Impact of The Positive Education: A Case Study of Its Implementation in Mathematics Lessons in Maguindanao, Philippines

by

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Statement of Originality

I, ARENAS, Joel Calixtro, hereby declare that I am the sole author of the thesis and the material presented in this thesis is my original work except those indicated in the acknowledgement. I further declare that I have followed the University's policies and regulations on Academic Honesty, Copyright and Plagiarism in writing the thesis and no material in this thesis has been submitted for a degree in this or other universities.

Abstract

Positive education involves the study of happiness and well-being to inspire students, teachers, schools and societies to better develop and flourish. The major objective is aimed at reducing the levels of anxiety, improving the life satisfactions and enhancing the academic performances of the students. This study explored the impact of positive education in schools, based on a case study of its implementation in Mathematics lessons in Maguindanao, Philippines.

A STMP model has been developed within this study, which involves four major components: student, teacher, method (pedagogy) and positive education. A detailed explanation of this model and the interrelationships of these four components are provided in this thesis. With the guidance of the STMP model, this study explored the experiences and feedbacks of participating students and teachers on integration of positive education in mathematics lessons, as well as the relationships among mathematics performances, levels of anxiety and life satisfaction of the students in Maguindanao, Philippines.

A mixed methods research was adopted in this study, which involved both quantitative and qualitative approaches. The quantitative approach was employed to study the results of the pre-test and post-test results obtained, and linear regression analysis was used during the analysis. On the other hand, the qualitative approach was used to study the feedbacks and experiences of the participating students and teachers regarding the mathematics performances, levels of anxiety and life satisfaction of the students concerned. There was a total of 120 students (60 in the experimental group and 60 in the control group) involved in this study and they were chosen from two secondary schools in Maguindanao, Philippines.

According to the findings of the study, students had positive feedbacks to positive education intervention in the Mathematics lessons. Their levels of anxiety were reduced and their life

satisfactions were improved. The results of academic performances in mathematics also suggested that positive education intervention could foster the well-being of students and their mathematics achievements. In general, teachers' experiences and feedbacks to positive education were also positive and encouraging. These results suggested that positive education intervention worked well at least for the sample of students involved in the study in Maguindanao. In fact, based on the results of statistical analysis, there was a significant relationship between mathematics performances and the levels of anxiety found in the experimental group but not in the control group. These observations suggested that there was a positive impact of positive education intervention in the school settings.

To conclude, the intervention of positive education in lessons adopted in this study could be a good and useful reference for teachers and educators who are interested in integrating positive education in their own teaching subjects. The STMP model reported in this thesis could also be used as a guide for conducting similar case studies in schools and it has potential for further development for studying the impact of positive education in various subjects in the near future.

Keywords: positive education, Mathematics, level of anxiety, life satisfaction, mathematics performance, STMP model

Acknowledgment

I would like to thank the students, parents, the principals and the Schools Division Superintendent of Maguindanao for the upright support of my request to conduct the study.

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To my family back home especially to Raqs, you are all loved.

Above all, I bring back all the glory and honour to Our Almighty God who is the source of life and the giver of mankind.

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List of Abbreviations

ARMM – Autonomous Region in Muslim Mindanao

BARMM – Bangsamoro Autonomous Region in Muslim Mindanao

BAI – Beck Anxiety Inventory

EDUHK – Education University of Hong Kong

GGS – Geelong Grammar School

MNHS – Maguindanao National High School

PERMA – Positive Emotion, Engagement, Relationship, Meaning and Accomplishment

STMP -Students, Teachers, Methods and Positive Education

SWLS – Satisfaction with Life Scale

TNHS – Talayan National High School

UNESCO – United Nations Educational, Scientific and Cultural Organization

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Chapter 1: Introduction

Positive education is the study of happiness and well-being with the finest teaching strategies to inspire and help learners, schools and societies to flourish. Flourishing is referred to as the state of "feeling good and doing good" (Norrish et al., 2013). Positive education centers on a skill that support students to increase their relationships, make positive feelings, build distinct resilience, and sustain healthful living. It is primarily carried out on Seligman's PERMA Model (Seligman, 2011) to improve the quality of life where an individual lives happily, peacefully and upholding human values. This is supported by Broaden-and-Build Model (Fredrickson, 2001) that denotes positive feelings change one's perception and outlook in the most optimistic ways. A Geelong Grammar School Model of positive education, on the other hand, frameworks how positive education provides its students with an increased capacity to learn effectively, as well as contributing them a solid foundation on which they can build a successful life. These models along with other positive education initiatives can be integrated to develop a positive learning environment in schools.

Aiming to create a healthy atmosphere in schools through positive education programs will reduce mental distress and mental hazards such as depression and anxiety (Furlong et al., 2009). The need for real-life connections to basically understand the purpose of schooling is a vital way for these learners to improve the quality of their lives. Every discipline has its own way of how the connection and motivation will be done and established.

A study of Seligman et al. (2009) regarded mathematics as one of the concepts that schools teach for accomplishment. They considered positive education and noted its impact when it is taught with the skills of well-being and skills of achievement. On the other hand, D'Ambrosio (1985) pointed out that mathematics plays a significant role to achieve the high human values of this generation with equality, justice and self-worth for humanity without

division by race, tribe, sex, beliefs, and culture. He noted that it would be likely for mathematics teachers to contribute some thoughts to the function of mathematics education to achieve a healthier society and more valuable worth of life. This would give people an idea on how the relationship of Mathematics and human behavior would be.

Thereby, the need to strengthen mathematics lessons should be considered. The challenge of this mathematical goal involves how mathematical empowerment goes with the positive values and well-being of students. Every school should give greater importance on how to construct lessons in mathematics to make them more substantial. There are collaborative learning methods that teachers should consider in giving classroom activities. These collaborative and active teaching activities can take a lot of practical forms inside the classroom. Collaborative learning, games, simulations, problem-solving and heuristic methods can be utilized to promote student achievement and are a vital component to encourage positive education. Using these collaborative activities is important to lessen the anxiety and depression of students and makes learning at its best.

With these, this study looked at how it impacted mathematics lessons through collaborative and active learning activities. This gave way to the STMP model (students, teachers, method and positive education), an integrated model which concerns the learning (for students), teaching (for teachers), method (collaborative and active learning) and positive education concepts in mathematics lessons. The STMP model is carried out in the intervention module developed in this study. Teachers were guided by activities with positive education in the intervention module after discussing the lesson proper. Students were also given extra tasks on making a diary which is called the “positive education note” where students indicated things they did during the weekend as well as their “thank you” message. These practices connect Mathematics education and the elements surrounding positive education like

productive disposition, positive emotions, achievement, attitudes, anxiety management and interest in mathematics. These all aim to attain the purpose of positive education as implemented in the mathematics lessons.

Furthermore, Norrish et al. (2013) stated that the basic goal of positive education is to raise the flourishing and positive intellectual well-being in the schoolroom. This could give way to the overall decreasing of the level of anxiety of students, maximizing life satisfaction, and eventually enhance the performance of students academically. This study, thereby, included the impact of positive education not only in students' mathematics performance but also in the students' anxiety level and life satisfaction. Anxiety is a standard response to a situation. A minor level of anxiety is usual, but severe anxiety will lead to a more serious hazard. There are some indicators of anxiety level based on one's personal feelings and conditions. On the other hand, life satisfaction is a stage in an individual life to which he assesses the over-all quality of his life either in positive or negative side (Diener et al., 2010). Shin and Johnson (1978) stated that life satisfaction is a universal measurement of a person's value of life, permitting to his selected standards. Reports from Bishop-Kallmayer and Lewis (2010) revealed that in high school, depression and anxiety are some of the utmost typical community health dangers which affect 5 to 10% of young adults yearly. The anxiety level of these students is attributed to the peer pressure, tribal conflict and the socio-economic status of the students. Andrews and Wilding (2004) revealed that students who are less privileged and have low socioeconomic status are the ones prone to anxiety.

The Philippines is a third world country where most of its people have low socio-economic status. In 2013, it transformed its educational system into K-12 curriculum aiming to allow students to master skills and knowledge and prepare for employment opportunities in the future. This K-12 program is based on competencies and made for the needs of the students

and the society (Official Gazette of Philippines, n.d.). The southern part of the Philippines, particularly in the province of Maguindanao, faces poverty and unstable peace and order brought by some lawless elements and tribal conflicts resulting in anxiety and decreasing life quality of students. The National Achievement Test performance (NAT) of students in Maguindanao has been consistently below the mean score of the national average score (Philippine Information Agency, 2018). In line with this new educational curriculum of the country and catering to the necessities of the local community in Maguindanao, this study looks at some aspects of how students become more positive and perform better in school through positive education intervention and motivation. Balogun et al. (2017) highlighted that achievement motivation enhances students' academic performance.

The high level of anxiety concerning students, the diminishing life satisfaction and the relationship among studying and positive feeling, altogether agree that there is a gap to fill, particularly in this part of the Philippines to bring back the students' life quality and well-being. With the help of the STMP model carried out in the intervention module, the impact of positive education in mathematics lessons of students being implemented in the context of Maguindanao, Philippines was conceived in this study.

Significance of the Study

In particular, this research gives impact to the following, which makes the study significant:

1. International Positive Education Network (IPEN)

Positive education has been growing as a key paradigm shift in the global educational system; hence, there need to be more tangible works and studies to prove how this positive education helps the individuality of a learner. With this, efforts from individual school, community, to national governments and networks across the globe will be realized to provide more

resources. This will meet the very goal of the International Positive Education Network (IPEN).

2. Various Global Organizations

Positive Education promotes well-being, happiness and peace education which are fundamental and emphasis to international teaching policy for worldwide organizations just like the "World Health Organization (WHO), the United Nations International Children's Emergency Fund (UNICEF) and the United Nation's Educational Scientific and Cultural Organization (UNESCO)". This endeavor will indeed contribute learning material to the schools and the results of positive education in teaching mathematics to the displaced students in Maguindanao, which will eventually help these global organizations on their plans on upgrading education to the third world countries.

3. Hong Kong Education

This study will serve as a reference for Hong Kong educational studies involving the use of positive education in the school curriculum to enhance the well-being of Hong Kong graders. It will play a great importance also in studying similarities and differences in educational systems between an industrialized city and the countryside community.

4. The K to 12 Transition Program of the Philippines

The Philippines is currently on curriculum transition giving way to the K to 12 programs. This study will be considered by the curriculum planners of the program to integrate positive education, particularly in the displaced area of the country where most students do not show good academic standing and will eventually help the total well-being of the learners. This is also very helpful in some areas throughout the country that experience the same case as very low life satisfaction of students because of the growing poverty, and the very high anxiety

level brought by different factors such as peer pressure, poverty among other personal and environmental factors.

5. Mathematics Department of Mindanao State University-Maguindanao

Inspiring the utilization of collaborative and student-centred techniques, not only in mathematics but across all disciplines is an important aspect in the advancement of fundamental education in this university. Since the university provides teachers in the Maguindanao area through its teacher college, pre-service teachers, particularly those majoring in mathematics will have to consider this strategy for their future students. Individual teachers in the other discipline will also integrate positive education in the field they are into to help students manage their anxiety and perceive life as meaningful.

6. Teachers

Well-being should not be considered in the learners but with the ability and skills of the teachers to impart the sense of positivity. The feeling of goodness and functioning well should start with the teachers. It is then noted that teacher exercise and how the teacher handles the positive education impact the students' well-being. This will suggest that even teachers' sense of positivity will be the aim of education, not just that of students' (Noddings, 2003). The author also asserts that happy teachers will result to happy learners. This study will therefore give an initial practice to teachers to feel good and be happy no matter how hard life has become, for them to discover what works and what doesn't when it comes to handling positive education.

7. Students

The aim of positive education centers on the learners. The instructional material or the module in this study offers student-centered activities that students will really enjoy for them

to learn at their fullest. The processing of positive education concepts will even make them better individuals with a sense of productive well-being.

8. General Depository of Knowledge

Mathematics references may already have enough materials, but on the associations of mathematics and positive education, there might be a scarcity of references and learning aids. This endeavor will hope to provide to the general depository and depository of knowledge and skills in mathematics, positive education, peace education, and values formation both in the Philippines and Hong Kong educational systems.

Chapter 2: Literature Review

This chapter presents literature review of the study which includes positive education models and different perspectives, positive education impacting mathematics learning and teaching, the STMP Model, positive education for level of anxiety and life satisfaction, the K-12 curriculum of the Philippines and the status of its implementation in mathematics in the Maguindanao Province.

Positive education models and different positive education perspectives

Positive psychologists have continually undertaken experiments to cultivate character strengths and even considered moral values from different religious teachings (Confucianism, Buddhism, Hinduism, ancient Greece, Christianity among others) to find positive socio-moral traits. Happiness and teaching for happiness are not only about the cultivation of positive traits but also about the creation of positive experiences in the classroom and anywhere else. Positive psychologists thus, place a room to give opportunity for positive emotions to prosper. There are already established researches that suggest the need to teach positive education to develop in every learner the elements of resilience, gratitude, strengths, meaning, flow, positive relationships and positive emotions ranging from Thorndike's behavioral character theories, Erickson's psychosocial stages, Kohlberg's stages of moral reasoning to Gardner's multiple intelligences. However, there are some models that primarily focus in enhancing positive education which could be integrated altogether to develop a new model to apply positive education in mathematics. These are the PERMA Model, Broaden-and-Build Model, Geelong Grammar School Model of Positive Education, Dewey's Learning Theory, Constructivist Learning Perspectives, Montessori's Character Strengths and the Developmental Psychology Perspectives. These models and perspectives are applied along with the mathematical pedagogy to develop an integrated new model in this study.

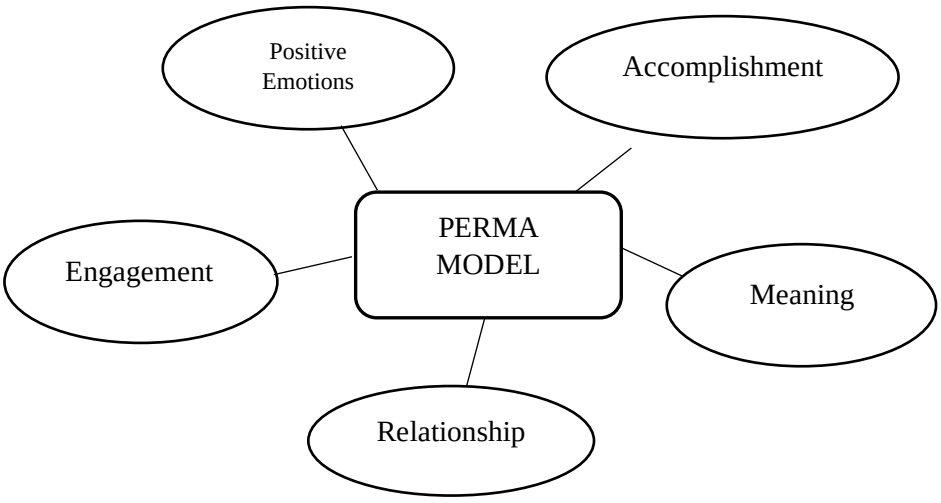
PERMA Model

Positive education is defined as the study of happiness and well-being. It is usually taught and associated with the use of Seligman's PERMA Model. Works of Seligman on integrating positive psychology to teaching aims to drop depression among the young and increase well-being and happiness. It stresses the meaning of teaching from within (the heart) and the mind (the brain) in schools. Education is often focused and attentive to academic achievement and the promotion of positive personality strength.

In positive psychology, this positive education model, Seligman's PERMA Model (2002) as shown in Figure 1, emphasizes "the five elements of becoming and having a well-being to be taught in schools to help the students achieve quality education". The PERMA Model makes up "five important building blocks of well-being and happiness." These are the p**o**sitive emotions (the state of feeling better), engagement (having been totally engrossed in activities), relationships (having been genuinely connected with others), meaning (having a determined being and living), and achievement (having a sense of attainment as well as feat and satisfaction).

Figure 1

PERMA model



The Positive Education Model, as illustrated above, supports students to generate, practice, involve, and create positive and affective skills. It is there to help these young people to experience life's positive emotional state such as thankfulness, happiness, resilience, pride, love, and encouragement. Positive education, as initiated by Seligman (2002) in Positive Psychology, denotes a compilation of findings meant at exploring what constructs life to be worthwhile. Positive education is described as "education for both traditional skills and for happiness". It aims to increase a much deeper thought of positive feelings, traits, and progressive institutions. Happiness has been merely defined as non-existence of sorrow but has never been really reviewed in depth. Seligman's purpose carried out by "humanistic psychology," was to make a more comprehensive portrait of individual learning and experience. Jacobs and Renandya (2017) states that positive education is a student-centered procedure which brings an affirmative perspective of learning, looks to build on students' own and group strengths. It promotes learners to hold accountability for collaborative works and interaction with peers. Seven positive education elements to be considered in positive education are "connections with others, responsibility, gratitude, positivity, strengths, kindness, and meaning".

Today's educational systems do not only aim for academic excellence. Developing the sense of well-being in schools is an additional aim, and positive education is a suitable means to achieve this aim, particularly now that there are well-controlled researches that prove the convenience of having well- being skills (Seligman et al., 2009). From a sociological perspective, Moos (1979) concluded that the societal-ecological setting in which students' performance can affect their attitudes and moods, their behavior and performance, their self-concept and the general sense of well-being. The societal-ecological background of the learning classroom, which is denoted as a learning environment or classroom climate involves social and affective phases. Norton (2008) supported this and stated that there are

several types of research confirming the correlation between classroom climate and students' academic progress. Having an environment in learning which is safe, sound and secured will help in the attainment and aim of positive education.

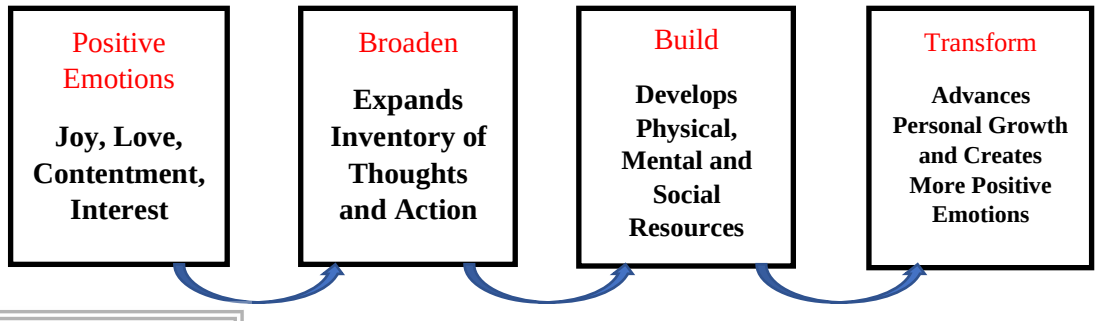
Seligman and Csikszentmihalyi (2014) reiterate in their study that positive well-being is the actuality of positive psychology stand and belief in the educational landscape. Positive education is not yet recognized for a great deal of theoretical and empirical attention when related to positive psychology. Moreover, he said that there is a significant scarcity of positive education studies that focus on students in the Asian region.

Broaden-and-Build Model

This study also considered some concepts in the Broaden-and-Build Model (Fredrickson, 2001). Like the PERMA Model, it denotes that positive feelings widen people's perception and outlooks that will gradually change who they are in the most optimistic ways and widen the array of thoughts and actions while negative emotions narrow people behavioral interest. It suggests that experience of positive emotions broaden people's momentary thought–action ranges, which will eventually serve to build their enduring personal resources, extending from physical and intellectual resources to social and psychological ones. The broaden–and–build theory describes the form and function of a subset of positive emotions, including joy, interest, contentment and love. Figure 2 shows the model of the Broaden-and-Build Theory.

Figure 2

The Broaden-and-Build model



A key proposition is that these positive emotions *broaden* an individual's momentary thought–action repertoire: joy sparks the urge to play, interest sparks the urge to explore, contentment sparks the urge to savor and integrate, and love sparks a recurring cycle of each of these urges within safe, close relationships which in turn *build* that individual's personal resources; ranging from physical and intellectual resources, to social and psychological resources.

In this model, the author describes a new theoretical perspective on positive emotions and situates this in perspective within the emerging field of positive psychology. Preliminary empirical evidence supporting the broaden-and-build theory is reviewed, and open empirical questions that remain to be tested are identified. The theory and findings suggest that the capacity to experience positive emotions may be a fundamental human strength central to the study of human flourishing.

Geelong Grammar School Model

Geelong Grammar School passionately believes in the importance of student and staff well-being. The high prevalence of depression among young people worldwide, the well-documented small rise in life satisfaction, and the synergy between learning and positive emotion all argue that the skills for well-being should be taught in school. There is substantial evidence from empirical studies that skills to increase resilience, positive emotion, engagement and meaning can be successfully taught to schoolchildren and achieve meaningful outcomes.

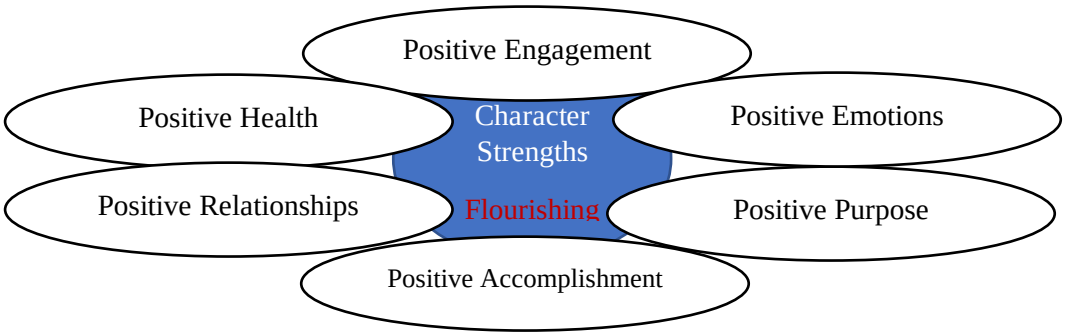
Since 2008, Professor Martin Seligman, one of the founders of Positive Psychology, has been involved in a collaborative project with Geelong Grammar School. This project is recognized

as pioneering the development and application of what has come to be defined as Positive Education.

The Geelong Grammar School Model of positive education as shown in Figure 3, is based on the scientific research underpinning Positive Psychology. It has been reinforced by observations and learning from implementing positive psychology interventions at the school.

Figure 3

The Geelong Grammar School model of positive education



In the Geelong Grammar School Model of positive education, the concept was taught two times in a week by the heads of the ten accommodation in the school, who were mostly mathematics- teachers. On students' first lessons, prior to taking the Values in Action (VIA) signature strengths test was done by the students through writing stories about the times when they were at their own best. Almost all of the students had two, and most had three of their strengths in their stories. Other strength lessons comprised family member interviews to develop a 'family tree' of strengths, learning how to utilize strengths to resist trials in life, and evolving a strength that was not expected by students. For the concluding strength topics, students had identified their leaders (students or teachers) whom they could consider models of every strength. The course to identify and develop strengths gave teachers and students a mutual language for discussing the lives they had been through.

Dewey's Learning Theory and Constructivist Learning Perspectives

Some psychologists and great educators in the past had seen the importance of the unification of positive psychology aspects in the values maturity of an individual, although they were not exactly considered as such in the learning environment. John Dewey is among one of the first believers to influence the field of positive learning and was credited with the present discussion about reflective learning. He acknowledged schools as prime institutions in the growth of independent learning standards. He resisted the boring approaches of schools, particularly in methods used in primary and secondary learning schools and did emphasize the significance of advancing learners' capacity to engage and construct information through their own thinking, giving them freedom and meaning.

John Dewey is known as the "father of the progressive education reform" as he crusaded for changes in curriculum and teaching phases. According to Westbrook (1993), his philosophy, termed for the integrity of "theory and practice" in his educational philosophy, depends on the evident notion and efficient training. Schools would then encourage them to make efforts in developing these changes because every individual student in society needs a better human invention to grow (Dewey, 1938). He pioneered the idea of learning by doing, which contends that every learner should take information and creatively construct it the way he perceives views it. This approach is contrary to the traditional sight of education that teachers permit down and transfer comprehension to the learners by means of direct teaching and interaction. Dewey's prospect in education is indeed the same with progressive education, which implies that students learn at their best in an atmosphere related to the physical world and that permit them to absorb through engaging activities and applied problem-solving. Dewey was also credited in initiating the current discourse about reflective education. Kolb and Fry (1975) reinvented Dewey's idea of experiential learning into a more arranged learning set.

