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Teaching Strategies and Social Support on Students' Mathematics Achievement, Attitude, and Anxiety

ABSTRACT: *The study aims to explore and analyze the impact of teaching strategies and social support on the Mathematics achievement, attitude, and anxiety among grade 8 students during the school year of 2018-2019. The population composed of 98 students of public secondary schools chosen through convenience non-random sampling. The instruments used to gather data are Personal Data Sheet, Teacher's Strategies Mathematics Scale, Attitude Scale, Anxiety Scale, and Social Support Scale. The students' first term Mathematics grades for school year of 2018-2019 represent their achievement. The data were analyzed through Mean, Pearson Product Moment Correlation, One-Way Analysis of Variance, and Stepwise Regression Analysis. The results revealed that teaching strategies and teachers', parents', and peers' support to the respondents are very satisfactory and moderately satisfactory correspondingly. The achievement and attitude of respondents towards Mathematics is satisfactory, while anxiety level is moderately satisfactory. The teaching strategies are predictors of achievement and attitude. Hence, teachers should constantly enhance students' abilities, attitude, and behavior in number related courses. Consequently, a research on exploring the student's self-efficacy, parents', and teachers' attitudes towards Mathematics among students in selected secondary schools of Division of Isabela, Philippines can be pursued. A training program on strategies for enhancing the teachers' skills in promoting their intellectual and social support abilities could also be designed and implemented.*
KEY WORD*: Mathematics Achievement; Attitude; Anxiety; Social Support; Teaching Strategies.*

RINGKASAN*: "Strategi Pengajaran dan Dukungan Sosial terhadap Prestasi, Sikap, dan Kecemasan Siswa dalam Matematika". Penelitian ini bertujuan untuk mengeksplorasi dan menganalisis dampak dari strategi pengajaran dan dukungan sosial terhadap prestasi, sikap, dan kecemasan dalam Matematika di antara siswa kelas 8 selama tahun ajaran 2018-2019. Populasi terdiri dari 98 siswa sekolah menengah negeri yang dipilih melalui sampel acak yang tidak biasa. Instrumen yang digunakan untuk mengumpulkan data adalah Lembar Data Pribadi, Skala Matematika Strategi Guru, Skala Sikap, Skala Kecemasan, dan Skala Dukungan Sosial. Nilai Matematika semester pertama siswa untuk tahun ajaran 2018-2019 mewakili prestasi mereka. Data dianalisis melalui Rerata, Korelasi Pearson Product Moment, Analisis Varian Satu Jalur, dan Analisis Regresi Stepwise. Hasil penelitian menunjukkan bahwa strategi pengajaran dan dukungan guru, orang tua, dan teman sebaya kepada responden sangat memuaskan dan tingkat memuaskan secara moderat. Prestasi dan sikap responden terhadap Matematika memuaskan, sedangkan tingkat kecemasan cukup memuaskan. Strategi pengajaran adalah prediktor pencapaian dan sikap. Karena itu, guru harus terus-menerus meningkatkan kemampuan, sikap, dan perilaku siswa dalam sejumlah matapelajaran terkait. Konsekuensinya, sebuah penelitian untuk mengeksplorasi efikasi-diri siswa, sikap orang tua, dan guru terhadap Matematika di antara siswa di sekolah menengah yang terpilih di Daerah Bagian Isabela, Filipina dapat dilakukan. Program pelatihan tentang strategi untuk meningkatkan keterampilan guru dalam mempromosikan kemampuan dukungan intelektual dan sosial mereka juga dapat dirancang dan diimplementasikan.*
KATA KUNCI*: Prestasi Matematika; Sikap; Kecemasan; Dukungan Sosial; Strategi Mengajar.*

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INTRODUCTION

Teaching Mathematics, like teaching other subjects, requires a lot of effort on the part of the teachers. Teachers are pressured to make the students learn. In so doing, teachers use teaching strategies and appropriate instructional materials to make learning effective and meaningful. Effective teaching requires "flexibility and creativity, constant monitor and adjustment" of the teaching techniques, because teachers influence students' performance and attitude towards the subject. Hence, efforts to insure quality teaching and learning of Mathematics are exerted by institutions and agencies. Teachers keep on discovering effective strategies and ways to support students' learning through training and research, while the educational entities conduct monitoring and evaluation of curriculum and programs (Mulligan, 2011; Ganal & Guiab, 2014; and Li & Schoenfeld, 2019).

The PISA (Programme for International Student Assessment), by the OECD (Organization for Economic Co-operation and Development), evaluates educational systems on the scholastic performance among 15 year old pupils in Mathematics, Science, and Reading. The data push countries to improve their education policies and outcomes. PISA measures problem solving and cognition. It tests the literacy and competence of students in Reading, Mathematics, and Science on an indefinite scale (*cf* Carnoy *et al*., 2015; Collas-Monsod, 2019; and Li & Schoenfeld, 2019).[1]

Results in Mathematics reveal that Singapore ranked the highest, followed by Hong Kong, South Korea, Taiwan and Japan, Northern Ireland, Russia, Norway, Ireland, and England. Results disclosed that boys outperformed girls by five score points in Mathematics, on average across OECD countries, but girls outperformed boys in Science by two score points. While boys significantly outperformed girls in Mathematics in 31 countries and economies, in 12 countries/economies the opposite pattern was observed (Coughlan, 2016; Vasagar, 2016; and Li & Schoenfeld, 2019).

Also, in 2015, the TIMSS (Trends in International Mathematics and Science Survey)' study reported that students from Singapore, Hong Kong, and Japan consistently beat other students in Mathematics. Boys favor more Mathematics than girls. The lessons in higher grades are already taught in the lower grades. Preprimary students perform better through the fourth grade with active engagements during instruction (Mullis, Martin & Foy, 2016; Vasagar, 2016; and Moore, 2018).

Notably, both reports previously mentioned reveal that Philippines is among the low performing countries in Mathematics. However, in the country context, the K-12 (Kindergarten-Twelfth Grade)'s curriculum addresses the educational needs and issues of the society. It pushes the administration to apply tighter monitoring and supervision to assess developments and challenges learners, teachers, and staff meet. The teaching personnel and their counterparts are encouraged and challenged to be critical, creative, and reflective in their functions to improve learning outcomes (SEI-DOST & MATHTED, 2011; Mata, Monteiro & Peixoto, 2012; and Mullis, Martin & Foy, 2016).

Considering the achievement of students in Mathematics and the factors that influence students' achievement, such as teaching strategies, teachers support, parents support, peer support, and students' attitude towards the subject, this present study aims to contribute to raise performance of Filipinos in Mathematics. Consequently, the findings of this study may be a springboard to the management to plan, design, execute, and evaluate continually all aspects of the curriculum to produce quality education outcomes. This may also supply administrators insights on improving and nurturing relationships, and adapt policies and programs on hiring, selecting, retaining, promoting, and capacitating teachers. Moreover, this may yield feedback to management and teachers about students' perception and attitude on Mathematics, teachers, parents, and peers for prompt and appropriate interventions.

