

**.Research Article**

## Academic Achievement and Life Satisfaction of Students in Mathematics in Positive Education Intervention

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**Abstract:**

This study investigated the significant differences in the means of the pretest and posttest of students' academic achievement and their life satisfaction in Mathematics. The relationship between students' academic achievement and their life satisfaction in Mathematics was also measured. A total of one hundred twenty students (60 in the experimental group and 60 in the control group) from the two secondary schools in Maguindanao, Philippines living in a hostile environment were chosen and involved in the study. Results showed that there is a significant difference in the means of the pretest and posttest results of academic achievement of students in Mathematics both in the control and experimental group. The means of the pretest and posttest results of students' life satisfaction in Mathematics were only significant in the experimental group of one school. Furthermore, there is no significant relationship between the academic achievement of students and their life satisfaction in Mathematics. The practical implication of the findings suggests that positive education intervention is also an effective strategy to improve academic achievement and that life satisfaction in Mathematics is subjective and perceived differently by the learners.

**Keywords:** Academic Achievement In Mathematics, Life Satisfaction In Mathematics, Positive Education Intervention

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**Introduction:**

Living in poverty, conflict, and a hostile environment affects students' sense of individuality, resulting in low life satisfaction. In the province of Maguindanao in the Philippines, most of the local communities face poverty and unstable peace brought by some lawless groups and tribal conflicts. Andrews and Wilding (2004) revealed that students who are less privileged and have low socio-economic status are the ones prone to anxiety. The cause of the anxiety level of students in the province of Maguindanao could be brought by these. The National Achievement Test performance (NAT) of students in the region has always had a mean score lower than the national average (Philippine Information Agency, 2018).

According to D'Ambrosio (1991), Mathematics has a vital role in attaining the human values of this generation with equality, justice, and self-worth for humanity without division by race, tribe, sex, beliefs, and cultures. This role also depends on how people understand the connection between Mathematics and human actions deeply. He noted further that it would be likely for mathematics teachers to contribute some thoughts to the meaning of real Mathematics education to achieve a healthier society and more enhancing value of life. Positive education takes the study of happiness and well-being with an optimum teaching role to inspire and help learners, schools, and societies to flourish. Flourishing refers to the state of "feeling good and doing good" (Norrish,

O'Connor, & Robinsons, 2013). Positive education caters to a particular skill that cares students to boost their relationships, construct positive feelings, develop individual resilience, and uphold a healthy life. Norrish, O'Connor, & Robinsons (2013) stated academic achievement of students. Life satisfaction is a point in one's life to which one positively or negatively assesses the general quality of his life (Diener et al., 2010). A report supported by Bishop The declining life satisfaction, as well as the interaction between studying and positive feelings all, agree that the concept of happiness is essential to that teachers would teach in school. Arthur (2005) noted that parents want school programs that should incorporate values to instil in their children. Teachers have that challenging role in honing these young individuals to become satisfied and happy despite the hardship and danger that life brings. These students could even be promoters and instruments of change and advocates of peace to their community. That is why Waters (2014) stated that a school program that integrates well-being to students would more likely avoid depression, promote life satisfaction, inspire group concern, uphold creativity, adopt learning, and even boost educational accomplishment. Positive education is termed as a science of happiness to improve quality of life where everyone lives happily, peacefully, and upholding human values. This study makes an essential component of efforts to promote positive education in schools with an unsecured and hostile community. It is conceived with some support from other past related studies reviewed by the researchers, notably the Seligman PERMA Model (2002), emphasizing "the five elements of becoming and having well-being to be taught in schools to help the students achieve quality education." He described five factors of well-being, which are referred to as the PERMA Model: "positive emotion, engagement, relationships, meaning and purpose, and accomplishment." These factors and purposes are being integrated into this study in the teaching of Mathematics through the researcher-made module. Positive education aids learners create, experience, and build positive emotional skills. It is worthy of helping these young people to experience life on positive feelings such as gratitude, happiness, hope, pride, love, and inspiration. Engagement includes living life high on attention, curiosity, and captivation, and following life goals with willpower and strength. Social connections are essential to