On the other hand, constructivism is “an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner” (Elliott et al., 2000). This constructivist’s idea is elaborated by Arends (1998) stating that constructivism trusts in learners’ building of meaning through experience and personal involvement influenced by the relationship of prior knowledge and what is currently happening.

The core notion of constructivist learning is that learning is created and that learners build new knowledge with the basis of the previous one. This prior knowledge affects what new or modified knowledge an individual will construct from new learning experiences (Phillips, 1995). The second notion is that learning is an active rather than a passive way of learning. The passive learning views the learner as ‘an empty vessel’ to be filled with knowledge, whereas constructivism states that learners construct meaning only through active engagement with the real-world (such as experiments, world problem-solving).

Maria Montessori’s Character Strengths for the Learners

Maria Montessori, on the other hand, the advocator and pioneer of Montessori education, also set onwards visions connecting to a positive environment (Montessori, 2013). From the Montessori education perspective, learning is mainly grounded on the positive psychology belief of learners’ creativity. Creativity, being known as “one of the twenty-four-character strengths,” offers independence to children in choosing how they want to learn. This is commonly regarded as self-directed learning. Learners are offered with proactive and interactive learning materials that do not only inspire and promote creativity but also stimulates attentiveness to study as children can freely learn from themselves and will not be pressured to work in order to learn. Montessori (2013) described Montessori education as an ideology about helping innovations discovered by the children at their younger age.

Montessori had an individual and distinct mission of the emerging mind by reflection and support for humanity. This meaning complex was explicitly encoded in her beloved painting. In her own words, as introduced by Montessori (2013), that children should represent not only social growth but universal human development and are closely connected to the idea of motherhood in protecting her children.

Developmental Psychology Perspective and Positive Behavior Support Model for Learners

In the Developmental Psychology perspective, Elizabeth Hurlock (1898-1988) was one of the pioneers in the study also of developmental psychology to convey out tests with positive psychology methods to assess the results of positive learning in the educational perspective. She considered the usefulness and effect of praise and allegation in the classroom, noting that praise is a more successful and long-term encouragement. Her research found out that praise was more authentic for children regardless of age, capability, and gender. This study is supported by Henderlong and Lepper (2002) as cited by Bear (2010) that praise is valuable to enhance learners' intrinsic enthusiasm and is particularly convincing among ethnic minority students. Some studies disbelieve the efficiency of praise. However, suitable use of affirmation is confirmed to be positively associated with self-confidence and better academic achievement outcomes. These studies support the idea that praise grows the personal conviction and one's ability to accomplish given duties. Moreover, cognitive evaluation theory backs up that praise enriches individuals' insight about performance results and those positive feelings encouraged by affirmation might contribute to more efficient results.

The Positive Behavior Support Model, on the other hand, developed a model to provide intensive individualized interventions to individual children with challenging behaviors. The model involves a pyramid model which includes elements like intensive intervention which comprises the smallest part of the top of the pyramid, followed by the targeted social and

emotional support, high quality supportive environments, nurturing and responsive relationships, and the effective workforce which is the largest bottom part of the pyramid model.

Positive Education Impacting Mathematics Learning and Teaching

Learning and teaching mathematics is a cognitive endeavor. However, affective aspect can play a vital role in the students' decisions about how much they need it in the future (Reyes, 1984). On the other hand, White (2016) points out that the increasing body of evidence on the need to apply positive psychology has made a persuading case to take well-being and happiness as an operational aim in schools. It is agreed that this aim is important and should be pushed through just like the case in which we improve strategies to boost academic growth, maintain school retention percentage and student participation. Romberg and Kaput (1999) pointed out that school mathematics has become sometimes unsuccessful to give students with sense of its historical or cultural importance nor any sense of its worth. With this, Boaler (2013) explained the significance of teachers and students to have open mindsets in relation to mathematics learning and the role of open tasks to this end. These ideas would connect to character strengths of creativity, curiosity, open-mindedness, and love of learning. Appreciating the integral beauty and value of mathematics is a worthy aim of mathematics education (Romberg & Kaput, 1999) that links with the character strengths of beauty and excellence. National education programs can have a bigger influence at the starting level on school development, better value of classroom teaching, and generating active and informed citizens.

With this, mathematics learning and teaching should play a chief role and impact in bringing in again the sense of positivity and well-being of the learners that schools must make to have mathematical lessons more satisfying. The positive education strategy is then reflected to

learning and teaching mathematics that will encourage Seligman Model (2002) along with the Fredrickson Theory (2001) and the different perspectives and theories. On the other hand, D'Ambrosio (1997) became the "intellectual father" of the "ethnomathematics" because of his theory on this. This theory has become significant in every learning atmosphere since multicultural classroom settings are now universally accepted. Every learning classroom is now depicted by equality regardless of gender, race, culture, and beliefs. Following some thoughts on the correlation of the humanity and the construction of knowledge, he further claimed a mutual relationship between human on his ways to explain and cope with the nature, and the progress of mathematics which will lead to a wider attitude and pedagogical nature of mathematics. He encouraged mathematics educators to relate the discipline with issues for humanity. This also includes several clues for the mathematics growth to an universal integrity, which encompasses the aim of peace in its various extents.

Positive education is generally an approach or strategy in teaching that ties with positive psychology's significance of specific strength and individual enthusiasm to encourage the acquisition of knowledge. Contrary to traditional ways of teaching in which teachers try to fit their materials to an "average" student and transport the class completely by a teaching and testing class, positive education teachers use methods which center on the happiness and well-being of students. In positive education, teachers are using techniques such as emerging goals for the individual student to learn and work with them. Rather than asserting students to attain at a specific set grade level and see through the importance of standardized testing, positive education will tailor learning ends to distinct students' points. Learning is regarded as a collaborative means where teachers just facilitate students, and every student's feedback and responses are appreciated and assessed.

In this positive education intervention, teachers delivered mathematics content as directed by the instructional material, which is the intervention module on positive education. Teachers processed each positive education concept after every activity. It is then expected for mathematics-educators to provide needed attention for the crucial development of mathematics education in realizing a positive community, just decisions, evident happiness and exalting value of lives. To understand the actual importance of mathematics in a wide variety of principles, it should be seen through many parts of mathematical understanding and imply new ways of studies. This will lead to the result of having a better understanding and suggestions of mathematical studies, its subjects and the pedagogical procedures in the accomplishment of positive education.

Hicks (1985) stressed out that mathematics can produce a culture of peace, opening before everybody's scenarios of controlled, or at least manageable connection to mathematics teaching, though unable to give us certainty of peace, can concede the hope of being peace operators, as well as the ability to work for its protection. It is the mathematics-educator who takes control in a Mathematics classroom. Mathematics-educator, like everyone else according to D'Ambrosio (1997), has the responsibility towards the future, the responsibility to defend what has forever been unique in the history of mankind, and in suggesting a hope for human beings to live peacefully and upholding that sense of positivity.

The Development of STMP Model

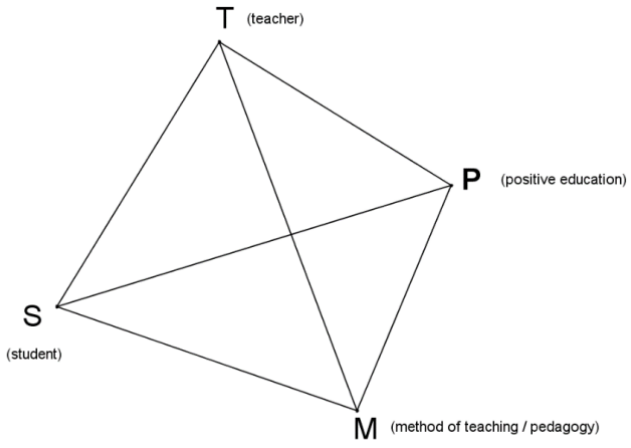
A study of Basch (2011) pointed out that no matter how well-prepared teachers are to teach, no matter what accountability measures are put in place, no matter what governing structures are established for schools, educational progress will be profoundly limited if students are not motivated and able to learn. This is supported by Mitchell & Bradshaw (2013) suggesting

that professional development activities should promote teacher's use of positive behavior strategies and encourage reduced reliance on exclusionary discipline strategies in order to enhance the school climate and conditions for learning. Based on the different positive education models and different perspectives, the elements of students, teachers, methods and the positive education concepts are interconnected and integrated for a successful enhancement of school learning.

With these, a STMP model (student, teacher, method and positive education) to teach positive education in mathematics is suggested. Given the different theories of education and the claim of positive psychologists to include moral teaching, resiliency and well-being in teaching, the integrated model was developed in this study. Each component in the STMP model is connected to achieve the aim of positive education intervention in mathematics carried out in the intervention module of this study. Figure 4 presents the STMP model and the relationship in the teaching and learning process of each pair of components.

Figure 4

The STMP tetrahedron model and the four components



There are four main components in the STMP Tetrahedron Model (or simply the STMP model) namely S (student), T (teacher), M (teaching method /pedagogy) and P (positive education).

They are represented by the apexes of the tetrahedron. The relationship between each pair of components is described below:

1. The **teaching process relation**: it refers to the relation between the students and the teacher, which is represented by the link S–T.
2. The **learning process relation**: it refers to the relation between the students and the teaching method (pedagogy) adopted by the teacher, which is represented by the link S–M.
3. The **positive education integration process relation**: it refers to the relation between the teacher and the positive education theory or elements to be promoted/implemented in school or after school, which is represented by the link T–P.
4. The **teaching method (or pedagogy) adoption process relation**: it refers to the relation between the teacher and the teaching method (or pedagogy) employed by the teacher, which is represented by the link T–M.
5. The **positive education infiltration process relation**: it refers to the relation between the positive education theory and the teaching method (or pedagogy) adopted by the teacher, which is represented by the link P–M.
6. The **positive education theory intervention process relation**: it refers to the relation between the students and the positive education theory or elements adopted by the teacher, which is represented by the link S–P.

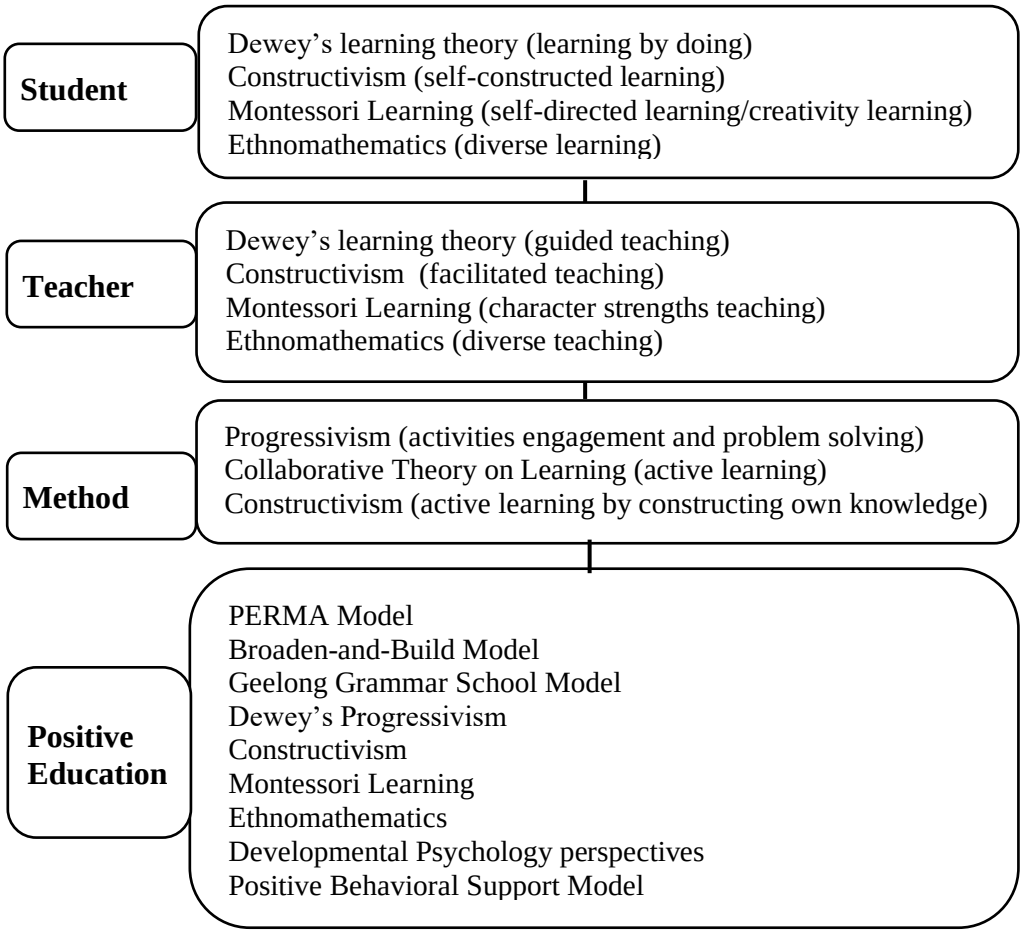
Each triangular face of the STMP tetrahedron model indicates that there are mutual interactions among three main components of the model that are denoted by the vertices of the triangular face concerned. For instance, the triangular face ΔTSM indicates the interactions among the teacher, the students and the teaching method, which are the vital components of the teaching and learning process appeared in traditional lessons without intervention of positive education theory or elements. However, with the presence of the positive education component, there are

three more triangular faces appeared in the STMP tetrahedron model, namely ΔPST, ΔPSM and ΔPTM, and there are three more linkages between P with T, S and M to illustrate their mutual interactions. By referring to such a model, it can be a useful tool for guiding teachers to plan their teaching materials, learning activities and pedagogies more systematically and effectively when trying to integrate positive education theory or elements in their lessons. For instance, this model can be used as a useful reference when planning to teach mathematics or other subjects with intervention of positive education, although in this thesis, the research findings on integrating positive education in mathematics lessons are limited in Maguindanao, Philippines. The STMP tetrahedron model described here is an attempt to generalize the well-known didactic triangle mentioned by Schoenfeld (2014) and Straesser (2007) and the related references therein.

This STMP model is an integrated model based on different models and educational theories as illustrated in Figure 5.

Figure 5

The STMP model as an integrated model from different models and perspectives



Student

The student as a component of the model involves how a student engages in learning mathematical knowledge with positive education. The concepts from Dewey's progressivism, the ideas of constructivism, the Montessori learning and the ethnomathematics are primarily concerned about students. This first component of the STMP model, the Student, is based on and linked to these learning perspectives. Norrish (2015) describes a model of positive education as a flexible and science-informed framework for helping the flourishing of students. The study of Camp (1990) suggests that academic achievement is enhanced by student participation and could raise questions about the rationale behind rules. On the other

hand, Huang et al. (2019) pointed out in their study that teacher's instructional improvement contributed to student achievement. Some research also indicated that student engagement in extra activities strengthened not only their academic performance but also non-academic areas like taking initiatives, problem solving, engagement, higher order thinking, belongingness, social network, and social skills of different types of students. (Lewis, 2004; Moriana et al., 2006). These studies support Dewey's progressivism, the ideas of constructivism, the Montessori learning and the ethnomathematics in enhancing learning.

Teacher

The teachers have that great role to relate every mathematical knowledge to positive education. For the teacher to process the intervention very well, he or she should have experiences about how to deal with life challenges. Teachers should possess the instructional leadership needed for an intervention. They should have a positive outlook in life to make the utmost outcome of the intervention. The concepts from Dewey's progressivism, the ideas of constructivism, the Montessori learning and the ethnomathematics guide teachers in enhancing teaching. The second component of the STMP model, the Teacher, is based on these learning perspectives.

The STMP model adopts the effective teaching insights which suggest that competent and effective teachers should use a wide scope of learning pedagogies, boosting student responsibility, taking mastery of their teaching area, delivering a safer environment, having high expectations, acknowledging individual differences, examining the development and building positive relations. In addition, Waters (2014) defined four schemes that these instructional leaders or heads can utilize to increase student performance and will provide a good learning atmosphere. One of these is having a visible presence. Teachers play a great role also for the students to have less anxiety feeling and more satisfied with school life

whenever students feel their presence. Kilpatrick et al. (2001) emphasized the need for teachers of mathematics to be proficient themselves. It is predictable that mathematics teachers must also know and understand the content that they are teaching. According to Kilpatrick et al. (2001) other aspects of mathematical proficiency can be understood in terms of procedural fluency in performing classroom activities, strategic aptitude in planning and solving problems that arise during teaching performance. A good school learning environment is indeed brought by the students' perseverance to learn and the teachers' commitment to impart knowledge and skills. Students and teachers make up as vital components in the success of positive education in schools.

Method

The active and collaborative learning of the students is considered by many studies as primary strategies to motivate students to learn. The modular method of this study using these active and collaborative learning activities was highlighted. Some of the teaching methods that enhance learning in mathematics include games, simulation, problem solving and cooperative learning. The concepts of progressivism (activity engagement and problem solving), collaborative theory on learning, and constructivism's active learning by constructing one's knowledge are where the third component of the STMP model, the Method, is based on.

Moreover, a book written by Mink (2010), entitled S*trategies in Teaching Mathematics*, emphasized some common strategies like games, problem solving and other collaborative learning strategies. These strategies will help interactive learning and student achievement. The OECD (2014) reported that students who are open to solving problems performed higher on average than other students. Such students believe they "can handle a lot of

information, are quick to understand things, seek explanations for things, can easily link facts together, and like to solve complex problems."

Solis et al. (2012) in their study, provided an empirical foundation to assist school positive educator in evidence-based decision making through their collaborative model of instruction. Johnson and Johnson (2008) suggested that for cooperative learning to be more effective should be a group of 2 to 4 members. They added further that the more skillful students are in interacting with each other, the higher the students' achievement.

Positive Education

The developed STMP model is a guided model to use the positive education in teaching mathematics. The STMP model is carried out in intervention module used in the study. In the intervention module, student participation through cooperative and active learning activities is highlighted. This gives a particular example of the exploration of the primary objective of Positive Education at Geelong Grammar School, which is the learning to flourish. Positive intervention studies primarily aim to enhance learning of students. The Positive Behavioral Support (PBS) model, for example, is a model of response to address challenging behaviors of learners in schools that has proven to be effective in developed countries. Given its human rights and functional contextualism contexts, the PBS model is particularly relevant to and of value to teaching. Since students' behaviors are a vital influential factor to classroom performance, an intervention module supporting the ideas of PBS was developed and evaluated for its effectiveness. In the field of mathematics, it is always a challenge on how to make learning to flourish. The positive education strategy is then reflected as a tool to learning and teaching mathematics that will encourage the Seligman PERMA Model (2002), along with the Fredrickson Theory (2001) and some positive education perspectives. With the right method of positive education concepts, learning and teaching will enhance the affective

domain of mathematics. This makes another affective achievement to use positive education in the field of mathematics grounded in different learning theories.

Positive Education for Level of Anxiety, Depression and Life Satisfaction

Becker and Luthar (2002) identified four critical social-emotional elements that influenced academic performance. These are academic and school attachment, teacher support, peer values, and mental health. As far as learning and achievement at school are concerned, mental health can be influential and distracting. Students experience anxiety in whatever form it is. The level of anxiety might be more than others. Some might be persistent and chronic. As anxiety gets distracting, it is correlated with a multitude of cognitive, behavior, and affective problem. When the anxiety level or depression is prevalent and severe, this could be identified as anxiety disorder if no treatment is considered. The occurrence of depression among young people is appallingly high all over the world. About 20% of young people have experienced an event of medical depression at the end of high school (Lewinsohn et al., 1993). Positive education makes an important role in enhancing the quality education bringing positivity to each learner. Teacher support is one of the strongest correlates with youth adjustment, social and motivational development, and achievement. Connection between teacher support and student emotional, motivational, and academic behaviors develop at very early stages of schooling and continue to their adolescence (Davis, 2003; Roeser et al., 1996). Social support and the lack of threat and anxiety in learning environments result in positive attitudes toward school, greater engagement in classroom activities, and higher achievement (Baker et al., 2003). In school, the usual causes of anxiety are inter-personal and academic linked problems. Moreover, some students encounter pressure to both obey and react, such as an outcome of the implementation of the policy, and values by peers, families, and schools. Individual differences

in upbringing, physical qualities, languages, social and emotional capacities may also distract whether a student belongs or not, hence becomes an anxiety source.

Further, lack of positive connections between teachers and students is associated with an increase in students' externalizing behaviors such as aggression in elementary classrooms (Silver et al., 2010) and risky behaviors. A number of recent articles have emphasized the importance of teacher–student relationships from kindergarten to college for many outcomes of great interest to school psychologists, including positive school adjustment, self-concept, affiliation with deviant peers, substance use, aggression, and help looking for behaviors for bullying (Baker, 2006; Buyse et al., 2008; Gest et al., 2005; Suldo et al., 2008) Perceived teacher support may increase the likelihood that students would report and seek support for threat of violence and bullying (Eliot et al., 2010). These researchers make a powerful case that school psychologists must educate teachers about positive student outcomes likely associated with teacher support.

Goodenow (1993) reported that students who perceive positive connections with their classmates experience a greater sense of belonging. Furrer and Skinner (2003) suggested that perceived sense of relatedness to the classroom environment promotes positive emotions such as enthusiasm and through this link, it is positively associated with students' motivation (such as classroom engagement and academic performance. Classroom burdens instead of positive emotions regularly cause stress and anxiety to students, such as in coursework, plans and duties when there is no sense of relatedness. Anxiety on being assessed, such as being tested and graded in the classroom, is also common among students and can hamper achievement, although students need to understand that it is part of knowing their academic progress. Difficulties in meeting academic anxieties also can be intensified by too many extracurricular

undertakings of these students. In secondary school students, there has been the additional stress of college and job training. The overwork of actions and difficulties can cut students off from important supports, hinder rest, restrict learning and progress, and affect physical and intellectual well-being.

Further studies also claim that the lack of relatedness deteriorates academic engagement due to increased negative emotions, such as frustration, depression and anxiety. Teachers may play a crucial role in satisfying students' needs for belonging in educational environments (Osterman, 2000). Therefore, examining the link between perceived teacher affective support and sense of belonging provides us a better understanding of the potential determinants of sense of belonging. Further, the positive feeling generated by a strong sense of belonging might have a positive impact on students' emotional well-being and, consequently influence their emotional responses to academic situations, which relate to their beliefs about their potential to accomplish academic requirements. Supporting this argument, Goodenow (1993) suggested that the relations between sense of belonging and academic effort might be mediated through motivational factors. Therefore, examining potential mediation variables such as academic feelings and academic efficacy is better understood by the relation between sense of belongingness and academic effort.

It was in the 1960s when life satisfaction had become a major concern of dialogue in research. Life satisfaction was basically thought to be assessed objectively and externally, just like the case of measuring heartrate or blood pressure during 1960 when life satisfaction became a wide area of research. From then, it has become viewed that life satisfaction must be measured subjectively rather than objectively. Methods commonly used to assess this maybe surveys, questionnaires, and interviews. Assessing life satisfaction does not only see how satisfied individuals are with their lives, but it is also a means of knowing how and

why unhappy they are. By having the positivity that enhances life satisfaction from the individual subjective involvement, clinicians and researchers can examine what builds one's happiness.

Life satisfaction is indeed a whole assessment of thoughts of an individual extending negatively to positively depending on how he reacts with a situation. Life satisfaction is one of three key determinants of well-being: "life satisfaction, positive affect, and negative affect" (Diener & Emmons, 1984). Grounded on the research "The Study of Life Satisfaction," the value of one's life is correlated with living circumstances, such as nutrition, health, protection, and so on. A contrast definition of life satisfaction states that it is an emotion, just like happiness or sadness. This can be understood by the concept of life satisfaction by means of the PERMA model, pioneered by Martin Seligman, the author of positive psychology (Seligman, 2011). According to him, PERMA makes up "five important building blocks of well-being and happiness."