Statement of the Problem. This study explored and analyzed the impact of teaching strategies and social support on

[1]See also, for example, "About PISA" by OECD [Organization for Economic Co-operation and Development], on 8th February 2018.

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the Mathematics achievement, attitude, and anxiety among grade 8 students in public national high schools in Alicia, Isabela, the Philippines, during the school year of 2018-2019.

It resolved the following inquiries: (1) What is the perception of the respondents on the teacher's strategies in teaching Mathematics?; (2) What is the level of social support of teachers, parents, and peers on the respondents in Mathematics?; (3) What is the level of the respondents' achievement, attitude, and anxiety in Mathematics?; (4) Is there a significant relationship between teaching strategies and social support on students' Mathematics achievement, attitude, and anxiety?; (5) Is there a significant difference in the Mathematics achievement, attitude, and anxiety among the respondents when grouped according to gender, family monthly income, and parents' highest educational attainment?; and (6) Which among the variables best predict the Mathematics achievement, attitude, and anxiety among the respondents?

Hypotheses. Firstly, "there is no significant relationship between teaching strategies and social support on the Mathematics achievement, attitude, and anxiety among the respondents". Secondly, "there is no significant difference in the Mathematics achievement, attitude, and anxiety among the respondents when grouped according to gender, family monthly income, and parents' highest educational attainment". Thirdly, "none of the variables best predict the Mathematics achievement, attitude, and anxiety among the respondents".

Framework of the Study. The impact of teaching strategies and social support on students' Mathematics achievement, attitude, and anxiety is anchored on the Normative Theory of Teaching; and relevant literature on teaching strategies, social support, and achievement attitude and anxiety in Mathematics (Kumar, 2012; Emmert, 2015; and Prahmana *et al*., 2019).

Normative Theory of Teaching has four theories of teaching: (1) *the Cognitive Theory of Teaching,* which assumes that one theory of teaching cannot serve the purpose of education, hence, there should be more than one theory because teaching may be analyzed in several ways; (2) *Theory of Teacher-Behavior,* which concerns the interaction between the teacher and students in the classroom; (3) *Psychological Theory of Teaching,* which focuses on the contractual relationship between the teacher and learners; and (4) *General Theory of Teaching,* which assumes that teaching is a process designed and performed to make change in the behavior of students (Chaudhary, 2013; Neha, 2013; and Podgurski, 2016).

The Normative Theory explains the relationship among teaching variables on the basis of observations in normal teaching condition. Fundamentally, quality learning requires highly competent and committed teachers employing active pedagogies (*cf* Chaudhary, 2013; Neha, 2013; and UNESCO-IBE, 2013).

Strategies are means and methods teachers use to facilitate learners' acquisition, understanding, and application of knowledge, skills, attitudes, and values. Teachers apply many ways of teaching content relevant to students' needs and capacities to learn. Anything, the teacher does and fails to do in the classroom redound to the learners (Philip, 2015; Darling-Hammond *et al*., 2019; and Zhao, Mok & Cao, 2020).

Claas Wegner *et al*. (2013), and other scholars, enumerated the different types of strategies. *Cooperation Strategies* make students support one another in realizing the learning objectives. Students work in pair or group to fulfill the tasks. They use conversational, decision-making, communication, and conflict-management skills. The teacher guides and facilitates the learning environment. This is useful and applicable for all students (Wegner *et al*., 2013; Celis & Cárdenas, 2014; and Galvis, 2018).

Elaboration Strategies develop remembering and understanding of knowledge and link new information with schemata. Students create analogies and mnemonics to express what they have learned. *Motivational and Emotional Strategies* influence student's learning. It drives the student to achieve a goal. Its strength affects the action's duration and intensity. Highly

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motivated learners develop and show stable emotions, while poorly motivated students manifest otherwise (Fry, Ketteridge & Marshall eds., 2009; Wegner *et al*., 2013; and McCombs, 2017).

In *Revision Strategies,* students acquire knowledge requiring constant reconstruction, modifications, and improvement to become relevant to existing scientific realm. In *Organizational Strategies,* knowledge is connected to different knowledge elements. The information is identified, combined, and clustered for cognition. Lastly, *Control Strategies* are metacognitive strategies, which regulate one's information processing, check the learning progress, adapt one's learning to the tasks, and lead learners to reflect (Krathwohl, 2002; Wegner *et al*., 2013; and Djudin, 2017).

Relatedly, other types of teaching strategies include: firstly, *Lecture***.** The teacher communicates huge amount of information to students, masters the content, controls the discussion, and is desirable to students. Secondly, *Discussion.* This is a forum for open-ended, collaborative exchange of ideas among a teacher and students or among students for furthering students thinking, learning, problem solving, understanding, or literary appreciation. Thirdly, *Active Learning.* It enables students to maximize their sensitivities for meaningful and productive learning. Students are engage in problem-solving, debate, research, making projects, simulations, role playing, and other related activities (Timperley *et al*., 2007; Podgurski, 2016; and Darling-Hammond *et al*., 2019).

Fourthly, *Cooperative Learning.* Students work together to achieve the common course objectives. The groupings could be mixed on sex, abilities, etc. Fifthly, *Integrating Technology.* This extends the experiences of faculty and students and promotes communication between teacher and students. The last, sixthly, *Distance Learning.* Learning happens outside of the classroom. The teacher and students are in different place and time. Television, computer, and correspondence are used (Schultz, Schultz & Round, 2008; Johnson & Johnson, 2015; and Hernawati, 2017).

On another note, the following are strategies considered as six keys to classroom excellence: (1) *Interest and Explanation*, in which teachers should explain content to students connecting their schemata to the new lesson to learn and apply it; (2) *Concern and Respect for Students and Student Learning,* in which teachers who apply the principles of teaching and learning, and react accordingly to students and situations realize their roles as builders of their charge's optimum development; (3) *Appropriate Assessment and Feedback,* by using authentic and relevant assessment techniques allows comprehensive and objective evaluation of learning outcomes; (4) *Clear Goals and Intellectual Challenge,* in which realistic goals direct students' behavior toward the tasks to be accomplished, a knowledge and understanding of the tasks push students to act desirably and become active throughout the learning process; (5) *Independence, Control, and Active Engagement,* in which teachers provide freedom to students in learning to foster critical thinking, creativity, responsibility, and perseverance; and (6) *Learning from Students,* in which good teaching is applying the results of evaluation to better education outcomes, teachers should exercise scientific character and acknowledge that teaching and learning are reciprocating processes (Timperley *et al*., 2007; Weimer, 2009; and Darling-Hammond *et al*., 2019).

