THE INFLUENCE OF STUDENT MOTIVATION AND CLASSROOM SETTING ON STUDENTS' ACADEMIC PERFORMANCE IN MATHEMATICS

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ABSTRACT

This study aimed to investigate the influence of student motivation and classroom setting on students' academic performance in mathematics at Sta. Fe National High School. In the research that was carried out, a quantitative research approach was adopted, and the primary tool that was utilized for the purpose of data collection was a survey questionnaire. For the purpose of the study, there were 105 students who were in grades 7 and 8 who participated. For the goal of determining the level of academic accomplishment that they have attained, the findings of their summative examination in mathematics that was standardized were collected. Furthermore, the survey questionnaire contained inquiries involving the students' motivations, both internal and external, in addition to inquiries concerning their physical and social environments for learning. In order to examine the data that was obtained, statistical procedures such as the mean and the Pearson r correlation were utilized. Both the level of motivation that students have and the environment that they are in in the classroom have a substantial impact on the level of academic achievement that they achieve in mathematics, according to the research. Research has shown that there is a favorable association between the academic accomplishment of students and the level of interest they have in their subject matter, as well as the quality of the setting in which they are learning. Based on the findings of the study, it is recommended that educators continue to work toward cultivating student excitement and building a positive culture inside the classroom.

Keyword: - *intrinsic motivation, extrinsic motivation, physical learning environment, social learning environment, academic performance, descriptive correlational study*

1. INTRODUCTION

Student motivation remains a crucial element that influences the range and excellence of learning experiences. It is a multifaceted concept that is influenced by several internal and external elements. The classroom environment, encompassing resources, instructional methodologies, and social dynamics, serves as the framework within which various motivational variables function simultaneously. It becomes essential to comprehend how classroom dynamics and student motivation work together that affects academic accomplishment in the field of mathematics instruction, where obstacles and successes frequently coexist.

Globally, Suren and Kandemir (2020) studied the effects of mathematics anxiety and enthusiasm on student's mathematics attainment. The general findings indicated that developing a learning environment that will help students succeed in mathematics, support their self-assurance, and cultivate a positive attitude toward mathematics are essential in order to upsurge students' motivation towards mathematics.

According to Bernardo et al. (2022) Filipino students performed poorly in the 2018 Programme for International Student Assessment (PISA) mathematics assessment. Some factors on poor performance in mathematics are the student's motivation and learning environment. Students who lack motivation to study often exhibit tardiness and absenteeism. Students are more motivated to do well when they have the support of their teachers and parents. Additionally, the learning environment had a role in how well students were motivated to learn mathematics.

At the local level, there are multiple complex problems related to the classroom setting and student motivation in mathematics instruction. Some students lack interest in mathematics, resulting in their frequent absences from class. They express their dislike for attending mathematics class due to their aversion to solving complex numerical problems, equations involving variables with exponents, and other demanding mathematical concepts. They perceive the topic as difficult. Students perceive their instructional environment as somewhat inconvenient. There are overly packed classrooms, uncomfortable seating, and insufficient lighting and ventilation.

Dornyei (2020) states that there is a clear link among the motivation of learners and their active participation in class. Hence, cultivating motivation is essential for promoting active learning. Zaccone & Pedrini (2019) added that students that actively participate and have a strong enthusiasm for their studies are more inclined to achieve academic achievement. In turn, they prioritize self-exploration over the benefits associated with academic achievement. Individuals who possess intrinsic motivation typically exhibit a higher degree of self-motivation and independence compared to individuals who lack intrinsic motivation. This implies that individuals are more inclined to take on accountability and have confidence in their academic abilities (Ryan & Deci, 2020).

According to Kotera et al. (2021) extrinsic motivation drives individuals to complete activities due to external influences. They derive greater gratification from external incentives or the threat of consequences instead of from the inherent enjoyment of the activity. Externally motivated learners consistently seek validation from their teachers to validate the correctness of their actions or accomplishments during educational activities. This action intensifies when the outcomes evoke a positive emotional response, and it diminishes when the outcomes elicit a negative emotional response (Wardani et al., 2020).