Seligman and Csikszentmihalyi (2014) thought of three main purposes of positive psychology research that describe and measure positive characters, encouraging positive feelings and emotion, and making a positive environment that struggles to help these strengths, experiences, and skills. It was noted further that a better way to understand these human strengths may avoid the damage of psychological complaints and support the development of some active interventions to ascend and maintain well-being (Gable & Haidt, 2005). At present, positive psychology also becomes an interest in the existence of these positive behaviours in an individual being and how these behaviors may support well-being. This concept is referred to as covitality (Sheridan et al., 2015).

Depression and anxiety, meanwhile, are widespread. Normal individuals who are assessed proficiently have average happiness. Long before research goes its way, depression and anxiety have not remotely kept up with an improvement for one's sake. Happiness starts to grow up only a bit. The widespread depression and selective increase in happiness are two good reasons that well-being should be considered in teaching - if it could be integrated - but there is a third better cause. More well-being is associated with better learning. Increased well-being is likely to produce an increased in learning, the traditional goal of education. Positive disposition produces broader attention (Fredrickson & Branigan, 2005), more creative thinking (Isen et al., 1987), and more rounded thinking, in contrast to a negative mood, which produces narrower kindness (Bolte, 1999), and more analytical thinking (Kuhl, 2000).

A study by Kaya et al. (2015) explored the relationship between perceived stress and life satisfaction of Turkish college learners. The study utilized the "Satisfaction with Life Scale" (Diener et al., 2010), the "Perceived Stress Scale" by Cohen and Williamson (1988), and a short demographic questionnaire which were used to evaluate 235 college students. The result showed that the students' marks on satisfaction with life scale were negatively significant with results on perceived stress scale, signifying that general life satisfaction of college learners is unfavorably influenced by college stress. Moreover, the study revealed that female students took greater satisfaction of life than the males.

The study of Diener and Diener (2009) also revealed that the relationship of money, acquaintances, and family fulfillments with life satisfaction and with esteem may vary from one nation to another, and that economic satisfaction is a greater relative of life satisfaction in most of the third world nations. It was revealed out also that life satisfaction and self-esteem are naturally discriminable concepts.

Schools that make very slight efforts to discourse inter-personal and academic linked stressors can assume many anxiety-related culture, performance, and affective problems. The first and often most significant prevention policies in school are those that improve the conservational conditions connected to anxiety. In relation, many students and educational support are expected to speak about the factors that are related to learner anxiety. As far as the schools' curriculum and programs are concerned, schools should start to encourage skills, resilience, resistance, and mindfulness to be included in school curricula. It is a worldwide concern and an anti-trauma plan is being integrated to be included in a classroom curriculum for all students. It stresses easing techniques, cognitive plans, exposure exercises, and inspiration of making friends and increasing community linkages. It integrates peer help to help lessen social anxiety. Schools can also help parents show a role in avoiding anxiety in schools. For example, parents will support and formulate correct changes to the next grade and/or new environment. Teachers also can ask parents to participate collaboratively with the school to cultivate and deliver scholastic and social care.

Schueller (2012) describes positive education and major concentrations of the discipline, including positive feelings, positive character being, and positive institutions. Her book discusses ideas on the landscape of well-being that has advanced the comprehension of what it really is to live a happy life and the goodness of acknowledging cultural diversity in well-being. In addition, it considers applications to promote human well-being by means of tested intervention procedures. As positive psychology nurtures, it moves to intervention settings to further positive foundations and raise global awareness of well-being.

The study of Brunzell et al. (2016) guided the part of a positive educational framework in a typical and actual classroom for learners who have undergone some traumatic experiences from abuse, war, conflict, and natural phenomenon. There are known as trauma-informed

studies that aim to fix regulatory faculties and help disturbances and indifferences in students. Meanwhile, a model of mind health notes that repairs deficits in students are just a part of the education solution of schools that is important in nurturing well-being in traumatic students. Trauma-informed-education, accordingly, can be regarded from both in a deficit viewpoint and a strength's perception. His paper produces the "strength-based trauma-informed positive education" (TIPE) approach, which sets three elements of learning needed for traumatic students: "repairing regulatory abilities, repairing disrupted attachment, and increasing psychological resources." These three elements help each other through interactions. The TIPE model contributes to research in the fields of positive education, positive psychology, and the study of trauma, with the actual thought of helping a classroom teacher and school-based practitioner to achieve the multi- behavioral, cognitive, and relational needs of learners trying hard for classroom performance.

Dr. Seligman thought further of having prevention and not a therapy to children's depression. He asked if it could be possible to teach these children who are in danger of depression to dispute against unreasonable pessimism to avoid depression. The question had led to the first "Penn Prevention Program" for children and the start of positive education. Seligman et al. (2009) devised a plan for 12 weeks of two hours per week prevention program for high school students. Dr. Seligman and his team wrote manually minute-by-minute and screened 200 Grade 5 and Grade 6 pupils to find the 70 of them most at threat of depression. They then followed-up the pupils for a two-year period to their puberty, when depression is considered to be on-hold.

Positive education plans typically explain positive personality as "core character strengths" that is signified in the VIA's six types of virtue. Such positive traits are outside paradigms that need to be developed rather than being inborn. The aim of positive education is to help

uncover and grow the child's capability to efficiently absorb their personality strengths. Norrish et al. (2013) noted that the basic aim of positive education is the promotion of flourishing and positive mind health inside the classroom.

With this, positive education can therefore, cater to problems with students' anxiety management and a factor for life satisfaction. Waters (2014) states that a school program, that integrates well-being to students will more likely avoid depression, promote life satisfaction, inspire group concern, uphold creativity, adopt learning, and even boost educational accomplishment.

K-12 curriculum of the Philippines and the educational status of its implementation in Mathematics in the Maguindanao Province

In the Philippines, the integration of positive education is a worthwhile move particularly in some of the poorest provinces in the country. The country comprises provinces where illiteracy is common despite the change of curriculum to K-12. Maguindanao province is one example, where peace is unstable, making the illiteracy problem worse with declining life satisfaction of students and increasing levels of anxiety for the young.

The K-12 program covers kindergarten, with the six (6) years of primary education and six (6) years of secondary school education, which is divided into four (4) years of junior high school and two (2) years of senior high school. It started in the year 2013. The program intends to give a stronger educational background and enhance the curriculum so that learners can obtain the fundamental competencies needed by students to work, become an entrepreneur, or continue to higher education. Kindergarten commences when a child is five years old; thus, Filipino students who have completed their basic education are considered ready for further education or can find a job by the legal age of employment (18). The 12 years of the basic education program is seen to be the best period of learning and is likewise

the globally recognized standard for students and professionals (Department of Education, Department of Science and Technology Science Education Institute, and University of the Philippines National Institute for Science and Mathematics Education Development, 2000). Based on the Education Commission Report of 1991 that identified English as the snag in student achievement, the K-12 programs likewise require the mother tongue or the home language of the child to be the medium of instruction or language of instruction from kindergarten until Grade 3. By Grade 4, the students are to transition to English as the medium of instruction.

Mostly, teaching in the Philippines is much more traditional in teaching the mathematics. In most of the classroom set-ups, the teacher is at the front explaining and asking questions while facing the entire class with the chalk in hand. Textbooks are often temporarily lent freely to the students in the public schools, and these textbooks serve as a guide as the teacher is teaching. If groupwork is strategized by the teacher, it is sometimes better. When students interact, they often cannot sustain the discussion and make it productive and meaningful (Pascua, 1993). Learners are, most of the time, passive but organized and being told not to be noisy. To start a new lesson, the teacher first unlocks and motivates students about prior knowledge of the topic then the teacher explains the definition and rules then starts the lecture proper (Department of Education et al., 2000).

Now that the K-12 curriculum is in place, the goals of mathematics education are continuous, but are coping with what technological advancement offers. Despite some deviations in the curriculum of mathematics, the purpose of it at the fundamental education phase still have remained unchanged “to provide opportunities for individuals to develop skills and attitudes needed for effective participation in everyday living and prepare them for further education and the world of work so that they make worthwhile contributions to the society at large”

(Pascua, 1993). While the national government is looking at how teaching in K-12 curriculum progresses with digital transformation, the challenge on how to cope with life struggles is still unavoidable in a region that is left behind like Maguindanao.

Maguindanao is a province in the south of the Philippines. It is one of the eight provinces of the Autonomous Region in Muslim Mindanao (ARMM) in the country. This ARMM has been replaced recently by The Bangsamoro, officially the Bangsamoro Autonomous Region in Muslim Mindanao or BARMM, an autonomous region located in the southern part of the Philippines. Changing the Autonomous Region in Muslim Mindanao, this Bangsamoro Autonomous Region was designed with the confirmation of its fundamental law, the "Bangsamoro Organic Law" , following a two-part plebiscite in West of Mindanao held on January 21 and February 6, 2019. The ratification was approved later on January 25 by the Commission on Elections.

A report of the Philippine Statistics Authority (PSA) of the country shows that more than half or the majority of the region's estimated three million people are living in intense poverty. The National Achievement Test (NAT) performance of students in the ARMM frequently has had a mean score lower than the national average over the last five years (Mindanao Examiner). This assessment result is attributed mainly by the conflict that exists over the region that makes learning hard to achieve. This is just one piece of evidence of how learning is being affected in the region of Maguindanao. This is the prevalent educational condition in the region, and the school authorities are always ready for some interventions and temporary solutions on how school activities will resume despite the hostilities.

Therefore, there is a need to consider the well-being and positivity of the students in Maguindanao affected by this terrifying and constant hostility in the province. Hence, this study had been purposively addressed to realize and fill-up this gap.

Purpose of the Study

The purpose of this research study is to determine and investigate the impact of using positive education in mathematics lessons through the STMP model in the performance of students, in lessening the level of anxiety of students and maximizing their life satisfaction. The study also wanted to contribute to the academic community in the affective domain of mathematics through the learning materials that this study created.

Research Questions:

1. What were the students' and teachers' experiences on the positive education intervention in relation to mathematics performance, anxiety level and life satisfaction using the proposed STMP model?
2. What were the mathematics performance of students, their level of anxiety, and life satisfaction before and after positive education intervention?
3. Were there significant differences in the pre-assessments and post-assessments of the mathematics performance, level of anxiety of students, and their life satisfaction with mathematics?
4. Did the experimental group and control group both obtain a significant result through hierarchical regression analysis? Was there a correlation between the mathematics performance and level of anxiety or life satisfaction of students?

Chapter 3: Methodology

This chapter presents the research method and design, research participants and ethical considerations of the study, the instruments used and interview script, the intervention, the intervention module and carrying out the STMP model, assessment of the module, and the data collection techniques and tools.

Research Method and Design

This study is a mixed methods research, employing both quantitative and qualitative approaches. It is quantitative, describing and interpreting the pre-test/post-test results of students' performance in the prepared mathematics test, level of anxiety, and life satisfaction as well as the results of the linear regression model. Quasi-experimental research using one (1) group pre-and post-assessment designs also calls on the quantitative part of the study as described in Langdridge and Hagger-Johnson (2013). This study is a quasi-experimental study involving the moderation effect of the positive education. Level of Anxiety and Life satisfaction were assumed to be the independent variables; academic achievement in mathematics is the assumed dependent variable and positive education as the moderating variable. This positive education was treated dichotomously, the experimental and control group. This is to determine if the use positive education intervention as guided by the STMP model is effective in dealing its aim to enhance students' well-being.

As part of the qualitative research design, student interviews were conducted to understand their perception and experiences on the intervention in relation to their level of anxiety, life satisfaction and mathematics performance. The method was grounded on and related to a case study approach. There would be a description of the case of students who live in unfriendly and unstable environment due to the conflict and some tribal misunderstanding in one of the

provinces of the Philippines. Retaliation and military offenses often affect innocent civilians particularly students leading to their poor academic performance, anxious about school and self, and not satisfied with life. These are the considered problems in the context of studying and schooling, given conflict and hostile environment. Based on Lincoln and Guba's (1985) study as cited by Creswell (2013) that a case study structure has a problem, the context, the issues and lesson learned. The positive education intervention was an issue to be tested whether it would help to solve the issues stated so that valid conclusion and right lesson can be posed and learned based on the result of the study.

The study also employed a semi-structured interview method to gather information from the teacher participants. These teacher participants imparted their positive education thoughts to their students as guided by the STMP model. These mathematics teachers were briefed on how to process positive education concepts and carry out the STMP model. The variety of responses of the group interview was coded and analyzed. Interview method was the main data collection method for this research although there were several classroom observations just to support the claim.

The interview transcripts were studied and coded for selected and emergent themes. Coding was done to analyze the data of the study, with the use of NVivo to organize and analyze qualitative and unstructured data. The researcher also asked the help of expert external coder for validation.

Figure 6

Research design of the study

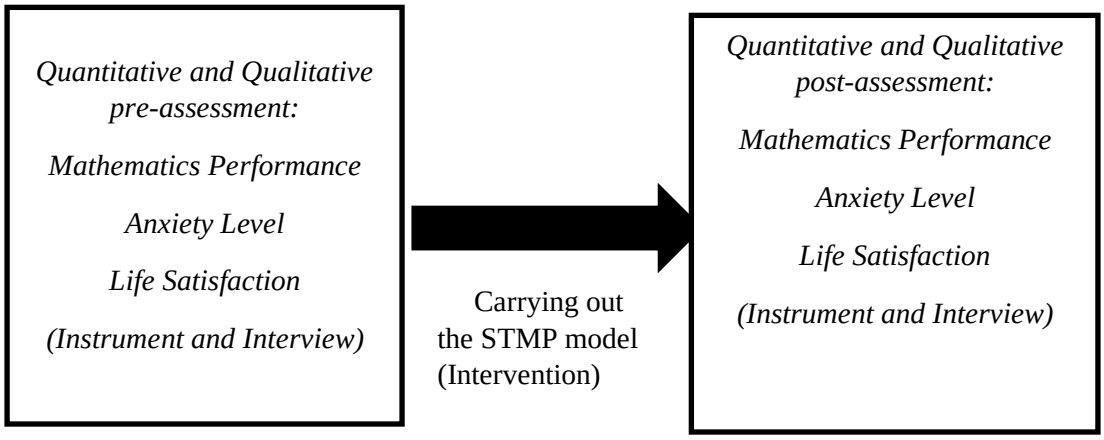


Figure 6 shows the design of the study. It reveals that there is an initial assessment of the students' mathematics performance, anxiety level, and life satisfaction before the positive education intervention through the research instruments and interview guide. After the intervention, a post-assessment on the mathematics performance, anxiety level, and life satisfaction were determined using the same instruments and semi-structured interview. The students were interviewed on their experiences on positive education conducted by their teachers relative to their Mathematics performance, anxiety level, and life satisfaction. Teachers' experiences were also coded to further assess the results of the study.

Participants and Ethical Considerations

Experimental groups were observed in two schools and were tested using positive education to make the learning of mathematics meaningful to these conflict-affected students in Maguindanao, Philippines. The researcher-made instructional material guided the teachers with the processing of positive education in the lesson which carried the STMP model. This instructional material is based on the Grade 7 mathematics competency in the Philippines but a revised one. It is comprehensive and built around the necessities of the learners and the

community. The K-2 curriculum of the country is trying to encourage teachers to develop initiatives for their community. On the other hand, the other treatment is the use of the existing module in mathematics used by the Grade 7 curriculum. This treatment was the control group of the study. The teacher who handled the experimental group was the same teacher who taught the control group. The participating teachers both handled and taught the experimental and control group to make sure that same lesson and approach are laid down to the two groups. This is to avoid bias. It cannot be a ground to reduce objectivity of the data gathered. The topics involved during the conduct of the research were the same for the two treatments. The experimental groups were given positive education notes where they wrote an "I did it note" every Monday to indicate the good things they proudly did during the weekend. A "thank you note" was also written by the students every Friday on their positive education note. This helps in the attainment of positive education elements such as connection with others, responsibility, strength, kindness and meaning, along with sense of creativity, self-construction and learning by doing approaches to learning.

To guarantee that this study would be conducted in an area which would target the purpose, the researcher identified two secondary schools in Maguindanao. The two schools had been identified as Talayan National High School (TNHS) and Maguindanao National High School (MNHS). The peace condition in the community where the schools are located is unstable. This has made the students in Maguindanao, who are mostly Islam believers, perform worst academically with high level of anxiety. The students' performance in Maguindanao in the National Achievement Test has always been below average.

Normally, one class section in a Philippine public secondary school consists of 60 students. However, 15 students were selected and interviewed from each school. A sum of a 120 students comprised of 44 males (36.67%) and 76 females (63.37%) were respondents of the

study. Of these respondents, 60 are in the experimental group and the remaining 60 students are in the control group regardless of their sex in the two secondary schools during the academic year 2018-2019. These students were selected randomly so they are heterogenous. The subject teachers in the study, on the other hand, are both females with more than 15 years' experience in teaching mathematics. One of the elements in learning and teaching positive education is the teacher's competence and effectiveness. However, putting the needed qualities of an effective teacher into words is a tough task unless proven by action.

Before the commencement of the study, ethical consideration was observed. Approval had been first sought from the Human Research Ethics Committee of EdUHK. Approval was then sought from the Schools Division Superintendent of Maguindanao, school heads and parents prior to the conduct of the study. After such approval from the different persons in authority, an informal meeting was arranged by the researcher to the teachers to explain how positive education would be processed and emerged in the experimental group. This processing of the positive education at the end of every activity was a challenge to the teachers, for they were giving a sense of happiness, hope and understanding, and sense of well-being to students. Pre-service teacher assistants were helping the T1 and T2 from the two schools to facilitate learning activities. A six-week time frame had been observed in the study, which covered the lessons of Grade 7 in the second half of the second quarter coverage.

Murphy and Aguinis (2019) pointed out that in research, research bias could involve a selective picking of the most favorable methods and outcomes from which different actions are all directing to response to the same research question. This is a threat to the validity and quality of this study since the selection of the respondents may be based on the researcher's personal preference. However, to ensure that the study remains valid and reliable, the

selection of the participants is anchored on a study of Schwind et al. (2017) about the mindfulness practice as a teaching and learning strategy in advanced education. This qualitative exploration research had 52 participants who were graduate and undergraduate students in various disciplines, and seven concerned instructors who guided the mindfulness practices and activities. This is quite similar to this study because this also involves an intervention strategy to the student-participants and the concerned teacher-instructors. Besides, defining an adequate sample size in a qualitative study is a matter of decision and experience in assessing the value of the data gathered against the uses to which it will be put.

Instruments Used and Interview Script

Level of Anxiety

The instrument and eventually, the results of the anxiety level of students were measured using the Beck Anxiety Inventory (Beck et al., 1988). It has a Cronbach alpha result of 0.92, and Test-Retest reliability (1 week) of 0.75. This test was 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 0.738 was obtained in this present study administered to Grade 7 students of Mindanao State University, Maguindanao Campus. The items in BAI asked students to rate how extensively they were bothered by anxiety indications with corresponding points like fear of worst might happen, numbness, feeling hot, unable to relax. These scale and corresponding points used were:

0 point	Not at all
1 point	Mildly, but it did not bother much
2 points and above	Moderately, it was not pleasant at times
3 points	Severely, it bothered me.

The answers to all 21 items were summed up and interpreted as follows.

0- 21	Low Anxiety
21.5– 35	Moderate Anxiety
35.5 and above	Potentially Concerning Level of Anxiety

Life Satisfaction

The Satisfaction with Life Scale (SWLS), pioneered by Diener and Diener (2009), is generally utilized and is one of the more valid assessment tools of life satisfaction. This "Satisfaction with Life Scale" (SWLS) is using a scale having seven points, which lets respondents measure the extent and level of their agreement on each specific item. The test has five items to assess the mental decision of one's subjective satisfaction in his personal life. This test instrument underwent various run of validity and reliability assessments. Convergent validity, for example, had tested through relating the outcomes with personal and peer evaluation. The given tests had led to significant correlations. On the other end, the conducted test-and-retest reliabilities resulted in the means of both 0.84 on two-week and one-month intervals. Its overall mean coefficient Cronbach alpha resulted to 0.85. Using the instrument in this study, a Cronbach's alpha resulted in 0.84 with the instrument given to ARMM Regional Science High School Grade 7 students before the administration to the respondents of this study.

The life satisfaction questionnaire asked students to rate how extent they agreed on the items with corresponding points, say how students in most of their ways perceived their life as close to their ideals with the help of mathematical concepts. The scale and corresponding points used were:

1	Strongly disagree
2	Disagree
3	Slightly disagree
4	neither agree nor disagree
5	Slightly agree
6	Agree
7	Strongly agree

The mean result of the life satisfaction with mathematics was interpreted as follows:

5.0 - 9.50	Extremely dissatisfied
9.51-14.50	Dissatisfied

14.51 – 19.5	Slightly Dissatisfied
19.51 – 20.5	Neutral
20.51 – 25.5	Slightly Satisfied
25.51 – 30.5	Satisfied
30.51 – 35.0	Extremely Satisfied

Mathematics Test

The academic achievement of the students had been determined by the mathematics performance of these students in the prepared test instrument, which contains questions related to the content of the module made by the researcher and being used by the teachers. This test instrument measuring the academic performance obtained a Cronbach's alpha of 0.71, which was given to Grade 7 students of Mindanao State University in Maguindanao Campus. The test was checked further by two Grade 7 math-teachers of the said school and two external math-teachers to establish validity. The sections in the control group used the existing module for Grade 7 mathematics, while the experimental group section utilized the positive education learning module created by the researcher.

The score of the 30-item test is scaled and interpreted as follows:

1-6	Beginning (74% and below)
6.5-12	Developing (75%-79%)
12.5-18	Approaching Proficiency (80%-84%)
18.5-24	Proficient (85%-90%)
24.5-30	Advanced (90% and above)

Interview Script

The interview script was based on the instruments Beck Anxiety Inventory (BAI) and Satisfaction with Life Scale (SWLS) for the level of anxiety and life satisfaction, respectively. For the mathematics learning, students were asked about their perception of mathematics and the learning style that their previous math-teachers used.

The Intervention

In this study, teachers were guided by the STMP model which include activities with positive education in the module after discussing the lesson proper. The activities involved collaborative learning activities in which teachers processed the positive education concept after every activity. The lessons and activities are shown in Figure 7.

Figure 7

The lessons and activities in the module to link mathematics pedagogy with positive education

Module 1: Algebraic Expressions

Lesson 1: Constants, Variables, Terms, Numerical and Algebraic Expressions
- Act. 1.1.1: Group Unity
  Strength of Unity with Friends
- Act. 1.1.2 : I'm Happy at Home
  Love in the Family
- Act. 1.1.3: United We Stand
  Awareness of Peace through Cooperation
- Act 1.1.4 : Helping One Another
  Community Service

Lesson 2: Translating A Verbal Phrases into an Algebraic Expression
- Act. 1.2.1: MetaCard Posting
  Contentment in Life and Happiness
- Act. 1.2.2: Food for Thought
  Respect, Affirmation and Well-being

Lesson 3: Simplifying Numerical Expressions Involving Grouping Symbols and Exponents
- Act. 1.3.1: What are we members of?
  Acceptance of Responsibility
- Act. 1.3.2: A Friendly Thought
  Promotion of Friendship

Lesson 4: Evaluating Algebraic Expressions
- Activity 1.4.1: 1, 2, 3 substitute!
  Environmental care

Module 2: Polynomials

Lesson 1: Properties of Equality
- Act 2.1.1: Balance me
  Human Rights and Social Justice

Lesson 2: Polynomials: Addition and Subtraction
- Act. 2.2.1: Imagine and Reflect
  Acceptance of Individual Difference
- Act 2.2.2 : Weigh Me
  Respect for Others

Lesson 3: Multiplication of Polynomials
- Act. 2.3.1: Promote It
  Gender Equality

Module 3: Solving Inequalities

Lesson 1:Inequality Sportsmanship and Cultural Unity
- Act. 3.1.2: Measure each other's Height
  Sportsmanship and Teamwork

Lesson 2:Solving Inequalities by Subtraction
- Act. 3.2.1: What is p?
  Helping those in need

Lesson 3: Solving Inequalities by Multiplication/Division.71
- Act. 3.3.1: Food for Life
  Respect Others' Belief
- Act. 3.3.2: What do we all want?
  Promotion of Unity and Justice

Lesson 4: Solving Inequalities with Parenthesis and Graphing Linear Inequalities
- Act. 3.4.1: Treasure Hunt
  Promotion of an atmosphere of camaraderie and teamwork.
- Act 3.4.2: Let's Play Basketball
  Creativity

These engaging activities were performed by the students based on the STMP model which links positive education with mathematics pedagogy. The red text indicates the module number, the black text indicates the lessons in mathematics and the green text indicates the positive education concepts. The students were also given extra tasks on making a diary which is called the positive education note where students indicated things they did during the weekend as well as their "thank you" message. These all aim to attain the purpose of positive education carried out in the STMP model of the intervention module to integrate positive education as a learning strategy.