Moreover, M.H. Behzadi, F.H. Lotfi & N. Mahboudi (2014), and other scholars' findings, declared that students taught with emphasis on study skills perform and achieve better than those taught with the traditional or usual mode of delivering content (Behzadi, Lotfi & Mahboudi, 2014; and Ledesma, 2017). Still, N.A. Mokmin (2015), and other scholars' findings, disclosed that the game-based multimedia application facilitates learning. Students are actively involved in the tasks (Mokmin, 2015; Plass, Homer & Kinzer, 2015; and Rondina & Roble, 2019).

R.G. Cuya et al. (2017), and other scholars' study, affirmed that the use of non-Math analogies in teaching Mathematics improved, both students' achievement and attitude (Savelsbergh *et al*., 2016; Cuya *et al.,* 2017;

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and Abramovich, Grinshpan & Milligan, 2019). C.D. Herrera & R.V. Dio (2016), and other scholars's findings, showed that students are moderately ready on the 17 pre-requisite competencies of General Mathematics and not ready on 8 of them. They proposed the use of Animath for students to master the least mastered competencies; and teachers should know the pre-requisites of senior high school General Mathematics (Fry, Ketteridge & Marshall eds., 2009; Herrera & Dio, 2016; and Niss, 2018).

J.P. Ledesma (2017), and other scholars' study, recommended that teachers need continuing professional education to better their competence; students must learn using the multiple intelligences, and the guidance program should address the personal and emotional needs of students (Austin, 2016; Ledesma, 2017; and Darling-Hammond *et al*., 2019).

In consolidation to improve students' abilities and attitudes in Mathematics, E. Sinay & A. Nahornick (2016), and other scholars' study, forwarded the following recommendations for all teachers to commit in their teaching practices: (1) build a fostering classroom atmosphere; (2) provide a grounded Mathematics experience during the critical period of development; (3) teach realistically to develop reasoning skills; (4) enhance problem-solving; (5) sustain collaborative interactions in Mathematics; (6) hold extra-ordinary beliefs of all students; (7) utilize knowhow in Mathematics instruction; and (8) provide relevant and diverse assessment tools (*cf* Sinay & Nahornick, 2016; Abramovich, Grinshpan & Milligan, 2019; and Darling-Hammond *et al*., 2019).

Social support means someone is cared for, receives assistance from other people, and a member of a supportive social network. Support comes from family, friends, pets, neighbors, coworkers, organizations, etc. The government provides social support in terms of public aid (Neal, 1986; Lakey, 2010; and Berger, 2013).[2]

There are four common functions of social support: (1) *Emotional Support*, this includes empathy, concern, affection, love, trust, acceptance, intimacy, encouragement, or caring, it is also the warmth and nurturance provided by sources of social support; (2) *Tangible Support*, this constitutes financial assistance, material goods, or services, it encompasses the concrete and direct ways people assist others; (3) *Informational Support*, this relates to provision of advice, guidance, suggestions, or useful information to someone, it helps others solve problems; and (4) *Companionship Support*, this offers someone a sense of social belonging, like engagement in shared social activities (Lakey, 2010; Anders *et al*., 2017; Wong, Tao & Konishi, 2018; and *ibidem* with footnote 2).

Social support is also perceived and received and structural or functional. Perceived support is the person's judgment that people provide during times of need. Received or enacted support includes the actions of people given during times of need. Structural support or social integration is the affiliation of the person within a social network. It is aligned to family relationships, friends, club, and organization memberships. Functional support defines the roles people in the network provide, such as emotional, instrumental, informational, and companionship (Lakey, 2010; Davis et al., 2016; and Darling-Hammond *et al*., 2019).

Perceived support is consistently linked to better mental health, while received support and social integration are not (Lakey, 2010; Mata, Monteiro & Peixoto, 2012; and Nurullah, 2012). Research confirmed that perceived and untapped social support is more effective and beneficial than utilized social support (Lakey, 2010; Lazarides & Ittel, 2012; and Wiegel, Sattler & Göritz, 2015). Meanwhile, E.S. Zhou, F.J. Penedo & J.E. Lewis (2010); E.T.K. Wong & W.W.K. Ma. (2010), and other scholars, claimed that invisible support, received consciously or unconsciously, posed as the most beneficial. Social support assures the individual love, protection, respect, appreciation, and a member of a reciprocal communication network (*cf* Erden & Akgül, 2010; Wong & Ma, 2010; Zhou, Penedo & Lewis, 2010; and Camp, 2011).

[2]See also "Social Support". Available online at: https://en.wikipedia.org/wiki/Social_support [accessed in Alicia, Isabela, Philippines: May 2, 2019].

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The study of X. Liu (2018), and other scholars, disclosed that female students receive less teacher support and only receive full support at the seventh grade. Also, grade 7 students without social support perform poorly in Mathematics and, consequently, to show the same pattern of performance in the next five years. There is likewise a positive relation between learners' academic and teachers' support, and a negative link between bad attitude and social support. This connotes that students, who do not receive social support, are negative in their behaviours (Mata, Monteiro & Peixoto, 2012; Liu, 2018; and NCTM, 2019).

Students desire and need a strong supportive connections from significant others. They are motivated and actively engaged in school tasks, when they obtain support from teachers, family, and friends. Students involved in school become secured, happy, and confident; and develop sense of belongingness. Parents' support to their children make the latter improve academically and behaviorally. Parents' active involvement in meetings, programs, activities, and projects in the school produce happiness, pride, self-esteem, and positive behaviors to their children (Hancock & Zubrick, 2015; Darling-Hammond & Cook-Harvey, 2018; and Liu, 2018).

Teachers are duty-bound to transfer the home to the school with love, empathy, kindness, impartiality, and care. They should support students in all their engagements for the latter to be clearly directed, motivated, and happy. Teacher support enhances and sustains rapport to students and vice versa. In this context, M.M. Chiu & B.W.Y. Chow (2011); C. Longobardi *et al*. (2016); and other scholars, affirmed that students improve cognitively, affectively, and behaviorally, when they receive support (Chiu & Chow, 2011; McKay, 2013; and Longobardi *et al*., 2016).

The study of L. Rice *et al*. (2013), and other scholars, indicated that students' interest towards STEM (Science, Technology, Engineering, and Mathematics) is very low as caused by their attitude, ability, and social support in developing their abilities and careers to STEM (Rice *et al*., 2013; Wiebe, Unfried & Faber, 2018; and Margot & Kettler, 2019). A. Veloo, R. Nor & R. Khalid (2015), and other scholars, stated also that students' attitude and achievement in Physics significantly correlate. Those who are positive in the subject are rated high, while those who are negative obtained low grades (Mata, Monteiro & Peixoto, 2012; Guido, 2013; and Veloo, Nor & Khalid, 2015). C.R.P. Ajisukmo & G. Saputri (2017), and other scholars' study, presented that students' attitudes towards Mathematics correlate with their achievement. Nonetheless, students' metacognitive skills and Mathematics achievement as well as their attitude and metacognitive skills bear no relationships (Bergstresser, 2013; Ajisukmo & Saputri, 2017; and Singh *et al*., 2019).

