INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 07 Issue 05 May 2024

DOI: 10.47191/ijmra/v7-i05-62, Impact Factor: 8.22

Page No. 2338-2349

The Mathematics Performance and the Track Preference of Grade 10 Students

Rowena C. Baucas

Ilocos Sur Polytechnic State College Philippines

ABSTRACT: This research paper focused on investigating the mathematical performance of grade 10 students and its role in determining their Senior High School (SHS) track/strand. The aim of the study is to explore the attitudes, beliefs, and opinions of the students towards mathematics and how it influences their decision-making process in choosing their SHS track/strand. Additionally, the study aims to examine the factors that affect students' performance in mathematics in relation to their chosen SHS track/strand. The research design utilized in this study is a survey questionnaire, which was administered to grade 10 students at Narvacan National Central High School. The participants of the study are primarily grade 10 students, with a majority being 16 years old. There are more female respondents than male, and a significant percentage of the respondents' parents have blue-collar jobs. Additionally, most of the parents are college graduates. The findings of the study indicate that the level of mathematics performance among grade 10 students at Narvacan National Central High School is considered "Fair." Furthermore, the students' preferred track for SHS is Humanities and Social Sciences (HUMSS). The study also reveals a significant relationship between mathematics performance and the profile of the respondents. Additionally, there is a significant relationship between mathematics performance and STEM, HUMSS, and TVL track/strands. However, there is no relationship between mathematics performance and the preferred strand of students who chose ABM. The implications of this research highlight the importance of mathematics in the decision-making process of students when choosing their SHS track/strand.

KEYWORDS: mathematics performance, grade 10 students, Senior High School track/strand, preferred track.

I. INTRODUCTION

Mathematics is a subject that is required at all stages of schooling. It is defined as knowledge, skills, understandings, and procedures that require an individual to interpret mathematical content of patterns such as number and space (Animasaun, 2021). Curriculum documents both internationally and locally recognize the importance of mathematics for teaching and the need to acquire mathematical thinking processes. The incorporation of mathematical thinking as a theme in curriculum documents, on the other hand, differs.

The choice of track/strand in senior high school is a critical decision that can significantly impact the future of students. Therefore, it is important for students to understand the role of mathematics in determining their track/strand. However, there is limited research on the performance of grade 10 students on the role of mathematics in determining their track/strand. Understanding the performance of students regarding the role of mathematics in their career path can help educators develop better strategies to help students make informed decisions about their future.

This research investigated the mathematical performance of grade 10 students of Narvacan National Central High School on the role of mathematics in determining their Senior High School track/strand. The study aimed to explore the attitudes, beliefs, and opinions of grade 10 students towards mathematics, and how it influences their decision-making process in choosing their track/strand. The study also examined the factors that affect the performance of students towards mathematics in relation to their Senior High School track/strand.

Choosing a track is crucial for a student to become extremely proficient in the field to which his or her selected track is related, particularly if the student desires to work soon after graduating from Senior High School. According to most educators, a mismatch between the track and the student's personality and interest might result in a poorly knowledgeable graduate who will struggle to compete in the job market or stay up with other students when he or she enters college.

II. FRAMEWORK OF THE STUDY

A. *Theories on the negative impact of mathematics*

Critical Theory is a philosophical method that involves a moral critique of culture. In this sense, a "critical" theory is one that aims to reject or invalidate a widely accepted or influential notion or way of thinking in society. Thus, critical race theorists and critical gender theorists challenge standard and hidden assumptions about race and gender. Critical theorists may employ critical thinking methods, but their subject matter is separate, and they may also provide critical assessments of critical thinking.

The so-called deficit theory, Dénes Szűcs (2019) states that poor arithmetic performance leads to math anxiety. In other words, students would predict or anticipate doing poorly on arithmetic examinations because they would expect themselves to score poorly on them. It would then become a self-fulfilling prophecy, causing anxiety. The important point is that only kids who score poorly in arithmetic will experience math anxiety.

John Dewey's Learning by Doing Theory (1916) is integrated when employing Rich Assessment Tasks Environment. By giving students worthwhile and meaningful tasks where they can use what they have learned in practical contexts, teachers can help students feel more in control of their education.