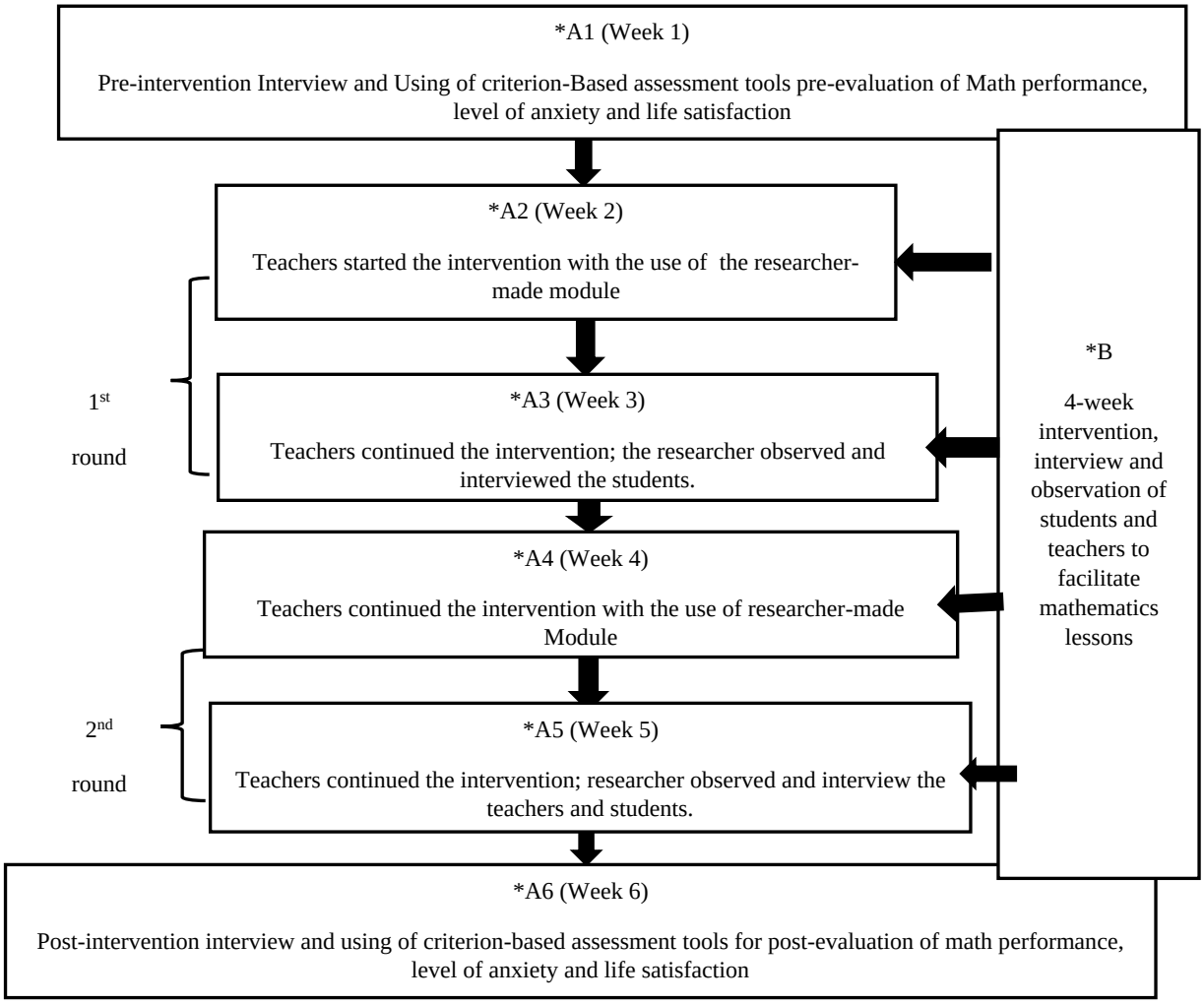
On the first day, the teacher had given both groups the pre-assessments of the students' level of anxiety, life satisfaction and academic achievement test instruments in mathematics. The academic achievement instrument covered the second half of the second quarter period.

Teachers began teaching the concept of a positive education intervention on the second day and onwards in the experimental group using the learning module. The control group, on the other hand, was using the given existing Grade 7 learning material being distributed by the education department. The class interventions were regularly observed and assessed once every week in the timeframe.

The last day of the study was the direction of the post-assessment instruments for the level of anxiety, life satisfaction and academic achievement in the mathematics of both the groups in the experimental and control groups. The pre and post-assessment results were then tabulated and analysed in this paper. Figure 8 is the six-week intervention schedule of the study.

Figure 8

The intervention time frame



*A Dependent variable, experiences on positive education

*B Independent variable, the positive education intervention

It further shows that the first column comprises the input-intervention-output of the study, which is the pre-assessment, intervention and post assessment. The researcher conducted a purposive interview to the students and teachers before and after the intervention. Results were then analyzed and compared after a month of intervention.

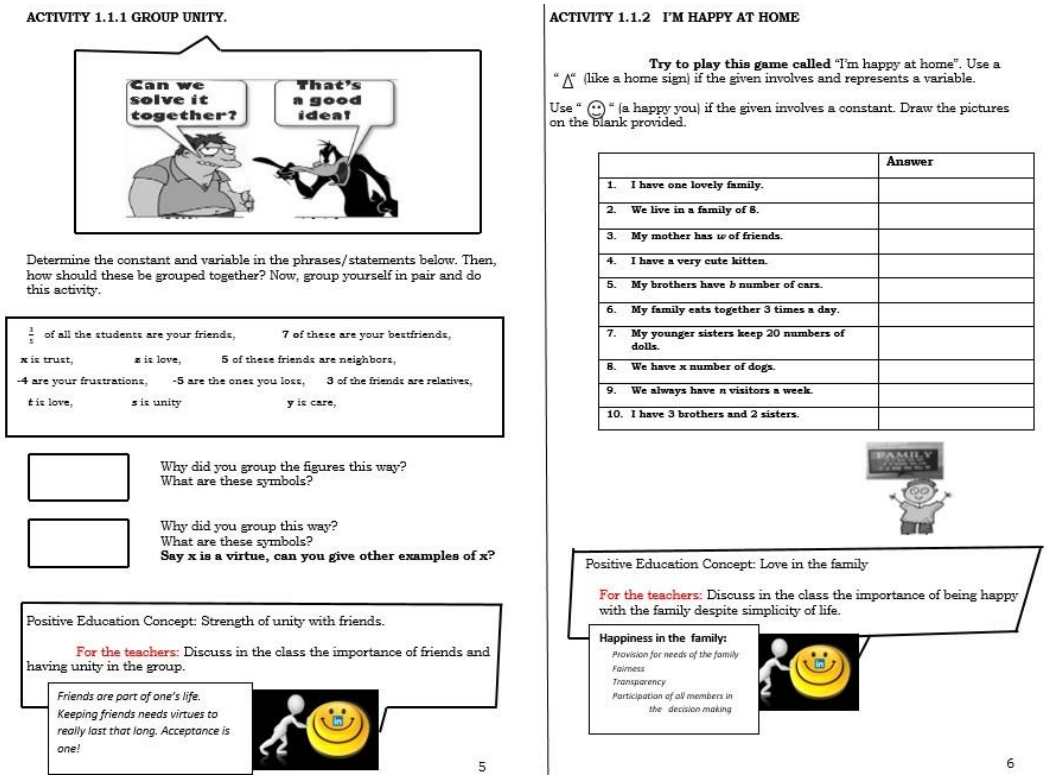
Intervention Module and Carrying out the STMP Model

The intervention module utilized in this study included the topics in the second half of the second quarter coverage. It was divided in three parts: module 1, module 2 and module 3. The concepts cover the lessons on "Constant and Variables, Algebraic Expressions, Verbal Phrases and Mathematical Phrases, Polynomials, Law of Exponents and Fundamental Operations on Polynomials." This module was validated by eight educators with proficiency in mathematics teaching. The activities in the lessons involved positive education. It involved processing which have been connected to the Geelong Grammar School Model for positive education (Norrish et al., 2013). The model applied context to teach and integrate positive education as a learning approach which emphasizes on the six well-being domains: "positive emotion, positive engagement, positive accomplishment, positive purpose, positive relationship and positive health." It is also based on the Broaden-and-Build concept on positive feelings by Fredrickson (2001), which suggests that the human capability to involve feelings can be a positive fundamental strength to health and flourishing.

The construction of the module is also influenced by the notions from Huntley- Moore, & Panther (2015). The guide has seven parts that altogether offer a step-by-step tutorial to develop a learning guide. Every part starts with a model and a set of learning outcomes to indicate what a reader should know. In this study, each lesson is taught normally with the motivation of teachers at the start, the lesson proper, the activities (with positive education) and assessment part. The module consists of objectives, lesson proper, activities, and processing of positive education concepts. A sample of the activities in the module and how the beginning of positive education concept was processed by the teachers is shown in Figure 9 to understand "constant and variable" as part of the topic of Lesson 1.

Figure 9

Example of the activities in the intervention module



The STMP model as carried out in the intervention module is shown in the Table 1. In carrying out the STMP model, it is important that the students learn mathematical and positive education concepts as teachers will relate each mathematical pedagogy to the concept of well-being and sense of human values through different collaborative engaging methods of learning.

In carrying out the model, the teachers will discuss the lessons first. After the lesson proper, the teacher will administer collaborative activities and learning tasks to students. After the activity, the teacher will relate each activity with the positive education concepts as guided by the STMP model. In this way, students both learn mathematical content and positive education concept.

Table 1

Carrying out the STMP model in the intervention module

Students	Teachers	Methods (Math Activity Number in Module)	Positive Education Concept
Students differentiate constant from variable and appreciate its connection to unity and friendship.	The teacher relates the topic either by asking "what are permanent in this world?" Students may answer "change" or "love." The teacher may also explain that there should always be understanding, respect and unity with friends to maintain the friendship. Having many friends as they want is also encouraged. (The number of quality and trusted friends is a variable- the more, the better). The teacher can discuss this further based on her experiences.	Cooperative learning (Activity 1.1.1)	Strength of Unity with Friends (Relationship, Positive Emotions)
Students differentiate constant from variable and appreciate its connection to the love of the family.	The teacher relates that our feelings change and vary (variable) depending on our mood, but it is always important to be happy (The constant goal of people is to find happiness.), particularly to be happy with the love of the family.	Cooperative learning (Activity 1.1.2)	Love in the Family (Relationship, Positive Emotions)
Students can identify a term and appreciate how it is connected to life satisfaction with love of the family.	The teacher may relate the terms as combination of variables to the strength of family when united with family members. Life satisfaction is guaranteed if unity and love are present in the family as well as being cooperative of peace initiatives.	Games (Activity 1.1.3)	Life Satisfaction with the Family, Peace Awareness through cooperation (Relationship, Positive Emotions)
Students can define algebraic expression and value its importance to family belongingness and community service.	The teacher may relate algebraic expressions as a term or a group of terms working together like a family or community with a common goal and where everyone plays an important role for the group .	Simulation (Activity 1.1.4)	Family Belongingness and Community Service (Broaden and Build, Engagement)
Students can translate mathematical statements to algebraic expressions and apply this to happiness and contentment in life.	The teacher may relate translating algebraic expressions to respect and affirmation. The teacher can specify operation to translate algebraic expression like addition/sum or subtraction/minus. Respect is expected (added to) to someone with great achievements.	Simulation, Game (Activity 1.2.1)	Happiness and Contentment in Life (Positive Emotion, Transformation)

Table -continued

Students can further translate verbal phrases to algebraic expression and appreciate how this works with respect and affirmation.	The teacher may relate the translation of verbal phrase into algebraic expression to every opportunity we face each day but be grateful though life is hard and a struggle. Addition would mean getting abundance in life. Subtraction of worry and stress should be considered and be contented in life despite not living in a luxurious environment.	Problem-solving (Activity 1.2.2)	Respect and Affirmation (Positive Emotion, Broaden-and Build)
Students simplify algebraic expression and appreciate its connection with taking responsibility.	The teacher may relate accepting responsibility in a society to simplifying algebraic expression. Accepting the responsibility means considering not just yourself in the group but be welcoming and open. No major task is left undone with cooperative members.	Game (Activity 1.3.1)	Taking and acceptance of responsibility (positive emotion, transformation)
Students simplify algebraic expressions and value its connection to good friendship.	The teacher may relate simplifying algebraic expressions to making life easier with the help of friends. True friends are there at any time, even if times are hard and complicated.	Cooperative learning (Activity 1.3.2)	Promotion of good friendship (relationship, transformation)
Students evaluate algebraic expression and recognize how this connects to environmental care.	The teacher may relate evaluating algebraic expressions to evaluating our care for the environment. It is also important to be thoughtful and to promote environmental initiatives and concern. The teacher may assess students if they do the 3Rs for the environment (Reduce, Reuse and Recycle).	Simulation (Activity 1.4.1)	Environmental Care (Engagement, transformation)
Students can define polynomials and appreciate how it is connected to human rights and social justice.	The teacher may relate polynomials to issues governing laws involving human rights and social justice. Students should be aware of these issues governing their rights and responsibilities like the laws of exponents.	Problem-solving (Activity 2.1.1)	Human Rights and Social Justice (Engagement, Broaden-and-Build)
Students can add and subtract polynomials and apply the rules of it as being related to accepting individual differences.	The teacher may relate addition and subtraction of polynomials to acceptance of individual differences. Variables cannot be combined when they are not the same, but they still stick together to form polynomials. Each of us has a purpose and is equally important.	Cooperative learning (Activity 2.2.1)	Acceptance of Individual Difference (Acceptance, Transformation)
Students can multiply polynomials and appreciate its connection with respect for others.	The teacher may relate multiplication of polynomials to respect of others. The multiplier effect of people respecting you when you have that sense of respect for them and for yourself. Respect begets respect.	Problem-solving (Activity 2.2.2)	Respect for Others (Acceptance, Broaden-and-Build)

Table -continued

Students can divide polynomials and value its connection to gender equality.	The teacher may relate division of polynomials to gender equality. For instance, we are divided by sex. However, this does not mean that one gender is above and superior over the other.	Cooperative learning (Activity 2.2.3)	Gender equality (Engagement, Broaden-and - Build)
Students can solve inequalities and value its importance with different cultural and religious understanding.	The teacher may relate solving inequalities to unity. We may be of different race, culture, religion or beliefs but our differences and inequalities should be a ground to embrace unity and diversity.	Games (Activity 3.1.1)	Cultural and Religious Understanding (Engagement, Broaden-and-Build)
Students can solve inequalities by addition and subtraction and appreciate its importance with helping those in need.	The teacher may relate solving inequalities by addition and subtraction to helping those in need. At times, we may face abundance or scarcity of life's sources. So, when life is abundant, it is worthwhile thing to share and give those in need.	Cooperative learning (Activity 3.2.1)	Helping Those in Need (Meaning, Broaden-and-Build)
Students can solve inequalities by multiplication and division and apply this to its connection to respect and acceptance of others to promote unity.	The teacher may relate solving inequalities by multiplication and division to respecting others' belief. Respect is a product of good upbringing without stepping over others' weaknesses.	Problem-solving (Activity 3.3.1 and 3.3.2)	Respect and Accept Other's Belief to promote Unity (Acceptance Broaden-and-Build,)
Students solve inequalities with graphing and appreciate its importance to its connection to community engagement.	The teacher may relate solving inequalities with graphing to taking up space in a society. Like graphing, everyone has his own space and place in this world. Everyone exists with a purpose and meaning.	Games, Cooperative learning, Problem-solving (Activity 3.4.1 and 3.4.2)	Camaraderie, Teamwork and Creativity (Positive Emotion and Engagement, Broaden-and-Build)

Assessment of the Intervention Module

Mathematics-teachers rated and assessed the module based on the module evaluation by Arguelles (2010). This evaluation helps in the attainment of the objectives of the study. The evaluation used a 5-point scale as follows:

Strongly agree ------- 5
Agree ---------- 4
Uncertain ---------- 3
Disagree ---------- 2
Strongly disagree ----1

The next scale was then used to interpret the results of the assessment by the mathematics education teachers.

4.50-5.00 - strongly agree
3.50-4.49 - agree
2.50-3.49 - not clear
1.50-2.49 - poor
1.00-1.49 – very poor

A questionnaire for evaluating the module was administered to eight mathematics education teachers. They were asked on the content of the modules, including the objectives, topics and activities. The assessment includes whether the objectives are formulated in an attainable manner; if the reader can readily predict the coverage of the instructional material after reading the objectives; if the objectives of the instructional material can be realized within the given time element; if the objectives are stated as intended learning outcomes, if the objectives provide a clear direction for the students; if the objectives of the module are formulated within the capabilities of the students; if the objectives in relation to peace education strategy are clearly stated; if the contents adequately meet the instructional materials' objectives; and practice sets are appropriate to the modules' objectives; if activities have been designed to help students realize the peace objectives of the module; if the examples and practice exercises prepare the students for the modules' activities; if the topics are presented in a logical sequence; if there are no misleading or doubtful statements in this module; if the activities considered in this module conform with the accepted principles in math education; if the concepts are presented in an orderly manner; if the illustrated examples considered in this module provide further explanation to the concepts being developed; if the concepts developed in this module may not be new but the way they are presented shows uniqueness; if the approaches in presenting the concepts are distinct and reflection of the writer's creativity; if the module uses simple words which can be easily understood by the students; if highly technical topics are well-explained; if the concepts in this learning module are presented in simple and comprehensible manner; if there is evidence that the learning material wants to communicate its thought to the readers; if the learning module is expected

to capture the interest of the reader; if the approaches adopted by the writer in presenting the concepts and examples may sustain the readers' interest; if the graphics included in this module are balanced and may sustain the interest of the readers and if in general, the learning modules are attractively packaged.

The assessment of eight teacher-evaluators in the learning material or the module developed was undertaken by the researcher. This further shows that, in general, math- teachers strongly agree with the module as indicated by the grand mean 4.50 with a standard deviation of 0.88. The result shows that, in general, the teacher-evaluators strongly agreed with items indicated in the assessment tool.

Data Collection Techniques and Tools

The study used different data collection techniques and tools to collect the data. Survey questionnaires were used to generate data on the participants' profile, level of anxiety, life satisfaction and mathematics performance. To determine the relationships of the variables, Pearson Correlation Coefficient *r* was used. The research hypotheses were tested using paired sample *t-test* to test the significant difference of pre-test and post-test and moderated hierarchical multiple regression analysis to determine the relationship of level of anxiety and life satisfaction to academic performance of students as moderated by positive education. Since this study also involves experimental and control group, the "post-test only analysis" for linear regression was used. Since positive education treatment is a dichotomous variable (either control or experimental), values were set as control=0 and experimental=1 to make positive education treatment as a dummy variable (Aguinis, 2004). The analysis was made through the help of SPSS and Microsoft Excel. The simple slope computation was also done online through ModGraph. (https://psychology.victoria.ac.nz/modgraph/modgraph.php)

The interview transcripts were translated by the researcher from Filipino to English and validated by an external translator. The translated transcripts were examined for selected and emergent themes. Coding was done to evaluate the data of the study with the use of NVivo to organize and analyze qualitative and unstructured data. The researcher also asked the help of one expert external coder. The data were also examined based on the proposed coding structure which is a primary coding and marginal observation. The data collection techniques and tools are summarized in Table 2.

Table 2

Data collection techniques and tools

Data	Techniques	Tools
Profile of the Participants	Questionnaire	Excel (Frequency Distribution, Mean, Standard Deviation)
Anxiety Level	Questionnaire / BAI	SPSS (Mean, Standard Deviation, t-test, correlation, Cronbach Alpha, ModGraph)
Life Satisfaction	Questionnaire/ SWLS	SPSS (Mean, Standard Deviation, t-test, correlation, Cronbach Alpha)
Academic performance	Questionnaire	SPSS (Mean, Standard Deviation, t-test, correlation, Cronbach Alpha, ModGraph)
Assessment of Module	Questionnaire	Excel (Mean, Standard Deviation)
Qualitative Data	Interview	nVivo/ external coder

Hypotheses:

The following hypotheses are based on the quantitative data of the study and were tested using hierarchical regression analysis:

H_{O1}: Level of anxiety will have no negative impact on academic performance in mathematics.

H_{11}: Level of anxiety will have a negative impact on academic performance in mathematics.

H_{O2}: Positive education will have no positive impact to the level of anxiety of students.

H_{12}: Positive education will have a positive impact to the level of anxiety of students.

H_{O3}: Positive education will not significantly moderate the relationship between the anxiety level and academic performance in mathematics.

H_{13}: Positive education will significantly moderate the relationship between the anxiety level and academic performance in mathematics.

H_{O4}: The relationship between the level of anxiety and academic performance in mathematics is not significant in the experimental group.

H_{14}: The relationship between the level of anxiety and academic performance in mathematics is significant in the experimental group.

H_{O5}: The relationship between the level of anxiety and academic performance in mathematics is not significant in the control group.

H_{15}: The relationship between the level of anxiety and academic performance in mathematics is significant in the control group.

Chapter 4: Data Analysis, Results and Discussion

This chapter presents the results, findings and the analysis of the study. The findings on the participants' profile, the level of anxiety, life satisfaction and mathematics performance, correlation between mathematics academic performance in the level of anxiety and life satisfaction, significant differences in the pre-test and post-test of level of anxiety, life satisfaction and academic performance, hierarchical regression analysis, math-teachers evaluation on the module, the interview data results, the weekly observations, and the positive education notes.

Participants' Profile

The participants' profile is discussed in the succeeding tables and figures. The participants' profile is needed to determine the background of the students and teachers which had bearing to the students' academic performance, level of anxiety and life satisfaction with mathematics.

Teachers in this study have had at least 15 years of teaching experience. To ensure that these participating teachers were doing their part effectively, it was important to determine their background and their interest to do the intervention. Table 3 is the profile information of the teacher- participants. The participating teachers both handled and taught the experimental and control group of the study to make sure that same lesson and approach are implemented in the two groups. This is aimed to avoid bias and reduce possible subjectivity of the data to be collected.

Table 3

Profile of the teacher-participants

School	Sex	Address	Years in Teaching Math	Highest Academic Qualification	Major teaching subject	Class size
T1	F	Tuka, Bagumbayan Sultan Kudarat	15	Bachelor of Science in Education with MA units	History and Mathematics	Control: 65 Experimental:70
T2	F	Sapalan Datu Odin Sinsuat, Maguindanao	19	Master of Arts in Education	Mathematics	Control: 78 Experimental:78

The researcher asked these Grade 7 teacher-participants who taught mathematics in the locale of the study to utilize the intervention module. Table 3 shows the information of the participating teachers where they were coded T1 and T2 throughout all the descriptions of them in this study. Teacher 1 (T1) is Ms. Funa, the mathematics teacher from Maguindanao National High School while Teacher 2 (T2) is Ms. Guiamad, the teacher from Talayan National High School. Both have more than 15 years' experience teaching mathematics and have had enough experience in dealing with students' well-being. Each of them was assisted by one pre-service teacher in dealing with the activities in the intervention.

