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The moderating role of positive education to the relationship of level of anxiety and academic achievement in mathematics

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Abstract: Positive education emphasizes the study of happiness and well-being to encourage and support students, teachers, schools, and communities in their growth and development. The primary goals are to lower anxiety levels, boost life satisfaction, and improve students' academic performance. This study employed an experimental research design aimed at analyzing the post-test results of positive education in the level of anxiety and academic achievement in mathematics through moderated hierarchical multiple regression analysis. Findings showed that students' anxiety level negatively affected their mathematics academic achievement. Positive education, on the other hand, demonstrated a significant effect on the mathematical achievement of the experimental group. Positive education significantly moderated the relationship between anxiety level and mathematics academic achievement. A test of simple slopes for post-test results revealed that the relationship between anxiety level and academic achievement was significant in the experimental group, but it was not significant in the control group. These results imply that positive education intervention serves as an effective strategy for enhancing mathematics teaching.

Keywords: *Academic achievement in Mathematics, Level of anxiety, Moderating role, Positive education in Mathematics.*

1. Introduction

Positive education is an educational approach that integrates traditional but transformative academic learning with principles of positive psychology. This principle aims to enhance students' well-being, foster positive emotions, and cultivate strengths, consequently improving academic achievement and reducing anxiety [1]. The conventional educational method often emphasizes academic success, sometimes at the cost of students' mental health, leading to increased level of stress and anxiety that negatively affect academic result [2]. Meanwhile, positive education offers a balanced emphasis on both academic achievement and emotional well-being.

Studies indicate that incorporating positive education initiatives in schools can significantly improve students' academic achievement. Waters [3] found out that students who participated in positive education interventions demonstrated higher academic achievement compared to their peers in traditional setting. The also have had lower levels of anxiety and stress. An important element of positive education is teaching learners to classify and develop their strengths, enhancing their' motivation and determination in academic tasks [4]. In addition, positive education nurtures the education of positive emotion such as gratitude and optimism which enhance positive work-life balance and protect against anxiety and other negative emotional states [5].

Anxiety, a common problem among students, can significantly hamper cognitive abilities like concentration, memory, and problem-solving, all of which are necessary for academic achievement [6].

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The high levels of anxiety among students, coupled with the interaction between studying and positive emotions, underscore the importance of teaching the concept of happiness in schools. Arthur [7] notes that parents desire school programs that incorporate values within their children. Teachers play a challenging role in shaping young individuals to become content and happy despite life's hardships and dangers. These students could potentially become advocates of change and peace within their communities when proper nurturing is done. By reducing anxiety through positive education, students may experience improvements in academic achievement. Waters [3] emphasizes that school programs integrating student well-being are more likely to prevent depression, promote life satisfaction, inspire community involvement, encourage creativity, adapt learning approaches, and even boost academic achievement. However, Seligman [8] points out that there is a significant lack of positive education studies focused on students in the Asian region. Therefore, integrating positive education in the curriculum has the potential to enhance academic achievement while reducing anxiety, and strengthening academic success and students' overall well-being.

Students often fail schools due to a lack of material, social, and emotional competencies [9]. Being less privileged individuals, victims of conflict, and living in a hostile environment are among the conditions that negatively impact students' performance affecting their sense of individuality and leading to depression and anxiety. This situation happens in the southern Philippines, particularly in the province of Maguindanao. Many local communities in Maguindanao struggle with poverty and unstable peace due to the presence of lawless groups and tribal conflicts. The National Achievement Test scores in the region are consistently below the national average [10].

