Grit Mindset and Attitudes: Their Influence on The Mathematics Academic Achievement

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ABSTRACT

This study examined the influence of grit mindset and attitude towards Mathematics on the academic achievement of Grade 10 students in selected schools in Pasacao District, Division of Camarines Sur during the School Year 2021 – 2022. Specifically, this study examined: (1) the profile of the students; (2) level of grit mindset of the students; (3) students' attitude towards mathematics; (4) level of mathematics achievement of students; (5) significant association of profile to grit mindset; attitude towards mathematics, and academic achievement of the students; (6) relationship between grit mindset, attitude towards mathematics and academic achievement of the students; and (7) intervention strategies to improve grit mindset, attitude and academic achievement in Mathematics.

The study concluded that: Students have high level of determination in overcoming setbacks, attaining goals, and sustaining interest in their studies. They have positive thoughts, feelings, and desire towards learning mathematics, and they have satisfactory academic achievement.

Key words: Grit Mindset, Attitude, Academic Achievement, Mathematics

1. 0 INTRODUCTION

1.1 Background

Teaching is the noblest profession. Lawyers, engineers, doctors, pilots, policemen, firemen and other professional practitioners owed a great tribute to teachers. Thus, it will always be traced backed to the quality of education as fundamental elements in nation building. Education as the way of every government to help and to initiate the revolution for everyone must be carefully examined. Creating an environment of success inevitably begins with teachers and educators. So as for students, academic achievement will rely on how teachers facilitate learning. One of the indicators of effectiveness in teaching can be attributed to the academic achievement of the students/learners.

Education is a fundamental right of an individual serves as a prevailing instrument in facing the world's demands today. It hones learners to achieve a high rate of success in terms of competencies and skills equaled to or exceeding with the demands of work industry. In response to this necessity of education, the national government had integrated laws related to education in the Philippines. Both statutory and constitutional provisions articulated the importance of establishing high quality education.

However, despite all the efforts of the state in providing high-quality education, it seemed not enough as Magsambol (2020) states in the report update that among the competitors on the assessment on the Trends in International Mathematics and Science Study (TIMSS) global assessment, the Philippines performed lower than 58 countries. This boosts this study that there is a need to empower innovation to address this arising issue of lowering the learners' performance. There is an immediate concern to explore variables that influence the academic achievement in mathematics of the students that could help them attain high achievement rates, especially in the two core subjects mentioned.

Despite the government’s efforts to strengthen the quality of education in the Philippines, research findings shows that some secondary school students have poor grit level. This was directly linked to student’s tendency to perform poorly inside the class that resulted to the dismal result in the TIMMSS and more even worst, to drop out from the class.

Numerous studies had been conducted to examine the academic achievement of the students in mathematics to address the pressing issue on poor achievement. Some of them investigated mathematics achievement in relation to grit mindset of the students and attitude towards mathematics. Research findings emphasized that grit mindset of the students was significantly related to their academic achievement in mathematics.

Aside from the grit mindset of the students, attitude towards mathematics was also a key factor in attaining high level of mathematics achievement. A more positive attitude towards mathematics would result to higher academic achievement. Educational experts articulated the significant relationship between attitude towards mathematics and academic achievement.

Meanwhile, some studies articulated a significant relationship between grit mindset of the students with their attitude towards mathematics. The degree on how the students persevere towards their studies relates with their attitude towards mathematics. The higher level of grit mindset the students has, the more positive attitude towards mathematics they will have. Their findings confirmed a significant relationship between grit mindset and attitude towards mathematics.

Thus, it points out that massive action towards enhancing the quality of mathematics education was highly needed. Teachers should know which parts to emphasize to highlight students’ strengths and minimize weaknesses in particular subjects or field to make things happen. Thus, there must be interventions to at least minimize if not eliminate, the issues on poor academic achievement of the students especially in mathematics. Intervention strategies in mathematics

would enhance the academic achievement of students. By this, teacher could help the students on their dilemma on low academic achievement.

Hence, study investigated the correlation between grit mindset, attitude towards mathematics and academic achievement of the students. Understanding the relationship between these variables will help on how to increase the level of the academic achievement in mathematics. In turn, these will surely result to high rates of success on the assessments conducted on the students.