E.A. Valdez (2016), and other scholars' study, opined that pupils with positive attitude towards Mathematics are confident and successful, and the teacher influences students' learning (Mata, Monteiro & Peixoto, 2012; Mensah, Okyere & Kuranchie, 2013; and Valdez, 2016). L. Mohamed & H. Waheed (2010), and other scholars, listed factors which influence student attitudes: (1) *students' factors*, i.e. achievement, anxiety, self-efficacy, motivation, and school experiences; (2) *school teacher factors*, i.e. teaching materials, classroom management, teacher knowledge, guidance, and beliefs; and (3) *home environment and society factors*, i.e. educational background and parental expectations (Mohamed & Waheed, 2010; Radišić, Videnović & Baucal, 2014; and Blazar & Kraft, 2017).

M. Mata, V. Monteiro & F. Peixoto (2012), and other scholars, in their study, presented the following findings: (1) students' positive attitudes influence their grades and achievement; (2) gender has no bearing but girls continue to hate Mathematics as they advance in school; (3) motivation-related variables predict attitudes; and (4) peers' social support understand the attitudes of students (Mata, Monteiro & Peixoto, 2012; Auliya, 2018; and Mazana, Montero & Casmir, 2019).

Positive attitudes facilitate learning, improve behavior, disposition, and achievement. S. Ursini, M.P. Ramírez & G. Sanchez (2007), as cited also in K. Asante

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(2012) and H. Sahaghi, S. Alipour & M.S. Yailagh (2015)'s studies, expressed that boys are more interested and positive in Mathematics than girls; and noted that school environment, gender identity, teacher, and parent attitudes and beliefs relate to the differences of gender towards Mathematics (Ursini, Ramírez & Sanchez, 2007; Asante, 2012; and Sahaghi, Alipour & Yailagh, 2015). While, T. Scafidi & K. Bui (2010), and other scholars' investigations, confirmed that gender does not influence achievement and attitude towards Mathematics (Scafidi & Bui, 2010; Mata, Monteiro & Peixoto, 2012; and Lee & Anderson, 2015).

Nonetheless, the study of Xin Ma & Nand Kishor (1997), as cited also in M. Mata, V. Monteiro & F. Peixoto (2012) and other scholars, concluded that gender has no bearing on the relationships between attitudes and performance in Mathematics. Though both consider Mathematics as an attractive subject, the boys perform better; thus, they believed that they are more intelligent than girls (Ma & Kishor, 1997; Mata, Monteiro & Peixoto, 2012; and Ganley & Lubienski, 2016). While, J. Green *et al.* (2012), and other scholars, highlighted that attitudes towards learning could be associated to motivation (Green *et al.,* 2012*;* Mata, Monteiro & Peixoto, 2012; and Goldin *et al*., 2016).

M. Mata, V. Monteiro & F. Peixoto (2012), and other scholars, confirmed that attitudes are related to motivation and social support; therefore, implementing strategies to improve teacher support and student engagement is vital in improving attitudes and performance of students throughout their school life (Dunne *et al*., 2007; Mata, Monteiro & Peixoto, 2012; and Abramovich, Grinshpan & Milligan, 2019). While, M. Mato & E. De la Torre (2010), and other scholars' investigation, concluded that positive attitudes parallel better academic performance (Mato & Torre, 2010; Mazana, Montero & Casmir, 2019; and Peteros *et al*., 2019).

S. Maat & E. Zakaria (2010), and other scholars, expressed that students who have higher perception on the learning environment and a better perception of their teachers are more positive towards Mathematics (Maat & Zakaria, 2010; Mata, Monteiro & Peixoto, 2012; and Mazana, Montero & Casmir, 2019). B. Hemmings & R. Kay (2010), and other scholars, also support that students' efforts positively relate to Math attitudes (Hemmings & Kay, 2010; Mata, Monteiro & Peixoto, 2012; and Rikhotso, 2015).

Anxiety is a complex emotion that is closely related to fear and worry. It is an emotional rather than cognitive problem obstructing one's competency to perform activities successfully (Maloney & Beilock, 2012; Luttenberger, Wimmer & Paechter, 2018; and Wang *et al*., 2018). M. Erden & S. Akgül (2010), and other scholars' findings, disclosed that Math anxiety and teacher support significantly predict achievement. Math anxiety and teacher support powerfully predicts males' and females' achievement respectively (Erden & Akgül, 2010; Olango, 2016; and Rodriguez *et al*., 2019).

M. Hamid *et al.* (2013), and other scholars' study, concluded that Mathematics achievement correlate with anxiety, self-esteem, and stress. Mathematics anxiety is not hereditary. However, parents', teachers' and peers' belief, good or bad impact the student's abilities, performance, and attitudes towards Mathematics. Instructional strategies relevant to students' endowments increase support and decrease anxiety. Parents who provide children with fostering home environment learn and succeed, despite the poorest learning environment (*cf* Hamid *et al*., 2013; Dowker, Sarkar & Looi, 2016; and Recber, Isiksal & Koç, 2018).

Basically, performance, attitude, and anxiety are results of student's mix of good and bad experiences in the home and school environment, particularly during the basic education period. A fostering environment creates positive thoughts, actions, and emotions; while a non-fostering environment produces otherwise. Impressions of parents, teachers, peers, and significant others on the child reverberate in the child's mind influencing many aspects of his life. The child becomes bounded to self-fulfilling prophecy causing equilibrium and disequilibrium (Yanuarto, 2016; Buckley, 2018; and Recber, Isiksal & Koç, 2018).

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Thus, the study grounds on a concept that an investigation on the impact of teaching strategies and social support on the Mathematics achievement, attitude, and anxiety among students can help ensure effective implementation of program towards enhancing teachers' pedagogical skills in improving Mathematics achievement and attitude of students. See figure 1.