Harkness and Monroe [11] note that the relationship between socio-economic profile and learners' socio-emotional abilities is mediated and moderated by harsh and exposure to chronic stressors. To create a healthy school condition, positive education programs can reduce mental distress and mitigate mental health risks such as depression and anxiety [12]. Students in conflict-affected areas are often living in fear, leaving their homes and losing interest in attending school. Establishing real-life connections that help students understand the purpose of studying is important to become resilient in every difficulty encountered. Every discipline has its own way of establishing and maintaining these connections. According to D'Ambrosio [13], as cited by Powell [14], Mathematics can play an important role in achieving ideal human values such as equality, justice, and self-worth, regardless of race, tribe, sex, beliefs, and cultures. This study introduces the concept of positive education in Mathematics

Schools should, therefore, emphasize teaching and learning of Mathematics more meaningful. Various methods can be used by the teachers making them mindful of their students' needs, placing them and their values formation at the center of the teaching process. These methods can take many practical forms in the classroom and are very essential in providing quality fundamental education which reduces student anxiety and depression, thereby, enhancing learning outcomes. Student-centered learning strategies can promote academic achievement and are integral part in fostering positive education.

It was with the relationship of level of anxiety and academic achievement as moderated by positive education using student-centered strategies that this undertaking was conceived by the researchers.

The following are the objectives of the study.

1. Did level of anxiety have negative impact on academic achievement in Mathematics?
2. Did positive education have a positive impact to the level of anxiety of students?
3. Did positive education significantly moderate the relationship between anxiety level and academic achievement in Mathematics.
4. Was the relationship between level of anxiety and academic achievement in Mathematics significant in the experimental group.
5. Was the relationship between level of anxiety and academic achievement in Mathematics significant in the control group?

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2. Literature Review

2.1. Positive Education Models and Different Positive Education Perspectives

Positive psychologists have consistently conducted research to enhance character strengths and explore moral values from various religious and philosophical traditions, including Confucianism, Buddhism, Hinduism, ancient Greek philosophy, and Christianity, among others. Their goal is to identify and foster positive socio-moral traits. Happiness and the pursuit of teaching happiness involve not only the development of positive attributes but also the creation of enriching experiences both in the classroom and beyond. Positive psychologists emphasize the importance of creating an environment where positive emotions can flourish.

Extensive research supports the need to incorporate positive education into learning to nurture resilience, gratitude, strengths, meaning, flow, positive relationships, and emotions in students. This includes foundational theories from Thorndike's behavioral psychology, Erikson's psychosocial stages, Kohlberg's stages of moral development, and Gardner's multiple intelligences. However, several models specifically aimed at enhancing positive education could be integrated to form a new model for applying positive education in mathematics. These include the PERMA Model, the Broaden-and-Build Model, the Geelong Grammar School Model of Positive Education, Dewey's Learning Theory, Constructivist Learning Perspectives, Montessori's Character Strengths, and Developmental Psychology Perspectives. This study aims to integrate these models with mathematical pedagogy to develop a cohesive new approach.

2.2. PERMA Model and Dewey's Learning Theory and Constructivist Learning Perspectives

Positive education focuses on the study of happiness and well-being, often associated with Seligman's PERMA Model. Seligman's work seeks to reduce depression among youth and increase overall well-being and happiness by teaching from both the heart and the mind. While education traditionally emphasizes academic achievement and the cultivation of positive personality traits, it often overlooks the holistic development of students.

Historically, psychologists and educators have recognized the importance of integrating aspects of positive psychology into individual values development, even if they were not labeled as such in the learning environment. John Dewey, a pioneer in progressive education, greatly influenced contemporary discussions on reflective learning. Dewey viewed schools as vital institutions for fostering independent learning standards and criticized outdated, monotonous teaching methods. He advocated for student engagement and self-directed learning, emphasizing that education should be relevant and meaningful.

Dewey, known as the "father of progressive education reform," championed curriculum and instructional changes. His philosophy, which integrates theory with practice, asserts that schools should encourage students to develop these changes to foster better human development [15]. Dewey's concept of "learning by doing" contrasts with traditional education models, which focus on direct teaching. Instead, Dewey believed that students learn best through interactive, problem-solving activities connected to the physical world.

Constructivism, another influential educational theory, posits that learners actively construct their own knowledge and that reality is shaped by their experiences [16]. This suggests that constructivism emphasizes how learners build meaning through personal experiences and the interplay between prior knowledge and new information.