Moreover, as stated by Adedoyin and Adebayo (2019), the classroom atmosphere is a crucial motivational factor in the teaching and learning process. Research demonstrates that students' academic performance benefits from the presence of a well-equipped physical classroom setting. This is attributed to the availability of facilities such as painted walls, furniture, electricity, designs, overhead projectors, and other instructional materials (Kausar et al., 2017). According to Qamar et al. (2018), an environment in the classroom that is conducive to learning facilitates the process of teachers imparting knowledge and enables pupils to achieve higher academic performance. Utilizing suitable instructional and educational resources enhances students' academic achievements within classroom settings. It improves students' learning experiences in a positive way.

In the same way, Mohammad et al. (2022) assert that the classroom's social atmosphere is a crucial factor influencing the learning process. The cultivation of awareness of oneself in children is contingent upon a favorable emotional atmosphere within the classroom, thereby underscoring the utmost significance of establishing a congenial learning environment (Dowker et al., 2019). Adolescents can achieve happiness and excellent health in school through the development of friendships, the refinement of their interpersonal and emotional aptitudes, and the exploration of their individual identities. Moreira et al. (2020) designed this unique setting to promote overall health and happiness.

El Zahrani (2020), academic performance is defined as the culmination of students' knowledge, experiences, and talents acquired through their efforts in various academic courses over the academic year. Students' academic achievements are important because they reflect their expertise, skills, and mindsets throughout their college education. In the study they conducted, Mappadang (2022) proposed that possessing a robust academic disposition is crucial for attaining academic success. Students who possess a high level of academic curiosity and dedication will consistently enhance their understanding and expertise in accounting.

1.1 Research Problem

1. What is the level of student motivation in terms of:
   1.1 Intrinsic motivation?
   1.2 Extrinsic motivation?
2. What is the level of classroom setting in terms of:
   2.1 Social?
   2.2 Physical?
3. What is the academic performance of the students in Mathematics?
4. Is there a significant relationship between student motivation and student academic performance in Mathematics?

5. Is there a significant relationship between classroom setting and student academic performance in Mathematics?

1.2 Null Hypothesis

The hypothesis was tested using the appropriate statistical tool set at 0.05 level of significance.

HO₁: There is no significant relationship between student motivation and student academic performance in mathematics.

HO₂: There is no significant relationship between classroom setting and student academic performance in mathematics.

2. METHODOLOGY

2.1 Research Design

This research study utilized the quantitative method using a descriptive-correlational research design. Arikunto (2007) explained that descriptive research is the one that is intended to gather information found in the study, and the correlation method is used to investigate the correlation between two variables.

Moreover, the correlational statistical test was employed in the correlational research design to characterize and quantify the degree of relationship between two or more variables or sets of scores (Creswell, 2012). This design allowed the researcher to delve into understanding the impact of the relationship between student motivation and academic performance, as well as the classroom setting and academic performance of the students in mathematics.

2.2 Research Respondents

The respondents of this study consisted of 105 students in grades 7 and 8 who were officially enrolled at Sta. Fe National High School in Sta. Fe, New Corella, Davao del Norte, during the academic year 2023-2024. The researcher employed the purposive sampling technique. The number of respondents from grades 7 and 8 is displayed in Table 1.

Table 1
Respondents of the Study

Grade Level	Total
Grade 7	45
Grade 8	60
Total	105

2.3 Research Procedures

The researcher wrote a formal letter of inquiry to the Davao del Norte Division Superintendent of Schools. An official correspondence was sent to the school head of Sta. Fe National High School, authorizing the researcher to proceed with the study. In addition, the researcher presented an official letter to the respondents, requesting their consent to take part in the study. Before commencing data collection, the researcher thoroughly completed all the required documents for the administration of the study instrument. In order to guarantee the accuracy and dependability of the findings, the researcher directly conducted the study. The task was carried out with great care, ensuring that all aspects of the instrument were thoroughly described to help the learner respondents grasp the nature of the questions presented. Following the data retrieval process, the researcher promptly proceeded to arrange and merge the collected data. Afterwards, present them to the statistician for the purpose of conducting statistical analysis. Subsequently, the data underwent further analysis and interpretation utilizing statistical methods.

2.4 Statistical Treatment of Data

To test the hypotheses formulated, the statistical tools utilized in the study were the following:

1. **Mean**. This was used to determine the competency level of the students in terms of student motivation and classroom setting.
2. **Pearson r correlation.** This was used to determine the relationship between the two variables present in the study.