Problem solving, according to behaviorists, is a process that evolves through positive and negative reinforcement mechanisms. Problem resolution, according to cognitive psychologists, is a process that incorporates introspection, observation, and the formation of heuristics. The information-processing perspective on issue solving is founded on generic problem-solving abilities and artificial intelligence (Hardin, 2003).

In addition, according to Norman and Gagne's theories of cognitive learning, knowledge is organized hierarchically in schemata. According to the idea, facts come together to form conceptions, concepts come together to make rules, and rules come together to form problem-solving structures. These findings also lend support to Norman's (1982) theory that expert performance in procedural knowledge is distinguished by smoothness, automaticity, and less mental effort as compared to beginner performance.

B. Scope and Delimitation of the Study

The purpose of this quantitative study was to investigate the mathematical performance of Grade 10 students at Narvacan National Central High School in relation to the function of mathematics in determining their senior high school track/strand. The study investigated the students' understanding of the value of mathematics in relation to their future jobs, as well as the elements that influence their choice of senior high school track/ strand. It also investigated how their mathematics proficiency affects their academic performance in their chosen track/strand, their performance on the importance of mathematics in their future careers and daily lives, and their recommendations on how to improve their understanding and appreciation of mathematics when deciding on a senior high school track/strand. The study was limited to grade 10 students at Narvacan National Central High School, and the main data gathering instrument was a questionnaire.

III. REVIEW OF LITERATURE

A. Profile of the Respondents

In research respondents' profile plays a very significant role. The personal characteristics of respondents based on either voluntary or involuntary participation forms the backbone of the scientific explanation (Glaser, 2012). Respondents' cooperation has been a concern of survey and opinion researchers since at least the latter part of the twentieth century both because of its implications for data quality, as well as its reflection upon research methods and the resulting ethical and regulatory considerations.

Moreover, student profile is a snapshot of a student's learning journey. Students' basic information, descriptions of themselves, education, career goals, courses taken, and work experience are all included in their student profiles. It also has a section for listing hobbies, abilities, badges obtained, accomplishments, and memberships. Student profiles bring to life the breadth and depth of a student's academic life. Student profiles show a history of a student's learning journey and growth throughout their school/ college career (https://www.mysphere.net/articles/why-is-your-student-profile-important/, May 2022).

Age

In Kalla's (2006) research claimed that diversity studies, on the other hand, have primarily focused on issues such as gender, race, and ethnicity, citing age as one of the aspects influencing how we view identities, capacities, and differences.

According to Heaven & Ciarrochi (2012). The adolescent years are a critical era of life, and knowing the role that individual differences play in predicting youth academic performance is critical. For example, it is well proven that people who complete high school have better financial outcomes than those who do not (Ceci & Williams, 1997). Countries are currently ranked based

on student accomplishment in reading, math, and science (Organisation for Economic Cooperation and Development, 2011). Maximizing young people's academic achievement may be of significant national importance in a globalized economy.

Moreover, in the study of (Thoren, 2016), the age of a students in relation to the age of her or his peers (relative age) has been discovered to be an impact determinant on academic achievement, particularly but not only at the start of formal schooling. Also, student age has a statistically significant impact on students' academic achievement (Voyles, 2011).

In addition, Zubković (2021) also revealed that older students valued mathematics less than younger students, had a less positive mathematics self-concept, used learning strategies less frequently, and performed lower in mathematics.

Sex

Sex disparities in mathematical problem solving, which are thought to be a key element in gender inequalities in mathematics achievement, have received considerable attention from scholars in recent decades (Zhu, 2007).

Hidayati et al. (2019) concluded that female students' problem-solving abilities outperform male students in guided exploration learning models. However, it negates the study of Fatimah et al. (2018) which revealed that sex has no substantial influence on students' mathematical problem-solving abilities.

In general, Benbow, (1992) discovered in his study that female students performed better in the classroom, as evidenced by grades and academic awards. Male students, on the other hand, tended to participate more in math/science areas, do better on standardized math/science achievement tests, and have higher educational goals (cf. Lubinski & Humphreys, 1990).

Parents Educational Attainment

These differences could result in unequal opportunities for children to acquire math, varying levels of cognitive stimulation in their learning contexts, and different access to resources (Davis-Kean et al., 2020). The relationship between home learning activities and children's outcomes in numeracy may therefore alter depending on SES, as may academic expectations and home learning activities.

