Mapping Students' Interest and Commitment to Mathematical Tasks at Various Secondary Education Stages: The Case of Cameroon

Beyoh Dieudone Nkepah

Department of Teacher Education, Faculty of Education, The University of Bamenda, Cameroon (ORCID: 0000-0001-7100-9676)

Article History: Received: 10 May 2024; Accepted: 22 August 2024; Published online: 30 August 2024

Abstract: This study investigates the dynamics of student interest in and commitment to mathematical tasks across different stages of secondary education in Bamenda Municipality. By examining students in the early (Form 1), intermediate (Form 4), and advanced (Form 6) stages, the research aims to understand how interest in and commitment to mathematics tasks evolve throughout secondary school. Using a cross-sectional developmental research design, data were collected from 375 students across five secondary schools using a self-designed questionnaire assessing interest and commitment levels. Statistical analysis, including ANOVA and Pearson correlation, revealed significant differences in both interest and commitment across the educational stages, with high levels at the start, a decline during mid-secondary years, and a partial rebound in advanced stages. A strong positive correlation between interest and commitment was found, suggesting that increased interest is associated with higher commitment to mathematical tasks. The study highlights the need for targeted educational strategies to maintain and enhance student engagement in mathematics. Recommendations include developing interactive and relevant curriculum materials, implementing support programs during critical stages, fostering a growth mindset, and involving parents and communities. The findings emphasize the importance of continuous support and strategic interventions to improve students' mathematical engagement and success.

Keywords: Student interest, Commitment, Mathematical tasks, Secondary education, Educational stages

1. Introduction

Understanding how students engage with and commit to mathematical tasks is pivotal for shaping effective educational strategies and interventions. In the context of secondary education, this engagement is not static but evolves as students progress through different stages of their academic journey. This research delves into the dynamics of student interest and commitment to mathematical tasks within the Bamenda Municipality, providing a detailed analysis across early, intermediate, and advanced stages of secondary education. In Bamenda, a region known for its diverse educational landscape, students encounter varying challenges and stimuli that influence their mathematical learning experiences. By mapping these dynamics, we aim to uncover patterns and shifts in student attitudes and behaviors as they advance through their educational stages. This exploration will illuminate how interest and commitment are nurtured or diminished over time, offering insights into how educational practices can be tailored to better support students' mathematical development.

1.1. Background

Mathematical competence is a vital component of educational achievement and future career success, influencing various fields from science and engineering to everyday problem-solving (National Research Council, 2001). The evolution of student interest and commitment to mathematical tasks throughout secondary education is crucial for optimizing educational outcomes. This process is not uniform; it varies significantly across different educational stages and is shaped by a multitude of factors (PISA, 2018). In the context of secondary education, students' attitudes towards mathematics typically evolve as they progress from early to advanced stages. Research suggests that early-stage students often exhibit higher levels of curiosity and enthusiasm towards mathematics, which can diminish as the subject becomes more complex and abstract (Eccles & Wigfield, 2002). This decline in interest can be attributed to various factors, including increased cognitive demands, perceived relevance of the subject, and the quality of instructional methods (Hoxworth et al., 2018).

The educational landscape in Bamenda Municipality presents a unique context for examining these dynamics. Bamenda, with its blend of traditional and contemporary educational practices, offers a diverse setting for studying how local factors influence mathematical engagement. Prior research in similar settings has shown that socio-economic factors, access to resources, and cultural attitudes significantly impact students' mathematical learning experiences (Sanyal, 2018; Bourdieu, 1986). However, there is a scarcity of localized studies addressing how interest and commitment in mathematics change specifically within Bamenda Municipality. While broader studies such as those by the Programme for International Student Assessment (PISA, 2018) and national reports provide useful insights into general trends, they do not fully capture the unique educational and socio-cultural dynamics present in Bamenda. This gap underscores the need for focused research that explores these factors in depth within the local context.

Corresponding Author: Beyoh Dieudone Nkepah **email:** beyohdieudone@gmail.com
Citation Information: Nkepah, B. D. (2024). Mapping students' interest and commitment to mathematical tasks at various secondary education stages: The case of Cameroon. *Turkish Journal of Mathematics Education, 5*(2), 23-32.

This study aims to map the dynamics of student interest and commitment to mathematical tasks across early, intermediate, and advanced stages of secondary education in Bamenda Municipality. By doing so, it seeks to offer a better understanding of how these factors evolve and identify key areas where targeted interventions can enhance students' interest and engagement with mathematics.