The fundamental concept of constructivist learning is that knowledge is actively constructed by learners, who build new understanding based on their existing knowledge. Unlike passive learning, which views learners as passive recipients of knowledge, constructivism posits that learners engage actively with their environment—through experiments and problem-solving—to create meaningful understanding.

Maria Montessori, a leading advocate of Montessori education, also emphasized the role of a positive learning environment. According to Montessori [17], her educational approach is rooted in positive psychology and emphasizes fostering creativity, recognized as one of the twenty-four character

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strengths. In the Montessori framework, students have the freedom to choose their learning paths, promoting self-directed learning. The method involves providing engaging and interactive materials that stimulate creativity and encourage attentiveness, allowing children to learn at their own pace without pressure. Montessori [17] described her educational philosophy as supporting children's innate innovations and personal development, reflecting a deep commitment to nurturing both their intellectual and emotional growth.

2.3. Developmental Psychology Perspective and Positive Behavior Support Model for Learners

In the realm of developmental psychology, Elizabeth Hurlock (1898-1988) made significant contributions by applying positive psychology methods to educational practices. Her research highlighted the effectiveness of praise over criticism, demonstrating that praise fosters long-term motivation and is universally beneficial across different ages, abilities, and genders. This finding is supported by Henderlong and Lepper [18], who found out that praise enhances intrinsic motivation and is particularly effective for ethnic minority students. While some studies question the efficacy of praise, it remains positively correlated with self-confidence and academic achievement, suggesting that it can boost personal conviction and performance.

Cognitive evaluation theory further supports the idea that praise can enhance individuals' perceptions of their abilities and contribute to improved outcomes. The Positive Behavior Support (PBS) Model, in contrast, focuses on providing intensive, individualized interventions for students exhibiting challenging behaviors. This model uses a pyramid structure: at the top, intensive interventions are tailored to individual needs, followed by targeted social and emotional support, high-quality supportive environments, nurturing relationships, and, at the base, an effective workforce.

2.4. Positive Education Impacting Mathematics Learning and Teaching

Teaching mathematics is inherently a cognitive process, but the affective aspects can significantly influence students' attitudes toward its future relevance [19]. White [20] highlights that the growing body of evidence advocating for positive psychology supports the incorporation of well-being and happiness as central goals in schools. This approach is crucial for improving academic outcomes, enhancing school retention rates, and increasing student engagement. Romberg and Kaput [21] note that school mathematics often fails to convey its historical or cultural significance, while Boaler [22] emphasizes the importance of fostering open-mindedness and creative problem-solving in mathematics education. Embracing the intrinsic value and beauty of mathematics aligns with character strengths such as creativity, curiosity, and a love of learning, and can be supported by national education programs aiming to improve teaching quality and student engagement.

Incorporating positive education into mathematics teaching involves aligning with models like Seligman's [8] PERMA Model and Fredrickson's [5] Broaden-and-Build Theory. D'Ambrosio [23], known as the "intellectual father" of ethnomathematics, has contributed significantly to understanding the role of mathematics in diverse cultural contexts. His theory promotes viewing mathematics as a universal and integrative discipline connected to human experience and societal progress. This perspective encourages educators to relate mathematics to broader humanitarian issues, fostering a more inclusive and peace-oriented approach to teaching.

Positive education integrates principles from positive psychology to enhance learning by focusing on individual strengths and enthusiasm. Unlike traditional methods, which often emphasize standardized testing and uniformity, positive education tailors learning experiences to individual needs, promotes collaboration, and values student feedback. In this model, mathematics instruction is delivered through positive education principles, encouraging educators to create a supportive and engaging environment that fosters well-being and academic success. By highlighting the relevance and beauty of mathematics, this approach aims to enhance students' overall educational experience and prepare them to contribute positively to society.

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Hicks [24] argues that mathematics can foster a culture of peace and provide a framework for managing interactions within the classroom. Although it cannot guarantee peace, mathematics education can inspire hope and promote peaceful coexistence. As D'Ambrosio [23] suggests, mathematics educators have a responsibility to uphold the discipline's unique contributions to human understanding and to foster a sense of positivity and hope for a better future.