Table 4

Students' gender distribution

Schools	Male	*Percentage*	Female	*Percentage*
Maguindanao National High School				
Experimental	9	30%	21	70%
Control	13	43%	17	57%
Talayan National High School				
Experimental	10	33%	20	67%
Control	12	40%	18	60%
TOTAL	44	37%	76	63%

Table 4 shows the students' gender distribution. A total of 120 students (44 males or 37% and 76 females or 63%) were involved in this study. In Maguindanao National High School, the experimental group comprised 9 or 30% male and 21 or 70% female. The control group, on the other hand, comprised of 13 or 43% male and 17 or 57% female. The pie chart of students' gender distribution of MNHS is shown in Figure 10. Furthermore, the experimental group of Talayan National High School comprised 10 or 33% male and 20 or 67% female. The control group, on the other hand, comprised 12 or 40% male and 18 or 60% female. The pie chart of students' gender distribution of TNHS is shown in Figure 11.

Figure 10

Pie chart of the students' gender distribution in the experimental and control group of Maguindanao National High School

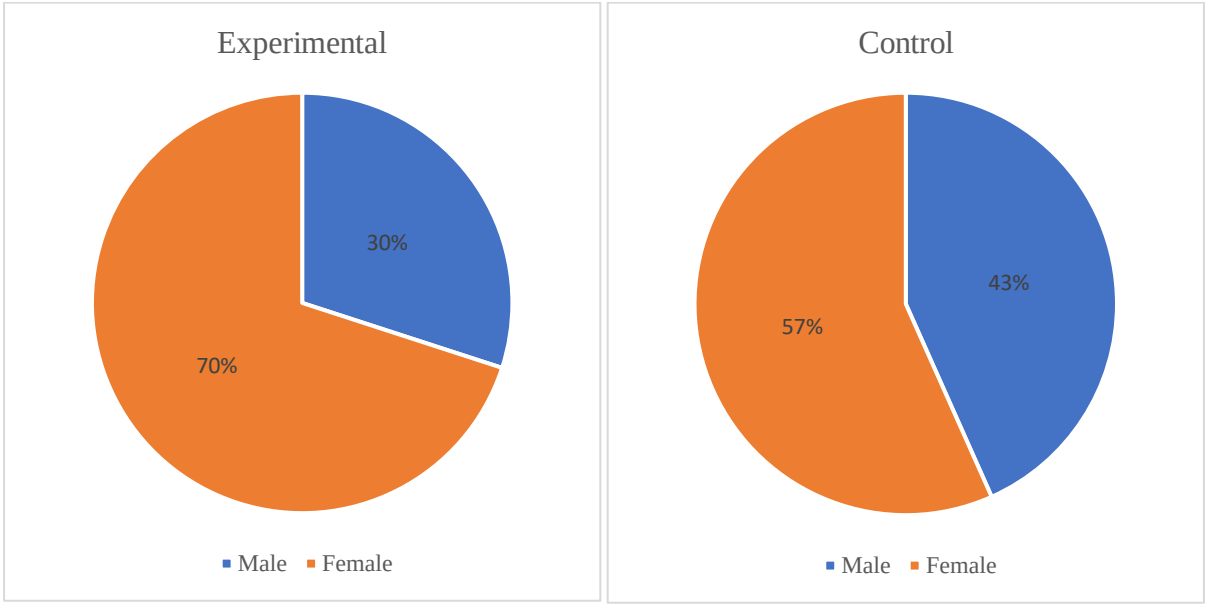
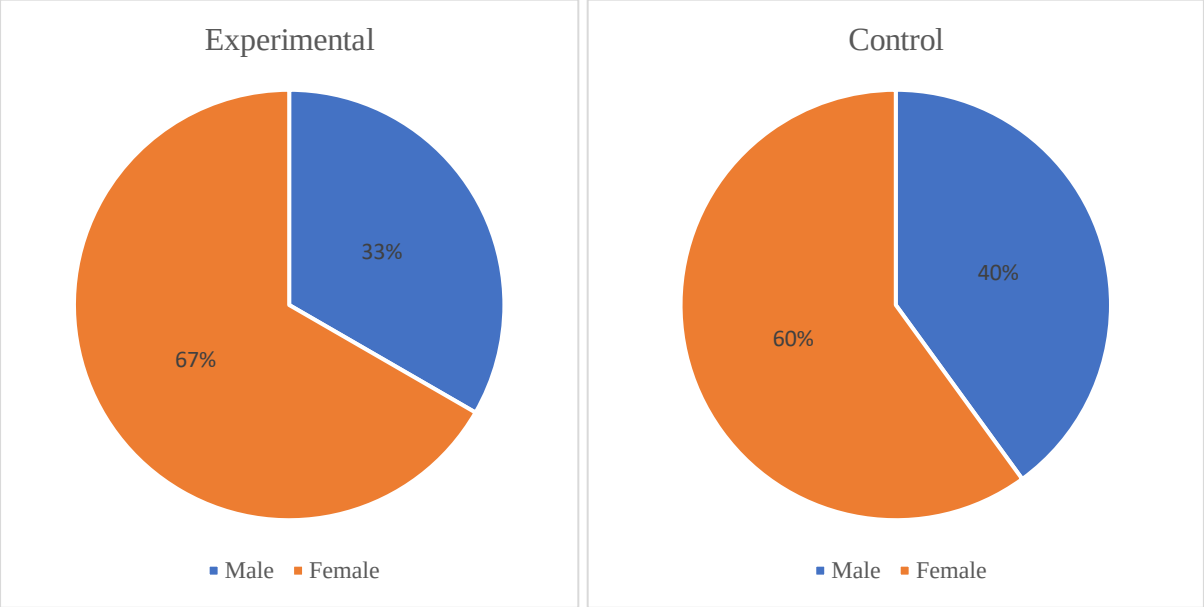


Figure 11

Pie chart of the students' gender distribution in the experimental and control group of Talayan National High School



In almost all classes in Maguindanao, female as a gender dominates the male population as shown in the total of number of students in experimental and control group. However, this does not make the study less valid. In a study by Mahon, Yarcheski, and Yarcheski (2005), they examine the gender differences in the happiness and well-being of early adolescents. Their study involved 151 early adolescents (male and female) who were in their Grade 7 and Grade 8 of an urban junior school. They replied to the questionnaire asking about their level of happiness, perceived health status, clinical health, and wellness. The results showed that there were no gender differences in happiness in males and females. Statistically significant positive correlations were found between happiness and the health-related aspects for all respondents, unlike forms of correlation when male and female were examined separately.

Table 5

Educational attainment of the father

Schools	Experimental		Control	
	frequency	*%*	*frequency*	*%*
Maguindanao National High School				
Postgraduate/Master's Degree	0	0%	0	0%
Bachelor's Degree Graduate	2	7.67%	0	0%
Vocational/Technical	1	3.33%	1	3.37%
High School Graduate/Undergraduate	12	40%	12	40%
Elementary Graduate/Undergraduate	15	50%	17	56.67%
Talayan National High School				
Postgraduate/Master's Degree	0	0%	0	0%
Bachelor's Degree Graduate	0	0%	0	0%
Vocational/Technical	0	0%	3	10%
High School Graduate/Undergraduate	8	26.67%	4	13.33%
Elementary Graduate/Undergraduate	22	73.33%	23	76.67%

Table 5 shows the educational attainment of the father of the student-participants. Maguindanao National High School shows that most of the experimental group's father is only elementary graduate or undergraduate, which comprised 50%, followed by high school graduate or undergraduate with 40%. In the control group, the majority of the fathers are also elementary graduate or undergraduate, which comprised 56.67%, followed by high school graduate or undergraduate with 40%. Furthermore, Talayan National High School shows that majority of the experimental group's father are only elementary graduate or undergraduate which comprised 73.33%, followed by high school graduate or undergraduate with 26.67%. In the control group, the majority of the fathers are also elementary graduate or undergraduate, which comprised 76.67%, followed by high school graduate or undergraduate with 13.33%.

Table 6

Educational attainment of the mother

Schools	Experimental		Control	
	frequency	*%*	*frequency*	*%*
Maguindanao National High School				
Postgraduate/Master's Degree	0	0%	0	0%
Bachelor's Degree Graduate	0	0.60%	0	0%
Vocational/Technical	1	3.33%	0	0.00%
High School Graduate/Undergraduate	12	40%	9	30%
Elementary Graduate/Undergraduate	17	57%	17	70.00%
Talayan National High School				
Postgraduate/Master's Degree	0	0%	0	0%
Bachelor's Degree Graduate	0	0%	0	0%
Vocational/Technical	0	0%	0	0%
High School Graduate/Undergraduate	5	16.67%	4	13.33%
Elementary Graduate/Undergraduate	25	83.33%	26	86.67%

Table 6 shows the educational attainment of the mother of the student-participants. In Maguindanao National High School, most of the experimental group's mother is only elementary graduate or undergraduate, which comprised 56.67%, followed by high school graduate or undergraduate with 40%. In the control group, most of the mothers are also elementary graduate or undergraduate which comprised 70%, followed by high school graduate or undergraduate with 30%. Furthermore, in Talayan National High School, the majority of the experimental group's mother is only elementary graduate or undergraduate, which comprised 83.33%, followed by high school graduate or undergraduate with 16.67%. In the control group, majority of the father are also elementary graduate or undergraduate which comprised 86.67% followed by high school graduate or undergraduate with 13.33%.

Family-related variables are factors affecting children's achievement. Among these background variables are parents' occupations, parents' education, family income, race, family structure, and parents' work patterns. Eccles (2005) reviewed the most projecting descriptions and presented a complete model of the impacts of parents' educational

attainment and summarized some of the research done that focused on the role of parental influences on children's academic achievement. There is a reliable indication that parents' education forecasts children's educational results, along with the other family characteristics such as family income, parents' occupations, and residential place. A variety of explanation have been offered for these associations. This is also supported by Kaplan and Kaiser (2010), who studied the level to which parents' negative personal feelings influence the correlation between their educational background and the educational expectation they have for their adolescents, being perceived by their adolescent children. As a result, they explored the level to which these parents' negative personal feelings also influence the correlation between their educational expectations for their adolescents and the present academic attainment of those adolescents. Result provided a preliminary indication that parents' expectations for their adolescents and the transmission of those expectations could be changed by how parents feel about themselves. Those changing effects are clarified employing both parents' and students' motivations and behaviors.

Table 7

Family's monthly income of the students

	Experimental		Control	
Schools	*frequency*	*%*	*frequency*	*%*
Maguindanao National High School				
Above P50,000	0	0%	0	0%
P40,000 - P50,000	1	3.33%	0	0%
P30,000 - P40,000	0	0%	3	10%
P20,000 - P30,000	6	20%	5	16.67%
P10,000 - P20,000	12	40%	12	40%
Below P10,000	11	36.67%	10	33.33%
Talayan National High School				
Above P50,000	0	0%	0	0%
P40,000 - P50,000	0	0%	0	0%
P30,000 - P40,000	0	0%	0	0%
P20,000 - P30,000	0	0%	1	3.33%
P10,000 - P20,000	3	10%	4	13.33%
Below P10,000	27	90%	25	83.33%

Table 7 shows the students' family's monthly income. The table shows further that most of the students' family income is less than P10,000, or greater than P10,000 but less than P20,000 in both the experimental and control groups of MNHS. On the other hand, the majority of the students' family income is less than P10,000 in both experimental and control groups of TNHS.

While several socio-economic status variables may be concerned in the gross variances in achievement between students from two-parent families and students from one-parent families, there is always a reason to accept as true that family income is imperative and essential. In a study of Bukodi and Goldthorpe (2013), they find out that the level of family income has an independent positive effect on children's educational attainment. On the other hand, Rege et al. (2011) found out that the negative impact on children occurs in areas with high unemployment rates and there were effects on a larger economic condition.

This socio-economic status becomes one of the main reasons why students perform worst at schools. The socio-economic background of the family really influences the nature of learning of the students, and that involves its capacity to learn. There are research evidences in the possibility for children from relatively underprivileged backgrounds to be less ready and less performer in school than children from more advantaged backgrounds to take a given standard of secondary school achievement as a basis for finding higher-level qualification. There are further indications to specify that this tendency mirrors the vital socio-economic threats that children in less privileged and less secure socio-economic circumstances would experience in making more determined selections in education (Goldthorpe, 2007).

Level of Anxiety, Life Satisfaction with Mathematics and Academic Performance of Students

The students' level of anxiety was tested both in the control and experimental groups of the two schools. Using the Beck Anxiety Inventory (BAI) for anxiety, it shows that the control group of the two schools had moderate anxiety in both the pre-test and post-test. However, the experimental group of both schools had reduced the level of anxiety after the intervention of positive education as shown in Table 8a.

Table 8a

Level of anxiety of students

School	Treatment	*Pre*	*SD*	Interpretation	*Post*	*SD*	Interpretation
MNHS	Control (30)	33.17	14.5	moderate anxiety	35.30	9.35	moderate anxiety
	Experimental (30)	29.40	7.64	moderate anxiety	17.50	8.71	low anxiety
TNHS	Control (30)	29.60	9.82	moderate anxiety	27.90	10.42	moderate anxiety
	Experimental (30)	36.53	8.09	potential risk	15.23	5.21	low anxiety

Maguindanao National High School's control group result of both the pre-test and post-test shows moderate anxiety as indicated by the means of 33.17 and 35.3, respectively. The experimental group, on the other hand, had 29.4 which is moderate anxiety, and 17.5 which is low anxiety, in pre-test and post-test, respectively. This shows a one-scale down in the experimental group, indicating that their anxiety level has reduced and improved.

Furthermore, Talayan National National High School's control group result of both the pre-test and post-test also shows moderate anxiety as indicated by the means of 29.6 and 27.9, respectively. The experimental group, on the other hand, had 36.53 which is a potentially concerning anxiety level and 15.23 which is low anxiety, in pre-test and post-test, respectively. This shows a two-scale down in the experimental group indicating a good reduction and improvement in their level of anxiety.

The anxiety level of these students has been brought by the tribal conflict and the socio-economic status of the students. Andrews and Wilding (2004) noted that students who are less privileged and have low socio-economic status are prone to anxiety. This has been the source of the anxiety level of students in the province of Maguindanao.

The help of positive education as an achievement motivation and intervention contributes to the students' academic success leading to lessening of the anxiety level. This is because the intervention is an efficient encouragement state which guides the human performance for successful involvement in a friendly competition. The activities in positive education have helped the students diminish and minimize their anxiety level. In terms of mathematics anxiety level, Kesici and Erdogan (2009) revealed that this motivation reduces students' anxiety levels. This is also supported by Erdogan et al. (2011), who claimed that achievement motivation had an inversely significant impact on anxiety in mathematics.

Table 8b

Life satisfaction with mathematics

School	Treatment	*Pre*	*SD*	Interpretation	*Post*	*SD*	Interpretation
MNHS	Control (30)	24.60	4.00	slightly satisfied	25.77	3.29	satisfied
	Experimental (30)	25.47	4.07	slightly satisfied	26.10	3.96	satisfied
TNHS	Control (30)	17.93	3.30	slightly dissatisfied	22.13	3.73	slightly satisfied
	Experimental (30)	19.87	5.17	neutral	28.67	2.71	satisfied

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

Result shown in Table 8b indicates that control group of Maguindanao National High School went a scale up from being slightly satisfied with life satisfaction in their pre-test to being satisfied in their post-test. This is indicated by the pre-test and post-test mean results of 24.6 and 25.77, respectively. The experimental group results of the pre-test and post-test, on the other hand, also went a scale up from slightly satisfied in the pre-test to satisfied in the post-test as indicated by the mean results of 25.47 and 26.1, respectively. This shows that the students have generally found satisfaction in life with the help of their mathematics lesson.

Moreover, the result of control group of Talayan National High School shows a two scale up from being slightly dissatisfied with life satisfaction in mathematics to being slightly satisfied. This is indicated by the pre-test and post-test result of 17.93 and 22.13, respectively. The experimental group results of the pre-test and post-test on the other hand, also went a two-scale up from being neutral in the pre-test to being satisfied in the post-test as indicated by the mean results of 19.87 and 28.67, respectively.

Life satisfaction is indeed a whole assessment of thoughts of an individual extending negatively to positively depending on how he reacts with a situation. Life satisfaction is one of three key determinants of well-being: “life satisfaction, positive affect, and negative affect” (Diener & Emmons, 1984). Assessing life satisfaction does not only see how satisfied individuals are with their lives, but it is also a means of knowing how and why unhappy they are. By having the positivity that enhances life satisfaction from the individual subjective involvement, clinicians and researchers can examine what builds one’s happiness.

The teaching of positive education concerning the well-being to students in mathematics including how to be resilient in most of bad times has somehow helped improve the life satisfaction of students, although life satisfaction according to some studies is subjective.

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 research revealed further that it has an indirect effect on life satisfaction.

Table 8c

Mathematics performance of students

School	Treatment	*Pre*	*SD*	Interpretation	*Post*	*SD*	Interpretation
MNHS	Control (30)	5.90	2.17	Beginning	17.20	2.79	Proficient
	Experimental (30)	7.77	2.93	Developing	22.50	2.43	Proficient
TNHS	Control (30)	5.10	1.72	Beginning	18.60	3.03	Proficient
	Experimental (30)	4.87	1.91	Beginning	19.47	3.00	Proficient

Academic performance in mathematics was measured using the researcher-made test, which underwent validity and reliability test. The test was administered before and after the positive education intervention also in mathematics. The pre-test results of the two schools averagely show a beginning performance and a proficient post-test result, as shown in Table 8c.

In particular, the control group of Maguindanao National High School got a mean of 5.9 and 17.2 in the pre-test and post-test, respectively. This shows a two-scale up from beginning to proficient level. The experimental group, on the other hand, got a mean of 7.77 and 22.5 in the pre-test and post-test, respectively. This also shows a two-scale up from developing to proficient level.

Moreover, Talayan National National High School result of the control group got a mean of 5.10 and 18.60 in the pre-test and post-test, 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 pre-test and post-test, respectively. This also shows a three-scale up from beginning to proficient level.

In positive education, teachers are using techniques such as emerging goals for an individual student to learn and work with them. Learning is regarded as a collaborative means where teachers just facilitate students, and every student's feedback and response are appreciated and assessed. With the help of positive education concept, students' sense of well-being and positive attitude are enhanced. This is a reason why students tend to improve their academic performance and are eager to learn. Positive education is 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.

Correlation between Mathematics Academic Performance in the Level of Anxiety and Life Satisfaction of Students

Table 9a

Correlation between mathematics academic performance and the level of anxiety of students

School	Treatment	*n*	Correlation between academic performance and level of anxiety (pre-test)	*p-value*	Correlation between academic performance and level of anxiety (post-test)	*p-value*
MNHS						
	Control	30	0.088	0.642 ns	0.136	0.474 ns
	Experimental	30	-0.171	0.366 ns	-0.425	0.019*
TNHS						
	Control	30	-0.369	0.55 ns	-0.099	0.602 ns
	Experimental	30	-0.213	0.258 ns	-0.463	0.01**

* (correlation is significant at 5% level)

** (correlation is significant at 1% level)

ns (not significant)

The correlation between the pre-test and post-test results of academic performance and the level of anxiety of both schools, as shown in Table 9a, was determined using Pearson Product Moment Correlation (*r*). All pre-test results did not have significant correlation. The result shows further that the control groups in the two schools did not significantly correlate students' academic performance with their level of anxiety in the post-test. However, the experimental groups of both schools have significant correlation between academic performance and the level of anxiety in the post-test.

In the post-test result of Maguindanao National High School, the control group had a Pearson *r* value of 0.136 with a *p*-value of 0.474. This is not significant at 5% level. The experimental group had a Pearson *r* value of -0.425 with a *p*-value of 0.019. This is significant at 5% level. On the other hand, the control group of Talayan National High School in the post-test had a Pearson *r* value of -0.099 with a *p*-value of 0.602. This is not significant at 5% level. However, the experimental group had a Pearson *r* value of -0.468 with a *p*-value of 0.010. This is significant at 1% level.

This result suggests that as the academic performance gets better, the level of anxiety becomes less. This is given by the direct negative relationship between the level of anxiety and academic performance. In the case of the control group, the "not significant" results are attributed to the students' different anxiety levels which may be caused by different internal and external factors.

Again, this result proved what traditional arousal theorists believe in, that there exists an optimal level of arousal around the middle of the arousal dimension-optimal both in terms of performance (Hebb, 1955). This notion is often graphed and is represented as an inverted U-curve showing a curved relationship in anxiety and achievement. Thus, this arousal theory

shows that some anxieties are with benefits to academic achievement, but after a certain point, it undermines this achievement.

Table 9b

Correlation between mathematics academic performance in the life satisfaction of students

School	Treatment	*n*	Correlation between academic performance and life satisfaction of students (pre-test)	*p-value*	Correlation between academic performance and life satisfaction of students (post-test)	*p-value*
MNHS						
	Control	30	0.111	0.561 ^{ns}	0.263	0.160^{ns}
	Experimental	30	-0.860	0.653 ^{ns}	0.248	0.186 ^{ns}
TNHS						
	Control	30	0.246	0.189 ^{ns}	0.032	0.867 ^{ns}
	Experimental	30	0.344	0.063 ^{ns}	0.240	0.202 ^{ns}

ns (not significant)

The correlation between the pre-test and post-test results of Academic Performance and the Life Satisfaction with Mathematics of students of both schools as shown in Table 9b was also determined using Pearson Product Moment Correlation (*r*). The result shows that both the experimental and control groups in the two schools did not significantly correlate students' academic performance with their life satisfaction in the pre-test and post-test.

In the post-test of Maguindanao National High School, the control group had a Pearson r value of 0.263 with a *p*-value of 0.160. The experimental group had a Pearson *r* value of 0.248 with a *p*-value of 0.186. Both are not significant at 5% level of significance.

On the other hand, the post-test of control group of Talayan National High School has a Pearson *r* value of 0.032 with a *p*-value of 0.867. The experimental group had a Pearson *r*

value of 0.240 with a *p*-value of 0.202. Both are also not significant at 5% level of significance.

The non-significance of life satisfaction with academic performance supports the result of the study of McLoyd (1998) on correlates of life satisfaction in children that recent school marks did not correlate significantly with life satisfaction.

Whether with life in general or specified in an area, answers on life satisfaction are identified to be dependent on distinct personality traits. Diener and Lucas (1999) cited example like considering two persons, with matching all respects except personality traits. If one of them is neurotic and the other 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 tends 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, but a correlation of life satisfaction with satisfaction in income and satisfaction with grades will have a perfect positive correlation 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, whereas the causes, in fact, are personality differences. The study of Diener and Diener (2009) also revealed that the relationship of money, acquaintances, and family fulfillment with life satisfaction and with esteem may vary from one nation to another, and that economic satisfaction is a greater relative of life satisfaction in most of the third world nations.

It was also confirmed by the study of Lew (2013) that school adjustment indirectly explained academic achievement through self-esteem and life satisfaction. While the study of Siedlecki et al.

(2008) revealed that although many variables had significant zero-order correlations with the SWLS, only a few variables had unique utility in predicting life satisfaction.

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.

Table 9c

Correlation between level of anxiety and the life satisfaction of students

School	Treatment	*n*	Correlation between level of anxiety and life satisfaction of students (pre-test)	*p-value*	Correlation between level of anxiety and life satisfaction of students (post-test)	*p-value*
MNHS						
	Control	30	0.111	0.561 ns	0.034	0.860 ns
	Experimental	30	-0.860	0.653 ns	-0.433	0.017*
TNHS						
	Control	30	0.246	0.189 ns	-0.657	0.000**
	Experimental	30	0.344	0.063 ns	-0.404	0.027*

* correlation is significant at 0.05 level
** correlation is significant at 0.01 level
ns (not significant)

The correlation between the pre-test and post-test results of level of anxiety and the life satisfaction with mathematics of students of both schools, as shown in Table 9c, was also determined using Pearson Product Moment Correlation *(r*). All the pre-test results show no correlation in both schools. The result further shows that only the control group of Maguindanao National High School did get a non-significant correlation in the post-test.

In the post-test of Maguindanao National High School, the control group had a Pearson *r* value of 0.034 with a *p*-value of 0.860 which is not significant at 5%. This non- significant result could be attributed to the heterogenous type of students in this class having different level of anxiety and life satisfaction perspectives. The experimental group had a Pearson *r* value of -0.433 with a *p*-value of 0.017. This is significant at 5% level.