Knowing the specific area where the students are having difficulties will become an easier way for the educators to supplement the ways to mend the problem and achieve a highly developed individual. In this context, this undertaking is important to pinpoint the aspect that could possibly be enhanced that would lead to high academic achievement. Examining grit mindset and attitude towards mathematics of the students is the key step in achieving high level of mathematics achievement.

1.2 Statement of the Problem

This study examined the influence of grit mindset and attitude towards mathematics on the academic achievement of Grade 10 students in selected schools in Pasacao District, Division of Camarines Sur during the school year 2021 – 2022.

Specifically, this study answers the following questions: 1) What is the profile of the students along: a. nutrition; b. coping mechanism; c. parents' occupation; and d. parents' educational attainment? 2) What is the level of grit mindset of the students along: a. overcoming setbacks; b. attaining goals; and c. sustaining interest? 3) What is the student's attitude towards mathematics in terms of: a. cognitive; b. affective; and c. behavioral aspect? 4) What is the level of mathematics achievement of students? 5) Is profile significantly associated to grit mindset, attitude towards mathematics, and academic achievement of the students? 6) Is there a relationship between grit mindset, attitude towards mathematics and academic achievement of the students? 7) What intervention strategies may be developed to improve grit mindset, attitude, and academic achievement in mathematics of the students?

1.3 Purpose of the Study

The purpose of this study was to determine the influence of grit mindset and attitude towards mathematics on the academic achievement of Grade 10 students in selected schools in Pasacao District and to identify a possible intervention strategy that could be suggested to improve grit mindset, attitude, and academic achievement in mathematics of the students**.**

2.0 REVIEW OF RELATED LITERATURE

This section will present some of the related literature and studies relative to students' level of satisfaction with the student's support services offered by educational institution arranged thematically.

2.1 Grit Mindset

This part will present literature about Grit Mindset of the respondents as one of the objectives of this undertaking.

Mayr, et al. (2020), as age and grit mindset is concerned, she conducted an intervention program for children and adolescents. At the end of their undertakings, they had found out that both children and adolescents had significantly improved their self – concept.

On the same vein, Fernández-Martín, et al. (2020), had conducted a study about "*Grit as a Predictor and Outcome of Educational, Professional, and Personal Success*". The results of their study revealed that age and sex predict grit level among students and general population. Older students and women showed higher level of Grit. They further added that educational variables predict Grit.

On the other side of the coin, Bowman (2019), conducted a meta-analysis on how to create an enduring academic legacy. In his paper he pointed out that GRIT was the engine for human accomplishments. He further stipulated that if students are inspired to pursue the right goals in the right way, they will surely succeed.

In addition, Cosgrove, et al. (2018), had conducted study about "*Physical Fitness, Grit, School Attendance, and Academic Performance among Adolescents*". They found out that adolescents have high grit score. They further added that GRIT and total number of attendances to class are significant contributors to academic success.

Furthermore, Black, et al. (2011), had examine the effect of school starting age of Norwegians. Their study revealed that school starting age has positive effects to mental health. They further emphasized that age has long term effect for educational attainment for men. However, age has no evidence of larger impact on educational attainment for women.

Moreover, Fernández-Martín, et al. (2020), as sex and grit mindset is concerned, he had conducted a study about "*Grit as a Predictor and Outcome of Educational, Professional, and Personal Success*". The results of their study revealed that age and sex predict grit level among students and general population. Older students and women showed higher level of Grit. They further added that educational variables predict Grit.

In the three sets of study conducted by Kannangara, et al. (2018), about Grit of the University students they had found out that gender was related to Grit level. Furthermore, in the first study, they had found out that Grit is significantly related to age and attitudes towards something. In addition, their second study concluded that Grit is related to resilience, mental well-being, mind-sets, and self-control. And, on their third study they had found out that Grit is a predictor of academic success.

In addition, Usher, et al. (2018), had investigated Grit and self-efficacy in relation to academic success of children. They found out that girls have higher Grit level as compared to boys. Furthermore, they added that age and Grit are related to self-efficacy.

Furthermore, Stoffel, and Cain (2018), had examined Grit and resilience with health professions. At the end of their undertakings, they had concluded that Grit is related to resilience. However, they did not find any significant relationship between Grit and sex.

