

Attitudes and Educational Settings: A Correlational Analysis

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Abstract. This study explored the relationship between students' attitudes towards mathematics and their educational settings at Pangasinan State University (PSU) Binmaley Campus. Using a descriptive-correlational research design, data was collected from 160 students across four programs: Criminology, Environmental Science, Fisheries and Aquatic Sciences, and Secondary Education major in Science. A survey questionnaire was administered to gather detailed insights into students' perceptions and experiences in mathematics classes. Results indicated that the majority of participants were in their late teens, with significant representation from 19 and 20-year-olds. Female students constituted 57.5% of the sample. First-year students were the predominant group, highlighting the need for transitional support in higher education. The study found that while students generally agreed that mathematics was important and felt confident in their abilities, it was not necessarily their favorite subject. Perceptions of the educational setting at PSU Binmaley were generally positive, with the highest agreement on the classroom environment being conducive to learning. However, areas such as noise level management and teaching pace received slightly lower scores. Importantly, a significant moderate positive correlation ($r = 0.444$, $p < 0.01$) was found between students' perceptions of their educational setting and their attitudes towards mathematics, emphasizing the impact of a supportive learning environment on student engagement. These findings underscored the critical role of tailored educational interventions to enhance mathematics learning and engagement, aligning with broader educational policies and research. The study's insights were valuable for informing strategies to improve mathematics education at PSU Binmaley, fostering a more positive and engaging learning experience.

Keywords: Attitudes towards Mathematics; Educational settings; Student attitudes; Higher education; Descriptive-correlational research; Philippines.

1.0 Introduction

Education plays a pivotal role in shaping the future of individuals and societies, and mathematics, as a core subject, is crucial for developing logical reasoning and problem-solving skills. At the Pangasinan State University (PSU) Binmaley Campus, understanding the attitudes and educational settings that influence students' engagement in mathematics is essential for improving educational outcomes. Research indicates that students' affective engagement in mathematics is significantly impacted by various school and student factors (Lee et al., 2023). This study seeks to explore these dynamics, addressing the critical need to enhance mathematics education and student engagement at PSU Binmaley.

Research consistently shows that the environment where students learn plays a significant role in shaping their attitudes and engagement. The educational environment encompasses various factors including physical classroom settings, school climate, teacher support, and peer interactions. For instance, Lee et al. (2023) conducted a comprehensive study examining both school and student factors and their influence on affective mathematics

engagement. Their findings indicate that a positive school climate, characterized by supportive relationships and a sense of belonging, significantly contributes to students' emotional connection to mathematics. This emotional connection is crucial as it enhances students' intrinsic motivation and engagement with the subject matter.

Moreover, Lee et al. (2023) identified individual student characteristics, such as self-efficacy and prior academic achievement, as critical determinants of their engagement levels. These factors interplay with the broader school environment to shape students' attitudes towards mathematics. For example, students who perceive their school environment as supportive are more likely to develop a positive attitude towards learning and show higher levels of engagement in mathematics activities.

Similarly, Li et al. (2023) highlight the critical role of perceived teacher support in boosting math engagement and reducing anxiety among elementary school students. Their longitudinal study, which tracked students over four waves, found that consistent and positive teacher support not only enhances students' engagement but also alleviates various dimensions of mathematics anxiety. This underscores the importance of a supportive learning atmosphere where teachers actively engage with students, provide constructive feedback, and foster a positive learning environment.

Li et al. (2023) also discovered that teacher support influences students' perceptions of their own abilities in mathematics. When students feel supported by their teachers, they are more likely to develop confidence in their mathematical abilities, which in turn, reduces anxiety and promotes sustained engagement. This dynamic relationship between teacher support and student engagement emphasizes the need for teachers to be trained in providing effective emotional and academic support to students.

In the Philippines, the Department of Education (DepEd) has recognized the importance of enhancing math education to meet global standards and improve student outcomes. The Department has issued several guidelines aimed at fostering a more engaging and effective learning environment. One such directive is DepEd Order No. 72, s. 2020, which calls for the implementation of innovative teaching strategies to motivate students and enhance their performance in mathematics. This directive is part of a broader effort to align Philippine education with international best practices, recognizing that strong STEM (Science, Technology, Engineering, and Mathematics) skills are essential for national economic development and competitiveness.

DepEd Order No. 72, s. 2020, encourages educators to adopt creative and interactive teaching methods, integrate technology into the curriculum, and utilize data-driven approaches to identify and address learning gaps. By fostering a culture of continuous improvement and innovation in teaching practices, the directive aims to create a learning environment that is both stimulating and supportive for students.