The mean scores of the students in student motivation and classroom setting, and the mean scores of the students in each academic performance in mathematics, were correlated.

3. RESULTS AND DISCUSSION

Table 2: Intrinsic Motivation

I …	MEAN	INTERPRETATION
1. Enjoy learning mathematics because it is fun.	2.91	Agree
2. Find mathematics to be challenging and stimulating.	2.97	Agree
3. Feel a sense of satisfaction when I solve a difficult math problem.	2.72	Agree
4. Feel a sense of accomplishment when I finish math assignment.	3.13	Agree
5. Feel good about myself when I do well in mathematics.	3.13	Agree
6. Do mathematics because it is important to me.	3.13	Agree
7. Do mathematics because it helps me to learn and grow.	3.17	Agree
8. Do mathematics because it allows me to be creative.	2.83	Agree
9. Do mathematics because it allows me to express myself.	2.87	Agree
10. Do mathematics because it is something that I am good at.	2.90	Agree
Over all mean	2.98	Agree

Table 2 shows that "I feel a sense of satisfaction when I solve a difficult math problem" had the lowest mean score of 2.72. According to the students, solving arithmetic problems can be pleasant, but the task's intricacy may cause dissatisfaction, lowering enjoyment. The category "I do mathematics because it helps me to learn and grow" has the highest mean score of 3.17, but the results show that students are more satisfied when they view mathematics as a way to improve their personal development and learn new skills. The mean for 'intrinsic motivation' is 2.98, indicating agreement. Students are moderately to highly self-motivated in mathematics. As stated by the research of Ryan and Deci (2020), learners that possess intrinsic motivation demonstrate more persistence in acquiring new material and hold a more positive attitude towards it compared to pupils without intrinsic motivation. This is because kids who possess intrinsic motivation are inherently driven by internal factors. Furthermore, students with high levels of motivation from within demonstrate a greater tendency to consistently accomplish their assignments, possess more ambitious educational objectives, and exhibit a reduced frequency of absenteeism. Moreover, intrinsically motivated behaviors can be computationally equated to externally stimulated behaviors as they both aim to reduce punishment and maximize goal achievement. These concepts are mathematically represented as dedication expense and value functions, respectively, as cited by Morris et al. (2022).

Table 3: Extrinsic Motivation

I…	MEAN	INTERPRETATION
1. Get good grades or my parents give me money (reward).	2.47	Disagree
2. Do not want to get bad grades or my parents will get mad at me.	2.65	Agree
3. Both my teacher or parents expect me to do well in math.	2.85	Agree
4. Want to get into a good college or get a good job.	3.41	Agree
5. Want to make my teachers or parents proud of me.	3.29	Agree
6. Have to take math classes to graduate.	3.05	Agree
7. Have to do well in math to get into a good college or get a good job.	3.19	Agree
8. Afraid of failing or getting bad grades.	2.83	Agree
9. Feel like I am not good at math and I have to work hard to do well.	2.66	Agree
10. Everyone else is doing math, so I have to do it too.	2.74	Agree
Over all mean	2.89	Agree

As shown in Table 3, the category 'I get good grades or my parents give me money (reward)' has the lowest mean of 2.47, while the category 'I want to get into a good college or get a good job' has the highest mean of 3.41. Students' aspirations for academic and professional achievement are more important to them than the benefits they receive. The results demonstrate that when students have a clear objective in mind, they are more invested in and like mathematics. The indicator 'extrinsic motivation' has a mean of 2.89, reflecting agreement. Many student external factors motivate them to do math. Praising and rewarding them motivates them to learn. According to Kotera et al. (2021), individuals who are extrinsically motivated are compelled to complete tasks due to external factors, and their satisfaction is derived from the end result (such as awards or preventing sanctions) instead of the activity itself. Wardani et al. (2020), added that extrinsic motivation refers to the act of studying with the specific intention of attaining a certain objective, such as improving one's grade point average, gaining a diploma, or receiving awards in the form of money or other tangible items.