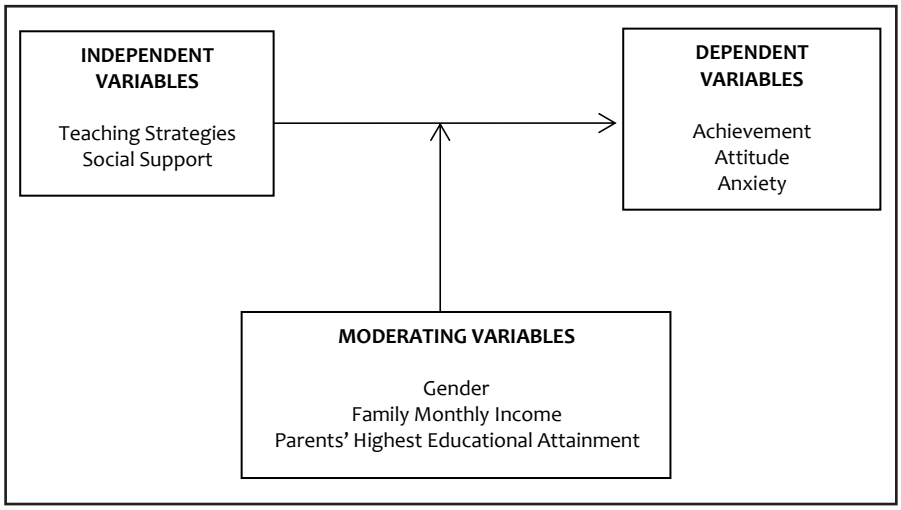

Figure 1:
Research Paradigm

The present study looked into the impact of teaching strategies and social support on the Mathematics achievement, attitude, and anxiety among 98 students of grade 8 in public national high schools in Alicia, Isabela, Philippines, during the school year of 2018-2019. It is hypothesized that: "*There is no significant relationship between teaching strategies and social support on the Mathematics achievement, attitude, and anxiety among the respondents*"; and "*No significant difference exists on the achievement, attitude, and anxiety among the respondents when grouped according to gender, family monthly income, and parents' highest educational attainment*". Finally, "*None of the variables considered in the study best predicts the Mathematics achievement, attitude, and anxiety among the respondents*".

METHODS

Research Design. The study used descriptive research, which makes possible to predict the future in the basis of the findings of the prevailing conditions, and on the basis of reasons of people toward certain issues (Calderon & Gonzales, 2013; Austin & Sutton, 2014; and Creswell, 2014). Specifically, the study is descriptive-correlational, because it established relationship of teaching strategies and social support on students' Mathematics achievement, attitude, and anxiety (Mata, Monteiro & Peixoto, 2012; Siebers, 2015; and Recber, Isiksal & Koç, 2018).

Participants and Sampling. The participants composed of 98 students of grade 8 enrolled during the school year of 2018-2019 in Alicia National High School and Alicia Vocational School in Alicia, Isabela, Philippines. The participants were chosen through convenience non-random sampling technique. One class of the grade 8 students was chosen by the principal of the 2 participating schools as respondents (Calderon & Gonzales, 2013; Austin & Sutton, 2014; and Creswell, 2014).

Data Gathering Procedures. A letter of permission was sought from the schools' division superintendent in the division of Isabela prior to gathering of data. Consequently, the letter was submitted to the principals of the participating schools. The researchers personally administered the instruments to the participants during their class time. The directions were read and explained to ensure clarity, objectivity, and precision of the data to be collected. There was a 100% retrieval of the questionnaires.

Instruments. The instrument, which proved the impact of teachers' strategies and social support on the Mathematics achievement, attitude, and anxiety, consists of 5 (five) parts. The part I, Personal Data Sheet inquires on the gender, family monthly income, and

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Table 1:
Perception of the Respondents on the Teacher's Strategies in Mathematics

Statements	Mean	SD	Remarks
01. Has a thorough knowledge of the subject matter.	4.58	.86	Very Satisfactory
02. Has superb communication skills in conveying the subject to the students.	4.66	.75	Very Satisfactory
03. Is imaginative in the use of teaching activities.	4.51	.75	Very Satisfactory
04. Conveys an enthusiasm for the subject to the students.	4.59	.71	Very Satisfactory
05. Is confident and at ease when teaching.	4.37	1.06	Very Satisfactory
06. Makes frequent use of criticism to motivate students.	1.65	1.30	Poor
07. Makes frequent use of praise to encourage students.	4.34	1.17	Very Satisfactory
08. Makes frequent use of questions to develop students' understanding.	4.60	.81	Very Satisfactory
09. Tries to develop students' interest in the subject.	4.36	1.03	Very Satisfactory
10. Tries to make lessons interesting whenever possible.	4.05	1.23	Very Satisfactory
11. Encourages students' self-initiated work.	3.89	1.32	Satisfactory
12. Stimulates students to think for themselves.	4.63	.62	Very Satisfactory
13. Tries to convey warmth in relationship with students.	4.43	.85	Very Satisfactory
14. Tends to maintain friendly relationships with students.	4.50	.91	Very Satisfactory
15. Shows a personal respect for each student.	4.72	.71	Very Satisfactory
16. Displays a sense of humor to students.	4.46	.89	Very Satisfactory
17. Makes regular use of tests during the course.	4.60	.71	Very Satisfactory
18. Uses various methods of evaluating students.	4.72	.60	Very Satisfactory
19. Has patience when dealing with students.	4.50	.78	Very Satisfactory
20. Relates new learning to students' own experiences whenever possible.	4.49	.69	Very Satisfactory
Teachers' strategies in teaching Mathematics	**4.33**	**.52**	**Very Satisfactory**

Notes: 5 = Outstanding, 4 = Very Satisfactory, 3 = Satisfactory, 2 = Fairly Satisfactory, 1 = Poor.

parents' highest educational attainment. Parts II, III, IV and V are R. Likert (1932)'s questionnaires dealing on Mathematics Attitude with 25 items; Mathematics Anxiety with 15 statements; Teacher's Strategies in Mathematics with 20 statements; and Social Support with 20 statements respectively (Likert, 1932; Mata, Monteiro & Peixoto, 2012; and Mazana, Montero & Casmir, 2019).

The Mathematics Attitude Scale assesses the student's attitudes toward Mathematics. The Mathematics Anxiety Scale was adopted from [44] A. Mateo (2011). The Teacher's Strategies in Mathematics Scale measures the respondents' perception on teaching competence. The Social Support Scale gauges the extent of support students received from peers, teachers, and parents (*cf* Mateo, 2011; Ganley & Lubienski, 2016; and Ramirez, Shaw & Maloney, 2018).

Using the K. Pearson (1895)'s Product Moment coefficient of correlation (r), a reliability of .78 was taken as acceptable. The index of reliability was also tested in terms of Mathematics Attitude, i.e. 0.8976; Mathematics Anxiety, i.e. 0.7972; and Teachers' Strategies, i.e. 0.9172 (Pearson, 1895; Mateo, 2011; and Ramirez, Shaw & Maloney, 2018).

Data Analysis. Mean defined the students' perception of the teachers' competence and the social support they received from their peers, teachers, and parents. K. Pearson (1895)'s Product Moment Coefficient of correlation (r) determined the relationship between the impact of teaching strategies and social support on the students' Mathematics achievement, attitude, and anxiety (Pearson, 1895; Mateo, 2011; and Ramirez, Shaw & Maloney, 2018).

One-Way Analysis of Variance obtained the relationship of teaching competence and social support on the achievement, attitude, and anxiety among the respondents. Stepwise's Regression Analysis determined the variables, which best predict Mathematics achievement, anxiety, and attitude among the respondents (Mark & Goldberg, 2001; Creswell, 2014; and Susanto & Sutarti, 2018).