2.5. Positive Education's Impact on Anxiety, Depression, and Life Satisfaction

Becker and Luthar [9] identify four crucial social-emotional factors that affect academic performance: academic attachment, school attachment, teacher support, peer values, and mental health. Mental health, in particular, can significantly impact students' learning and academic achievements. Anxiety, in various forms and intensities, can be especially disruptive. For some students, anxiety may be chronic and severe, leading to a range of cognitive, behavioral, and emotional issues. Without appropriate intervention, severe anxiety or depression may develop into anxiety disorders. Globally, depression rates among young people are alarmingly high, with about 20% of adolescents experiencing clinical depression by the end of high school [25].

Positive education plays a pivotal role in enhancing educational quality and fostering a positive learning environment for all students. Teacher support is closely linked to student adjustment, social and motivational development, and academic success. The connection between teacher support and students' emotional, motivational, and academic behaviors begins early in schooling and persists into adolescence [26]. A supportive learning environment, characterized by minimal anxiety and interpersonal conflict, promotes positive attitudes toward school, greater engagement in classroom activities, and improved academic performance [27].

Common sources of anxiety in schools include interpersonal and academic challenges, as well as pressures from policies, peer influences, and family expectations. Variations in upbringing, physical characteristics, language, and social-emotional capacities can also contribute to feelings of exclusion and anxiety among students.

The absence of positive teacher-student relationships is associated with increased externalizing behaviors, such as aggression, and risky behaviors in elementary classrooms [28]. Recent studies underscore the importance of teacher-student relationships from early education through higher education, highlighting their impact on school adjustment, self-concept, peer affiliation, substance use, aggression, and help-seeking behaviors [29]; [30]; [31]; [2]. Students who perceive strong teacher support are more likely to seek help and report incidents of violence and bullying [16]. These findings stress the need for school psychologists to educate teachers about the positive outcomes associated with supportive student-teacher relationships.

Goodenow [32] notes that students who feel connected to their classmates experience a greater sense of belonging. Furrer and Skinner [33] suggest that a strong sense of relatedness to the classroom environment fosters positive emotions like enthusiasm, which are positively linked to student motivation, engagement, and academic performance. Conversely, classroom stressors and a lack of relatedness can lead to anxiety, especially regarding assessments and academic demands. This anxiety, compounded by extracurricular commitments and the pressures of college and job training, can impair students' access to support, disrupt rest, and affect their overall well-being.

Further research indicates that a lack of relatedness diminishes academic engagement and exacerbates negative emotions such as frustration, depression, and anxiety. Teachers play a crucial role in fulfilling students' need for belonging in educational settings [34]. Understanding the relationship between perceived teacher support and students' sense of belonging can offer insights into factors that enhance students' emotional well-being and their responses to academic challenges. Goodenow [32] suggests that the link between a sense of belonging and academic effort might be mediated by motivational factors. Therefore, exploring variables such as academic feelings and efficacy can provide a deeper understanding of how a sense of belonging influences academic effort.

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2.6. The Conceptual Model

Figure 1 below illustrates the conceptual model of the study. It shows anxiety level as the independent variable, academic achievement in Mathematics as the dependent variable, and positive education as the moderating variable. Participants were divided into two groups: an experimental group and a control group, based on the implementation of positive education in this study.

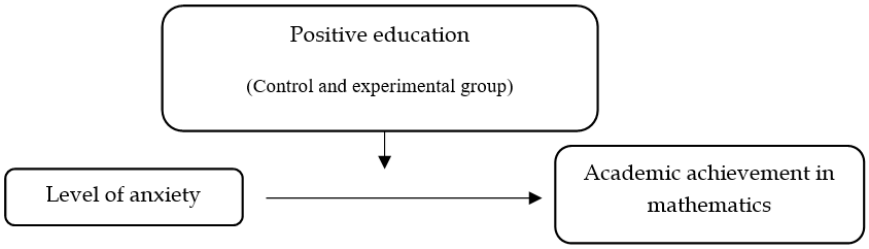

Figure 1.
Conceptual model of the study.