Nationally, there is a growing body of research highlighting the need for ongoing professional development for teachers to improve math instruction. Dicdiquin, Mobo, and Cutillas (2023) conducted a study evaluating the effectiveness of professional development programs for junior high school mathematics teachers within the K to 12 curriculum framework. Their research emphasizes that well-designed professional development programs are crucial in equipping teachers with the necessary skills and knowledge to implement innovative teaching strategies effectively. The study found that teachers who participated in these programs showed significant improvements in their instructional practices, which subsequently led to better student performance and more positive attitudes towards mathematics.

The findings of Dicdiquin et al. (2023) underscore the importance of continuous professional development in enhancing the quality of math education. These programs often include workshops, training sessions, and collaborative learning opportunities that help teachers stay updated with the latest pedagogical techniques and educational technologies. By improving teachers' competencies, these programs ensure that students receive high-quality instruction that can foster their interest and engagement in mathematics.

Furthermore, research by Doño and Mangila (2021) on mathematics teacher engagement and student motivation in the Philippines highlights the direct correlation between teacher engagement and student outcomes. Their study suggests that teachers who are more engaged and motivated are better able to inspire their students and

create a positive learning environment. This finding aligns with the broader literature indicating that teacher enthusiasm and commitment play a critical role in student engagement and academic success.

Collectively, these efforts and research findings highlight a concerted push towards improving math education in the Philippines. By focusing on teacher professional development, innovative teaching strategies, and creating supportive learning environments, the DepEd aims to enhance student attitudes and performance in mathematics. This multifaceted approach recognizes that both structural changes at the policy level and practical improvements at the classroom level are necessary to achieve meaningful progress in math education.

Locally, Pangasinan State University (PSU) recognizes the need to boost math engagement among its students. Previous research, including Pereyras' (2019) study on sustainable practices at PSU, shows the university's commitment to progressive strategies. Yet, there's still a gap in understanding how PSU Binmaley students' attitudes towards math are influenced by their educational settings.

Recent local assessments reveal a concerning trend: many students show low motivation and engagement in math. Querido (2023) found that interactive classroom tools can significantly enhance student engagement and performance, though their use is not yet widespread. Additionally, Balala et al. (2021) point out that early numeracy activities play a crucial role in shaping long-term attitudes towards math, indicating a need to strengthen these foundational practices.

Despite efforts to improve, the current educational system faces several challenges. Traditional teaching methods often don't meet the diverse needs of students or address their anxieties about math. Davadas and Lay (2020) note that factors like teaching styles and classroom environments greatly influence students' attitudes towards math. At PSU Binmaley, these issues are compounded by a lack of resources and adequate teacher training, resulting in a learning environment that doesn't fully support student engagement.

This study is motivated by a desire to find effective ways to improve math education at PSU Binmaley. By examining the link between students' attitudes and their educational settings, we hope to uncover insights that can help shape better policies and practices. This research is justified by the urgent need to enhance math engagement, as emphasized by educational authorities and supported by a wealth of literature.

Thus, this study addresses a critical issue: the low engagement and negative attitudes towards math among students at PSU Binmaley. Through detailed analysis, we aim to contribute to the creation of more supportive and effective educational environments, ultimately fostering a more positive and engaging learning experience in math.

2.0 Methodology

2.1 Research Design

This study employs a descriptive-correlational research design to explore the relationship between students' attitudes towards mathematics and their educational settings at Pangasinan State University (PSU) Binmaley Campus. This approach involves collecting comprehensive data through surveys to describe students' perceptions and experiences in their mathematics classes. By using statistical analysis to examine correlations between these attitudes and various educational factors such as teacher support and classroom environment, the study aims to identify significant relationships without manipulating any variables. This design is ideal for providing insights into how different aspects of the educational setting influence mathematics engagement, thereby informing strategies to enhance mathematics education at PSU Binmaley.