1.1.1. Conceptual review

The concepts of student interest and commitment in the context of mathematics are integral to understanding educational outcomes and engagement. Student interest refers to the degree of curiosity or enthusiasm a student has towards a subject, which can significantly influence their learning experiences and performance (Hidi & Renninger, 2006). Commitment, on the other hand, involves a student's dedication and perseverance in engaging with mathematical tasks over time (Eccles et al., 1998). These concepts are closely related but distinct; interest often serves as a precursor to commitment, which is critical for sustained engagement and academic success.

Interest in mathematics is typically categorized into situational interest, which is triggered by specific instructional strategies or contexts, and individual interest, which reflects a student's long-term engagement with the subject (Hidi & Renninger, 2006). Commitment is often influenced by both intrinsic factors (such as personal goals and values) and extrinsic factors (such as rewards and recognition) (Schiefele, 1991). Understanding these concepts helps in mapping how they evolve through different educational stages.

1.1.2. Theoretical review

Several theories provide a framework for understanding the dynamics of student interest in and commitment to mathematical task over time. Three of such stand out distinct:

Self-Determination Theory (SDT): Deci and Ryan's SDT emphasizes the role of intrinsic motivation and the need for autonomy, competence, and relatedness in fostering engagement and commitment (Deci & Ryan, 1985). According to SDT, students who perceive their mathematical tasks as fulfilling these needs are more likely to develop sustained interest and commitment. Expectancy-Value Theory: Eccles and Wigfield's Expectancy-Value Theory posits that students' academic choices, including their engagement with mathematics, are influenced by their expectations of success and the value they place on the task (Eccles & Wigfield, 2002). This theory helps explain how students' perceptions of the relevance and difficulty of mathematical tasks affect their interest and commitment. Achievement Goal Theory: This theory, developed by Ames (1992) and Dweck (1986), suggests that students' goals (mastery vs. performance goals) significantly impact their motivation and engagement. Mastery goals, focused on learning and self-improvement, are associated with higher levels of interest and commitment compared to performance goals, which emphasize demonstrating ability relative to others.

1.1.3. Empirical review

Empirical research provides insights into how student interest and commitment to mathematics evolve across different educational stages and in various contexts.

Early Stages: Studies indicate that early secondary education is a critical period where students' initial enthusiasm for mathematics can be influenced by instructional quality and early experiences (Pope & Hargis, 2018). Research by Wang and Degol (2016) suggests that positive early experiences in mathematics are crucial for maintaining interest and building a foundation for later stages. Intermediate Stages: During intermediate stages, students often face increased cognitive challenges and a growing perception of the subject's difficulty, which can impact their interest and commitment (Meece et al., 2006). Studies show that motivational support and relevant, real-world applications of mathematics can mitigate declines in interest during these years (PISA, 2018). Advanced Stages: At advanced stages, students' interest in mathematics often correlates with their career aspirations and academic goals. Research by Hulleman and Harackiewicz (2009) highlights the role of task relevance and future goals in sustaining interest and commitment in high school mathematics.

1.2. Statement of the Problem

In Bamenda Municipality, secondary education plays a crucial role in shaping students' mathematical proficiency and interest. However, there is limited empirical research on how students' interest in and commitment to mathematical tasks evolve across different stages of secondary education. Understanding these dynamics is essential for developing targeted strategies to enhance mathematical engagement and achievement. The problem is to systematically map how student interest in and commitment to mathematical tasks change from the early (Form 1), intermediate (Form 4), to advanced stage (Form 6) of secondary education. There is great need to understand the dynamics at each of these stages. Without this understanding, educators and policymakers may keep struggling to implement effective interventions to foster a sustained and robust engagement with mathematics throughout secondary education. This study thus seeks to address this gap by examining the variations in students' attitudes, motivations, and levels of engagement with mathematical tasks at different educational stages in public secondary schools within Bamenda Municipality. The findings are

expected trigger policy makers and teachers to develop educational practices tailored towards supporting students' mathematical development effectively across their educational journey.

1.3. The Aim

This paper aims 1) to compare the levels of interest in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality, 2) to compare the levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality, and 3) to investigate the nature of the overall association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality. In line with this purpose, the following research problems were sought to be answered:

1) What are the mean interest levels in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality?

2) What are the mean levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality?