In the same contentions, Hodge, et al. (2017), had examined Grit in relation to academic engagement and academic outcomes of students. They found out that there is a significant relationship between grit, demographic factor, and academic engagement. They further added that male and female students have equivalent level of Grit.

Also, Lechner, et al. (2019), as grit mindset and attitude towards success in mathematics was concerned, he investigated about Grit in relation to socio-demographic profile, career success and career engagement. At the end, they found out that Grit level is related to attitude towards studies. In addition, they found out that Grit is related to gender. Female is grittier than male. Age was also found related to Grit.

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being, mind-sets, and self-control. And, on their third study they had found out that Grit is a predictor of academic success.

As studied by American Mathematical Association of Two-Year Colleges (2018), attitudes towards mathematics could be analysed in relation to several factors. One of them was students' motivation of the students towards mathematics. The higher the level of motivation of the students, the better the way they appreciate the subjects.

Furthermore, Al – Mutawah, and Fateel (2018), conducted a study about students' achievement in math and science in relation to Grit. They found out that there is a significant relationship between Grit level and attitude towards mathematics and science.

Similarly, Lechner, et al. (2019), as grit mindset and academic achievement in mathematics was concerned, he investigated about Grit in relation to socio-demographic profile, career success and career engagement. At the end, they found out that Grit level is related to attitude towards studies. In addition, they found out that Grit is related to gender. Female is grittier than male. Age was also found related to Grit as well as academic performance.

In addition, Wills, and Hofmeyr (2018), had conducted a study about academic resilience in primary schools of South Africa. They had found out that girls tend to be more academic resilient than boys. They further identified a significant relationship between academic resiliency, Grit level and attitude towards school.

2.2 Attitude towards Mathematics

Several studies about the Attitude towards Mathematics of students were conducted. They aimed at understanding the appreciation of the students towards the subject.

Silao (2018) had examined the Factors Affecting the Mathematics Problem Solving Skills of Filipino Pupils. Based on his findings, there is a significant relationship between pupil factor and attitude towards mathematics. He further added that pupil factor and performance in mathematics had significant relationship.

On the same contentions, Luttenberger, et.al (2018), conducted study on math anxiety in US. They found out that age difference affects the attitude towards mathematics. They further emphasized that math anxiety affects individuals of all ages in academic situations as well as in their academic success and well-being.

In addition, Fabian K., et. al (2018) examined the effect of using mobile technologies for teaching mathematics. Based on their findings, they found out that all the participants, regardless of age have positive attitude towards mathematics. They generally label the respondents as having relatively high level of enjoyment towards mathematics.

It was established by several literature reviews that attitudes towards attitudes towards mathematics vary across age. Furthermore, gender difference and other socio-demographic characteristics had a significant relationship with achievement in mathematics.

Mata M, et. al (2012) conducted a study on interrelated variables and attitudes towards mathematics of students. Their study shown that students had positive attitudes towards mathematics. They had also pointed out the main effects of grade and math achievement on these attitudes. Furthermore, they articulated that no gender effect was identified although the girls showed a continuous decline in attitudes the further, they progressed in school.

It was established by several literature reviews that attitudes towards attitudes towards mathematics vary across age. Furthermore, gender difference and other socio-demographic characteristics had a significant relationship with achievement in mathematics.

In addition, G. Kaiser, and N. Presmeg (2019) had examined sex and mathematics education in general. They pointed out that there is transitions from traditional point of view that male were

generally fit for mathematics education than female. They made mention about several literature and studies pointing out equality in mathematics performance of both male and female.

Parallel to these, Otoo D. et. al (2018) had examined the interest and motivation of students in learning mathematics. They had constructed a structural model explaining the relationship between student's interest, motivation, and mathematics performance. They had explained that sex and age have direct effect to students' attitude towards mathematics.

In addition, Uwineza, et al. (2018), had conducted a study about gender attitudes and perceptions towards mathematics of secondary students. They found out that boys and girls shared the same perceptions towards the importance of mathematics subjects. However, they also discovered that boys manifested more negative perceptions towards girls' ability to perform well in mathematics.

Furthermore, Mensah, and Yankson (2017), had examined the attitude of the students towards mathematics in relation to sex. They found out that girls seemed to have higher positive attitude towards mathematics than boys.