3. Methodology

3.1. Research Design

This study employed an experimental research design. It investigated the role of positive education in moderating the relationship between anxiety level and academic achievement in Mathematics among students affected by conflict in Maguindanao del Norte, Philippines. Participants were divided into two groups: an experimental group and a control group, based on the implementation of positive education.

3.2. Respondents of the Study

The study was conducted at Maguindanao National High School and MSU-Maguindanao Integrated Laboratory Science High School, both located in Maguindanao, Philippines—an area where depression and anxiety on the part of the students are common due to armed conflicts and political instability. A total of 120 Grade 7 students from the academic year 2023-2024 were randomly selected to participate, with 60 students from each school. Each school had an experimental group and a control group, with 30 students in each group.

The experimental groups, conducted in two schools, used an instructional module that integrated positive education principles. Teachers used especially developed instructional materials that integrated positive education in the Mathematics lessons. These materials were adopted which meet the Grade 7 Mathematics standards in the Philippines and were developed to better suit the specific needs of the students and their community, indicating the K-12 curriculum's emphasis on contextualized learning (Department of Education, 2016). The control group, on the other hand, received teaching using the standard Grade 7 Mathematics module as distributed through the Department of Education. For the consistency of the study, the same cooperating teacher taught both the experimental and control groups. Having one teacher to handle the experimental and control group in both schools can provide a more accurate comparison of the effects of the positive education intervention on students' academic development in Mathematics.

3.3. Research Procedure

Prior to the study, all necessary ethical procedures were followed. Approval was obtained from the Schools Division Superintendent, school principals, and parents through formal letters. The study was done over a six-week period, covering the lessons from the second half of the Second Quarter Period for Grade 7 Mathematics. The first day of the study involved briefing the teachers assigned to the experimental groups on their responsibilities. This briefing included instructions on how to incorporate positive education into their lessons, emphasizing activities that promoted happiness, self-worth, and

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well-being among students. Each teacher was supported by a pre-service teacher assistant to ensure the smooth implementation of the intervention.

During the first week, teachers administered pre-assessment instruments to both the experimental and control groups to measure students' level of anxiety and their academic achievement in Mathematics. The pre-assessment content was from the second half of the Second Quarter Period.

In the subsequent weeks, the teachers in the experimental groups started to apply the positive education intervention using the researcher-designed modules, while the control groups were with the standard Grade 7 Mathematics curriculum and conventional mode of teaching. The researchers conducted weekly classroom observations to monitor the progress of the intervention done by the cooperating teacher.

The study concluded with the administration of post-assessment instruments to evaluate the levels of anxiety and academic achievement in Mathematics for both the experimental and control groups. The analysis of these post-assessment results forms the basis of this research paper.

3.4. Data collection instruments

3.4.1. Level of Anxiety

The data collection instrument was based on that of Beck Anxiety Inventory (BAI. The same instrument was used to interpret the results of anxiety level of students. It has Cronbach's alpha result of 0.92, and Test-Retest reliability (1 week) of 0.75. This test was compared to the other tests and found out that it also moderately correlated with the revised Hamilton Anxiety Rating Scale (0.51) and mildly correlated with the Hamilton Depression Rating Scale (0.25). A Cronbach's alpha of 0.74 was obtained in this present study.

3.4.2. Mathematics Test

Students' academic achievement was assessed through their performance on a mathematics test designed specifically for this study. The researcher-made test included questions aligned with the module used by the teachers. This assessment tool, which demonstrated a Cronbach's alpha of 0.71, was administered to Grade 7 students at Mindanao State University - Maguindanao Campus. In the study, the control group followed the standard Grade 7 Mathematics module, while the experimental group engaged with a positive education module developed by the researcher.