3) What is the nature of the overall association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality?

The hypotheses of the research are as follows:

Ho_1: The mean interest levels in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality do not differ significantly.

Ha_1: The mean interest levels in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality do not differ significantly.

Ho_2: The mean levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality do not differ significantly.

Ha_2: The mean levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality differ significantly.

Ho_3: The association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality is not significant.

Ha_3: There is a significant association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality.

2. Method

The study employed a cross-sectional developmental research design to track students' interest in and commitment to mathematical tasks throughout various stages of their secondary education. It focused on secondary school students in early (Form 1), intermediate (Form 4), and advanced (Form 6) stages of mathematics education across five functional secondary schools in Bamenda Municipality. This approach resulted in a total accessible population of 3,740 students, as outlined in Table 1. Using a stratified disproportionate sampling technique, 25 students from each class (Forms 1, 4, and 6) were selected from all five schools, leading to a total sample size of 375 students (75 from each school, as shown in Table 1). The study was carried out after the first term examinations in the 2023/2024 academic year where all the students had spent a full term in their various classes.

Data was gathered through a self-designed questionnaire (see Appendix A), which comprised three sections: Section A collected demographic information, while Sections B and C contained 10 items each assessing students' interest in and commitment to mathematics, respectively. The designed questionnaire was reviewed by three experts in measurement and evaluation, educational psychology, and mathematics education. A pilot test involving 21 students resulted in a Cronbach's alpha reliability coefficient of 0.89, indicating strong reliability. The questionnaire used a 4-point Likert scale with a cutoff score of 25 (derived from ten items multiplied by the midpoint of 2.5) out of a possible 40. Scores above 25 indicated high interest or commitment, whereas scores below 25 indicated low interest or commitment. Data collected was analysed using frequency counts, means, Pearson Product-Moment correlation, and ANOVA.

The study adhered to ethical standards by ensuring informed consent, voluntary participation, and maintaining the confidentiality and anonymity of participants, in accordance with research guidelines for studies involving human subjects.

Table 1. Distribution of Accessible Population and Sample Size of the Study

S/N	Name of School	Accessible Population				Sample Size
		Form 1	Form 4	Form 6	Total	
1	Government Bilingual High School Atiela	186	206	198	590	75
2	Government Bilingual High School Bayele	201	230	162	593	75
3	Government Bilingual High School Bamenda	315	381	186	882	75
4	Government Bilingual High School Down Town	329	408	215	952	75
5	Government Bilingual High School Mendankwe	193	356	174	723	75
	Total	**1224**	**1581**	**935**	**3740**	**375**

3. Findings

First research question of the study was to compare the levels of interest in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality. Table 2 shows the descriptive statistics on interest in mathematical task.

Table 2. Descriptive Statistics on Interest in Mathematical Task

	N	Mean	SD	SE	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Early Stage (Form 1)	125	32.84	2.421	.217	32.41	33.27
Intermediate Stage (Form 4)	125	27.48	1.532	.137	27.21	27.75
Advanced Stage (Form 6)	125	30.20	1.988	.178	29.85	30.55
Total	375	30.17	2.972	.153	29.87	30.48

Table 2 shows that students exhibit a very high level (Mean = 32.84, SD = 2.421) of interest in mathematical tasks upon entering secondary school (Form 1). This commitment, however, drops by Form 4 (Mean = 27.48, SD = 1.532). Although commitment to mathematical tasks does rise again (Mean = 30.30, SD = 1.988) in the advanced stage (Form 6), it still remains notably lower than the levels seen at the beginning of their secondary education in Form 1.