On the other hand, the post-test of control group of Talayan National High School has a Pearson *r* value of -0.657 with $p<0.001$. This is significant at 1% level. The experimental group, on the other hand, had a Pearson *r v*alue of -0.404 with *p*-value of 0.027. This is significant at 5% level.

This result in life satisfaction with mathematics is generally supported by the report of McLoyd (1998) that students who reported high life satisfaction in general tended to assess themselves more on self-esteem measures, inner locus of control, and extraversion and lesser on levels of anxiety. Life satisfaction is, indeed, a subjective feeling.

Significant Difference in the Pre-test and Post-test Results of Level of Anxiety, Life Satisfaction with Mathematics and Mathematics Academic Performance

Table 10a

Significant difference in the pre-test and post-test of level of anxiety

School	Treatment	*n*	standard error	*t-value*	*p-value*	interpretation
MNHS						
	Control	30	2.82	0.755	0.456	not significant
	Experimental	30	1.86	6.388	0.000**	significant
TNHS						
	Control	30	2.52	0.676	0.505	not significant
	Experimental	30	1.91	11.148	0.000**	significant

** correlation is significant at 0.01 level

The differences of the means between the pre-test and post-test of the level of anxiety were determined if significant as shown in Table 10a, using paired-sample t-test. The significant differences, however, showed only in the experimental groups of the two schools. In Maguindanao National High School, the control group had a *t*-value of 0.755 with a *p*-value of 0.456, which is not significant at 5% level of significance. The experimental group had a *t*-value of 6.388 with $p<0.001$ which is significant at 1% level. On the other hand, the control group of Talayan National High School had a *t*-value of -0.676 and a *p*-value of 0.505, which is not significant. The experimental group had a *t*-value of 11.148 with $p<0.001$, which is significant at 1% level of significance.

The result of the experimental group of this study supports the findings of Vinson (2001) in which students' mathematics anxiety levels were lessened post-manipulatives and the use of framework in a mathematical method course. In this study, the anxiety of students with mathematics were decreased, as shown by pre- and post-results and interviews.

However, the result of the control groups is not significant because there was no intervention that could reduce the anxiety levels of the students. The differences of the means of the pre- and post-test of the control group were almost the same and were not significantly different.

Table 10b

Significant difference in the pre-test and post-test of life satisfaction with mathematics

School	Treatment	*n*	standard error	*t-value*	*p-value*	interpretation
MNHS						
	Control	30	0.67	-1.742	0.092	not significant
	Experimental	30	0.84	-0.608	0.548	not significant
TNHS						
	Control	30	0.61	-1.748	0.91	not significant
	Experimental	30	1.09	-8.572	0.000**	significant

** correlation is significant at 0.01 level

The differences of the means between the pre-test and post-test of the life satisfaction with Mathematics were also determined if significant as shown in Table 10b using paired-sample t-test. The differences, however, were only significant in the experimental group of Talayan National High School. In Maguindanao National High School, the control group had a *t*-value of -1.742 with a *p*-value of 0.092 which is not significant at 5% level of significance. The experimental group had a *t*-value of -0.608 with *p*-value of 0.548, which is not significant at 5% level. On the other hand, the control group of Talayan National High School had a *t*-value of -0.610 and a *p*-value of 0.505, which is also not significant. The experimental group had a *t*-value of -8.572 with $p<0.001$ which is significant at 1% level of significance.

Seligman (2002) and most of his research associates used the terms happiness and well-being interchangeably, although some studies suggested that they are not the same. Kristjánsson (2012) believes the word happiness conveys connotations of a simple subjective theory of well-being. This is supported by the study of Arenas and Man (2020) that life satisfaction is a subjective perception. Bottom line is that happiness and well-being are determinants of life satisfaction.

Table 10c

Significant difference in the pre-test and post-test of mathematics academic performance

School	Treatment	*n*	standard error	*t-value*	*p-value*	interpretation
MNHS						
	Control	30	0.60	18.921	0.000*	significant
	Experimental	30	0.63	22.641	0.000*	significant
TNHS						
	Control	30	0.59	22.782	0.000*	significant
	Experimental	30	0.67	20.857	0.000*	significant

** correlation is significant at 0.01 level

The differences of the means between the pre-test and post-test of the Academic Performance in Mathematics were determined if significant, as shown in Table 10c using paired-sample *t*-test. 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.

Both results in the control and experimental groups are significant and this is expected given they were taught about the lessons but using positive education is suggested as a strategy to improve learning. Results are significant, particularly in the experimental group because of the evident learning of the students and the intervention done. These results are being supported by the Inverted U-Principle theory based on Law of Drive Theory (Yerkes & Dodson, 1908). The theory associates stimulation to the functioning and being called the "Arousal and Performance Theory." A study of Chung et al. (2013) also revealed an improved learning performance with happiness of students in geometry using interactive scenarios. Learning of the students in the experimental group in this study is enhanced by the positive education intervention which aroused their interest in learning mathematics.

Hierarchical Regression Analysis

Since life satisfaction had no significant correlation with mathematics performance *($r(118) = 0.24, p>0.01$),* it was no longer considered for the hierarchical regression analysis. The level of anxiety had a significant negative correlation with academic performance *($r(118)=-0.36, p<0.001$).* This implies that as 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)=0.327, p<0.001).* This implies that the academic performance of students is associated with positive education.

The moderated hierarchical multiple regression analysis through SPSS was used to determine the moderation effect of positive education treatment in the relationship between level of anxiety and academic achievement of students in mathematics. The Conceptual Model and Working Model are shown in Figure 12 and Figure 13, respectively.

Figure 12

Conceptual model of the hierarchical regression

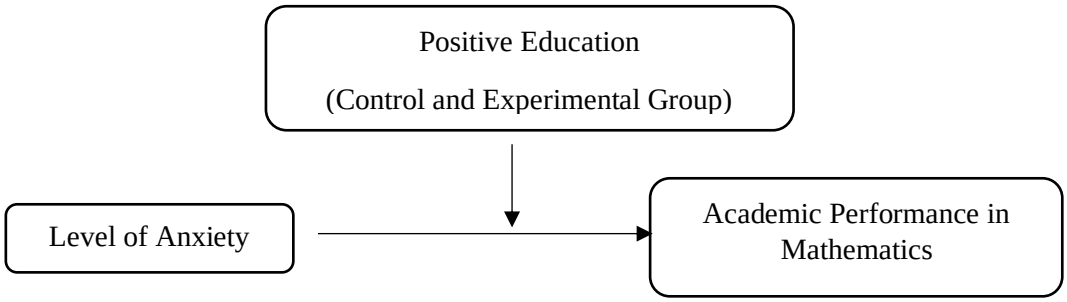
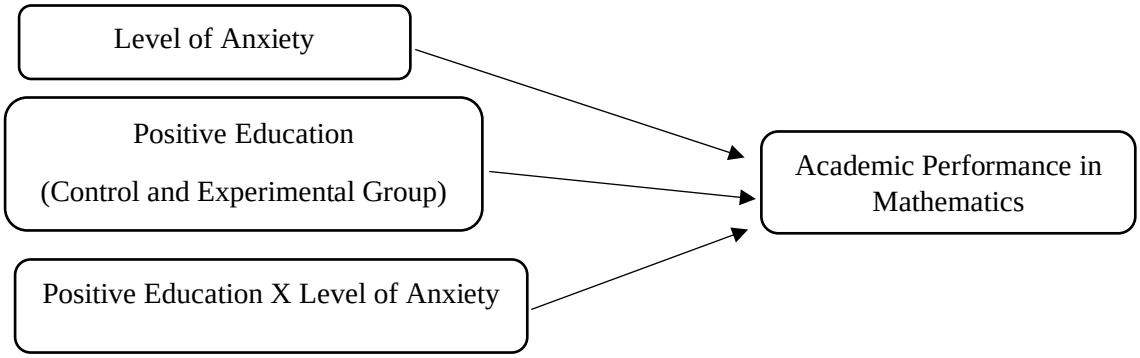


Figure 13

Working model of the moderation effect



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 the level of anxiety on academic achievement. A significant model *($F (1, 118) = 17.565$, $p < 0.01$, $R^2 = 0.13$, $\Delta R^2 = 0.13$)* was obtained. This model explained 13% of the variance in the outcome. In model 2, the level of anxiety was entered in a block together with the positive education to test its effect with the dependent variable (academic achievement in math). A significant model *($F (2, 117) = 9.93$, $p < 0.01$, $R^2 = 0.145$, $\Delta R^2 = 0.016$)* was also obtained. This model explained 14.5% of the variance in the outcome. In model 3, the interaction term of the level of anxiety and positive education were added which significantly increased the model's R^2 *($F (3, 116) = 8.862$, $p < 0.01$, $R^2 = 0.186$, $\Delta R^2 = 0.04$).* This suggests, of most interest, that positive education moderated the relationship between level of anxiety and academic achievement of students.

Furthermore, results showed that the students' level of anxiety had a negative impact on their academic performance in mathematics *($ß_1 = -0.073$, $t = -0.55$, $p<0.05$).* This accepts H_{11} and rejects H_{O1}. On the other hand, positive education had a positive impact on students' academic performance in mathematics *($ß_2 = 0.673$ $t = 2.841$, $p<0.01$).* This implies acceptance of H_{12} and rejection of H_{02}. Also, positive education significantly moderated the relationship between the level of anxiety and academic performance of students *($ß_3 = -0.464$, $t = -2.53$, $p<0.01$).* This implies acceptance of H_{13} and rejection of H_{03}. The summary of the results is shown in Table 11.

Table 11

Hierarchical regression analysis showing the moderating effect of positive education in the relationship between level of anxiety and mathematics academic achievement

Variables	*B*	*R*	ΔR^2	F_{change}	*df*	ß	*t*	*p-value*
Model 1		0.13	0.13	17.565	118			
Level of Anxiety						0.36	-0.42	
Model 2		0.145	0.16	2.128	117			
Level of Anxiety						-0.255	-2.29	
Positive Ed						0.163	1.46	
Model 3	18.58	0.186	0.41	5.895	116			
Level of Anxiety	-0.021					-0.073	-0.55	0.25
Positive Ed	4.702					0.673	2.84**	0.002
Anxiety * Positive Ed	-0.168					-0.464	-2.53**	0.005

Note: Dependent Variable=Academic Performance
**correlation is significant at 0.01 level (2-tailed)

To determine if the relationship of level of anxiety and academic achievement in mathematics is significant in experimental group and control group, test of simple slope was done. The interaction effect using the estimated regression model were visualized and data points were created based on the estimated regression equation. A graphic representation was generated to examine the direction of the interaction. The interpretation of the interaction was aided by the program ModGraph (Jose, 2013) that permits the processing of data for the purpose of visually groping the statistical connections.

The interaction effect of the level of anxiety and positive education impact the academic achievement of students in mathematics. The *Y-axis* represents the predictor variable academic achievement in mathematics, and the *X-axis* represents the level of anxiety in both the experimental and control group. Positive education as the moderator is represented by two

types of lines differentiated by the level of anxiety according to high, medium or low levels. High levels indicate a potentially concerning level of anxiety, while medium and low levels indicate moderate to low level of anxiety. The different levels of high, medium and low levels of anxiety are separated by one standard deviation above and below the mean (Jose, 2013). The result of the mean of level of anxiety which is one standard deviation below and one standard deviation above the mean were obtained as shown in Table 12.

Table 12

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

	Level of Anxiety		
Positive Education	*M-1SD*	*M*	*M+1SD*
Experimental	18.71	14.21	9.72
Control	16.04	13.53	11.04

Using Modgraph Computation, the simple slopes for the experimental group and control group were computed and determined *(ω_1 and ω_2,* respectively), as shown in Figure 14. The slopes and line figures are illustrated in Figure 15. 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 the level of anxiety and academic performance in the experimental group. This implies acceptance of H_{14} and rejection of H_{04}. 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 performance in the control group. This implies acceptance of H_{O5} and rejection of H_{15}.

Figure 14

Test of simple slope computation using modgraph

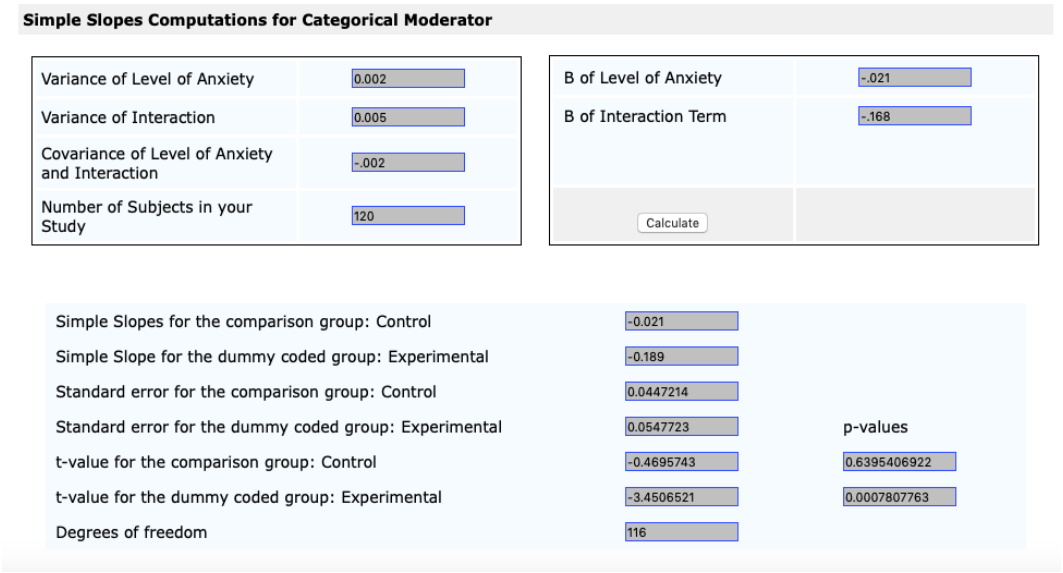
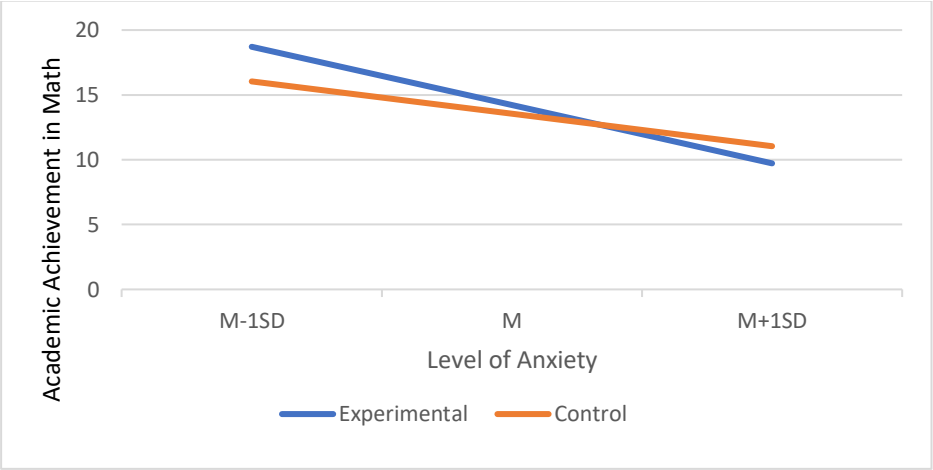


Figure 15

Relationship between level of anxiety and academic performance in mathematics of the experimental group and control group



The Qualitative Data and Results

The following are qualitative data results from the pre-intervention and post-intervention interview of the students. The experiences of the teachers were also coded. The weekly observation of classes was also tabulated for the two experimental groups.

Interview Data Results

1. Pre-intervention responses of students

Before the positive education intervention, students were asked about the nature of their anxiety, life satisfaction, and their performance in Mathematics through a closed group discussion. Students all agreed that they have the same feeling of fear and worries because of their experiences of witnessing airstrikes and bomb explosions. They felt that every day is a threat that something bad would just come out in the open. The presence of the military men often led to their thought of having troubles coming.

"We were sometimes afraid because there are conflicts, fights. We have that fear that anytime, anywhere, something bad will happen to us."

"All of the sudden we were awakened by gunshots and screams near our homes. So, we just tried to hide as possible as we could."

"We always think that there will be gunshots and airstrikes if ever military men are just around and surrounding us."

They reported cases of anxiousness, unsecured environment, feeling unlucky and sleeplessness. They were sometimes afraid of going out of their homes and go out for school. There was an increased level of worrying that they would be part of a terrifying conflict or would get shot anytime. At night times, they were experiencing trembling dreams and sometimes sleepless nights. They were afraid of the presence of the soldiers in their area and made them afraid of talking to strangers. These were quite evident during the observation of the researcher.

"More often my heart beats faster I see them around with high powered arm and guns."

"Sometimes, we had sleepless nights and we experienced that we even run for our lives in the middle of night because of some gunshots."

These responses support the quantitative results of this study on the students' level of anxiety before the intervention. The moderate anxiety level of the students may be due to these experiences of fear and trouble. A researcher observation also proved the students' anxiety when talking to people they do not know.

However, despite of feeling these negative emotions, students were quite satisfied with their life because of their family. Their strong close family ties and faith makes them happy despite fear and uncertainty in life. Before this positive intervention, students were satisfied with their life for they believe that life must go on despite challenges and they need to be resilient.

"Life is beautiful. As long as I have my parents with me, I am so happy, and life is worthwhile."

"Yes, this is what Allah gave to me, so we need to accept"

"Yes, we believe that this is the way we live although there are life aspirations. We stand still despite conflict. We need to be resilient."

These responses are related to the quantitative results of this study on the students' life satisfaction before the intervention. The slightly general satisfaction of students in their life is brought by their motivation to move on with life with the support and love they get from their families.

When asked about their views on mathematics and their performance, most of them do not like mathematics and found motivation not enough. They had low grades in mathematics.

These responses support the beginning and developing level of students in their pre-test on their academic achievement test in mathematics.

"I hate mathematics because teachers do not explain to us well, so we expect that the subject is so difficult."

"They are motivating but motivation might not be enough for us to be motivated."

"We hate to mention our grades because they were very low."

2. Post-intervention responses of students

After the positive education intervention, students were again asked about the nature of their anxiety, life satisfaction and their performance in mathematics through a closed group discussion. They feel that it is already normal to experience living in an environment and witnessing conflict and troubles brought by lawless elements and being surrounded by military men. Themes like contentment, happiness, security, motivation, appreciation and learning were coded.

"We feel that it is just normal for us to be living in this kind of environment. We are still happy because we have a family."

"We just stay positive in every experience we had, and we just want to live happily now and peaceful."

They are even used to the presence of the military around which gives them security and protection with the lawless elements and troublemakers.

"They will just come if there are troubles, and they protect us."

"Actually, the presence of military men is not a reason of losing the interest of going to school. They are there for security reasons."

The results of students post-test in the level of anxiety indicated a general low level of anxiety which in one way or another, speaks about these responses. Students have become more aware on how to response to their anxiety level.

Students have been positive about their lives and keeping their faith despite uncertainties in life. Although they worry about the future, but they stay positive in everything they do.

"I am just wishing and praying that Allah will protect us every day."

"Life is unpredictable so there should be nothing to worry. God will always provide."

"We just want to stay positive."

Their perspective about life satisfaction is even more strengthened. Before the positive education intervention, they already perceived life as something worthwhile and happiness is just a matter of choice. After the positive education intervention, students become more positive and family-oriented individuals. The responses below support the quantitative results that are generally satisfied with life after the intervention.

"I am happy with my life and family now. I just pray to Allah that nothing bad will happen."

"Life is worth living and we just have to make the most of our lives."

"I don't get the things I want. Yet, I get the things I need."

"There are sometimes family problems, but I think life should be lived the way you should be. You need to be positive and happy."

Mathematics often needs motivation to be loved by the students. The positive education intervention achieves a step closer to this, based on the students' responses to their performance in mathematics with the help of positive education intervention.

"My grades now are improving. I hope I will get better in the examination since I love the activities in mathematics now."

"I am motivated with the encouragement and activities."

"The activities make you achieve good grades. We hope to achieve better as we go on with our lessons in math."

The post-test results in the academic achievement in Mathematics are generally proficient. The improvement supports the students' responses that they perform better and achieve better in the activities.

3. Teachers' Experiences on Teaching Positive Education

Teachers from the two schools were asked about their experiences on teaching positive education in relation to the students' level of anxiety, life satisfaction and academic performance in mathematics. They were interviewed twice, and their responses are almost the same. They admitted that there have been positive outcomes with the intervention and they too are motivated to give the activities to the students. Although it is not easy to change students' perception on mathematics, learning could still take place if students find the topic relevant and fun.

"Most of them don't like the subject. So, they got very low grades during the last grading. But with the integration of positive education and the activities it offers, they are enjoying, and they like the activities. I hope they can gradually learn to like the learning of mathematics."

"The concepts are quite easy to understand, and they like the friendly approach of the module."

"It is a good thing to teach positive education because the students do well in class, in their activities as well as in the assessment exercises. Their values, although not totally, started to change for the better. They have become so positive."

On the level of anxiety of students, teachers believe that there is that feeling of anxiety and fear of the students brought by the hostile environment, but these students are already used to it. The conflict that students witness and experience including conflict with their peers, make them stronger and these perceived by the teachers as normal for being in the adolescence period. Students have reservations talking to strangers, but they talk a lot with the people they know.

"There is that feeling of fear. I think we can't easily take that away from them. Military men and policemen are very friendly here."

"Sometimes with their classmates, but I think it is normal for them to have some conflict with peers. They have unique and distinct behaviour."

"Sometimes there are peer-conflicts among them that make them irritable at times."

"Although some students yawn in my class but that does not mean they could hardly understand the topic. I think they like the way it is being taught with positive education."

"There are times that they don't want to speak up because they are afraid but most of the times, my students are talkative and getting very active particularly when they are talking with the people they used to know."

On the life satisfaction, teachers could assure that students are happy and contented with their life despite the absence of material things they want. Teachers are even happy for being a part of students' happiness and life satisfaction.

"They are still smiling. I guess they are happy. I can see those happy faces despite that they have problems at home. They have also conflict with their classmates, but I think it is part of their adolescence."

"I have the chance to inspire them through the positive education concepts. I think they value life. I am happy with that also."

"With the poverty they are in, I don't think so. But materials things don't make one happy, there is something more to happiness than these materials things."
I know they have problems, but they are Muslims, so they must respect their lives and live it to the fullest by following the teachings of Islam.

On the academic performance of students, teachers believe that there has been an active participation from the class when the activities are for students' cooperative learning. The students have been doing great in their class.

"It is given that their performance will improve because the strategy is new to them. The positive education in every end of activity makes them realize the importance of living happily with family. With this, they are motivated. They are doing very well in the activities. The class is so lively, and the students are very active in participating in the activities."

"They have become so active in the class. They got scores higher in their quizzes and exercises. There has been an improvement to some slow learners."

4. Themes Coded

By using NVivo software and with the help of an external examiner, themes are coded and tabulated. The themes like fear, anxiousness, irritation, palpitation, loneliness, feeling of unloved and unlucky, and low grades of the students before the intervention were coded. Teachers verified these students' experiences through the teachers' interview. After the

intervention, themes like becoming calm, satisfied and contented, motivated, secured and happy were coded. Students tend to become calm, energetic in going to schools, and smiles were evident on their faces. Table 13 and Table 14 reveal some of the highlighted responses of the students before and after the positive education interview in Maguindanao National High School and Talayan National High School, respectively as well as the combined themes generated by the NVivo and the help of an external examiner.

Table 13

MNHS students' responses before and after the intervention

Question	Themes Coded	Pre-intervention responses	Post-intervention responses
1	Fear	Afraid because there are conflicts, fights. We have that fear that anytime, anywhere, something bad will happen to us. Awakened by gunshots and screams near our homes. So, we just tried to hide as possible as we could. Loud screams when bombs explode. We were so afraid, and we ran to our homes from school	Feeling of fear because of our experiences of witnessing airstrikes and bomb explosions.
	Negative effect on health	Heart attack caused by the presence of military.	
	Feeling of content and happiness		It is just normal for us to be living in this kind of environment. We are still happy because we have family.
	Sense of grit (determination and enthusiasm)		We need to stand for our life.
2	Feeling of content and happiness	We are happy. Despite the conflict and unfriendly environment, we believe that we are still happy, and we should be happy. We are happy with our family. As long as we live, we are happy, and we can eat three times a day.	
	Fear	Although sometimes, we are afraid.	
	Positive influence of the school		School is fun. We have more friends. We can always have play time with them.