that the simple aim of positive education is the promotion of flourishing and positive mental health inside the classroom. This aim gives way to the general declining of the level of anxiety of students, promoting life satisfaction, and in the end, improve Kallmayer and Lewis (2010) cited that in high school, depression is one of the most usual public health threats distressing five to ten percent of adolescents every year. happiness and flourishing. Positive education is to help learners grow social and emotional services to produce and encourage real and healthy relationships with self and others. Within the model of positive education, the positive purpose is defined as considering and understanding, believing in, and serving for self-worth belief and deliberately pleasing in activities for the assistance of others. The value of helping others and society delivers a strong foundation for a purpose within schools. Positive accomplishment, on the other hand, is the growth of individual capability through motivation and attaining meaningful results. It encompasses the capacity to make efforts towards achieving desired goals, the inspiration to persevere despite impediments and delays, and the accomplishment of realizing essential life aspects. All these factors (positive emotion, engagement, relationships, meaning and purpose, and accomplishment) are being tackled in the module and enhanced in every learner by the teachers in this study. This study, therefore, used this positive education concept along with this PERMA Model and investigated its effects on the means of the pretest and posttest of students' academic achievement and their life satisfaction in Mathematics. The relationship between students' academic performance and their life satisfaction in Mathematics was also measured.

### **Statement Of The Problem:**

This study investigated the effect of a positive education intervention on the students' academic achievement and life satisfaction in Mathematics. Specifically, it determined answers to the following:

1. What is the academic performance of students in the pretest and posttest?
2. What is the life satisfaction in Mathematics of students in the pretest and posttest?
3. Is there a significant difference in the means of the pretest and posttest of students in their academic achievement?

4. Is there a significant difference in the means of pretest and posttest of students in their life satisfaction?
5. Is there a significant relationship between academic achievement and life satisfaction in Mathematics of students?

### 1. Theoretical Basis And Framework Of The Study:

This study is anchored on the different Positive Psychology Models and Theories. Models involving positive education include the Seligman's PERMA Model (2002), which emphasizes "the five elements of becoming and having well-being to be taught in schools to help the students achieve quality education." The Broaden-and-Build Model by *Barbara Fredrickson (2001)* denoting that "positive feelings widen people's perception and outlooks that gradually will change who they are in the most optimal ways" was also considered.

Figure 1: Conceptual Framework of the Study

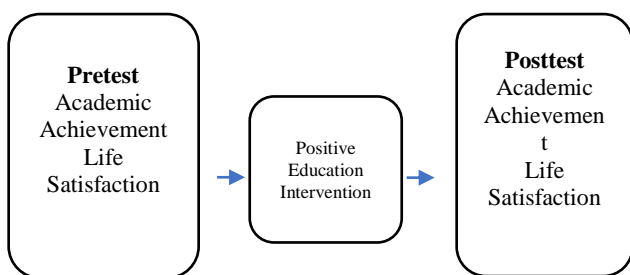


Figure 1 shows the Conceptual Framework of this study. Before the conduct of the positive education intervention by the teachers, there was an administration of pretest on the academic achievement of students and life satisfaction in Mathematics. After the intervention, these instruments were again administered to students to determine if significant changes took effect.

## 2. Method

### 2.1 Data Collection Instruments

#### 2.1.1 Life Satisfaction:

The [Satisfaction with Life Scale \(SWLS\)](#), established by Ed Diener, is now widely used and is one of the more valid measurement checks of life satisfaction. The "Satisfaction with Life Scale (SWLS)" uses a 7-point scale, letting individuals on how much they

agree on teaching specific items. There are five items to evaluate mind judgment of one's subjective satisfaction in life. The instrument had undergone different series of validity and reliability tests. Convergent validity was tested through comparing the results with self and peer assessment. Conducted tests resulted in significant correlations. The Test-and-retest reliabilities were concluded through two-week and one-month intervals, which both had a mean of 0.84. Its general mean coefficient Cronbach alpha was 0.85. In this study, A Cronbach's alpha of 0.68 was obtained using the results administered to ARMM Regional Science High School Grade 7 students.

#### 2.1.2 mathematics Test :

The academic achievement of students was measured by the Mathematics performance of students in the prepared test containing questions relevant to the module used by the teachers. This is a researcher-made test. This test instrument that measured the academic achievement got a Cronach's alpha of 0.71 administered to Grade 7 students of Mindanao State University -Maguindanao Campus. The control group section used the existing module for Grade 7 Mathematics. The experimental group used the positive education module made by the researchers.

### 2.2 Researcher-Made Module and the Intervention

The researcher-made module that was used in the study included the topics in the second half of the Second Quarter Period. The module was validated by ten individuals with expertise in mathematics education. The activities of the topics involve positive education which is in line with Geelong Grammar School Model for positive education (Norrish et al., 2013), a practical framework to implement positive education as a learning approach. It is also anchored on the Broaden-and-Build Theory on positive emotions (Fredrickson, 2001), which suggested that the human ability to experience emotions positively could be an underlying strength to flourishing. The making of the module is also guided by the thoughts from Huntley-Moore and Panther (2015). The intervention is included in this module in which the teachers were guided by during their activities. Activities involved pair and group work to emphasize collaborative learning in a positive education context.