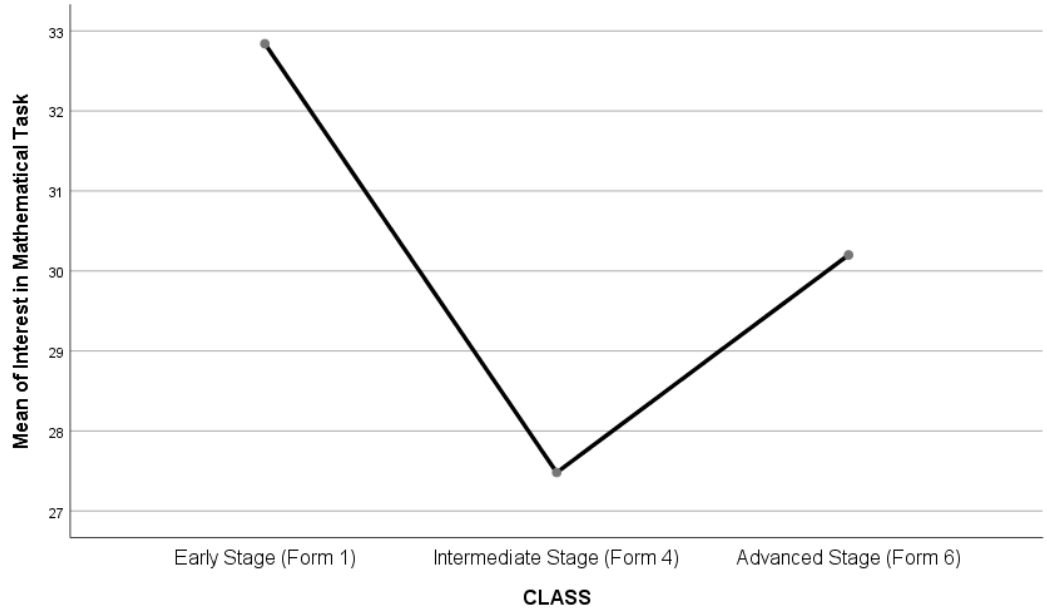

Figure 1. Plot of Means for Students' Interest in Mathematical Task at the Various Educational Stages

Figure 1 indicates that students' interest in mathematical tasks is high when they enter secondary school (Form 1). However, this commitment experiences a significant decline by the time they reach Form 4. In the

advanced stage (Form 6), interests in mathematical tasks does increase, but it remains considerably lower compared to the levels observed at the start of their secondary education in Form 1.

Ho_1: The mean interest levels in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality do not differ significantly.

Ha_1: The mean interest levels in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality do not differ significantly.

Table 3. ANOVA to Compare Means of Students' Interest in Mathematical Task at the Various Educational Stages

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1795.733	2	897.867	221.490	.000
Within Groups	1508.000	372	4.054		
Total	3303.733	374			

The ANOVA results presented in the table show $F(2,372) = 221.490$, with a *p*-value of 0.000. Therefore, the null hypothesis (Ho_1) is rejected at the 5% significance level. In summary, there are significant differences in the levels of interest in mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality (Refer to Table 4 for details).

Table 4. Scheffe's test for Multiple Comparisons of the Significance of the Mean Differences of Students' Interest in Mathematical Task at the Various Educational Stages (Dependent Variable: Interest in Mathematical Task)

(I) CLASS	(J) CLASS	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Early Stage (Form 1)	Intermediate Stage (Form 4)	5.360*	.255	.000	4.73	5.99
	Advanced Stage (Form 6)	2.640*	.255	.000	2.01	3.27
Intermediate Stage (Form 4)	Early Stage (Form 1)	-5.360*	.255	.000	-5.99	-4.73
	Advanced Stage (Form 6)	-2.720*	.255	.000	-3.35	-2.09
Advanced Stage (Form 6)	Early Stage (Form 1)	-2.640*	.255	.000	-3.27	-2.01
	Intermediate Stage (Form 4)	2.720*	.255	.000	2.09	3.35

*. The mean difference is significant at the 0.05 level.

The Scheffe's test indicates that the mean differences in students' interest in mathematical tasks between each stage and the others are all statistically significant, with p-values below 0.05.

Second research question was to compare the levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality.

Table 5. Descriptive Statistics on Commitment to Mathematical Task

	N	Mean	SD	SE	95% Confidence Interval for Mean: Lower Bound	95% Confidence Interval for Mean: Upper Bound
Early Stage (Form 1)	125	34.24	2.130	.191	33.86	34.62
Intermediate Stage (Form 4)	125	26.40	1.238	.111	26.18	26.62
Advanced Stage (Form 6)	125	28.48	1.843	.165	28.15	28.81
Total	375	29.71	3.764	.194	29.32	30.09

Table 5 illustrates that students demonstrate a very high level of commitment to mathematical tasks when they start secondary school (Form 1), with a mean score of 34.24 and a standard deviation of 2.130. However, this commitment declines by Form 4, where the mean score drops to 26.40 with a standard deviation of 1.238. Although there is an increase in commitment by the advanced stage (Form 6), with a mean score of 28.48 and a standard deviation of 1.843, it remains remarkably lower than the levels observed at the beginning of their secondary education in Form 1.