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RESULTS AND DISCUSSION

Perception of the Respondents on the Teacher's Strategies in Teaching Mathematics. Table 1 shows the respondents' perception of teaching competence as *Very Satisfactory* with the Mean of 4.33 and SD (Standard Deviation) of .52. This implies that the teachers provide quality and competent instruction. The teachers are creative and innovative. There is transfer of learning from continuing professional education. They abide by the principles of teaching and learning and philosophies of education. It can be deduced that the teachers provide quality and competent instruction. The students are very satisfied with teachers' strategies in teaching Mathematics. However, teachers need continuing professional education to better their competence, and students must learn using the multiple intelligences (Ledesma, 2017; Jusoh *et al*., 2018; and NCTM, 2019). See table 1.

Level of Social Support of Peers, Parents, and Teachers to the Respondents. The respondents yielded a Mean of 2.91, or *Moderately Satisfactory*, and SD (Standard Deviation) of .46. This indicates that social and cooperative learning occurs among the respondents. They study and learn with others in doing projects, requirements, solving problems, and other related tasks. They engaged themselves in several social situations to generate conclusions linking with different perspectives for lifetime learning.

On teacher's social support, the respondents disclosed a Mean of 3.56, or *Satisfactory*, and SD of .40. The data provide that teachers exercise impartiality, compassion, and patience to students. They realize their loco parentis role in the classroom and convey high expectations to students, which M. Erden & S. Akgül (2010), and other scholars, found significant positive connection of teacher support to success in Mathematics. Learners perform best, when they receive support from the teacher; thus, become less apprehensive in the subject. With these, the students' morale and dignity are being elevated (*cf* Erden & Akgül, 2010; Mata, Monteiro & Peixoto, 2012; and Acharya, 2017).

As to parental social support, the Mean obtained is 2.28, or *Moderately Satisfactory*, and SD of .75. This implies that the parents are short in providing the necessary learning materials and resources to their children. Parents are not much assisting students in their curricular endeavors perhaps of lack of time and business. Finally, parents are not much appreciative in recognizing simple, but hard-earned and worthy accomplishments of their children. The data implies that parents should be encouraged to give more social support to their children, because parents supportive to their children improve academically and behaviorally. Their attendance and involvement in meetings, programs, activities, and projects in the school produce happiness, pride, self-esteem, and positive behaviors. As pointed out students' achievement is influenced by a supportive network of connections. They are motivated and actively engaged in school tasks, when they obtain support from teachers, family, and friends (Dunne *et al*., 2007; El Nokali, Bachman & Votruba-Drzal, 2010; and Love, 2014).

To sum up, the level of social support in terms of peers, teachers, and parents is *Moderately Satisfactory.* The result implies that there is a need for parents to realize the importance of providing support to their children. That support is consistently linked to: *better mental health* (Hughes & Kwok, 2007; SEI-DOST & MATHTED, 2011; and Mata, Monteiro & Peixoto, 2012); *more effective and beneficial than utilized social support (*El Nokali, Bachman & Votruba-Drzal, 2010; Wiegel, Sattler & Göritz, 2015; and Abramovich, Grinshpan & Milligan, 2019*); and that social support is associated to better achievement among students* (Hughes & Kwok, 2007; Mata, Monteiro & Peixoto, 2012; and Liu, 2018). It, moreover, assures the individual to experience love, protection, respect, appreciation, and becomes a member of a reciprocal communication network (*cf* Erden & Akgül, 2010; Qohar & Sumarmo, 2013; and Lomibao, 2016). See table 2.

Level of the Respondents' Mathematics Achievement, Attitude, and Anxiety. The computed Mean of 81.61 shows the students' satisfactory achievement in Mathematics. They learn the competencies with average

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Table 2:
Level of Social Support of Peers, Teachers, and Parents to the Respondents

Statements	Mean	SD	Level
01. I enjoy learning math with my classmates.	3.35	.70	Satisfactory
02. We help each other learn.	3.33	.74	Satisfactory
03. We go over and discuss each other's work.	3.03	.88	Satisfactory
04. When I speak about my work in front of the class, they listen to me.	2.36	.82	Moderately Satisfactory
05. When I present my work to the class, my classmates ask questions and give feedback.	2.70	.79	Moderately Satisfactory
06. We review what we've learned with one another.	2.67	.98	Moderately Satisfactory
Peers Social Support	**2.91**	**.46**	**Moderately Satisfactory**
07. My teacher isn't fair with me.	3.85	.45	Satisfactory
08. My teacher likes the other students in my class better than me.	3.54	.76	Satisfactory
09. My teacher doesn't make clear what he/she expects from me in school.	3.44	.83	Satisfactory
10. My teacher interrupts me when I have something to say.	3.41	.88	Satisfactory
11. My teacher likes to assist me.	3.58	.69	Satisfactory
12. My teacher is fair with me.	3.49	.77	Satisfactory
13. My teacher's expectations for me are way off base.	3.46	.90	Satisfactory
14. My teacher cares about how I do in school.	3.55	.81	Satisfactory
15. My teacher has patience when dealing with me.	3.75	.57	Satisfactory
Teacher Social Support	**3.56**	**.40**	**Satisfactory**
16. My parents provide enough Math books at home.	1.98	1.07	Poor
17. I have my own study room and table at home.	2.25	1.28	Moderately Satisfactory
18. Computer is available at home.	1.99	1.20	Poor
19. My parents help me do my assignments.	2.45	1.05	Moderately Satisfactory
20. My parents commend my good performance.	2.75	1.18	Moderately Satisfactory
Parent Social Support	**2.28**	**.75**	**Moderately Satisfactory**
Social Support	**2.92**	**.39**	**Moderately Satisfactory**

Notes: 5 = Outstanding, 4 = Very Satisfactory, 3 = Satisfactory, 2 = Moderately Satisfactory, 1 = Poor.

level of performance. The data implies teachers have to device ways to level up the performance of students in Mathematics.

Students have satisfactory attitude towards Mathematics as supported by the Mean of 3.18 and SD (Standard Deviation) of .35. This implies positive attitude towards Mathematics. That it is an interesting subject: they enjoy learning it, and love discovering and doing new things by themselves with the teacher's guidance and facilitation. It could also be influenced by some factors, like: (1) *students' factors*, i.e. achievement, anxiety, self-efficacy, motivation, and school experiences; (2) *school, teacher factors*, i.e. teaching materials, classroom management, teacher knowledge, guidance, beliefs; and (3) *home environment and society factors*, i.e. educational background and parental expectations (Mohamed & Waheed, 2010; Mata, Monteiro & Peixoto, 2012; and Mazana, Montero & Casmir, 2019).

Generally, students have moderate level of anxiety problems as shown in the Mean of 2.44. This also calls for teachers' attention to decrease the level of anxiety in the classroom by employing appropriate motivational strategies and make students really at ease (Siebers, 2015; Blazar & Kraft, 2017; and Abramovich, Grinshpan & Milligan, 2019). See table 3.