Moreover, studies on parents' educational status undertaken in established and developing nations found many types of correlations and impacts on students' academic attainment. According to research findings, different educational levels of parents had different effects on students' academic achievement, and the findings revealed diverse nutrition practices of parents at home. According to Hanafi (2008), illiterate parents approach their children with additional care, but unstable academic conditions at home for children's education, and they have great expectations from their children. These tactics contribute to pupils' academic progress being unequal and unclear.

On the contrary, Journal of Arts and Social Sciences 7(2), 2020 85 primary pass parents employ relatively neglected and unrealistic academic methods from their children since they have great expectations from children with low investments, sometimes traditional reward, and punishment concepts, as well as corporal punishment. Parents with a higher educational status, on the other hand, are more practical and systematic when it comes to setting educational goals for their children. The current and adoptive parents are highly educated. Academic environments for their children at home (Hanafi, 2008).

Parent's Occupation

In terms of parent occupation, according to Pilarta (2010) and Barcelona (2017), there is a significant association between pupils' Mathematics performance and parent occupation. Gabriel (2012), as noted by Milan (2018), found a substantial link between these variables. Furthermore, as mentioned by Milan (2018), Imam and Singh (2014) offered a complete result. It was discovered that father's occupation was associated with math academic achievement. It has been reported that the kind of the father's employment is essential for the math achievement of their children. Children of engineers, doctors, businessmen, and other professional fathers outperformed all other professional groups in math. Children of engineers, doctors, businessmen, and other professional fathers outperformed all other professional groups in math. Children of businessmen performed better in math than the other two groups, but not as well as children of professionals.

Furthermore, they discovered that mothers' occupation was unrelated to scholastic ability in math. Children of housewives and working mothers performed equally well in math. The study implies that adult education programs aimed at young mothers and fathers could be one method to improving youngsters' mathematics proficiency.

Thus, parental occupation has tremendous potential to impact the educational performance of children. Since research has established that the parental occupation is an important factor that has a strong bearing on academic performance. Parental occupation is the most important determining factor of creating cash, which influences the total development of young wards, particularly their academic development and progress (Omar, M Hussain,2021).

B. Preferred Senior High School Track/ Strand

The senior high school program in the Philippines offers various tracks/strands that students can choose from, depending on their interests and career goals (Department of Education, 2016).

According to Malaguial et al., 2022, choosing a senior high school strand is one of the most difficult decisions that junior high students will undertake. The problem solving and critical thinking skills sought to assist students in deciding on their future senior high school strand by understanding the components' levels of effect and their link with their decision.

In the study of Villa et al., (2017), it has shown that mathematics plays a critical role in preparing students for specific senior high school tracks/strands. For example, students who are interested in pursuing STEM-related tracks/strands will require a strong foundation in mathematics. Additionally, students who are interested in pursuing business-related tracks/strands will need a solid understanding of mathematical concepts such as statistics and financial analysis (Nguyen & Abbott, 2017).

Science, Technology, Engineering, and mathematics (STEM) Strand

Science, Technology, Engineering, and Mathematics (STEM) is one of the most sought-after strands in senior high school, which focuses on preparing students for careers in the fields of science, technology, engineering, and mathematics. Mathematics plays a crucial role in the STEM strand, as it provides a foundation for understanding scientific concepts and principles.

According to a study by Alinsunurin, Leano, and Aguila (2018), students who took advanced mathematics courses in junior high school performed better in STEM-related courses in senior high school. Furthermore, mathematics serves as a tool for problem-solving and critical thinking in STEM-related courses, making it essential for students pursuing this strand.

However, according to Langdon et al. (2013), a STEM career in this study is one that involves scientific research and the application of any combination of science, mathematics, engineering, and technology disciplines to the production of scientific and technological products that contribute to the country's economic development.

Furthermore, Mamolo, (2019). The STEM strand demonstrated significantly different capability than the other strands in the academic track. This could be reinforced by the notions offered in Sison et al [14]'s study, which underlined the concentration of each strand of the academic route. It was stated that the Science, Technology, Engineering, and Math (STEM) strand provides students with the knowledge and abilities to solve difficult issues, analyze evidence, and make sense of available information to create solutions through invention and discovery to enhance people's lives.

