes, further investigation is necessary to identify harmful elements and develop interventions that foster improved performance.

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