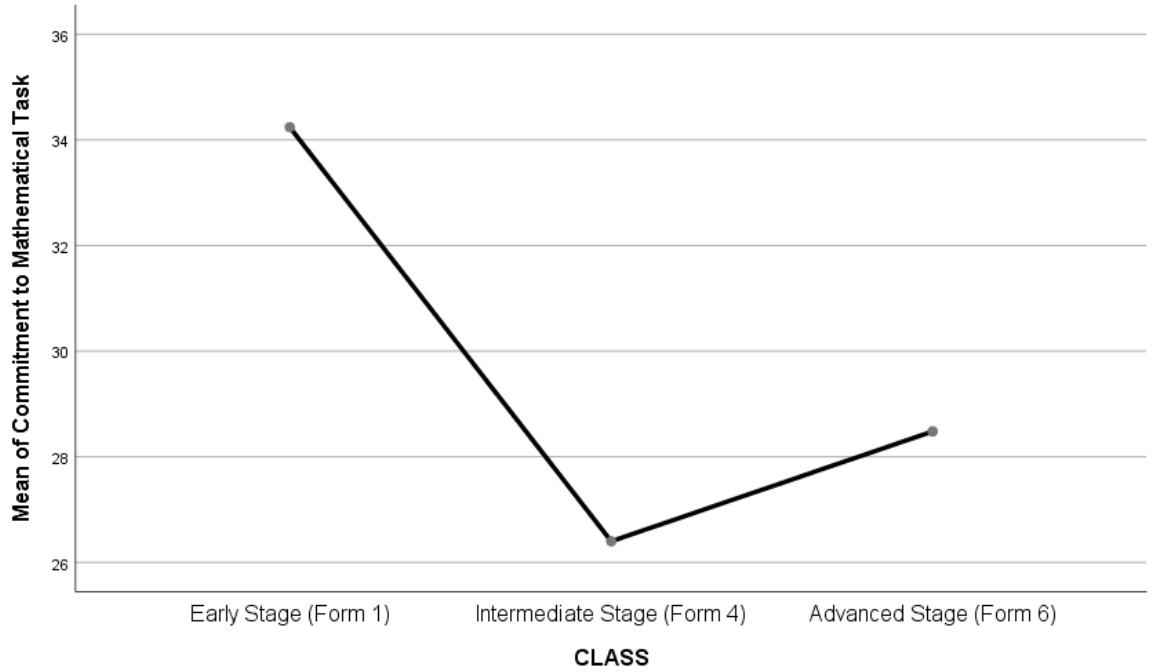

Figure 2. Plot of Means for Students' Commitment to Mathematical Task at the Various Educational Stages

Figure 2 shows that students exhibit a very high level of commitment to mathematical tasks upon entering secondary school (Form 1). This commitment, however, significantly drops by Form 4. Although commitment to mathematical tasks does rise again in the advanced stage (Form 6), it still remains notably lower than the levels seen at the beginning of their secondary education in Form 1.

Ho_2: The mean levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality do not differ significantly.

Ha_2: The mean levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality differ significantly.

Table 6. ANOVA to Compare Means of Students' Commitment to Mathematical Task at the Various Educational Stages

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4123.733	2	2061.867	653.334	.000
Within Groups	1174.000	372	3.156		
Total	5297.733	374			

The ANOVA test on the Table 6 shows that $F(2,372) = 653.334$, with $p = 0.000$. Thus Ho_2 is rejected at 5% level of significance. Conclusively, the mean levels of commitment to mathematical tasks among students at the early, intermediate, and advanced stages of secondary education in Bamenda Municipality differ significantly (See details on Table 7).

The Scheffe's test further suggests that the mean differences in students' commitment to mathematical task between each stage and the others are all significantly different as indicated by p-values which are all less than 0.05.

Third research question was to examine the nature of the overall association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality.

Ho_3: The association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality is not significant.

Ha_3: There is a significant association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality.