Finally, the STEM strand in the Philippines is a critical educational route for the country's economic growth and development. Its curriculum is meant to provide students with the skills, knowledge, and experience they need to succeed in fields linked to science, technology, engineering, and mathematics. While its implementation is fraught with difficulties, the government and educators must collaborate to overcome these obstacles and promote STEM education in the country.

Accountancy, Business, and Management (ABM) Strand:

The Accountancy, Business, and Management (ABM) strand is another popular senior high school strand that focuses on preparing students for careers in business, finance, and accounting. Mathematics is a critical component of the ABM strand, as it provides the necessary skills for understanding and analyzing financial and economic data. According to a study by Arceo and Paragas (2020), mathematics performance in junior high school is positively related to academic performance in the ABM strand.

Furthermore, mathematics provides a foundation for courses such as calculus and statistics, which are essential in the ABM strand. ABM is related to the field of mathematics, which requires in-depth learning and analysis.

In the study of Gepila, Emijidio et al. (2022), stated that most of the respondents acquired low level thinking skills in Anderson and Krathwohl Taxonomy. It was also concluded that there was no significant relationship between the level of thinking skills of the respondents and their demographic profile.

Humanities and Social Sciences (HUMSS) Strand

The Humanities and Social Sciences (HUMSS) strand is a senior high school strand that prepares students for careers in the fields of humanities, social sciences, and communication. Although mathematics is not the primary focus of the HUMSS strand, it still plays a vital role in the strand. According to a study by Baring and Solis (2020), mathematics proficiency is positively related to academic performance in HUMSS-related courses such as statistics, research, and social sciences.

Furthermore, HUMSS strand is ideal for students who want to work in the social sciences and humanities. It gives them a solid basis in these subjects and helps them to pursue careers in law, education, psychology, sociology, and other fields.

Lastly, Mamolo, (2019)) stated that the Humanities and Social Sciences (HUMSS) strand focuses on developing a strong liberal arts background, exploring theoretical elements of their chosen subject, and gaining practical professional experience.

Technology – Vocational – Livelihood (TVL) Track

According to a study by Lopez and Morada (2019), mathematics proficiency is positively related to academic performance in TVL-related courses such as computer hardware servicing and automotive servicing.

Moreover, Agri-Fishery Arts, Home Economics (HE), Information and Communication Technology (ICT), and Industrial Arts are the four strands of the SHS program's Technical-Vocational-Livelihood (TVL) Track. These correspond to Technology and Livelihood Education (TLE) in Grades 7–10. Each TVL strand provides a variety of specialties that may or may not have a TESDA National Certificate (NC) equivalent. The time allocation per strand specialization is based on TESDA Training Regulations-Based Courses. In addition, the Technical-Vocational-Livelihood (TVL) track is a senior high school strand that focuses on preparing students for careers in technical and vocational fields. Mathematics plays a crucial role in the TVL strand, as it provides the necessary skills for understanding and applying technical concepts.

In the study of Ramos (2018), the findings stated that the necessity for infusing and developing critical thinking skills of students as they progress through the levels and face the 21st Century Skills and Outcomes-Based Education in the Senior High School Level; Development of comprehensive teaching and instructional materials such as multi-media contents materials including simulators and video tutorials, modules, and assessments. Textbook that can help GAS and Tech-Voc students in the SHS level develop their analytical, logical, and problem-solving capabilities, as well as decision-making abilities.

Finally, Lebosana, et. al (2019) on the other hand, said that to help students' families support their studies, a livelihood program should be developed. Schools should introduce and encourage kids to learn about various fields such as agriculture and industrial arts. PTA (Parents Teachers Association) meetings for Moving Up pupils should include Career Guidance counseling because they have a large influence on their students' choices.

C. Mathematics Performance

In the study of Pagtulon-an & Tan (2018) stated that the phrase "Assessment tool should match with the performance objective" appears as one of the Assessment of Learning's guiding principles. Your instruction will be valid and reasonable if the assessment instruments are accurately matched to the intended objectives. As a result, achieving the lesson's objectives will result in successful learning for the students as well as valuable instruction and learning.

According to research in the field (Voskoglou and Buckley 2012), issue resolution may be defined as the successful outcome of the cognitive engagement process and subconscious thinking toward a barrier. Peter Henderson (National Research Council 2011) defined CT as "generalized problem solving with constraints" (p.95) and aptly articulated the relationship of problem solving with computational thinking, elaborating that problem solving predominantly engages some form of computation to achieve a solution. Barr and Stephenson (2011) emphasized the importance of technology education further, claiming that computational thinking is problem solving that can be conducted on a computing device.