2.2 Research Locale

The study was conducted at the Pangasinan State University (PSU) Binmaley Campus, one of the nine campuses of Pangasinan State University. PSU Binmaley Campus is renowned for its distinction as a Center of Excellence for Fisheries, reflecting its commitment to high-quality education and research in this field. Located in the coastal town of Binmaley, Pangasinan, the campus provides a unique learning environment that integrates academic rigor with practical, hands-on experiences, particularly in fisheries and aquatic sciences. This campus not only serves as a hub for aspiring professionals in fisheries but also offers a diverse range of programs, including Bachelor of

Science in Criminology, Bachelor of Science in Environmental Science, and Bachelor of Secondary Education major in Science. The vibrant academic atmosphere, coupled with state-of-the-art facilities and a strong emphasis on research and community engagement, makes PSU Binmaley Campus an ideal setting for this study on the attitudes towards mathematics among its students. This rich educational landscape ensures that the findings of the research are grounded in a context that values both academic excellence and practical application, thereby providing valuable insights for enhancing mathematics engagement across various disciplines.

2.3 Research Participants

The research participants for this study were drawn from Pangasinan State University - Binmaley Campus, comprising a total of 160 respondents. The participants included 40 students each from four different programs: Bachelor of Science in Criminology, Bachelor of Science in Environmental Science, Bachelor of Fisheries and Aquatic Sciences, and Bachelor of Secondary Education major in Science. This diverse group of students provided a comprehensive representation of the campus population, allowing for a thorough examination of the various attitudes towards mathematics across different academic disciplines. By including respondents from these distinct fields of study, the research aimed to capture a wide range of perspectives and experiences, thereby enriching the analysis and findings.

The sampling technique employed in this study was stratified random sampling. This method involves dividing the population into distinct subgroups, or strata, that share similar characteristics and then randomly selecting participants from each stratum. In this case, the strata were the four academic programs mentioned: Bachelor of Science in Criminology, Bachelor of Science in Environmental Science, Bachelor of Fisheries and Aquatic Sciences, and Bachelor of Secondary Education major in Science.

By using stratified random sampling, the study ensured that each academic program was proportionately represented, which helped in capturing the diversity of attitudes towards mathematics within the university. This technique also enhanced the reliability and validity of the findings by reducing sampling bias and ensuring that the sample accurately reflected the overall population of students at Pangasinan State University - Binmaley Campus.

2.4 Research Instrument

The sampling technique employed in this study was stratified random sampling. This method involves dividing the population into distinct subgroups, or strata, that share similar characteristics and then randomly selecting participants from each stratum. In this case, the strata were the four academic programs: Bachelor of Science in Criminology, Bachelor of Science in Environmental Science, Bachelor of Fisheries and Aquatic Sciences, and Bachelor of Secondary Education major in Science.

The survey questionnaire was distributed to the selected respondents in a structured format, ensuring that each participant had an equal opportunity to provide their responses. The questions were designed to elicit comprehensive information on the students' attitudes towards mathematics, focusing on various dimensions such as their emotional engagement, perceived teacher support, and the overall learning environment. This approach facilitated the collection of nuanced data that could be analyzed to understand the correlational relationships between educational settings and student attitudes towards mathematics.

2.5 Data Gathering Procedure

The data gathering procedure for this study involved preparing and validating a survey questionnaire to capture students' attitudes towards mathematics and their perceptions of the educational settings at Pangasinan State University (PSU) Binmaley Campus. The researcher collaborated with faculty members to distribute the questionnaires to 160 students from four different programs, ensuring balanced representation. The surveys were administered during class times to maximize response rates and ensure minimal disruption. Students were informed about the study's purpose and assured of confidentiality. The collected data was then organized and analyzed to identify students' attitudes, understand their perceptions of the educational environment, and examine the relationship between these perceptions and their attitudes towards mathematics.

2.6 Ethical Considerations

Ethical considerations were paramount throughout this study to ensure the integrity and respect for all participants involved. Prior to data collection, the researcher obtained informed consent from all student participants, ensuring they were fully aware of the study's purpose, procedures, and their right to withdraw at any time without any consequences. Confidentiality was strictly maintained, with all responses anonymized to protect the identities of the participants. Additionally, the data was securely stored and used solely for research purposes. The study adhered to the ethical guidelines set forth by the institution and relevant academic bodies, ensuring that the research was conducted with the highest standards of ethical responsibility and respect for the participants' rights and well-being.