In addition, Lee, and Anderson (2015), had examined the attitudes towards mathematics of students in secondary education. Their findings revealed that there is a significant difference in the attitude towards mathematics for the students in single-sex schools and mixed-sex school.

Mazana, et al. (2020), assessed student's performance in mathematics based on teachers' perspectives. They found out that there is a higher failure rates in primary and secondary school's particularly lower secondary school. Gender differences exist at all levels of education with girls underperforming in primary, lower secondary, and college examinations due to cultural factors impacting female students' learning.

On the other hand, Ganesan, et al. (2020), examined factors and interventions influencing children's attitudes towards mathematics. They found out that there is only a weak correlation between attitude towards mathematics and their performance in mathematics.

2.3 Mathematics Achievement

This part will present literature about Academic Achievement in Mathematics as patterned in the research problem to be examined.

Abramovich, et al. (2019), conducted a study about "*Teaching Mathematics through Concept Motivation and Action Learning"*. They had found out that action learning could be used in teaching mathematics across k-12 curriculum. Age factor relative to performance in mathematics could be minimized using action learning.

In addition, Koponen, et al. (2018), examined the prevalence of comorbidity of dysfluent reading and math skills. They found out that children who showed very low performance in one skill also evidenced low or very low performance in the other. They further emphasize that difficulties had somewhat higher prevalence in third and fourth graders than in first and second graders.

Furthermore, Costa, et al. (2018), had examined the performance of pre-schoolers in mathematics. They had found out that preschool low achievers constitute a heterogeneous group, and they stress the importance of domain□general factors for the development of mathematical abilities during the preschool years.

Anders, et al. (2018), examined the variation of subject choices relative to their previous school attended. They found out that young students studying core subjects performed the same as those who are not studying the core subjects' combination. They further noted a statistically significant association between an individual's gender and the academic selectivity of the subjects they study.

Fernández-Méndez, et al. (2018), studied the effectiveness of mental rotation training for Preschool pupils. The results showed a significant improvement in the MR ability of the training group only in the older children, and a tendency toward significance in the younger participants. Moreover, no sex differences in MR or group differences across age groups were found.

Rodríguez, et al. (2020), had investigated about the effects of motivation in mathematics performance of students in primary education. They found out that girls tend to exhibit fewer positive attitudes towards mathematics than boys. And they further explained that motivation towards mathematics was significantly related to academic performance.

In addition, Hinojo-Lucena, et al. (2020), had examined the status of STEM in the web of science. They had found out that there are differences at the level of gender in its use in teaching and learning process.

Also, Leder (2019), had examined gender and mathematics education. She had reviewed studies about gender relative to mathematics education. She had pointed out the gender difference in terms of opportunity to participate in mathematics education.

Moreover, Guhn, et al. (2019), examined the level of participation and academic achievement of students in music, mathematics, and English. They had found out that the positive engagement in music and academic achievement in independent with sex.

3.0 METHODOLOGY

This study utilized quantitative method which uses the descriptive – correlational design. The study identified the profile, grit, attitude, and Mathematics achievement of the respondents.

3.1 Respondents of the Study:

The respondents of this study include 273 Grade 10 students from selected public schools in Pasacao District in the School Year 2021-2022. All throughout the study, only 273 Grade 10 students had participated on the study. During the data gathering, some of them were inaccessible and do not have contact numbers and address. Due the pandemic, data gathering was conducted via Google form to those with internet access and questionnaire to those who do not have internet. The study was limited grit, attitude, and Mathematics achievement only. Other variables not indicated were not included in the study.

3.2 Research Instrument.

The researchers used validated questionnaire to gather data on respondents' demographic profile. On the same vein, to gather data on grit and attitude, a validated questionnaire was adopted. For Mathematics achievement, first and second quarter grades in Mathematics were requested from their respective advisers.

3.3 Method Of Data Analysis

This study utilized Frequency Count, Percentage Technique, Weighted Mean, Mean, Pearson Product Moment Correlation Coefficient with T – Test for Testing the Significance of Correlation and Chi-Square Test as tools for treatment of data.