Table 7. Scheffe's test for Multiple Comparisons of the Significance of the Mean Differences of Students' Commitment to Mathematical Task at the Various Educational Stages (Dependent Variable: Commitment to Mathematical Task)

(I) CLASS	(J) CLASS	Mean Difference (I-J)	SD	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Early Stage (Form 1)	Intermediate Stage (Form 4)	7.840*	.225	.000	7.29	8.39
	Advanced Stage (Form 6)	5.760*	.225	.000	5.21	6.31
Intermediate Stage (Form 4)	Early Stage (Form 1)	-7.840*	.225	.000	-8.39	-7.29
	Advanced Stage (Form 6)	-2.080*	.225	.000	-2.63	-1.53
Advanced Stage (Form 6)	Early Stage (Form 1)	-5.760*	.225	.000	-6.31	-5.21
	Intermediate Stage (Form 4)	2.080*	.225	.000	1.53	2.63

*. The mean difference is significant at the 0.05 level.

Table 8 shows the descriptive statistics on correlation between students' ınterest in and their commitment to mathematical task.

Table 8. Descriptive Statistics on Correlation between Students' Interest in and their Commitment to Mathematical Task

	Mean	SD	N
Interest in Mathematical Task	30.17	2.972	375
Commitment to Mathematical Task	29.71	3.764	375

Table 8 shows that the overall mean of students at the various stages of their mathematics academic journey from early to advanced, stands at 30.17 for interest in mathematical task and 29.71 for commitment to mathematical task. Thus their interest in mathematical task is slightly higher than their commitment to mathematical task.

Table 9. Pearson Correlation between Students' Interest in and their Commitment to Mathematical Task

		Interest in Mathematical Task	Commitment to Mathematical Task
Interest in Mathematical Task	Pearson Correlation	1	.867**
	Sig. (2-tailed)		.000
	N	375	375
Commitment to Mathematical Task	Pearson Correlation	.867**	1
	Sig. (2-tailed)	.000	
	N	375	375

**. Correlation is significant at the 0.05 level (2-tailed).

Table 9 indicate that the value of the Pearson correlation between students' interest in mathematical task and their commitment to mathematical task is 0.867. This shows that there is a strong positive relationship between both variables, meaning that when students' interest in mathematical task increases, their commitment to mathematical task also increases. Furthermore, the *P*-value ($P < 0.05$) suggests that this relationship is statistically significant. It can therefore be concluded that there is a significantly positive association between students' interest in mathematical tasks and their commitment to mathematical tasks throughout their secondary education journey in Bamenda Municipality.

4. Discussion

The study's findings reveal significant variations in students' interest in mathematical tasks across different stages of secondary education. The high level of interest observed at the start of secondary school (Form 1) is consistent with the idea that early enthusiasm can be a common trait among students entering a new educational phase. This initial engagement aligns with the findings of studies such as those by Eccles and Wigfield (2002), which suggest that students often enter new educational stages with high motivation and interest in academic subjects. However, the notable decline in interest by Form 4, despite the introduction of more advanced topics, reflects a pattern observed in educational research. This drop is consistent with the "motivation crisis" reported in adolescent development literature. For instance, studies by Midgley et al. (1998) and Lepper et al. (2005) have

highlighted how students' motivation and interest in academic subjects often decline during middle and early high school years. This decline has been attributed to several factors, including adolescence, increased pressure, perceived difficulty, curriculum difficulty and a shift in focus from intrinsic to extrinsic motivations which often contribute to waning interest in subjects like mathematics. The subsequent rise in interest by Form 6, though not reaching the initial levels, suggests a partial recovery of commitment. This rebound may be associated with the culmination of secondary education and the approaching transition to higher education or the workforce. Research by Pintrich and Schunk (2002) indicates that students' motivation can be influenced by future goals and aspirations, which might explain the renewed interest as students begin to think about their future careers and academic choices. These findings highlight the need for strategies that sustain student motivation throughout their secondary education to mitigate the mid-phase decline and support continuous interest in mathematical tasks.

The findings of the study also reveal significant variations in students' commitment to mathematical tasks across different stages of secondary education. The very high level of commitment to mathematical task observed in Form 1 is consistent with previous research highlighting that students often start their secondary education with high motivation and enthusiasm (Schiefele, 1991). This phase is typically marked by a sense of new beginnings and curiosity, which can drive strong commitment to academic tasks. The sharp decline in commitment by Form 4 is in line with findings from Eccles et al. (1993), who reported that academic commitment often wanes as students encounter increased academic demands and potentially lose the initial excitement of starting secondary school. This decline can be attributed to several factors, including increased difficulty of mathematical content, growing academic pressure, and possibly reduced perceived relevance of the subject matter (Wigfield & Eccles, 2000). The partial recovery of commitment in Form 6, though still lower than in Form 1, aligns with the literature suggesting that commitment to mathematical task can rise again as students approach the end of their secondary education and start to focus on future academic or career goals (Hidi & Renninger, 2006). This rebound might be due to students' increased understanding of the importance of mathematics for their future aspirations, or as they become more engaged with the subject in preparation for exams and future studies. To address the decline in commitment, educational strategies should focus on maintaining student engagement and emphasizing the relevance of mathematics throughout the secondary education journey. By understanding and addressing these trends, educators and policymakers can better support students in sustaining their commitment to mathematical tasks.