3.4.3. Researcher-Made Module

The researcher-made module that was used in the study included the topics in the second half of the Second Quarter Period. The topic covers Constant, Variables, Algebraic Expressions, Verbal Phrases and mathematical Phrases, Polynomials, Law of Exponents and Fundamental Operations on Polynomials. The module was validated by ten individuals with expertise on Mathematics education. The activities of the topics involve positive education which is in line with Geelong Grammar School (GGS) Model for positive education, a practical framework to implement positive education as a learning approach which focuses on six well-being domain which are "positive emotion, positive engagement, positive accomplishment, positive purpose, positive relationship and positive health."

The researcher made module and how the positive education concept was processed by the teachers are available through this link. *(https://drive.google.com/drive/folders/1C7zlsj_niBswsUDR6wGJO-z6HfhhtuVd?usp=sharing)*

3.5. Data Analysis

To determine the relationships of the variables, Pearson Correlation Coefficient *r* was used. The relationship of students' positive education on academic achievement in Mathematics (nominal and scale data) was also double-checked using directional measure crosstabulation. The research hypotheses were tested using moderated hierarchical multiple regression analysis. Since positive education treatment is a dichotomous variable (either control or experimental), values were set as control=0 and experimental=1

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to make positive education treatment as a dummy variable. The analysis was made through the help of Statistical Package for the Social Sciences (SPSS) and Microsoft Excel. The simple slope computation was also done online through ModGraph. (*https://psychology.victoria.ac.nz/modgraph/modgraph.php*)

4. Discussion

The correlational analysis of the three variables is shown in Table 1. It shows that level of anxiety has a significant negative correlation with academic achievement ($r(118)= -0.36$, $p<0.001$). This implies that as the students' level of anxiety increases, their academic achievement in Mathematics decreases. The positive education (experimental and control group), on the other hand, had a positive relationship with students' academic achievement in Mathematics ($r(118)=0.33$, $p<0.001$). This implies that academic achievement of students is associated with the positive education.

Table 1.
Mean, standard deviation and correlations.

Variables	Mean	SD	1	2	3
1. Level of anxiety	23.98	3.51	1	-0.64**	-0.36**
2. Positive education	0.5	11.89	-0.64**	1	0.33**
3. Academic achievement	19.04	19.04	-0.36**	0.33**	1

Note: ** correlation is significant at 0.01 level (2-tailed).

The moderated hierarchical regression showing the moderation effect of the positive education in the relationship between level of anxiety and academic achievement was analyzed. The moderated hierarchical multiple regression analysis through SPSS was used to determine this analysis. The regression analysis established three models. In model 1, the dependent variable (academic achievement in Mathematics) and the independent variable (level of anxiety) were entered simultaneously to determine the main effect of level of anxiety on academic achievement in Mathematics. In model 2, level of anxiety was entered in block together with positive education to test its effect with the dependent variable (academic achievement in Mathematics). In model 3, the interaction term of the level of anxiety and positive education were simultaneously entered with level of anxiety and positive education to test the cross-product effect.

To test whether Model 3 fits well to the data, the comparison of Model 2 and Model 3 was analyzed. This is also shown in Table 2 which summarizes the moderated hierarchical regression analysis. The R^2 change was significant with $\Delta R^2 = 0.41$, $F_{change}(1,116) = 5.90$, $p<0.05$, suggesting that positive education moderated the relationship between level of anxiety and academic achievement of students. This Model 3 (with the interaction term) fits best to the data.

Table 2.
Moderated hierarchical regression analysis showing the moderation effect of the positive education in the relationship between level of anxiety and academic achievement.

Variables	B	R	R	F_{change}	df	ß	t
Model 1		0.13	0.13	17.57	118		
Level of anxiety						0.36	-0.42
Model 2		0.15	0.16	2.13	117		
Level of anxiety						-0.26	-2.29
Positive Ed						0.16	1.46
Model 3	18.58	0.19	0.41	5.90	116		
Level of anxiety	-0.21					-0.07	-0.55*
Positive Ed	4.70					0.67	2.84*
Level of anxiety * positive Ed	-0.11					-0.46	-2.53**

Note: Dependent variable: Academic achievement
* correlation is significant at 0.05 level (2-tailed)
** correlation is significant at 0.01 level (2-tailed).