To process the data on Socio-economic Profile of the respondents along Nutrition, Coping Mechanism, Parent's Occupation and Parents' Educational Attainment, Frequency Count and Percentage Technique were used. Chi-Square Test was used to determine the association of the Socio-economic Profile of the respondents with Grit Mindset, Attitude and Academic Achievement in Mathematics. Pearson Product Moment Correlation Coefficient was used to determine the

correlation between Grit Mindset, Attitude towards Mathematics, and Academic Achievement in Mathematics of the respondents.

4.0 RESULTS AND DISCUSSIONS

4.1 DEMOGRAPHIC PROFILE OF THE RESPONDENTS

This study analyzed the Profile of the students as one of its objectives.The profile of the respondents was gathered and presented numerically using appropriate data presentation method. The data on the profile of the respondents were clustered in four themes namely, Nutrition, Coping Mechanism, Parent's Occupation, and Parent's Educational Attainment

4.1.1 NUTRITION.

The profile of the students along nutrition was examined. As shown on the results, 62.3 % of the students were underweight, 37.3% of the students were normal, and 0.4% were overweight. The results indicated that majority of the Grade 10 students were underweight. The result implied that most public-school students failed to acquire the basic nutritional requirements that was necessary to have a sound well-being that was important for learning.

4.1.2 COPING MECHANISM

In terms of profile of the students along Coping Mechanism, results have shown that ***Planning*** was the first mechanism employed by the students with a mean of 3.08, followed by *Active Coping* with a mean of 3.05, *Religious Coping* with a mean of 3.00, *Positive Interpretation and Growth* with a mean of 2.96 and *Use of Social Support* with a mean of 2.92 as the top 5 coping mechanism.

4.1.3 PARENT'S OCCUPATION

The summarized information on Profile of the students along Parent's Occupation revealed that, 84.1% of the mothers of the students were housewife, 11.1% were businesswomen, 2.38% were Overseas Filipino Workers (OFW), 1.19% were farmers and, 1.19% were teachers. Meanwhile, 38.89% of the fathers of the students were househusband, 27.78% were construction workers, 13.09% were farmers, 7.14% were drivers, 3.97% were office workers and fishermen, 1.59% were businessmen, and only 0.4% was electrician. The results indicated that majority of the parents of the students were housewife and househusband.

4.1.4 PARENTS' EDUCATIONAL ATTAINMENT

The figured information on Profile of the students along Parent's Educational Attainment shown that 27% of the mothers of the students attained Elementary Level, 21% were Elementary Graduate, 19.8% were Secondary Level, 18.7% were Secondary Graduate, 7.94% were College Graduate, 3.57% were College Level, 1.19% attained master's degree Level, and 0.79% were master's degree Graduate. Meanwhile, 32.94% of the fathers of the students attained Elementary Level, 20.24% were Elementary Graduate, 17.46% were Secondary Graduate, 16.27% attained Secondary Level, 7.94% were College Graduate, 4.76% attained College Level, and only 0.39% attained master's degree Level. The result indicated that majority of the parents of the students attained Elementary Level.

4.2 GRIT MINDSET

This study included the investigation of the grit mindset of the students as one of its objectives.

4.2.1 OVERCOMING SETBACKS

The figured computation for Grit Mindset of the students along overcoming setbacks got a mean of 2.922 with interpretation of High was observed. This impliesthat students not easily give up when they were confronted with setbacks on their studies.

4.2.2 ATTAINING GOALS

The figured computation for grit mindset of the students along attaining goals acquired a mean of 2.906 with interpretation of High was noted. This implies that students finished whatever they started on their studies. They were hardworking and strive hardto achieve the goals set on their studies.

4.2.3 SUSTAINING INTEREST.

The value of computation for Grit Mindset of the students along sustaining interest got a mean of 2.726 with interpretation of High was shown. This implies that students would not be easily distracted by new ideas.

4.3 ATTITUDE TOWARDS MATHEMATICS

This study incorporated the analysis of the Attitude towards Mathematics of the students as one of its objectives. The data on the Attitude towards Mathematics of the respondents was gathered and presented numerically using appropriate data presentation method. The data on the Attitude towards Mathematics of the students were analyzed in due consideration to the three aspects namely, Cognitive Aspect, Affective Aspect, and Behavior Aspects.