Table 4: Physical Learning Environment

ITEM	MEAN	INTERPRETATION
1.The classroom is clean and well-maintained.	3.19	Agree
2. The classroom is well-lit and ventilated.	2.89	Agree
3. The classroom is furnished in a way that is conducive to learning.	3.09	Agree
4. There are adequate resources and materials available for all students.	3.05	Agree
5. The classroom is a safe and comfortable place to learn.	3.14	Agree
6. I have enough desk space to take notes in the classroom.	2.75	Agree
7. The classroom is large enough for the number of students enrolled.	2.90	Agree
8. The arrangement of seats in their classroom is appropriate.	2.99	Agree
9. It is easy to hear the teacher in the classroom.	2.98	Agree
10. The classroom is accessible for all students.	3.12	Agree
Over all mean	3.01	Agree

All student responses for 'physical learning environment' in Table 4 agree with the proposition. The lowest category, "I have enough desk space to take notes in the classroom," scores 2.75. Students may feel constrained without ample note-taking space. Students feel more comfortable in "the classroom is clean and well-maintained," with the highest mean score of 3.19. There is agreement on the physical learning environment mean of 3.01. Mathematics learning is moderate to high in the student's physical surroundings. Kausar et al. (2017) found that the physical setting of a classroom has a beneficial impact on students' academic performance. This is due to the availability of facilities such as painted structures, furnishings, electric supply, water for drinking, designs, illustrations, projection screens, and other instructional materials related to information and communication technology (ICT). Furthermore, these facilities serve as a catalyst for students' active engagement in classroom activities, hence enhancing their performance in examinations. An environment in the classroom that is favorable to learning facilitates the process of teachers transmitting knowledge and enables students to enhance their academic performance. Utilizing suitable instructional and educational resources enhances students' academic achievements within classroom settings, it improves students' understanding in a favorable manner (Qamar et al., 2018).

Table 5: Social Learning Environment

The …	MEAN	INTERPRETATION
1.Teacher does not respectful of all student.	1.62	Disagree
2. Teacher creates a positive and supportive learning environment.	3.14	Agree
3. Teacher encourages students to participate in class discussions and activities.	3.34	Agree
4. Teacher provides students with opportunities to work collaboratively.	2.98	Agree
5. Teacher values diversity and inclusion in the classroom.	3	Agree
6. Teacher effective engagement in activities is important for students at my school.	3.09	Agree

7. Teacher explains something, I understand immediately.	3.02	Agree
8. Teacher encourage mutual respect among all students.	3.16	Agree
9. Teacher makes me feel welcome in the classroom.	3.25	Agree
10. Teacher recognizes that I have important ideas to contribute.	3	Agree
Over all mean	2.96	Agree

Table 5 shows that category 1 has the lowest mean rating of 1.62, which is disagree, while the rest of the categories have virtually the same mean rating, which is agree. The students disagreed that the teacher disrespected them. The class has seen firsthand how the instructor treats each student with dignity and compassion. The category with the highest mean score, "The teacher makes me feel welcome in the classroom," scored 3.25. This shows that teachers can foster a sense of belonging, emotional safety, and free expression in their students. The instructor fosters open communication, cares about students, and celebrates diversity. The indicator 'social learning environment' had a mean of 2.96, indicating agreement. Results shows that the teacher appreciates, encourages, and cherishes student diversity. Mohammad et al. (2022), asserts that the classroom's social atmosphere is a crucial factor influencing the learning process. The classroom's social environment encompasses the interactions between students and professors, as well as among students themselves, which have an impact on students' motivation and performance. These interactions can be categorized based on their amount, nature, and quality. Furthermore, according to Stewart (2016), the school environment and the professional experience of instructors both have an impact on the philosophy of instruction and attitudes towards learning. These elements can influence students' views of the social environment within the classroom. This environment enhances the motivation, well-being, and adaptation of adolescents in the classroom by fostering the growth of their interpersonal and intellectual abilities.