Finally, the high correlation coefficient (0.867) reveals a strong and significant connection between interest and commitment. Empirical research supports this finding. For instance, Schiefele (1991) emphasizes that students' intrinsic motivation, often reflected in their interest, plays a crucial role in their engagement and commitment to academic tasks. This is consistent with the study's results, highlighting that students who find mathematics enjoyable and engaging are more likely to commit to it. The statistically significant p-value reinforces the reliability of the observed correlation. This aligns with research by Ainley, Hidi, and Berndorff (2002), who found that high levels of interest are typically associated with increased persistence and effort in academic tasks. Their work suggests that fostering interest in a subject can effectively enhance students' commitment and performance. The educational implications of this findings underscore the importance of nurturing and sustaining students' interest in mathematics at every stage of their education, in a bid to boost their commitment. According to Hidi and Renninger (2006), interest is a key motivational factor that influences students' learning outcomes and persistence. Educators and policymakers should therefore consider strategies that make mathematics more engaging and relevant to students to enhance their commitment at all stages of their learning. Contextually, given that the study focused on Bamenda Municipality, this finding provides valuable insights into how these dynamics play out in the municipality, potentially guiding localized educational interventions.

5. Recommendations

- Curriculum developers in mathematics should design curriculum materials that are interactive and relevant to students' interests and real-life applications of mathematics. Incorporating project-based learning and practical examples can help maintain high levels of interest and engagement.
- Mathematics departments and teachers should introduce targeted support and enrichment programs during the mid-secondary years, when students' interest commitment tend to decline. This can include tutoring, mentorship, or extracurricular activities that emphasize the importance and enjoyment of mathematics.
- Teachers should foster a growth mindset in students by promoting the belief that mathematical abilities can be developed through effort and persistence. They should provide opportunities for students to see their progress and celebrate their successes, no matter how small.
- Mathematics teachers should undergo professional development and training on effective strategies to maintain student interest and engagement. This includes understanding students' needs, employing diverse teaching methods, and creating a supportive learning environment.

- Parents and the community involvement in supporting students' mathematical education should be encouraged. Provide resources and workshops that help parents understand how they can contribute to their children's learning and interest in mathematics.

6. Conclusion

In conclusion, this study underscores a significant positive correlation between students' interest in and commitment to mathematical tasks, which aligns with existing research highlighting the impact of interest on commitment. The findings reveal a distinct pattern: high initial interest and commitment, a notable decline during the mid-secondary years, and a partial recovery in the advanced stages. This pattern reflects the evolving nature of student motivation throughout secondary education. To mitigate the mid-phase decline and sustain engagement, it is essential to implement educational strategies that foster continuous interest and emphasize the relevance of mathematics. By addressing these trends, educators and policymakers can enhance students' motivation and commitment, ultimately supporting their success in mathematics.

Funding: No funding was reported for this study.

Declaration of interest: The author declares no competing interest.

References

Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest and engagement in work and learning. In P. R. Pintrich, D. K. Brown, & P. R. Pintrich (Eds.), *Motivation in education: Theory, research, and applications* (pp. 117-147). Pearson.

Ames, C. (1992). Classrooms: Goals, Structures, and Student Motivation. *Journal of Educational Psychology, 84*(3), 261-271.

Bourdieu, P. (1986). *The Forms of Capital. In J. Richardson (Ed.), Handbook of Theory and Research for the Sociology of Education (pp. 241-258).* Greenwood.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior.* Plenum Press.

Dweck, C. S. (1986). *Motivational Processes Affecting Learning. In R. M. Sternberg (Ed.), Advances in the Psychology of Human Intelligence (pp. 239-256).* Lawrence Erlbaum Associates.

Eccles, J. S., & Wigfield, A. (2002). *Motivational Beliefs, Values, and Goals. Annual Review of Psychology, 53,* 109-132.