Relationship between Teaching Strategies and Social Support on Students' Achievement, Attitude, and Anxiety. Table 4 shows the strength of relationships between teaching strategies and social support with Mathematics achievement, attitude, and anxiety of the respondents. It shows that teaching strategies have moderate positive association with grades; while attitude is moderately negatively associated as reflected in the obtained *r* values of 0.252 and -0.238 respectively. This means that a teaching strategy that best fits students' preference would likely result to better grades; while,

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Table 3:
Level of the Respondents' Mathematics Achievement, Attitude, and Anxiety

Variables	Mean	SD	Level
Achievement	81.61	6.361	Satisfactory
Attitude	3.18	.35	Satisfactory
Anxiety	2.44	.26	Moderately Satisfactory

generally, a poor teaching strategy results to a negative attitude towards the subject.

Findings postulate that perceived teacher support positively predicted the Mathematics achievement. Although the noted association between the variables is not very high, its relationship is significant. This signifies that the relationship is not being caused by chance alone; hence, teaching strategy is really associated with grades and attitudes of the learners (SEI-DOST & MATHTED, 2011; Mata, Monteiro & Peixoto, 2012; and Leon, Medina-Garrido & Nunez, 2017).

On the other hand, there is a very minimal strength of relationships that exist between social support and grades, attitude, and anxiety. Social support is negatively related with grades and anxiety, but positively related with attitude. This confirms that the higher the support coming from the parents, teachers, and peers the lower the grades and higher anxiety, but better attitude towards the subject. However, the established relationship is noted to be insignificant. This implies that it only happens by chance, but not as a result of the effects of the independent variable to the dependent variable (Ganal & Guiab, 2014; Siebers, 2015; and Luttenberger, Wimmer & Paechter, 2018).

Furthermore, this proves that the support given by peers, teachers, and parents is not associated with their grades, attitude, and anxiety. There might be other factors that affect their grades, attitude, and anxiety towards the subject. The result is different from the study of M. Mata, V. Monteiro & F. Peixoto (2012), and other scholars, that disclosed that students have positive attitudes towards Mathematics and underscored the effects of grade and achievement on attitudes. Furthermore, motivation-related variables predict attitudes towards Mathematics, and teachers' and peers' social support significantly influence the attitudes (*cf* Mata, Monteiro & Peixoto, 2012; Mazana, Montero & Casmir, 2019; and Rodriguez *et al*., 2019).

Again, M. Mata, V. Monteiro & F. Peixoto (2012), and other scholars, confirmed that attitudes are related to motivation and social support; therefore, implementing strategies to improve teacher support and student engagement is vital in improving attitudes and performance of students throughout their school life (Mata, Monteiro & Peixoto, 2012; Blazar & Kraft, 2017; and Abramovich, Grinshpan & Milligan, 2019).

M. Mato & E. De la Torre (2010), and other scholars' investigation, concluded that positive attitudes parallel better academic performance (Mato & Torre, 2010; Mata, Monteiro & Peixoto, 2012; and Peteros *et al*., 2019). S. Maat & E. Zakaria (2010), and other scholars, expressed that students who have higher perception on the learning environment and a better perception of their teachers are more positive towards Mathematics (Maat & Zakaria, 2010; Mata, Monteiro & Peixoto, 2012; and Lomibao, 2016). B. Hemmings & R. Kay (2010), and other scholars, also support that students' efforts positively relate to Math attitudes (*cf* Hemmings & Kay, 2010; Ganal & Guiab, 2014; and Peteros *et al*., 2019). See table 4.

Difference in the Mathematics Achievement, Attitude, and Anxiety among the Respondents when Grouped According to Gender, Family Monthly Income, and Parents' Educational Attainment. Table 5 reflects the data on the Mathematics achievement, attitude, and anxiety of the respondents, when grouped according to gender. Females have higher means in attitude and in their anxiety; while the males have higher mean in their grades and lower in anxiety levels.

Furthermore, the t-values for the grades, attitude, and anxiety are 1.622, -1.161, and -1.012 respectively, with p-values of .108, .249, and .314. The null hypothesis is accepted

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Table 4:
Relationship between Teaching Strategies and Social Support on Students' Achievement, Attitude, and Anxiety

Variables		Grades[1]	Attitude	Anxiety[1]
Teaching Strategies	r	.252*	-.238*	.021
	p	.012	.018	.838
	N	98	98	98
Social Support	r	-.191	.137	-.107
	p	.060	.179	.294
	N	98	98	98

Table 5:
Mathematics Achievement, Attitude, and Anxiety among the Respondents When Grouped According to Gender

Variables	Sex	N	Mean	t	df	*p*	Remarks
Grades	Male	47	82.7872	1.622	96	.108	Not significant
	Female	51	80.6667				
Attitude	Male	47	3.1626	-1.161	96	.249	Not Significant
	Female	51	3.2447				
Anxiety	Male	47	2.3887	-1.012	96	.314	Not Significant
	Female	51	2.4418				

indicating "*No significant difference in the three variables, when grouped according to gender*". It implies that the means of the males and females in their grades, attitudes, and anxiety show commonalities. However, though both consider Mathematics as an attractive subject, the boys perform better.

The result supports the study of Xin Ma & Nand Kishor (1997), as cited also in M. Mata, V. Monteiro & F. Peixoto (2012) and other scholars, that gender has no bearing on the relationships between attitudes and performance in Mathematics (Ma & Kishor, 1997; Mata, Monteiro & Peixoto, 2012; and Peteros *et al*., 2019).

J. Green et al. (2012), and other scholars, explained that attitudes towards learning could be associated to motivation and other factors, such as: (1) students' positive attitudes influence their grades and achievement; (2) gender has no bearing but girls continue to hate Mathematics as they advance in school; (3) motivation-related variables predict attitudes; and (4) peers' social support understand the attitudes of students. Positive attitudes facilitate learning: improve behavior, disposition, and achievement (*cf* Green *et al.,* 2012; Mata, Monteiro & Peixoto, 2012; and Capuno *et al*., 2019).

The finding affirm that Math anxiety and teacher support significantly predict achievement (Erden & Akgül, 2010; Hamid *et al*., 2013; Manalaysay, 2019; and Peteros *et al*., 2019). The result shows females have higher Mathematics anxiety than males, which affirms the study of T. Khatoon & S. Mahmood (2010). Furthermore, S. Ursini, M.P. Ramírez & G. Sanchez (2007), as cited also in K. Asante (2012); H. Sahaghi, S. Alipour & M.S. Yailagh (2015); and other scholars, expressed that boys are more interested and positive in Mathematics than girls; and noted that school environment, gender identity, teacher and parent attitudes, and beliefs relate to the differences of gender towards Mathematics (*cf* Ursini, Ramírez & Sanchez, 2007; Khatoon & Mahmood, 2010; Asante, 2012; Sahaghi, Alipour & Yailagh, 2015; and Saidi & Siew, 2019).