Table 6: Academic Performance

No. of Students	Mean	Class Proficiency	Competency level
105	26.08	65%	Near Mastery

Table 6 shows the mean academic achievement of the 105 students in mathematics is represented by an average score of 26.08, which is the average score for the students. As demonstrated by the class proficiency, the performance of the students is approximately 65 percent of the level that was projected. Based on this information, it appears that the student's level of proficiency is near mastery that are set. There is a lack of interest, engagement, and suitable resources among learners in relation to the subject matter. According to Yusuf, Onifade, and Bello (2016), academic performance is defined as the behavior of a student that can be measured and observed over a specific amount of time. As an additional point of clarification, the authors stated that the evaluation scores are obtained from a number of tests and exercises that students complete in class, as well as midterm exams, mock exams, and final exams. Additionally, Alova and Calanza (2022), academic accomplishment is considered to be a function of how well students manage their schoolwork and how well they handle or complete the tasks that are assigned to them by their teachers. It is common practice to utilize scores as a means of evaluating a student's capability for factual study and recall, as well as their capacity to transmit newly learned material verbally or in writing. One of the primary goals of the school is to enhance students' academic performance, as measured by their performance on standardized tests. The fundamental purpose of educational institutions is to enhance the academic performance of students by providing them with the knowledge and skills necessary to succeed in their studies.

Table 7: Significant Relationship Between Student's Motivation and Academic Performance in Mathematics

Variables	p-value	Correlation coefficient	Remarks
Motivation	0.000	0.46	Significant
Academic Performance			

A correlation is conducted to test the relationship between student motivation and academic performance, with a with a p-value of 0.000, which is significant, and a correlation coefficient of 0.5, which is moderately positive. Students' motivation and Mathematics achievement are moderately positively correlated. Although imperfect, it shows a consistent

link between student motivation and academic accomplishment. Increasing one variable raises the other. Dornyei (2020) asserts that there is a clear link between students' motivation and their active participation in class. Therefore, it is essential to cultivate motivation in order to promote active learning. Students who demonstrate high levels of engagement and passion are more inclined to achieve academic achievement. A study conducted by Ahn et al. (2021) found that educators who effectively address students' needs through their teaching methods significantly influence students' motivation to achieve academic achievement. When students think that their teachers are providing them with support, they are more inclined to attain academic achievement. Furthermore, students who feel more supported by their professors demonstrate higher levels of competency and improved engagement in class, especially in the subjects of mathematics and natural sciences. The teacher's support and an individual's self-assurance in their own expertise are directly correlated with motivation (Wei et al., 2022).

Table 8: Significant Relationship Between Classroom Setting and Academic Performance in Mathematics

Variables	p-value	Correlation coefficient	Remarks
Classroom Setting	0.000	0.51	Significant
Academic Performance			

A correlation conducted to test the relationship between classroom setting and academic performance, with a with a p-value of 0.000, which is significant, and a correlation coefficient of 0.51, indicating a moderately positive correlation. This suggests that there is a somewhat beneficial relationship between the students' academic success in mathematics and the classroom environment. It suggests that the teaching environment has a consistent, although not perfect, relationship. The tendency is for both variables to increase as one does. Adedoyin and Adebayo (2019) assert that the classroom setting is a crucial motivational factor in the teaching and learning process. The quality of instruction in secondary school courses and learning programs can be influenced by the condition of the classroom environment. In addition, the learning environment can be understood as the outcome of the interaction between individual needs and external influences. When assessing the educational setting in the classroom, it is essential to take into account both the requirements of individuals and the external influences on the environment (Malik and Rizvi, 2018).

4. CONCLUSIONS

The findings indicated that the motivation level of students and the quality of the classroom environment have a significant impact on academic performance. If individuals possess motivation and are exposed to a conducive learning environment, they are likely to excel. According to respondents, the primary factors that have the greatest impact on academic accomplishment are student motivation and the classroom atmosphere. Determined students exhibit increased effort, maintain resilience, and employ effective study strategies. A well-structured classroom facilitates students' concentration, cooperation, and availability of educational materials. Therefore, a strong drive and a nurturing educational setting promote achievement in academics.

4.1 Implications of Future Research.

According to the study's findings, these are the conclusions that can be drawn. The subsequent suggestions were put forth:
1. Teachers must continue to assist and encourage the motivation of the students by putting into action measures that will maintain and further improve the students' motivation.
2. Teachers must continue cultivating a favorable atmosphere in the classroom and place an emphasis on tactics that will help to preserve the advantages of the classroom setting.
3. Administrators must prioritize more chances for teachers to participate in professional development that should be made available to them so that they can improve their classroom management skills, teaching methods, and ways of fostering student motivation.
4. Future researchers are encouraged to extensively examine student motivation and the classroom environment in order to enhance academic achievement.

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