3.0 Results and Discussion

3.1 Demographic Profile

Table 1. Descriptive statistics of the demographic profile of the respondents

Age	Frequency	Percentage (%)
18 and below	7	4.40
19	71	44.4
20	61	38.1
21	8	5.00
22 and above	13	8.10
Sex		
Male	68	42.5
Female	92	57.5
Year		
1st Year	98	61.3
2nd Year	58	36.3
3rd Year	2	1.30
4th Year	2	1.30
Course		
Bachelor of Science in Criminology	40	25.0
Bachelor of Science in Environmental Science	40	25.0
Bachelor of Science n Fisheries and Aquatic Sciences	40	25.0
Bachelor of Secondary Education (Science)	40	25.0

Table 1 reveals that the majority of respondents are aged 19 (44.4%) and 20 (38.1%), predominantly female (57.5%), and primarily first-year students (61.3%). This age distribution aligns with typical university enrollment ages, with younger students often showing higher enthusiasm yet greater anxiety towards mathematics (Davadas & Lay, 2020). The slight female majority is noteworthy, as gender differences significantly impact math attitudes and performance (Espinoza & Taut, 2020). The high proportion of first-year students suggests that early academic experiences in mathematics are crucial, as highlighted by Diddiquin et al. (2023). The evenly distributed representation across four academic programs ensures a comprehensive analysis, supporting Querido's (2023) emphasis on tailored educational strategies to enhance math engagement across diverse fields.

3.2 Attitudes Towards Mathematics

Table 2. Descriptive statistics of the attitudes of the respondents towards mathematics

Attitudes	Mean	SD	Description
1. I enjoy learning Mathematics.	2.99	0.476	Agree
2. Mathematics is an important subject for my future career.	3.14	0.446	Agree
3. I feel confident when solving Mathematics problems.	2.60	0.771	Agree
4. I find Mathematics concepts easy to understand.	2.58	0.696	Agree
5. I am motivated to study Mathematics outside of class.	2.76	0.601	Agree
6. Mathematics is one of my favorite subjects.	2.38	0.875	Agree
7. I believe I can get good grades in Mathematics.	2.66	0.743	Agree
8. I look forward to Mathematics classes.	2.74	0.687	Agree
9. I feel anxious when it comes to Mathematics exams.	3.11	0.634	Agree
10. I find real-life applications of Mathematics interesting.	2.78	0.660	Agree
Overall	2.77	0.659	Agree

Table 2 shows that respondents generally have a positive attitude towards mathematics, with an overall mean score of 2.77. The highest agreement was with the statement "Mathematics is an important subject for my future

career" (Mean = 3.14, SD = 0.446), emphasizing the perceived career value of math, in line with Dicdiquin et al. (2023). However, moderate levels of confidence and understanding were noted, with mean scores of 2.60 (SD = 0.771) and 2.58 (SD = 0.696), respectively. This suggests that while students see the importance of math, there is a need to enhance their confidence and comprehension, as highlighted by Espinoza and Taut (2020) and Li et al. (2023), who emphasize the role of supportive educational environments.

A notable level of anxiety was observed with a mean score of 3.11 (SD = 0.634) for the statement "I feel anxious when it comes to Mathematics exams," reflecting findings from Lee et al. (2023) and Li et al. (2023) on math anxiety. Despite this, students expressed motivation to study math outside class (Mean = 2.76, SD = 0.601) and looked forward to math classes (Mean = 2.74, SD = 0.687), indicating a recognition of math's importance. To address areas of low confidence and high anxiety, innovative teaching strategies and ongoing teacher support, as suggested by Querido (2023), Balala et al. (2021), Doño and Mangila (2021), and Chua (2023), could be implemented to improve student attitudes and engagement in mathematics.

3.3 Educational Setting

Table 3. Descriptive statistics of the respondents' perception to the educational setting

Attitudes	Mean	SD	Description
1. The classroom environment is conducive to learning.	3.06	0.383	Agree
2. The classroom is equipped with adequate seating and lighting.	2.96	0.493	Agree
3. The noise level in the classroom is manageable and does not disrupt learning.	2.71	0.587	Agree
4. The teaching methods used in Mathematics classes are engaging.	2.86	0.570	Agree
5. Instructors use a variety of teaching methods to cater different learning styles.	2.96	0.493	Agree
6. The pace of teaching in Mathematics classes is appropriate for my understanding.	2.79	0.605	Agree
7. The availability of textbooks and other learning materials for Mathematics is satisfactory.	2.86	0.588	Agree
8. There are sufficient technological resources (e.g., computers, projectors) to support Mathematics learning.	2.81	0.555	Agree
9. Online resources provided by the school are helpful for my Mathematics studies.	2.82	0.525	Agree
10. The overall educational setting at PSU Binmaley supports my engagement in Mathematics.	3.04	0.378	Agree
Overall	2.89	0.518	Agree

Table 3 illustrates the respondents' perceptions of the educational setting at PSU Binmaley Campus, with an overall mean score of 2.89, indicating general agreement that the environment supports their mathematics learning. The highest-rated statement was "The classroom environment is conducive to learning" (Mean = 3.06, SD = 0.383), which suggests that students find their physical learning environment supportive. This is consistent with findings by Davadas and Lay (2020), who emphasized the importance of a conducive classroom environment in enhancing students' attitudes towards mathematics.