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Results showed that the students' level of anxiety had a negative impact on their academic achievement in Mathematics ($ß_1$= -0.07, t= -0.55, p<0.05). Positive education had a positive impact on students' academic achievement in Mathematics ($ß_2$= 0.67, t= 2.84, p<0.01). Also, positive education significantly moderated the relationship between the level of anxiety and academic achievement of students ($ß_3$= -0.46, t= -2.53, p<0.01).

To determine if level of anxiety and academic achievement in Mathematics is significant in experimental group and control group, tests of simple slope were done. The interaction effect using the estimated regression model were visualized and data points were created based on the estimated regression equation. These were plotted on a graph shown on Figure 3. Based on the result of the regression, the estimated regression equation of students' academic achievement in Mathematics was calculated by

*Predicted Academic achievement = [18.58 − 0.21(Level of anxiety) + 4.70(Positive Education Treatment) − 0.17 (Positive Education Treatment * Level of Anxiety)]*

With this computed estimated regression equation, predicted values for academic achievement in Mathematics were computed given the values of level of anxiety and positive education. As an example, the predicted value of academic achievement for experimental group (positive education treatment=1, SD=4.48) with the mean level of anxiety =23.98 is given by

Predicted Academic achievement = 18.58 -0.21(23.98) + 4.70 (1) − 0.17 (1) (23.98) = 14.17

Through this example, the level of anxiety 12.09 (1 standard deviation below mean), 23.98 (Mean) and 35.87 (1 standard deviation above the mean) were computed and the predicted academic achievements were tabulated and shown in Table 3 which includes the control group (treatment=0, SD=2.49).

Table 3.
Results of mean of level of anxiety 1 standard deviation below and 1 standard deviation above the mean.

	Level of anxiety		
Positive education	**M+1SD**	**M**	**M-1SD**
Experimental	18.65	14.17	9.69
Control	16.02	13.53	11.04

Using Modgraph, the simple slopes for experimental group and control group were determined. Results show that the simple slope of experimental group was significant (ω_1 =-0.189, t(116)=-3.45, p<0.001), suggesting that there is a significant relationship between level of anxiety and academic achievement in the experimental group. However, the simple slope analysis for the control group was not significant (ω_2 =-0.021, t(116)=-0.47, p>0.05), suggesting that there is no significant relationship between level of anxiety and academic achievement in the control group. The data result of the test of simple slope using Modgraph is shown in Figure 2.

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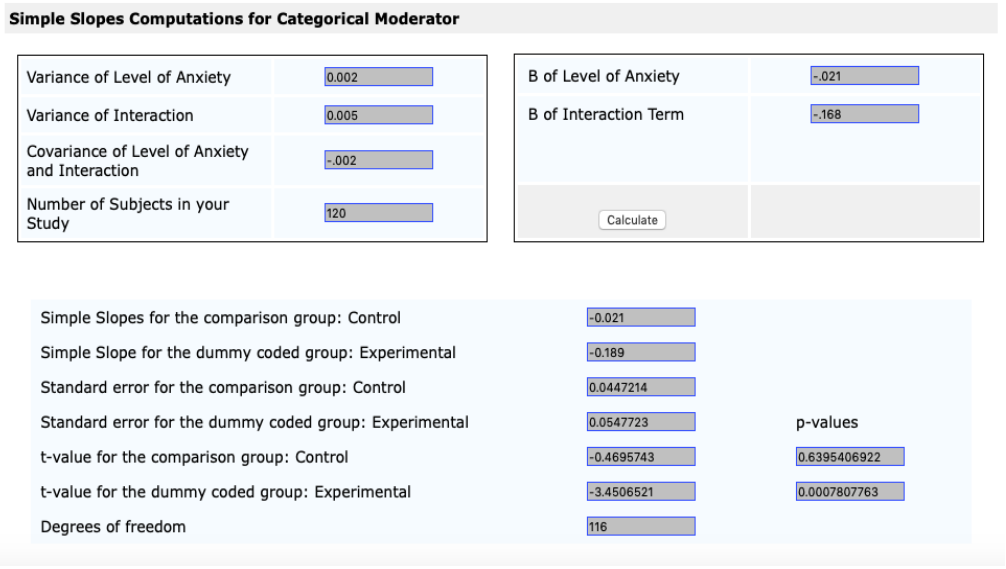