### 2.3 Participants And Procedure:

To ensure that the study was conducted in a conflict-affected area, the researchers had identified two schools. The two schools are namely Maguindanao National High (MNHS) and Talayan National High School (TNHS). Both are in Maguindanao, Philippines. A total of one hundred twenty students (44 males or 36.67% and 76 females or 63.37% ) were involved in the study. Sixty (60) of which are in the experimental group and sixty (60) in the control group regardless of sex from the two secondary schools during the School Year 2018-2019. They were selected randomly. Before the conduct of the study, ethical procedures were made. There was also an informal meeting conducted by the researchers to the teachers to discuss how positive education would be processed in the experimental group. This meeting included a discussion on how the inclusion of the processing of positive education would be done at the end of every activity. A preservice teacher assistant also assisted each teacher from the two schools. There was a six-week time frame for the study, which covers the lessons of Grade 7 in the second half of the Second Quarter Period. During the first day, the teachers administered to both groups the pre-assessment of the students' level of anxiety and academic achievement instrument in Mathematics. This academic achievement instrument covers the second half of the Second Quarter Period. Teachers started teaching positive education intervention during the second day and the succeeding weeks in the experimental group using the module, while the control group, on the other hand, was using the existing Grade 7 module being distributed by the education department of the government. The class interventions were regularly observed once a week.

### 3. Results:

The findings of the academic achievement and the life satisfaction level of students before and after the intervention are discussed and shown in the table. The significant difference in the pretest and posttest and the relationship of the academic achievement and the life satisfaction of students are also discussed.

Table 1: Academic Performance In Mathematics

	Mean Pretest	Mean Posttest
MNHS		
Control	5.90 Beginning	17.20 App.Proficiency
Experimental	7.77 Developing	22.50 Proficient
TNHS		
Control	5.10 Beginning	18.60 Proficient
Experimental	4.87 Beginning	19.47 Proficient
Mean Control: 5.50	Beginning 17.90	17.90 Proficient
Mean Experimental:	6.32 Beginning	Proficient 20.99 Proficient

#### Scaling and Interpretation

1.0-6.50 Beginning (74% and below)

6.51-12.50 Developing (75%-79%)

12.51-18.50 Approaching Proficiency (80%-84%)

18.51-24.50 Proficient (85%-90%)

24.51-30 Advanced (90% and above)

Academic achievement in Mathematics was measured by the researcher-made test, which underwent validity and reliability tests. The test was administered before and after the positive education intervention also in Mathematics. The pretest results of the two schools averagely show a Beginning performance and a Proficient posttest result. In particular, the control group of Maguindanao National High School (MNHS) had a mean of 5.90 and 17.20 in the pretest and posttest, respectively. This shows a two-scale up from Beginning to Approaching Proficiency. The Experimental group, on the other hand, got a mean of 7.77 and 22.50 in the

pretest and posttest, respectively. This also shows a two-scale up from Developing to Proficient Level. Moreover, Talayan National High School (TNHS) results of the control group had a mean of 5.10 and 18.60 in the pretest and posttest, respectively. This shows a three-scale up from Beginning to Proficient Level. The Experimental group, on the other hand, got a mean of 4.87 and 19.47 in the pretest and posttest, respectively. This also shows a three-scale up from Beginning to Proficient. In general, the mean of the control group is 5.50 in the pretest, which is in the Beginning level and 17.90 in the posttest, which is in the Proficient level. The mean of the experimental group is 6.32 in the pretest, which is in the Beginning level and 20.99 in the posttest, which is in Proficient level. With the help of a positive education concept, the sense of well-being and positive attitude of students is enhanced. This is a reason why students tend to improve their academic performance and are eager to learn. Positive educationist generally an approach or strategy in teaching that ties on positive psychology's importance of specific strength and individual enthusiasm to encourage the acquisition of knowledge.

Mean Experimental:	22.67slightly satisfied	27.39 satisfied
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#### Scaling and Interpretation

- 5.0 - 9.50 Extremely dissatisfied
- 9.51-14.50 Dissatisfied
- 14.51 – 19.50 Slightly Dissatisfied
- 19.51 – 20.50 Neutral
- 20.51 – 25.50 Slightly Satisfied
- 25.51 – 30.50 Satisfied
- 30.51 – 35.0 Extremely Satisfied

On Students' Life Satisfaction in Mathematics, both the control and experimental group of the two schools was tested using Life Satisfaction in Mathematics instrument patterned from Satisfaction with Life Scale by Diener. This was done before and after the positive education intervention in Mathematics.