Eccles, J. S., Midgley, C., & Adler, T. (1984). Stage-Environment Fit: Developmentally Appropriate Classrooms for Early Adolescents. *Journal of Early Adolescence, 4*(3), 265-287.

Hidi, S., & Renninger, K. A. (2006). The Four-Phase Model of Interest Development. Educational Psychologist, 41(2), 111-127.

Hoxworth, L., Brown, C., & Combs, E. (2018). Investigating Factors Influencing Student Engagement in Mathematics. *Journal of Educational Psychology, 110*(4), 543-556. https://doi.org/10.1037/edu0000275

Hulleman, C. S., & Harackiewicz, J. M. (2009). Promoting Interest and Performance in High School Science Classes. *Science, 326*(5958), 1410-1412.

Meece, J. L., Anderman, E. M., & Anderman, L. H. (2006). Classroom Goal Structure, Student Achievement, and Motivation. *Psychological Bulletin, 132*(2), 262-280.

National Research Council. (2001). *Adding It Up: Helping Children Learn Mathematics.* National Academy Press.

PISA. (2018). *Programme for International Student Assessment 2018 Results (Volume I): What Students Know and Can Do.* OECD Publishing. https://doi.org/10.1787/5f07c754-en

Pope, D., & Hargis, C. (2018). The Impact of Early Mathematics Education on Long-Term Student Outcomes. *Journal of Educational Research, 111*(3), 223-234.

Sanyal, S. (2018). Educational Inequality and Student Performance in Developing Countries. *Comparative Education Review, 62*(3), 334-359. https://doi.org/10.1086/699076

Schiefele, U. (1991). Interest, Learning, and Motivation. *Educational Psychologist, 26*(3-4), 299-323.

Wang, M. T., & Degol, J. L. (2016). Gender Gaps in Mathematics Achievement: The Role of Gender Stereotypes and the Domain-Specific Self-Concept of Ability. *Journal of Educational Psychology, 108*(1), 140-154.

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25*(1), 68-81. https://doi.org/10.1006/ceps.1999.1015

Appendices

Appendix A: Instrument for Data Collection

Questionnaire for Students

Dear Student,

I kindly request your participation in completing this questionnaire for our research study titled *"Mapping the Dynamics of Student Interest and Commitment to Mathematical Tasks Across Early, Intermediate, and Advanced Stages of Secondary Education in Bamenda Municipality."* Please answer the questions as honestly as possible. Rest assured, your responses will be kept confidential and used solely for research purposes, with no need to provide your name.

Section A: Demographic Information

Tick on the option that applies to you or provide the required responses for the items in this Section.

a. Sex: Male / Female

b. Age: _____

c. Class: _____

d. Name of School: _____

For the sections which follow, please indicate your degree of agreement or disagreement with the following statements as they apply to you by ticking the most appropriate option on a scale of 4, where SD = Strongly Disagree, D = Disagree, A = Agree and SA = Strongly Agree.

Section B: Interest in Mathematical Tasks (IMT)

S/N	Statements	SD	D	A	SA
1	I enjoy solving mathematical problems in my spare time.				
2	I am excited about participating in mathematics-related activities.				
3	I find it rewarding to tackle challenging mathematical problems.				
4	I am interested in learning about new mathematical theories and concepts.				
5	I find mathematics competitions or quizzes enjoyable.				
6	I enjoy using mathematics to solve practical problems in everyday life.				
7	I am curious about how mathematical concepts apply to real-life situations.				
8	I frequently discuss mathematical problems with my peers.				
9	I find mathematics to be an interesting subject.				
10	I feel enthusiastic when starting new mathematical tasks.				

Section C: Commitment to Mathematical Tasks (CMT)

S/N	Statements	SD	D	A	SA
11	I consistently complete my mathematics homework on time.				
12	I review and practice mathematical problems regularly to enhance my skills.				
13	I often spend extra time studying mathematics outside of class.				
14	I set specific goals for my performance in mathematics.				
15	I actively participate in mathematics class discussions and activities.				
16	I take responsibility for my learning and progress in mathematics.				
17	I am willing to put in additional effort to achieve high scores or grades in mathematics.				
18	I prioritize mathematics tasks and assignments over other non-academic activities.				
19	I stay focused and persistent when working on challenging mathematical tasks.				
20	I seek feedback from teachers to improve my performance in mathematics.				