Figure 2.
Test of simple slope using modgraph.

The pursuit of integrating positive education within schools is not merely a beneficial but also a practical endeavor, with substantial implications for enhancing student well-being and academic success. This study underscores the value of infusing positivity into educational practices, particularly in the realm of mathematics—a subject frequently perceived as challenging. By adopting a positive approach to teaching mathematics, educators can render the subject more engaging and meaningful to students. The study's findings highlight the positive impact of such interventions on academic achievement and anxiety levels, reinforcing the necessity of making learning experiences practical and rewarding for students.

This approach aligns with the principles of Positive Behavioral Interventions and Supports (PBIS), a comprehensive whole-school strategy designed to improve the educational environment by fostering positive behavior among students and teachers [35]. PBIS emphasizes the creation of enriched measures and practices to promote constructive behavioral changes, which is supported by [36], which indicates that subjective life satisfaction and targeted interventions can positively affect learners.

Positive education, as both a motivational and intervention tool, contributes significantly to academic success while reducing anxiety levels. Interventions serve as effective motivators, guiding student performance in a supportive and competitive manner. The reduction in anxiety levels due to positive education activities is further corroborated by Kesici and Erdogan [37], who found that motivation specifically alleviates mathematics anxiety and enhances academic performance.

Norrish et al. [38] emphasize that the core objective of positive education is to foster flourishing and positive mental health within the classroom environment. This study's findings align with this objective, demonstrating that positive education interventions can significantly moderate the relationship between anxiety levels and academic achievement. The theoretical framework of Hebb's theory of arousal and the cognitive interference model supports these findings by suggesting that higher anxiety levels typically correlate with poorer academic performance, though positive education can mitigate this effect.

Bond et al. [39] advocate for the creation of supportive and secure environments in schools to implement interventions that promote well-being and positivity among adolescents. This aligns with the World Health Organization's (WHO) findings in 2011, which emphasize that students who experience physical and emotional flourishing tend to perform better academically. Additionally, these

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goals resonate with the United Nations International Children's Emergency Fund (UNICEF) mission to support disadvantaged children globally.

In the context of the Philippines, the Department of Education can leverage positive education interventions to address the specific needs of underprivileged students, particularly in regions such as Maguindanao where instability and distress are prevalent. The study suggests that positive education can be a fundamental component in reinforcing the K-12 curriculum, making it more responsive to the needs of students and communities, and thereby contributing to improved academic outcomes and well-being.

6. Conclusion

The findings indicated that students' levels of anxiety had an impact on their achievement in mathematics. On the other hand, positive education had a positive effect on mathematics achievement. Positive education significantly moderated the relationship between anxiety level and academic achievement in mathematics. The relationship between level and anxiety and academic achievement in mathematics is significant in the experimental group, but not in the control group. These results suggest that implementing positive education interventions can be an effective strategy for improving mathematics instruction and student outcome.

The integration of positive education is strengthened by a growing body of studies involving collaborative learning strategies on teaching. This study in positive education, specifically in mathematics is a gateway and entry point to a more rigorous application of the concept in some other fields of discipline. Better consideration of the critical components of positive education will also help in determining which area of interest should be prioritized. More studies are now needed to provide labelling of school as a positive institution where the total sense of individuality of students is promoted, level of anxiety is minimized, and their valuable insights are supported.

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This research has secured approval from the ethical review committee of the university.

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