4.3.1 COGNITIVE ASPECT

The figured calculation for attitude towards mathematics of the students in terms of cognitive aspect got a mean of 2.8 with interpretation of Positive was observed. This implies that students have positive belief about the value of mathematics.

4.3.2 AFFECTIVE ASPECT.

The calculated value for attitude towards mathematics of the students in terms of affective aspect arrived at a mean of 2.61 with interpretation of Positive was shown. This implies that students have positive feelings about mathematics.

4.3.3 BEHAVIOURAL ASPECT.

The figured calculation for attitude towards mathematics of the students in terms of behavioral aspect revealed a mean of 2.88 with interpretation of Positive was presented. This implies that students have positive intention towards mathematics.

4.4 MATHEMATICS ACHIEVEMENT

This undertaking included the examination of the academic achievement in Mathematics of the students as one of its objectives. The data on themathematics achievement of the respondents was gathered and presented mathematically using appropriate data presentation method.

The figured calculation for achievement in mathematics of the students revealed that the average for the grades in Mathematics for the two grading period was 83.12 with interpretation of Satisfactory. The computed value for Standard Deviation was 4.4572 with interpretation of Scattered. This implies that students have satisfactory academic achievement in mathematics.

4.5 ASSOCIATION OF PROFILE, GRIT MINDSET, ATTITUDE, AND MATHEMATICS ACHIEVEMENT OF THE STUDENTS

This study incorporated the investigation of the association of profile with grit mindset, attitude, and academic achievement in mathematics of the students as one of its objectives. The data on the association of profile with grit mindset, attitude and mathematics achievement of the respondents was determined using chi-square test and presented mathematically using appropriate data presentation method.

4.5.1 NUTRITION, GRIT, ATTITUDE AND ACHIEVEMENT

The figured association of profile along nutrition with git mindset, attitude and academic achievement in mathematics shown that the profile along nutrition acquired an association value of 0.888 with interpretation of Not Significant with grit mindset, 0.978 with interpretation of Not Significant with attitude, and 0.954 with interpretation of not Significant with mathematics achievement.

The result indicated that Nutrition was not related to Grit Mindset, Attitudeand Mathematics Achievement.

4.5.2 COPING MECHANISM, GRIT, ATTITUDE, AND ACHIEVEMENT

The figured association of profile along coping mechanism with grit mindset, attitude and academic achievement in mathematics revealed that s profile along coping mechanism garnered an association value of 7.301 with interpretation of Significant with Grit Mindset, 4.311 with interpretation of Significant with Attitude, and 1.309 with interpretation of Not Significant with Mathematics Achievement.

The result implied that the coping mechanism of the students was significantly related with their grit mindset and attitude but not with Mathematicsachievement.

4.5.3 PARENT'S OCCUPATION, GRIT, ATTITUDE AND ACHIEVEMENT

The figured association of profile along parent's occupation with grit mindset, attitude and academic achievement in mathematics shown that profile along parent's occupation acquired means of 0.63 and 0.57 both with interpretation of not significant with grit mindset, 0.975 and 0.368 both with interpretation of not significant with attitude, and 0.598 and 0.735 with interpretation of not significant with Mathematics achievement.

The result indicated that the parents' occupation was not related togrit mindset, attitude, and mathematics achievement of the students.

4.5.4 PARENT'S EDUCATIONAL ATTAINMENT, GRIT, ATTITUDE AND ACHIEVEMENT

The computed association of profile along parent's educational attainment with gitmindset, attitude and academic achievement in mathematics shown that profile along parent's educational attainment means of 0.631 and 0.825 both with interpretation of not significant with grit mindset were observed, means of 0.787 and 0.398 both with interpretation of not significant with attitude, and, means of 0.989 and 0.887 with interpretationof not significant with mathematics achievement were also shown on the data.

The result implied that parents' educational attainment was not related with the grit mindset, attitude and mathematics achievement of the students.

5.0 RELATIONSHIP OF GRIT MINDSET, ATTITUDE AND MATHEMATICS ACHIEVEMENT OF THE STUDENTS

This study included the investigation of the relationship of grit mindset, with attitude and academic achievement in mathematics of the students as one of its purposes.