This could explain the lower anxiety level of male students and their higher achievement in Mathematics. In the context of this study, there is no significant difference in Mathematics anxiety between males and females. This finding confirms S. Mohamed & R.A. Tarmizi (2010); T. Scafidi & K. Bui (2010); and other scholars, that there is no significant difference in Mathematics anxiety between males and females (Mohamed & Tarmizi, 2010; Scafidi & Bui, 2010; and Manalaysay, 2019). See table 5.

Family Monthly Income. The null hypothesis is accepted implying "No significant difference in the three variables, when grouped

Table 6:
Mathematics Achievement, Attitude, and Anxiety among the Respondents When Grouped According to Family Monthly Income

Variables	Family Income	N	Mean	t	df	*p*	Remarks
Grades	15,000 and Below	64	81.5000	-.665	88	.508	Not significant
	Above 15,000	26	82.5385				
Attitude	15,000 and Below	64	3.2113	.006	88	.995	Not significant
	Above 15,000	26	3.2108				
Anxiety	15,000 and Below	64	2.4063	.184	88	.855	Not significant
	Above 15,000	26	2.3949				

Table 7:
Mathematics Achievement, Attitude, and Anxiety among the Respondents When Grouped According to Parents' Educational Attainment

	Educational Attainment		N		Mean		t		df		p		Remarks	
Variables	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother
Grades	At most High School Level		52	44	81.6731	82.2045	.081	.386	91	91	.936	.700	Not significant	Not significant
	At Least College Level		41	49	81.5610	81.6735								
Attitude	At most High School Level		52	44	3.1554	3.1673	-2.181	-1.467	79.864	91	.032*	.146	Significant	Not significant
	At Least College Level		41	49	3.3122	3.2735								
Anxiety	At most High School Level		52	44	2.4269	2.4318	.017	.780	86.988	91	.987	.437	Not significant	Not significant
	At Least College Level		41	49	2.4260	2.3905								

according to family income". It implies that the respondents reveal sameness in grades, attitudes, and anxiety regardless of their family income, whether high or low. See table 6.

The null hypothesis is accepted indicating "No significant difference in the two variables, when grouped according to fathers' educational attainment"; while a significant difference is noted in their attitude. It describes that their grades and anxiety are the same for those, whose fathers attained at highest school and at least college level. However, there is a significant difference in their attitude, when grouped according to fathers' educational attainment. Those whose fathers attained at least college level have better attitude towards Mathematics than those whose fathers only finished high school.

Therefore, father's educational attainment influences positively the student's academic achievement. Students, whose fathers have higher education, performed higher in Mathematics than students whose fathers have lower educational attainment. This indicates that the father's educational attainment affects heavily the students' academic achievement (*cf* Hughes & Kwok, 2007; Topor *et al*., 2010; and Geist, 2019).

The null hypothesis is accepted. This indicates that the mother's educational attainment leaves no significant impact on the achievement, attitude, and anxiety among the respondents. The respondents' achievement, attitude, and anxiety are close regardless of their mother's highest educational attainment (Yanuarto, 2016; Mazana, Montero & Casmir, 2019; and Peteros *et al*., 2019). See table 7.

Best Predictor of Mathematics Achievement, Attitude, and Anxiety. Result implies for every change of 1 unit in the independent variable results to .261-unit increase in dependent variable (achievement); hence, teaching strategies predict Mathematics achievement. Similarly, for every change of

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Table 8:
Predictor Variables of Mathematics Achievement, Attitude, and Anxiety

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	SE	Beta			LB	UB
(Constant)	1.900	.006	.261	314.390	.000	1.888	1.912
LogStrat	.092	.038		2.451	.016	.017	.167
(Constant)	3.359	.055	-.305	60.526	.000	3.249	3.470
LogStrat	-.999	.345		-2.899	.005	-1.684	-.313

1 unit in the independent variable results to .305-unit increase in dependent variable (attitude), meaning teaching strategies predicts attitude.

There is no indication on change in the dependent variable (anxiety); hence, teaching strategy does not predict Mathematics anxiety. It can be deduced that only teaching strategies impact Mathematics achievement and attitude of students. The result is similar to the studies of L. Mohamed & H. Waheed (2010); E.A. Valdez (2016); and other scholars, that teacher influences students' learning and positive attitude (*cf* Mohamed & Waheed, 2010; Rikhotso, 2015; Valdez, 2016; Magayon & Tan, 2016; and Peteros *et al*., 2019). See table 8.

Summing up, the students recognize and appreciate the teachers' teaching strategies and support extended to them. The peers, teachers, and parents support the students in their academic pursuits. Students show satisfactory achievement, positive attitude, and low anxiety level. Females have better attitude and high anxiety level; while the males perform better in Mathematics. Gender and family monthly income bear no significant difference on the students' achievement, attitude, and anxiety (Mata, Monteiro & Peixoto, 2012; Ganal & Guiab, 2014; Siebers, 2015; Abramovich, Grinshpan & Milligan, 2019; and Mazana, Montero & Casmir, 2019).

There is no significant difference in the achievement, attitude, and anxiety among the students when grouped according to family monthly income. The father's education influences the student's achievement and attitude; while the mother's educational attainment shows no bearing. Finally, among variables considered, teaching strategies and teacher social support best predict achievement and attitude.

CONCLUSION [3]

The study explores the impact of teachers' teaching strategies and social support to students' Mathematics achievement, attitude, and anxiety. While vast literature offers insights and activities for ensuring effective strategies in teaching Mathematics and making students perform high, the study avers that teachers need to determine how teaching strategies, social support, and other related factors (parents' educational attainment) influence students' achievement, attitude, and anxiety; thus, enabling teachers to perform their tasks optimally.

The study proves the importance of the role teachers play in shaping the learning environment and motivating students to learn. It also proves the importance of social support from parents and peers. Notably, teachers should constantly enhance students' abilities, attitude, and behavior in number related courses. They also have to benchmark on the best practices of their colleagues to further improve students' achievement and sustain positive attitude and low anxiety level in the classroom. In the process, teachers have to encourage active involvement of parents.

The study although timely and relevant

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is limited in methodology. Its weakness lies on the small number of respondents and category of students. Thus, it is suggested that bigger samples of students – grades 7 to 10 be considered through simple random sampling for more comprehensive and reliable findings.

Another research can be done in the four school divisions in Isabela, the Philippines. It may explore self-efficacy, issues and challenges, and attitudes of teachers and parents towards Mathematics education. The present findings could help in designing training program on strategies for enhancing teachers' competence.[4]

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[4]***Statement***: We, as the Authors, declare no conflict of interest. We also declare that this article is the result of our academic work together. It is not the result of plagiarism, because the sources we cite and refer to are clearly stated in the Bibliography or References. This article has also never been sent, reviewed, and published by other scientific journals, both in the Philippines and in other countries. We are willing to accept academic sanctions, if what we declare, turns out later, is untrue and does not correspond to reality.

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