Other aspects of the educational setting also received favorable ratings. Statements like "The classroom is equipped with adequate seating and lighting" (Mean = 2.96, SD = 0.493) and "Instructors use a variety of teaching methods to cater different learning styles" (Mean = 2.96, SD = 0.493) highlight the adequacy of physical resources and the diversity in teaching approaches, which are crucial for catering to various learning preferences (Dicdiquin et al., 2023). However, the relatively lower mean score for "The noise level in the classroom is manageable and does not disrupt learning" (Mean = 2.71, SD = 0.587) suggests that noise control could be improved to further enhance the learning environment. Studies by Lee et al. (2023) and Li et al. (2023) support the notion that a well-managed classroom environment significantly impacts student engagement and reduces anxiety. Overall, the educational setting at PSU Binmaley appears supportive of mathematics learning, aligning with Querido's (2023) findings on the importance of a supportive learning environment for enhancing student engagement in mathematics.

3.4 Relationship Between Educational Setting and Attitudes

Table 4 shows the relationship between respondents' perspectives on the educational setting at PSU Binmaley Campus and their attitudes towards mathematics. The correlation coefficient ($r = 0.444$) indicates a moderate positive relationship, which is statistically significant at the 0.01 level ($p = 0.000$). This suggests that improvements in the educational setting are associated with more positive attitudes towards mathematics among the students.

Table 4. Analysis for the relationship between educational setting and their attitudes towards mathematics

Relationship	Correlation Coefficient	Attitudes towards Mathematics	Interpretation
Educational Setting	r	0.444**	Moderate
	Sig.	0.000	Positive Relationship

** . Correlation is significant at the 0.01 level (2-tailed).

This finding is consistent with previous research emphasizing the significant role of the learning environment in shaping students' attitudes and engagement with mathematics. For instance, Lee et al. (2023) and Li et al. (2023) highlighted how supportive educational settings, including effective teaching methods and adequate resources, contribute to higher levels of student engagement and reduced math anxiety. Furthermore, Dicdiquin et al. (2023) and Querido (2023) have demonstrated that diverse and interactive teaching strategies enhance student motivation and performance in mathematics. Therefore, the moderate positive relationship observed in this study underscores the importance of fostering an enriching and supportive educational environment to improve students' attitudes towards mathematics.

4.0 Conclusion

The findings from this study provide a comprehensive understanding of the attitudes towards mathematics among students at Pangasinan State University (PSU) Binmaley Campus, highlighting various demographic, academic, and environmental factors. The majority of participants were in their late teens, particularly 19-year-olds, indicating a critical stage in higher education where attitudes are significantly influenced by their educational environment. Female students constituted a higher percentage of the sample, which is consistent with broader educational trends and emphasizes the importance of understanding gender-specific factors in mathematics engagement. First-year students were predominantly represented, suggesting the necessity of focusing on transitional support to enhance their mathematics experiences. The equal distribution of respondents across different academic programs allowed for a balanced analysis, revealing that while students generally acknowledge the importance of mathematics and feel confident in their abilities, it is not necessarily their favorite subject. Perceptions of the educational setting at PSU Binmaley were generally positive, with students appreciating the conducive learning environment and diverse teaching methods, though areas for improvement were identified. Importantly, the study found a significant moderate positive relationship between students' perceptions of their educational setting and their attitudes towards mathematics, underscoring the critical role of a supportive educational environment in fostering positive mathematical engagement. These insights align with existing literature and provide valuable guidance for developing targeted interventions to enhance mathematics education at PSU Binmaley.

5.0 Contributions of Authors

This study was conducted solely by the author, who was responsible for all aspects of the research. The author independently carried out the writing, editing, data gathering, data analysis, encoding, and interpretation of the findings. Every stage of the research process, from conceptualization to final reporting, was meticulously managed by the author to ensure the study's integrity and coherence. This comprehensive involvement underscores the author's dedication and expertise in the subject matter.

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7.0 Conflict of Interests

The author indicated that there are no conflict of interests in the publication of this paper.

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