5.1 GRIT AND ATTITUDE.

The calculated correlation between grit mindset and attitude shown correlation value of 0.34 with interpretation of Slight Correlation, with the computed t-test value of 5.668 interpreted as Significant. The result implied that grit mindset was significantly related to attitude towards mathematics of the students.

5.2 GRIT AND ACHIEVEMENT.

The computed correlation between grit mindset and achievement was 0.34 with interpretation of slight correlation, with the computed t-test value of 5.67 interpreted as significant. The result indicated that grit mindset was significantly related to academic achievement in Mathematics of the students.

5.3 ATTITUDE AND ACHIEVEMENT.

The calculated correlation between attitude and achievement was 0.33 with interpretation of slight correlation, with the computed t-test value of 5.55 interpreted as significant interpreted as significant.

The result pointed out that attitude towards mathematics was significantly related to academic achievement in mathematics of the students

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results and discussions, the following conclusions and recommendations were drawn.

6.1 Conclusions: Majority of the Grade 10 students are underweight. Planning was the most frequent coping mechanism employed by the students. Many of the parents of the students were housewife and househusband. The largest number of the parents of the students attained Elementary Level. Students have high level of determination in overcoming setbacks on their studies, high level of will power in attaining goals on their studies and high level of persistence in sustaining interest on their studies. The students have a positive thought towards the value of learning mathematics, positive feelings towards learning mathematics and positive desire to engage in learning mathematics. The students have satisfactory academic achievement in mathematics subject. There is no significant relationship between the socio-economic profile, grit mindset, attitude and academic achievement in mathematics of the students. There is a significant relationship between grit mindset, attitude towards mathematics and academic achievement of the students.

6.2 Recommendations. School officials, teachers and parents couldcome up with a plan on how to decrease malnutrition in school. Feeding program introduced by the Department of Education (DepEd) in cooperation with the Department of Social Welfare and Development (DSWD) might be reinforced. Constant monitoring of Body Mass Index (BMI) could be conducted by school nurse to monitor the health status of the students. If time and budget warrants, school canteen might be encouraged to sell nutritious foods and if possible, refrain from selling junk foods. Classroom advisers may consider enhancing the planning skills of the students through trainings if time and budget was available. Constant counselling on the importance of planning skills could be conducted

by the guidance counsellor to further reinforce the students towards planning. Livelihood trainings and other economic opportunities might be provided for parents by schools in cooperation with the Department of Labor andEmployment (DOLE) and DSWD to help them generate income while at home. On the first day of school year, orienting the parents on their emotional, financial and social responsibilities for their children could be tackled. They mightalso be encouraged to avail the Alternative Learning System (ALS) program offered by the DepEd in case they wish to study. Teachers may continue to reinforce the determination of the students in overcoming setbacks on their studies by giving appropriate praises. If allowed, teachers might extend effort to sustain the will power in attaining goals on their studies of the students, by soliciting the participation of their parents on explaining the importance of having high "will power" to achieve their goals in life. If time permits, teachers and parents could continuously instill the importance of sustained interest not just on studies but also in real life situations. Teachers could continue articulating theimportance of mathematics on daily living through the discussions. The confidence towards mathematics of the students may be considered by the teachers by organizing the lesson in terms of increasing level of difficulty. Students who perform well in easy and moderate tasks would be confident that they can do difficult task as well. Teachers may consider incorporating interesting activities on their lessons in mathematics to sustain the desire of the students to engage in lesson. Highly motivating discussion would catch up the desire of the students to participate in the class. To sustain and enhance the academicachievement of the students in mathematics, teachers may consider improving further their teaching strategies. Attendance to trainings and seminars related to improving pedagogical skills was highly advised. Replications of this study with different set of respondents and place may be conducted to further validate the results of this study. Analyzing other variables that might be related to grit mindset, attitude towards mathematics and academic achievement in mathematics could also be explored. Teachers may consider enhancing either Grit Mindset or Attitude towards Mathematics or both, to improve the academic achievement in Mathematics. Intervention strategies that aimed at improving Grit Mindset and Attitude towards Mathematics of the students might be investigated by teachers. Best practices such as differentiated instruction, and the likes, could be adapted by teachers on their lessons to further improve the academic achievement in Mathematics.

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