The result shows that the control group of Maguindanao National High School went a scale-up from slightly satisfied with Mathematics in their pretest to satisfied in their posttest. This is indicated by the pretest, and posttest mean results of 24.60 and 25.77, respectively. The experimental group results of the pretest and posttest, on the other hand, also went a scale-up from slightly satisfied in the pretest to satisfied in the posttest as indicated by the mean results of 25.47 and 26.10, respectively. This shows that the students have generally found satisfaction in life with the help of their Mathematics lesson.

Moreover, the result of the control group of Talayan National High School shows a scale-up from neutral to slightly satisfied with Mathematics, as indicated by the pretest and posttest results of 17.93 and 22.13, respectively. The experimental group results of the pretest and posttest, on the other hand, went two scale-ups from neutral in the pretest to satisfied in the posttest as indicated by the mean results of 19.87 and 28.67, respectively.

In general, the mean of the control group is 21.27 in the pretest, which is slightly satisfied and 23.95 in the posttest, which is slightly satisfied. The mean of the experimental group is 22.67 in the posttest, which is slightly satisfied and 27.39 in the posttest, which is satisfied. This also shows that in a way, the positive education in Mathematics helps in boosting life satisfaction. The teaching of positive education concerning the well-being of students in

Table 1: Academic Performance in Mathematics

	Mean Pretest	Mean Posttest
MNHS		
Control	24.6 slightly 25.77 satisfied	25.77 satisfied
Experimental	25.47 slightly	26.10 satisfied
TNHS		
Control	17.93 slightly	22.13 slightly
Experimental	19.87neutral	28.67 satisfied
Mean Control: 5.50	21.27slightly	satisfied23.95 slightly

Mathematics, including how to be resilient in most of the bad times, has helped improve the life satisfaction of students. This is in relation to the study of Samani et al., 2007, which concluded that resilience leads to life satisfaction through the lessened levels of bad emotions. Their study revealed further that it has an indirect effect on life satisfaction.

Table 3. Significant Difference in the Pretest and Posttest of Academic Achievement in Mathematics

Treatment	t-value p-value	Interpretation
MNHS Control significant	18.921	0.000**
Experimental significant	22.641	0.000**
TNHS		
Control	22.782	0.000**
Experimental	20.857	0.000**

The differences of the means between the pretest and posttest of the academic achievement in Mathematics were determined if significant. Differences were significant in all the control and experimental groups of the two schools. In Maguindanao National High School, the control group had a t-value of 18.921 with  $p < 0.001$ . The experimental group had a t-value of 22.641 with  $p < 0.001$ . On the other hand, the control group of Talayan National High School had a t-value of 22.782 and  $p < 0.001$ . The experimental group had a t-value of 20.857 with  $p < 0.001$ . All of these are significant at 1% level of significance. This implies further that all the groups' academic achievement results have significantly improved.

Table 4. Significant Difference in the Pretest and Posttest of Life Satisfaction in Mathematics

Treatment	t-value p-value	Interpretation
MNHS Control	-1.742 .092	not significant
Experimental	-.608 .548	not significant
TNHS		
Control	-.610.505	not significant
Experimental	8.572 .000	**significant

significant at 1% level

The differences in the means between the pretest and posttest of life satisfaction with Mathematics were also determined if significant. The difference, however, is only significant in the experimental group of the one school, the Talayan National High School. In Maguindanao National High School, the control group had a t-value of -1.742 with p-value of .092, which is not significant at 5% level of significance. The experimental group had a t-value of -.608 with p-value of .548, which is not significant at 5% level. On the other hand, the control group of Talayan National High School had a t-value of -.610 and p-value of .505, which is not significant. The experimental group had a t-value of -6.612 with  $p < 0.001$ , which makes it significant at 1% level of significance.

This implies further that life satisfaction differs from learner-to-learner and in school-to-school results. Life satisfaction is brought by a lot of factors and perceived differently by the learners. Life satisfaction is indeed perceived differently by the learners as supported by Kristjánsson (2012), who believed that the word happiness carries connotations in a subjective theory of well-being. The correlation between the posttest results of Academic Performance in the Life Satisfaction with

Mathematics of students of both schools were determined also using Pearson Product Moment Correlation ( $r$ ). The result also shows that both the experimental and control groups in the two schools did not significantly correlate the academic performance of students with their life satisfaction. In Maguindanao National High School, the control group had a Pearson  $r$  value of .263 with p-value of .160. The experimental group had a Pearson  $r$  value of .248 with p-value of .186. Both are not significant at 5% level of significance.