Table -continued

			It is so good to be in school and I take the positivity of school to home.
3	Anxiousness	We always feel that there is war and conflict when military men are closer to our homes. We presume that there will be gunshots and airstrikes if ever military men are just around.	They are still bothering us and making us palpitate the moment they are near us.
	Sense of Fear	Sometimes military men asked about where we live, and it is so scary. More often, my heart beats faster when I am seeing military men, and even when there are troubles around.	
	Negative Threat	When military is just around, it seems like there is a threat that something bad would just come out in the open.	
	Sense of Security/ Protection		They are just there without doing anything bad to us. We believe they are there to protect us.
4	Fear	Sometimes, we don't want to go out and just hide in our own houses.	
	No Security Outside (Feel more secured at home)	It is much secure at home and we always feel that the environment is not secured.	
	Negative influence of military presence	Sometimes, military men created even more troubles when they were around, so we don't want to see them especially near the school.	
	Security purpose		They are there for security reasons.
	No negative influence of military presence (towards schooling)		They don't affect our interest of going to school. The presence of military men is not a reason of losing interest of going to school. No, they are actually don't bother us.
5	Source of irritation (home)	Sometimes at home . There is always misunderstanding at home.	
	Source of irritation (classmate/others)	Most of the time with our classmates because they are so mean.	Sometimes when jokes of my classmates are below the belt.
	Negative interaction (among themselves)	We feel that we just don't like them. I don't want to talk to people to some extent.	
	Immediate response to irritation	I always become so irritated with people, easily pissed off.	

Table -continued

	Physiological cause of irritation	When I'm starving, because I did not eat my breakfast which happens almost every day.	
	No response		No
6	Concern for family safety (negative)	We feel that sometimes, it is not safe in our house. I hope that's not the case.	
	Concern for family safety (positive)	Sometimes, I helped them in the market selling vegetables.	I am just wishing and praying that Allah will protect us every day. No. they are safe, and they are working.
	Cause of worries	There is conflict near our house and military surround the community. We think they would be part of a terrifying conflict or would get shot anytime.	
	Reaction to conflict	There is increased level of worrying. Always worried.	
7	Source of fear	There are humors on people in white vans who kidnap children. We are afraid to lose our parents and family.	Sometimes, we have no food to eat.
	Afraid and anxiousness	We are even afraid to go out. I am worrying that in the future we will be in big troubles.	
	Reaction to fear (negative)	We feel that it is not good to go out anymore.	
	Reaction to fear (positive)		We are helping our parents and families. We just want to stay positive in all we do.
8	Negative dreams and sleeplessness	I am experiencing trembling dreams and sometimes sleepless nights. We have these bad dreams that make us wake up all of the sudden.	
	Fear	We are trembling and afraid.	
	Source of fear and sleeplessness	These happened when we evacuated due to one of the troubles during a political crisis.	Because there are noisy neighbors. Because dogs bark at the middle of the night.
	Reaction to fear (negative)	We needed to leave our home	
	Reaction to fear (positive)	We have sought refuge from our relatives in the other town.	
	Peaceful sleep		Not anymore (waking up suddenly at the middle of the night). I used to. I already have peace sleeping.
9	Cause or source of sleeplessness	During those days of having politically conflicting moments. We experience that we even run for our lives in the middle of night.	

Table -continued

		We heard gun fires in the middle of the night. Sometimes rebel just attack and military will retaliate.	
	Cautiousness	We tend to keep an eye on the attack.	
	Peaceful sleep		We always have to sleep every night. Now that there seems to be peace in our community also.
10	Negative judgement of person	We are afraid of those people and we just don't know them.	(feeling nervous) Sometimes, especially to strangers and not pleasant looking people.
	Introvert personality	I don't want to personally meet and talk to strangers. We just don't want to be with a lot of people. I feel nervous when talking and presenting myself to others.	
	Openness in meeting people		I am starting to be so much acquainted to people.
11	Feeling safe at home (or at school)	We prefer to stay at home since we know that it is safer.	There is nothing to worry outside the school.
	Introvert personality/ Not engaging into social activities	We don't actually go out with friends that much.	
	Conflict outside	We are afraid of going out particularly if there has been a reported trouble nearby.	
	Life custom/ Routine (Responsibility at home)	We just go to school then go home. At around 6 in the evening we are supposed to be home already.	We want to stay at home during weekends. But we like to stay in school during school days. We still want to be at home during weekends and in school during weekdays. We go to our friends when there are no more house chores.
12	Religious influence	This is what Allah gave to me, so we need to accept. We believe that this is the way we live.	I just pray to Allah that nothing bad will happen.
	Aspirations/ Dreams	Although there are life aspirations. We always dream more. We just wish to be safe and live peacefully.	I live my life the way I want it.
	Sense of Grit and Resiliency	We stand still despite conflict. We need to be resilient. We are contented with our life now.	We believe that we are contented with what we have. I am happy with my life and family now.

Table -continued

13	Positive Outlook in life	Life must go on. Life is beautiful. Life is worthwhile.	Life is good. Life is worth living and we just have to make the most of our lives.
	Sense of Grit and Resiliency	We need to stand up and be resilient no matter what life may bring.	Life is worthwhile despite problem in life.
	Essence of Family	As long as I have my parents with me, I am so happy.	
14	Financial constraints	Unfortunately, we can't afford.	We are just poor.
	Aspirations/Dreams	There are things we still want and like. There are a lot of things I want. But now, I am just hoping that one day in the future, I can have them like a car, house and lot	
	Contentment	I have everything I need so far.	I don't get the things I want. Yet, I get the things I need. So, we just ask the things we can just afford to get. We always are contented.
15	Contentment	We are satisfied now. I am satisfied despite not being so privilege to have everything. I am happy with family.	Yes, very much (satisfied). I am always happy and positive with what life brings every day.
	Worries	I am just afraid of losing my family now.	
	Aspirations/ Dreams	There are still needs that we dream that we will have.	
	Source of contentment		Our family makes us satisfied with life.
16	Status quo	About my life, there is no more that I want to change.	Nothing to change in our life.
	Aspirations/Dreams	Just a dream that I want to achieve someday . We want to be happy.	
	Personal (behavioral) improvement	Our attitude, peoples' attitude and the way we live our lives.	I just want to change my bad attitude that I can't resist.
17	Positive Attitude towards Mmath	Mathematics is one of our favorite subjects.	Yes (I like) mathematics and science. I started to like mathematics.
	Negative Attitude towards math	I hate Mathematics . I don't like mathematics and my grades are very low in mathematics.	
	Reason for liking Math	Our teacher is good.	When the teacher is good.
	Reasons for not liking math	Teachers do not explain to us well The subject is so difficult.	

Table -continued

	Coping strategy in learning mathematics	I just pass mathematics because I copy assignments from my classmates and friends.	
18	Sense of enjoyment (satisfaction)	We enjoy solving math problems. There are feeling of enjoyment and satisfaction when we solve problems.	
	Physical pain	Sometimes, I have headache and trouble solving problems in Math.	
	Reasons of enjoyment (Interest)		If the problems are interesting and the topics are explained well.
	Engaging learning activities		Because the activities are fun, I am so excited to solve through games
19	Traditional	Our teachers taught the topic and then we will solve after. It is a traditional teaching. It is lecture and we need to solve afterwards.	
	Boring/ Non-engaging	Teaching was very boring . My math teachers remind me of sleeping in the class.	
	Collaborative		It is so fun that every activity we are in a group. I like the activities. I enjoy them with my classmates.
	Interesting		The topics are very interesting.
20	Absence of stimuli	Most of the times, mathematics learning was traditional and not motivating.	
	A motivation	They are motivating but motivation might not be enough for us to be motivated.	
	Positive/ Reinforced Teacher's strategy		The way teachers teach in the subject makes one student interested.
	Real life relevance of math		Mathematics is very applicable to life.
	Appreciation to mathematics		If you understand it, you will learn to love and like it.
21	Low/ Failing	Our grades were very low. They are not really high, but not also failing.	
	Achieving good/ improving grades		I am getting good grades now. The activities make you achieve good grades. Our grades are getting better in quizzes and assignments.
	Aspiration of having good grades		We hope to achieve better as we go on with our lessons in mathematics.

Table 14

TNHS Students' Responses Before and After the Intervention

Question	Themes	Pre-intervention responses	Post-intervention responses
1	Fear and anxiety of conflict	Afraid because there are conflicts, fights. We have that fear that anytime, anywhere, something bad will happen to us. We just tried to hide as possible as we could. We were so afraid that we ran off to our homes from school. We had the feelings of fear, trouble and worry . It is so scary to think of those moments. There were times that we ran going to our homes. We did not know where to go and hide. We just ran for our safety.	Feeling of fear because of their experiences of witnessing airstrikes and bomb explosions.
	Causes of Fear	We were awakened by gunshots and screams near our homes. Loud screams when bombs exploded. Because of the bombs that we witness to explode, we've been afraid. There had been airstrikes that destroy the homes of our neighbors. Because of the gun fires.	
	Negative effect on health	Heart attack caused by the presence of military.	
	Feeling of content and happiness		It is just normal to us to be living in this kind of environment. We are still happy because we have family. We just stay positive in every experience we have.
	Aspiration of having a good life		We just want to live happily and peacefully now.
	Sense of grit (determination and enthusiasm) and resiliency		We need to stand for our life. The conflict makes us stronger and be resilient in every problem.
2	Feeling of content and happiness	We are happy. Despite the conflict and unfriendly environment, we believe that we are still happy, and we should be happy. As long as we live, we are happy, and we can eat three times a day. We are so interested to go to school.	
	Fear	Sometimes, we are afraid.	

Table -continued

		Sometimes, we are afraid. We just skipped school and be absent if there were some lawless elements and our security is at stake. We are really afraid to go to school because the way going there is not secured.	
	Positive influence of peers and family		I have many friends here in the school and I love to be with them all the time. My classmates and teacher make me feel comfortable and safe also in school. My family likes me to study.
	Aspirations/Dreams		I want to attain all my dreams in the future.
	Positive influence of the school		School is fun. We have more friends. We can always have play time with them. It is so good to be in school and I take the positivity of school to home.
3	Anxiousness and Threat	We always feel that there is war and conflict when they are closer to our homes. We presume that there will be gunshots and airstrikes if ever military men are just around. When military is just around, it seems like there is a threat that something bad would just come out in the open. We always think that there will be gunshots and airstrikes if ever military men are just around and surrounding us. When military is hovering around, it seems like there is a threat that something bad would happen anytime soon.	They are still bothering us and making us palpitate the moment they are near us.
	Sense and Manifestation of Fear	Sometimes, military men asked about where we live, and it is so scary. More often, my heart beats faster when I am seeing military men, and even when there are troubles around. More often, my heart beats faster I see them around with high powered arm and guns.	
	Sense of Security/ Protection (Contentment)		They are just there without doing anything bad to us. We believe they are there to protect us. Now we are used to them . I have relatives from the men in uniform and they are just there to protect us.

Table -continued

			They will just come if there are troubles and they protect us.
	Friendly Nature		Some if not all of them are actually very friendly and helpful.
4	Fear	Sometimes, we don't want to go out and just hide in our own houses.	
	No Security Outside (Feel more secured at home)	It is much secure at home and we always feel that the environment is not secured. Sometimes, we don't want to go out and just hide in our own houses. It is much secure at home and we always feel that the environment is not secured.	
	Negative influence of military presence	Sometimes, military men create even more troubles when they are around, so we don't want to see them especially near the school	
		There is always a threat of conflict when they are around.	
	Security purpose		They are there for security reasons.
	No negative influence of military presence (towards schooling)		They don't affect our interest of going to school.
			The presence of military men is not a reason of losing interest of going to school.
			No, they actually don't.
			They don't affect our interest of going to school.
			They actually don't affect my interest to go to school.
5	Source of irritation (home)	Sometimes, at home .	
		When there is always misunderstanding at home.	
	Source of irritation (classmate/others)	Most of the time with our classmates because they are so mean. I cannot control to be so angry with my classmates especially when they are interrogating me with nonsense	Sometimes when jokes of my classmates are below the belt.
		II am easily pissed off with my classmates when they throw jokes at me that really hurt.	
	Negative interaction (among themselves)	We feel that we just don't like them. I don't want to talk to people to some extent.	
	Immediate response to irritation	I always become so irritated with people. Because I am so easily irritated and pissed off.	
		I am so easily irritated.	

Table -continued

		I am easily pissed off with my classmates when they throw jokes at me that really hurt.	
		I am easily pissed off and easily irritated.	
	Physiological cause of irritation	I was starving because I was not eating my breakfast which happened almost every day.	
		I do not eat my breakfast. I am easily pissed off and easily irritated.	
	Sense of optimistic		I understand that I have to stay positive and make also other, my friends and family to be happy.
	No issue response		No.
			But nothing serious to be pissed that off.
6	Concern for family safety (negative)	We feel that sometimes it is not safe in our house.	Especially when my parents work so far, and they leave us home.
		I hope that's not the case.	
		I am so worried at them (family).	
		I worry about my parents and family. Sometimes, we have nothing to eat in the morning and only eat lunch and dinner.	
	Concern for family safety (positive)	Sometimes, I helped them in the market selling vegetables.	I am just wishing and praying that Allah will protect us every day.
		I want to always be with my family all the time.	No. they are safe, and they are working.
			I just always pray that every day we are all safe.
	Cause of worries	There is conflict near our house and military surround the community.	
		That they we think they would be part of a terrifying conflict or would get shot anytime.	
		Especially when there are threats of violence around.	
	Reaction to conflict	There is increased level of worrying .	
		Always worried.	
7	Source of fear	There are humors of some people in white vans who kidnap children.	Sometimes, we have no food to eat.
		Afraid to lose my parents and family.	
		I am afraid to lose my family. They are my life.	
	Afraid and anxiousness	We are even afraid to go out.	
		I am worrying that in the future we will be in big troubles.	
		I am worrying that in the future, we will face big problems without money.	
	Reaction to fear (negative)	We feel that it is not good to go out anymore.	

Table -continued

	Divine providence		God will always provide.
	Reaction to fear (positive)		We are helping our parents and families.
			We just want to stay positive in all we do.
			We just want to stay positive.
			Life is unpredictable so there should be nothing to worry.
8	Negative dreams and sleeplessness	I am experiencing trembling dreams and sometimes sleepless nights.	
		We have these bad dreams that make us wake up all of the sudden.	
		We have bad dreams that make us wake up all of the sudden at night.	
	Fear	Then we are trembling and afraid.	
	Source of fear and sleeplessness	These happen when we evacuated due to the one of the troubles during a political crisis.	There are noisy neighbors.
		Bad dreams that anything bad will happen to our family.	Dogs bark at the middle of the night.
	Reaction to fear (negative)	We needed to leave our home.	
	Reaction to fear (positive)	We have sought refuge from our relatives in the other town.	
	Peaceful sleep		Not anymore (waking up at the middle of the night). I used to.
			I already have peace sleeping.
			No more (waking up at night), not really.
9	Cause or source of sleeplessness	During those days of having politically conflicting moments.	
		We experience that we even run for our lives in the middle of night.	
		We heard gun fires in the middle of the night.	
		Happening because sometimes rebel just attack and military will retaliate.	
		We had sleepless nights and we experienced that we even run for our lives in the middle of night because of the airstrike and gunshots.	
	Cautiousness	We tend to keep an eye on.	
		Sometimes you just need to be awake for you and your family's safety during war.	
	Peaceful sleep		We always have to sleep every night.
			Now, there seems to be peace in our community.
			No more (experiencing sleeplessness).

Table -continued

10	Negative judgement of person	We are afraid if those people are bad and we just don't know them. We feel nervous because we are afraid if those people are bad because we don't know them, and they will put us in troubles and there is doubt to people.	(feeling nervous) Sometimes, especially to strangers and not pleasant looking people.
	Introvert personality	I don't want to personally meet and talk to strangers. and just don't want to be with a lot of people. I feel (nervous) so when talking and presenting myself to others. There is that feeling of shyness. I am scared to talk to them.	But with the people I already know.
	Openness in meeting people		I am starting to be so much acquainted to people. But, I am overcoming it now.
11	Feeling safe at home (or at school)	We prefer to stay at home since we know that it is safer. We prefer to stay at home. It is safe there. We rather stay home.	There is nothing to worry outside the school.
	Introvert personality/ Not engaging into social activities	We don't actually go out with friends that much.	I prefer to stay home or in school than going out.
	Conflict outside	We are afraid of going out particularly if there is a reported trouble nearby.	
	Social Interactions		Sometimes, I go out with friends . I go to my friends' house.
	Life custom/ Routine (Responsibility at home)	We just go to school then go home. At around 6 in the evening we are supposed to be home already. We also go out but not at night. We have curfew so we need to be home by 6pm.	We want to stay at home during weekends. But we like to stay in school during school days. We still want to be at home during weekends and in school during weekdays. We go to our friends when there are no more house chores. I go out sometimes, when there is nothing to do in school or at home.
12	Religious influence	This is what Allah gave to me, so we need to accept. We believe that this is the way we live.	I just pray to Allah that nothing bad will happen. I just pray to Allah that nothing bad will happen.
	Aspirations/ Dreams	There are life aspirations. We always dream more. We just wish to be safe and live peacefully.	I live my life the way I want it.
	Sense of Grit and Resiliency	We stand still despite conflict.	We believe that we are contented with what we have.

Table -continued

		We need to be resilient.	I am happy with my life and family now.
		We are contented with our life now.	I am happy with my life.
		This is the life I want despite uncertainties and problems.	I am contented with what we have.
		We need to be resilient.	
		We are contented with our life now.	
13	Positive Outlook in life	Life must go on.	Life is good.
		Life is beautiful.	Life is worth living and we just have to make the most of our lives.
		Life is worthwhile.	There are sometimes family problems, (but) you need to be positive and happy.
		Life is beautiful. I am so happy, and life is worthwhile.	I love to live my life.
	Sense of Grit and Resiliency	We need to stand up and be resilient no matter what life may bring.	Worthwhile despite problem in life.
			I think life should be lived the way you should be.
	Religious Affiliation	We feel that life is worthwhile with Allah as the center of our lives.	
	Essence of Family	As long as I have my parents with me, I am so happy.	I enjoy life with my family.
		As long as me and my family eat three times a day.	
14	Financial constraints	Unfortunately, we can't afford.	We are just poor but happy.
	Aspirations/Dreams	There are things we still want and like.	
		There are a lot of things I want. But now, they are just hoping that one day in the future, I can have them like a car, house and lot .	
		There are a lot of things I want.	
	Contentment	I have everything I need so far.	I don't get the things I want. Yet, I get the things I need.
		I don't ask for anything that I see unimportant.	So, we ask the things we can just afford to get.
			We always are contented.
			I am satisfied with the things I have.
			We are happy.
			We always are contented. My family doesn't ask what we can't have.
15	Contentment	I am satisfied now.	Yes, very much (satisfied).
		I am satisfied despite not being so privilege to have everything. I am happy with family.	I am always happy and positive with what life brings every day.
		I am satisfied now.	Yes (satisfied), very much.
		I am happy and satisfied.	
		I want to have more in the future, so I need to study hard to achieve my dreams.	

Table -continued

	Worries	I am just afraid of losing my family now.	
	Aspirations/ Dreams	There are still needs that we dream that we will have .	
		I only ask good health for my family. Peace also for my community.	
	Source of contentment		Our family makes us satisfied with life. Our family and parents are the most important in our lives now.
16	Status quo	About my life, there is no more that I want to change.	Nothing to change.
		About my life, there is no more that I want to change.	Nothing to change in my life.
		No more to change.	I am always contented with what I have so there is no more reason to change something.
	Aspirations/Dreams	It 's just a dream that I want to achieve someday.	
		We want to be happy.	
		But I have dreams to achieve.	
	Religious influence	This is what Allah gave me.	This is what Allah gave to me.
	Personal (behavioral) improvement	Our attitude, peoples' attitude and the way we live our lives.	I just want to change my bad attitude that I can't resist. My bad character is what I want to change for the better.
17	Positive Attitude towards Math	Mathematics is one of our favorite subjects.	Yes (I like) mathematics and science.
		Mathematics was one of our favorite subjects.	I started to like Mathematics.
			Yes, mathematics is my favorite.
	Negative Attitude towards math	I hate Mathematics.	
		I don't like mathematics and my grades are very low in mathematics.	
		I hate mathematics .	
		I don't like mathematics and I have very low grades in mathematics.	
	Reason for liking math	Our teacher is good.	When the teacher is good.
			I love how my teachers have taught the subject.
	Reasons for not liking math	Teachers do not explain to us well.	
		The subject is so difficult.	
		Teachers do not explain well the topics. It was so confusing.	
	Personal Improvement		Arabic is my most favorite because it makes me a good person and Muslim.
	Coping strategy in learning mathematics	I just pass mathematics because I copy assignments from my classmates and friends.	

Table -continued

18	Sense of enjoyment (satisfaction)	We enjoy solving math problems. There are feeling of enjoyment and satisfaction when we solve problems.	I enjoy solving math now with my groupmates. I love mathematics now.
	(Physical/ Mental) pain	Sometimes, I have headache and trouble solving problems in math. I could hardly understand.	
	Teacher Factor (Positive)		Topics are very understandable when teachers know how to teach.
	Teacher Factor (Negative)	Teachers did not explain well and even became angry when we asked questions.	
	Reasons of enjoyment (Interest)	There are topics that are easy.	The problems are interesting, and the topics are explained well.
	Social Interaction/Peer Influence (Positive)		I enjoy solving math now with my groupmates.
	Engaging learning activities		The activities are fun, I am so excited to solve through games.
19	Traditional/ Route Teaching-Learning Process	Our teachers taught the topic and then we will solve after. It is a traditional teaching. It is lecture and we need to solve afterwards. It is a traditional teaching. The teacher taught with us listening then the teacher gave quiz to assess if we understood.	
	Boring/ Non-engaging	Teaching was very boring. My math teachers remind me of sleeping in the class. Teaching was very boring. It made us to hate the subject.	
	Collaborative		It is so fun that in every activity, we are in a group. I like the activities. I enjoy them with my classmates.
	Teachers Encouragement		My teacher gives us encouragement after every after activity.
	Positive transformation/ Personal Improvement		We find it very helpful and I become so helpful with my parents now and obey them.
	Interesting		Topics are very interesting. I like the way my teacher is teaching the subject. Topics are very interesting. I like the way my teacher is teaching the subject.
20	Absence of stimuli	Most of the times, mathematics learning was traditional and not motivating. Most of the times, mathematics learning was traditional and not motivating.	

Table -continued

		They did not motivate me to learn mathematics.	
	Amotivation	They are motivating but motivation might not be enough for us to be motivated.	
	Positive/ Reinforced Teacher's strategy		The way teachers teach in the subject makes one student interested. I am motivated with the encouragement and activities. There are so much fun with the positive activities that my teacher is teaching.
	Real life relevance of Math		Mathematics is very applicable to life.
	Appreciation to math		If you understand it, you will learn to love and like it.
21	Low/ Failing	Our grades were very low. They are not really high, but not also failing. Our grades were very frustrating. They were nearly failing. We hate to mention our grades because they were very low.	
	Achieving good/ improving grades		I am getting good grades now. The activities make you achieve good grades. Our grades are getting better in quizzes and assignments. My grades now are improving.
	Aspiration of having good grades		We hope to achieve better as we go on with our lessons in math . We hope I will get better in the examination since I love the activities in mathematics now. We hope to get better grades as we go on with our lessons in mathematics.