On the other hand, the control group of Talayan National High School has a Pearson  $r$  value of .032 with p-value of .867. The experimental group had a Pearson  $r$  value of .240 with p-value of .202. Both are also not significant at 5% level of significance.

This result suggests that correlation of academic performance and life satisfaction of students particularly in Mathematics is not statistically significant.

#### **4. Conclusion and Implications:**

Based on the results of this study, the following are concluded.

1. The academic achievement of the control group is in Beginning level in the pretest and Proficient level in the posttest. The academic achievement of the experimental group in the pretest is in the Beginning level and Proficient level in the posttest.
2. The life satisfaction of the control group in the pretest is slightly satisfied and slightly satisfied also in the posttest. The life satisfaction of the experimental group is slightly satisfied in the pretest and satisfied in the posttest.
3. There is a significant difference in the pretest and posttest of students in their academic achievement in both control and experimental groups in the two secondary schools.
4. There is no significant difference in the means of the pretest and posttest in the life satisfaction of the control group in the two secondary schools. However, there is a significant difference in the pretest and posttest results of the experimental group in Talayan National High School while there is none in Maguindanao National High School.
5. Both the experimental and control groups in the two schools did not significantly correlate the

academic achievement of students with their life satisfaction in Mathematics. The concept of positive education implies a positive result in enhancing the academic achievement of students. However, the non-significance of life satisfaction with academic performance supports the result of the study from PsycINFO Database Record (2019) on correlates of life satisfaction in children, that recent school marks did not correlate significantly with life satisfaction.

Answers on life satisfaction, whether with life in general or specified in an area, are identified to be dependent on distinct personality traits. [Diener et al., \(2010\)](#) cites example like considering two persons, with matching all respects except personality traits. If one of them is neurotic and the other is not, it is possible that the neurotic's replies on satisfaction with life, in general, will both be lower than the other's because a neurotic tend to evaluate his or her conditions more depressingly. In particular, a correlation of life satisfaction with actual income or grades for the two persons would show no significant relationship because their objective economic and academic conditions are the same. Still, a correlation of life satisfaction with satisfaction in income and satisfaction with grades will have a perfect positive relationship since the neurotic is less on the same measures. This positive correlation would mean a mistaken inference that income satisfaction or grade satisfaction was the source of the difference in life satisfaction between the two individuals. In contrast, the causes, in fact, are personality differences.

Further, Seligman (2002) and most of his colleagues formerly used the terms happiness and well-being interchangeably, although some studies suggest that they are different. [Kristjánsson \(2012\)](#) believes the word happiness carries connotations of a mere subjective theory of well-being. Bottom line, happiness, and well-being are determinants of life satisfaction. The goal of encouraging positive education within schools is distinctly a sensible pursuit, and this study achieves this at a more attainable level. With this, [Bond et al., \(2007\)](#) recommended that schools should deliver available and relatively secure sites within which to find interventions to encourage the well-being and positivity of these adolescents. These are needed for successful learning, and there are evident conditions that learners who flourish physically and internally also achieve better in their studies as encouraged by

the World Health Organization. Harkness and Monroe (2016) pointed out that the connection between socio-economic disadvantaged and learners' socioemotional ability appeared to be mediated and moderated by harsh, inconsistent parents' guide and raised exposure to a serious and chronic stressor. Aiming to create a healthy atmosphere in school through positive education programs will reduce mental distress and mental hazards such as depression and anxiety (Furlong, et al., 2014), which leads to low life satisfaction of students. This study, therefore, will help teachers in Mathematics create an atmosphere of active student learning. This will eventually be also applied in some disciplines in the future. The life satisfaction of students is subjective and therefore be given emphasis in dealing with learners' emotional skills.

### 5. Limitations And Issues Of Further Exploration:

Although the involved schools are good for the conduct of positive education, the study is still limited in the experimental and control group. The wider the scope, the better it will become. There are also some issues that need to be addressed, like the characteristics of the teachers involved in the teaching of positive education, the type of students for the intervention, how the method of positive education will be given, and the instructional aid to be used.

This study in positive education in Mathematics is a gateway and entry point to a more rigorous application of the concept in some other fields of discipline.

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