The teachers were interviewed once about their experiences in the intervention. This happened at the start of the second round (the third week of the intervention). Although they found the intervention challenging, teachers concluded that there was a significant change in students' anxiety level and life satisfaction. The mathematics performance of the students also significantly improved as recorded by their teachers. This can be attributed by the positive education intervention since the control group did not have the same result of significance. The positive atmosphere of teaching mathematics with the STMP model of

positive education has helped students improve their experiences, minimize their level of anxiety and boost academic performance. Teachers responses in their interview are shown in Table 15. Themes like intervention helps, better performance, enthusiasm of students, becoming responsive and participative of students, and being happy and satisfied were coded through the teachers' responses while doing the intervention.

Table 15

Teachers' responses on the interview in relation to students' level of anxiety, life satisfaction with mathematics and academic performance in mathematics

	Themes	MNHS teacher's response	TNHS teacher's response
1	Hate mathematics at the start	They don't like the subject. So, they got very low grades during the last grading. But with the integration of positive education and the activities it offers, they are enjoying, and they like the activities.	
		I hope they can gradually learn to like the learning of mathematics.	
	Intervention helps students enjoy		
	better performance in the class		It's a good thing to teach positive education because the students do well in class, in their activities as well as in the assessment exercises. ….values although not totally but started to change. They have become so positive.
	gaining positive values		
2	Enthusiasm of the students	It is very enjoyable, so they are very happy.	
		Activities involve pair and group activities, so they enjoyed them a lot.	
	Looking forward for the activities		They are enjoying the activities very much.
			They look forward for the group activities.
3	Easy to understand concepts	Concepts are quite easy to understand, and they like the friendly approach of the module.	
	Easy to understand		Concepts are quite easy to understand so they are really motivated with those.
4	Attendance in Class with happiness	Start to be always present in the class.	

Table -continued

		They seem happy.	
	Responsive to activities		I love how they respond to the activities that they don't want to be out of their class in mathematics.
5	Fear as always	They have that feeling of fear. I think we can't easily take that away from them.	
	Friendly men in uniform	Military men and police are very friendly here.	
	Used to men in uniform		It is normal to us seeing those men in uniform with their weapons.
6	Peer conflicts	There are peer-conflicts among them that make them irritable at times.	
	Peer conflict		It is normal for them to have some conflict with peers. They have unique and distinct behavior.
	Unique behavior		
7	Eager about home	They always want to go home early although there are still classes because they just want to help their parents and worried about them.	
	Helping parents		
	Problems at home		There are problems in their home, I guess.
8	Yawn in class but love positive education	Students yawn in my class sometimes but that does not mean they could hardly understand the topic.	
		They like the way it is being taught with positive education.	
	Good rest at night		They are having good night sleep.
9	Afraid at the start but learning to develop skill in talking	There are times that they don't want to speak up because they are afraid but most of the times, my students are talkative and getting very active particularly when they are talking with the people, they used to know.	
	Used to face people		Most of them are very used to people.
10	Smiles and happiness	They are smiling.	
		They are happy.	
		I can see those happy faces despite that they have problems at home.	
		They have also conflict with their classmates but I think it is part of their adolescence.	
	Having problems but happy		They are happy.
			They have problems, they tell that to their teachers and adviser.

Table -continued

11	Inspiring students through positive education	They have the chance to inspire them through the positive education concepts.	
		I think they value life. I am happy with that also.	
	Students value life		
	Respect life with their religious belief		They have problems, but they are Muslims, so they have to respect their life and live it to the fullest by following the teachings of Islam.
	Following Islam		
12	Happy despite no materials things	Material things don't make one happy, there is something more to happiness than these material things.	
	Contentment		
	Happy with the family		What matters is that they are happy and their family loves them.
13	Life Satisfaction	They are satisfied with their life.	
			They generally say yes.
			Parents are very supportive of them.
14	Happy students and more secure	I can't say personally for each one of them, but based on my observations, they are happy.	
		They need now is much more secure and safe environment and no conflict.	
	Dreams of success in the future		
			Big dreams for themselves.
			They want to take their family out of poverty.
15	Realizing the value of life	It is given that their performance will improve because the strategy is new to them.	
		Positive education in every end of activity makes them realize the importance of living happily with family.	
	Enthusiasm in the activities	They are motivated. They are doing very well in the activities. The class is so lively, and the students are very active to participate in the activities.	
	Participation in the activities		
	Proactive in the class		They have become so active in the class.
			They got scores higher in their quizzes and exercises.
	Improvement of slow learners		There has been improvement to some slow learners.

Weekly Observations

The researcher had kept an observation diary during his weekly visit in the two schools. The diary noted all the lessons, activities and positive education concepts during the class discussions. The observations also included the description of the atmosphere of the learning environment during the classes. Themes like active learning, student participation, academic noise and fun activities were coded in both schools during the observation. The researcher's weekly observation is shown in Table 16.

Table 16

Weekly observations

Observation Week	Observation	
	MNHS	TNHS
First Week of Intervention	Administration of pre-test by the teacher-respondent for the level of anxiety, life satisfaction and math performance.	Administration of pre-test by the teacher-respondent for the level of anxiety, life satisfaction and math performance.
Second Week of Intervention	The teacher taught the lesson Numerical Expression. The students were engaged in learning activities. She explained the concept of peace through unity and cooperation and community service to students.	The teacher taught the lesson Numerical Expression. The students were very active and having fun translating verbal phrases into algebraic expression. The teacher processed the concept of contentment in life and happiness.
Third Week of Intervention	The teacher taught the lesson Numerical Expression. Students were actively involved in the learning activities. The teacher explained the concept of acceptance of responsibility.	The teacher taught the lesson evaluating algebraic expressions. The students were having fun with the activities. The teacher explained the concept on how to care for our environment.
Fourth Week of Intervention	The teacher taught the lesson about addition and subtraction of polynomials. Students were so noisy in relation to their learning activity. The teacher explained the positive education concept of respecting others.	The teacher taught the lesson Multiplication of Polynomials. The students actively engaged in the teaching Promote It. Then the teacher explained and processed gender equality.
Fifth Week of Intervention	The teacher taught the lesson about solving inequalities. The students had very fun activities. The teacher explained the positive education concept of sportsmanship and teamwork.	The teacher taught the lesson about solving inequalities. The students enjoyed the activity helping those in need in the positive education concept.
Last Week of Intervention	Administration of post-test by the teacher-respondent for the level of anxiety, life satisfaction and math performance.	Administration of post-test by the teacher-respondent for the level of anxiety, life satisfaction and math performance.

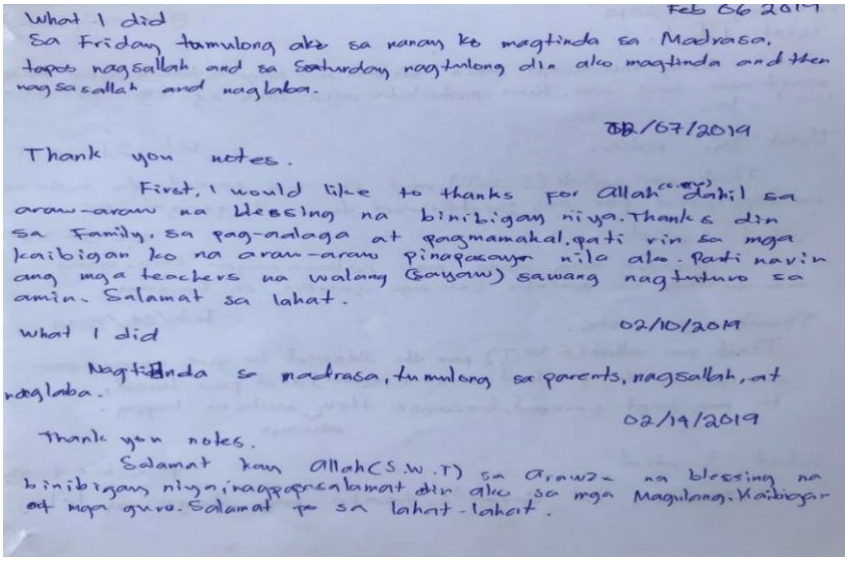
Positive Education Notes

Students in the experimental group both in Maguindanao National High School and Talayan National High School wrote a "I did it note" every Monday to recognize the good things they had done during the weekend. A "thank you note" was also written by the students every Friday on their Positive Education Note provided by the researcher. This helps, aside from the positive intervention in every activity, in the attainment of positive education elements such as connection with others, responsibility, strength, kindness and meaning. This also gives way to the realization of purpose of the STMP model. An example of a student's response written on a student's positive education note is shown in Figure 16.

The "I did it note" and "thank you note" indicated that students have strong faith in their religious belief, have strong family ties, and are very thankful to the people around them. Results also indicated how grateful the students are to their parents are and to their God, Allah. This is an indication of positive emotion, engagement, positive relationship, meaning to their life, and sense of achievement.

Figure 16

Student's positive education note sample



The four-week intervention accumulated four "I did it" notes and also four "thank you" notes of the two concerned schools in Maguindanao. Results of the positive education notes were coded, and themes were tabulated. The coded themes indicated that students have strong faith in their religious belief, have strong family ties and very thankful to the people around them. They are summarized below and tabulated according to their relatedness. The themes suggest an indication of positive emotion, engagement, positive relationship, meaning to their life and sense of achievement.

Table 17

First round of intervention responses of "I did it" notes

	First Week		*Second Week*	
Responses	*frequency*	*%*	*frequency*	*%*
I helped doing household chores.	17	28.33%	20	33.33%
I went to Mosque (Muslim church) to pray.	12	20.00%	13	21.67%
I went to school and helped our group activity/project.	9	15.00%	5	8.30%
I accompanied my parents/relatives to somewhere.	8	13.33%	11	18.33%
I went out with my friends and had bonding moments.	7	11.67%	4	6.67%
I helped my parents in the farm.	4	6.67%	5	8.33%
I helped my parents sell in the market.	3	5.0%	2	3.33%
TOTAL	60	100	60	100

Table 17 shows the first two weeks of intervention, which is the first round of the intervention, where students wrote their notes saying the things they had done. It further shows that in the first week, most of the students helped to do household chores with 17 of responses or 28.33% of them. This included cleaning the houses and backyard, washing dishes, doing the laundry, and watering the plants. Another response is 12 or 20% of them went to the Mosque to pray during the weekend. Other things that students accomplished the first week include going to school for a group project (9 of them or 15%), accompanying parents and relatives (8 of them or 13.33%), having a bonding moment with a friend (7 or

11.67%), helping parents in the farm (4 of them or 6.67%), and helping parents in the market (3 of them or 5%).

In the second week, most of the students also helped in the household chores (20 of them or 33.33%), also followed by going to the Mosque to pray (13 of them or 21.67%). Other things that students accomplished include accompanying parents and relatives (11 of them or 18.33%), going to school for a project (5 of them or 8.33%), having a bonding moment with friend (4 of them or 6.67%), helping parents in the farm (5 of them or 8.33%) and helping parents in the market (2 of them or 3.33%).

Table 18

First round of intervention responses of the "Thank You" notes

	First Week		Second Week	
Responses	*frequency*	*%*	*frequency*	*%*
I thanked my parents for giving me 'baon' (money).	25	41.67%	20	33.33%
I thanked Allah for everything He has done.	20	33.33%	18	30.00%
I thanked my classmates for their company and support.	7	11.67%	8	13.33%
I thanked my siblings/relatives for their constant help	5	8.33%	6	10%
I thanked my teacher for the encouragement I received.	2	3.33%	4	6.67%
I thanked my neighbours for the care and concern.	1	1.67%	4	6.67%
TOTAL	60	100	60	100

Table 18 shows the first two weeks of the intervention, which is the first round of the positive education intervention, where students wrote their notes about people they wanted to say thank you to. It further shows that in the first week, most the students thanked their parents for giving them "baon", a Filipino term of money to be spent on food and transportation given to pupils or students for going to school, with 25 of them or 41.67%. Another response shows that they thanked Allah for everything He has done for them and their family, with 20 of them or 33.33%. Other responses for the students "thank you note" include thanking their

classmates for their company and support (7 or 11.67% of them), thanking their brothers, sisters and relatives for their constant help (5 or 8.33% of them), thanking their teacher for the encouragement they received (2 or 3.33% of them), and thanking neighbor for their care and concern (1 or 1.67%. of them). In the second week of the intervention, most of them again thanked their parents for giving them "baon" (20 or 33.33% of them), followed by thanking Allah (18 or 30% of them), thanking their classmates for their company and support (8 or 13.33% of them), thanking their brothers, sisters and relatives for their constant help (6 or 10% of them), thanking the teacher for the encouragement received (4 or 6.67% of them). and thanking their neighbors for their care and concern (4 or 6.67% of them).

Table 19

Second round of intervention responses of the "I did it" notes

	Third Week		Fourth Week	
Responses	*frequency*	*%*	*frequency*	*%*
I helped doing household chores.	20	33.33%	18	30.00%
I went to Mosque (Muslim church) to pray.	19	31.67%	28	46.67%
I went to school and helped our group activity/project.	14	23.33%	5	8.33%
I accompanied my parents/relatives to somewhere.	2	3.33%	8	13.33%
I went out with my friends and had bonding moments.	2	3.33%	0	0.00%
I helped my parents in the farm.	2	3.33%	0	0.00%
I helped my parents sell in the market.	1	1.67%	1	1.67%
TOTAL	60	100	60	100

Table 19 shows the second two weeks of the intervention, which is the second round of the intervention, where students wrote their notes saying the things they had done. It again shows that in the third week, most of the students helped doing household chores, with 20 responses or 33.33%. This included cleaning the houses and backyard, washing of dishes, doing the laundry and watering the plants. The second highest (19 or 31.67% of them) went to the Mosque to pray. Other things that students accomplished the third week include going to

school for a group project (14 of them or 23.33%), accompanying parents and relatives (2 of them or 3.33%), having a bonding moment with friend (2 or 3.33%), helping parents in the farm (2 of them or 3.33%) and helping parents in the market (1 of them or 1.67%).

In the fourth week, most of the students went to the Mosque to pray (28 of them or 46.67%), followed by doing the household chores (18 of them or 30%). Other things that students did include accompanying parents and relatives (8 of them or 18.3%), going to school for a project (5 of them or 8.3%), and helping parents to sell in the market (1 of them or 1.7%).

Table 20

Second round of intervention responses of the "Thank you" notes

	Third Week		Fourth Week	
Responses	*frequency*	*%*	*frequency*	*%*
I thanked my parents for giving me 'baon' (money).	14	23.33%	8	13.33%
I thanked Allah for everything He has done.	33	55.00%	37	61.67%
I thanked my classmates for their company and support.	4	6.67%	8	13.33%
I thanked my siblings/relatives for their constant help.	5	8.33%	5	8.33%
I thanked my teacher for the encouragement I received.	4	6.67%	2	3.33%
I thanked my neighbours for the care and concern.	0	0	0	0
TOTAL	60	100	60	100

Table 20 shows the third and fourth weeks of the intervention which is the second round of the positive education intervention. It further shows that in the third week, most of the students were very thankful to Allah for everything He has given them (33 of them or 55%). This is followed by thanking their parents for giving them "baon" (14 of them or 23.33%). Other responses for the students' "thank you note" include thanking their classmates for their company and support (4 or 6.67% of them), thanking their brothers, sisters and relatives for their constant help (5 or 8.33% of them), and thanking their teacher for the encouragement they received (4 or 6.67%). In the fourth week, most of the students were very thankful to Allah for everything He has given them (37 of them or 61.67%). This is followed by thanking

their parents for giving them “baon” (8 of them or 13.33%). Other responses for the students’ “thank you note” include thanking their classmates for their company and support (8 or 13.33% of them), thanking their brothers, sisters and relatives for their constant help (5 or 8.33% of them), and thanking their teacher for the encouragement they received (2 or 3.33%).

Chapter 5: Conclusion, Implications, Limitation, and Future Exploration

The purpose of this research study is to determine and investigate the impact of using positive education in mathematics lessons through the STMP model in the performance of students, in lessening the level of anxiety of students and maximizing their life satisfaction. The study also wanted to give pedagogical contribution to the academic community in the affective domain of mathematics through the learning materials that this study created.

It also explored the students' and teachers' experiences on the integration of positive education and determined its effect on the mathematics performance and level of conflict-affected students in Maguindanao, the Philippines. This mixed method research answered queries related to:

1. Exploration and discussion of students' and teachers' experiences on the positive education intervention through the STMP model carried out in the intervention module in relation to mathematics performance, anxiety level and life satisfaction.

2. Discussion of the mathematics performance of students, their level of anxiety and life satisfaction before and after positive education intervention.

3. Determination of the significant difference in the pre-assessments and post-assessments of the mathematics performance, level of anxiety of students and their life satisfaction with mathematics.

4. Investigation into whether the level of anxiety predict mathematics performance after controlling the effects of positive education and the determination if experimental group and control group would both obtain a significant result through hierarchical regression analysis. The correlation between the mathematics performance in the level of anxiety of students was also determined.

Conclusion

Based on the finding of this study, the following conclusions are therefore drawn:

1. Students' experiences in this study of positive education intervention brought positive feedback from them. Their level of anxiety improved, and life satisfaction was enhanced. Results of academic performance in mathematics also suggest that positive education should be a tool for connecting the students' well-being and performing better in the class. Teachers' experiences are positively suggesting the need to apply this type of strategy to this type of environment resulting, in the high level of anxiety and low life satisfaction.

2. Students' level of anxiety was moderate in two schools before the intervention, but both became low levels after the intervention. Life satisfaction with mathematics was slightly satisfied before the intervention to satisfied after the intervention. Academic performance was from Beginning level to Proficiency level. These results conclude that the positive education intervention worked in the case of Maguindanao.

3. The pre-assessment and post-assessments of the level of anxiety, life satisfaction and mathematics performance all had significant differences. The significant relationship of mathematics performance to the level of anxiety is significant, but not in the life satisfaction with mathematics of students. This non-significance of mathematics performance and life satisfaction could be explained in the subjective theory of life satisfaction. This concludes that life satisfaction can be achieved even without intervention if the students felt the care and love of the family.

4. Since life satisfaction did not have significant relationship with academic performance in mathematics after the intervention, it was not included in the regression analysis. The regression analysis revealed that positive education significantly moderated the relationship between the level of anxiety and academic achievement of students in

mathematics. Results conclude that level of anxiety had a negative impact on the academic achievement of mathematics. This accepts H_{11} and rejects H_{O1}. Positive education had a positive impact to the level of anxiety of students. This implies acceptance of H_{12} and rejection of H_{02}. Positive education significantly moderated the relationship between the level of anxiety and academic achievement in mathematics. This implies acceptance of H_{13} and rejection of H_{03}.

5. In addition, the test of simple slopes revealed that the relationship between the level of anxiety and academic performance was significant in the experimental group but not significant in the control group. The relationship between the level of anxiety and academic achievement in mathematics is significant in the experimental group. This implies acceptance of H_{14} and rejection of H_{04}. The relationship between the level of anxiety and academic achievement in mathematics is not significant in the control group. This implies acceptance of H_{O5} and rejection of H_{15}. These results give way to the conclusion that a significant relationship is brought and being attributed by the positive education intervention.

Implications

Based on the summary of the findings, the following implications are brought up.

1. The first implication brings another strategic and practical learning and teaching mathematics under the STMP model. Although the model is still very young and needs further refinement, it can't be denied that encouraging positive education within schools is distinctly a sensible pursuit, and this study achieves this in a more attainable level. Mathematics is often referred to as a difficult subject but, teaching it with a sense of positivity would take a step closer to making it more meaningful to students, particularly in the case of Maguindanao in the Philippines. The significant results of the experimental group's academic achievement and level of anxiety are an indication that there is a need to

make learning to this type of student more sensible and worthwhile. This is another backup to the Positive Behavioral Interventions and Supports (PBIS). PBIS is a "one whole-school prevention strategy" that transforms the learning environment by generating enriched measures and practices to encourage positive variations in learners' and teachers' behaviors (Barrett et al., 2008). This study adds also information to the International Positive Education Network (IPEN) on their support and drive to make changes in education around the world (Bott et al., 2017).

2. The second implication brings the notion of the three concepts of this research: level of anxiety, life satisfaction and academic performance. The help of STMP model in positive education as a motivation and intervention contributes to the students' academic success leading to lessening the anxiety level and maximizing life satisfaction. The intervention is an efficient encouragement state which guides the student performance for successful involvement in mathematics lessons. The activities in positive education have helped the students diminish and minimize their anxiety level. In terms of mathematics anxiety level, Kesici and Erdogan (2009) revealed that motivation obviously reduces anxiety levels of students. They further claimed that achievement motivation had a negatively significant impact on anxiety, specifically in mathematics.

3. The third implication answers life satisfaction as not significantly correlated with academic performance, 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. Arenas and Man (2020) claimed in the results of their study that life satisfaction is subjective and varies from one individual to another, regardless of socio-economic status. 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.

4. The fourth implication goes to the attainment of the positive education elements such as connection with others, responsibility, strength, kindness and meaning in the STMP model. This also gives way to the attainment of purpose of Seligman's PERMA Model (Positive Emotion, Engagement, Relationship, Meaning, Accomplishment) along with the other positive education perspectives. Norrish et al. (2013) noted that the primary aim of positive education is the promotion of flourishing and positive mental health inside the classroom. The findings of this study targeted this basic aim of positive education. Theoretically, this study is for them a support of the Hebb's theory of arousal and cognitive interference model. The results validate by indicating that those with higher levels of anxiety are likely to achieve poorly in academics. However, positive education intervention significantly moderates the relationship between the level of anxiety and academic performance. With this, Bond et al. (2007) recommended that schools deliver available and relatively secure sites within which to find interventions to encourage 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. This is also a great support on the aims of endeavors of the United Nations International Children's Emergency Fund that works across the globe to extend help to achieve a world where all children, especially the weakest and most disadvantaged have equal opportunities to survive and flourish.

5. The fifth implication is about its applicability and timely approach to the curriculum change of the Philippines. The Department of Education of the Philippines can implement the STMP model in the local communities affecting the well-being of these less privileged

students that often lead to a high level of anxiety and low academic performance, particularly in mathematics. In a community where peace is unstable and students live in distress, this concept of positive education is much more needed than anywhere else. The result of this study implies and concludes that positive education is an essential tool in upholding the K-12 curriculum in the country, which is truly comprehensive and made around the needs of the students and the community, particularly in that of Maguindanao province.

6. The final implication is its potential to be applied as one of the pedagogical approaches and strategies that other international schools could apply. These international schools may include this type of challenging students and the community. In one way or another, this strategy can be applicable and utilized across the globe aiming to uplift students' well-being and strengthening the concept of positive education in the curriculum.

Limitations

This study has some scope and limitation. Below are the existing limitations of the study:

1. This study could not be possible without limitations. There were only two schools involved with a limited number of students in the experimental and control group. The broader the scope, the better it gets. The students' quality and characteristics are also confined in this type of environment.

2. The assessment materials, particularly the level of anxiety, are quite vague as teachers needed to explain what they refer to when students are assessing themselves in terms of their level of anxiety.

3. The items are only limited to the standardized assessment tools in the level of anxiety and the improvised life satisfaction with Mathematics.

4. The period of conducting the intervention is just a quarter of the entire school year. The intervention will have a good effect should it be long enough.

5. The intervention module made by the researcher needs to include all lessons in mathematics for the entire school year to make the most of the outcome of the intervention in the STMP model.

6. Demographic factors were not considered in the regression analysis since they are secondary variables affecting academic performance, life satisfaction and level of anxiety of students. Positive education in this study only moderated the relationship of academic performance, life satisfaction and level of anxiety which are the core variables of the survey questionnaire and interview.

7. A longitudinal study on a target may be worthwhile for further studies in the future. This current study is limited to a smaller scale due to time and resource constraints.

Issues for further development and recommendation

The integration of positive education is strengthened by a growing body of studies involving collaborative learning strategies on teaching. The STMP model in this study is still very young and needs further refinement. However, the STMP model in mathematics lessons is a gateway and entry point apply the concept in some non-mathematics subjects in the Philippines. Better consideration of the critical components of positive education will also help determine 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, the level of anxiety is minimized, and their valuable insights are supported. Hence, it is recommended that other disciplines join hands together to promote and strengthen the notion of positive education.

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