Furthermore, Salimaco (2020) cited that there have been various factors that contribute to learners' scientific capacity, such as family foundation and financial status (Suhas and Pandya, 2016; Spybrook, 2008), the impact of nearby friends (Kupari,2006), sex-related differences (Else-Quest, et al., 2010; Guiso et al., 2008), and their personal and habitual attributes (Campbell, 2016). Emmanuel et al. (2014) also stated that it is critical to direct investigations relating to senior high school academic endeavors because it is the transitional stage prior to upper postsecondary education.

Finally, Alcantara, et.al (2017) stated that, given the findings of previous studies on mathematics performance, problem solving ability, and critical thinking skills, as well as the researchers' concern about the quality of mathematics instruction in secondary schools, the current study was deemed necessary. Most students nowadays are completely reliant on how the internet answers their questions, oblivious to the fact that their mathematical abilities have been affected as a result.

Problem-solving Skills

According to Garcia and Dela Rosa (2021), problem solving abilities are one of the main points in studying mathematics since it is a process of finding a route around a difficulty around an obstacle and finding a solution to an unknown problem (The K to 12 Mathematics Curriculum Guide, 2013). The word "problem solving" refers to mathematical problems that can present intellectual difficulties for developing students' mathematical understanding and development. It is significant in mathematics and should be emphasized in the mathematics education of K-12 pupils. However, knowing how to include problem solving effectively into the mathematics curriculum is not always evident to Mathematics teachers (Brown & Nanny, 2003).

In the problem-solving process, the perception of students' problem-solving talents is crucial (Wismath et al., 2014). It entails compiling and synthesizing a diverse set of skills, beliefs, attitudes, perceptions, information, and prior accomplishments (Orsel and Yavuz, 2017).

Problem solving is just one form of thinking skill that teachers employ to teach pupils how to think. Problem-based learning, critical thinking abilities, creative thinking skills, decision making, conceptualizing, and information processing are some other ways to develop thinking skills (Ellis, 2005).

Critical Thinking Skills

One of the primary goals of education is critical thinking. Then, it is critical to determine cognitive characteristics that aid kids' critical thinking (Magno, 2010). Problem solving skills and critical thinking have similar traits. Like the issue, critical thinking

is a type of thinking that incorporates cognitive processes such as reasoning, analyzing, assessing, etc. Critical thinking is an intellectual capacity that is essential in both educational and social life of an individual (Akin, Hamedolu, Arslan, Akn, elik, Kaya, & Arslan, 2015). The critical thinking process can be viewed as a problem-solving strategy (McPeck, 2004). 1983). Although there are numerous definitions of critical thinking, most of them include Making decisions and problem solving are common themes. (Halpern, 1998). Problem solving could improve one's critical thinking skills (Buku, Corebima, & Rohman, 2004). 2016).

According to Ubarre (2016) as stated by Garcia and Rosa (2021), "critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action." It may include inductive and logical reasoning, analysis, and problem solving, as well as creative, innovative, and complicated methods to problem solving. Based on these considerations, the ability to critically review and analyze emerges as vital for enjoying a high quality of life (The University of the West Indies, n.d.).

Also, Butterworth & Thwaites (2013), stated that independent critical thinking is required. Listening to others, respecting their thoughts and perspectives, learning from teachers, obtaining information from books and/or online sources are all acceptable. But, to think critically, you must be willing to take the initiative and ask your own questions and draw your own conclusions.

However, to successfully apply critical thinking skills in teaching and learning, several fundamental notions must be instilled in an individual. The ability to comprehend, analyze, make inferences, assess, explain, and self-regulate are among the notions (Facione, 2006, 2015). These ideas are like those expressed by Paul and Elder (2005). They both agree that critical thinking is a way used by an individual to try to improve his thinking talents to the highest level possible by developing new ideas and thoughts using a variety of skills, competencies, and intellectual standards that he already possesses. Meanwhile, problem definition, systematic observation, brainstorming, beginning of problem solution, defining short-term goals, argumentation based on qualitative indicators, feedback, and self-assessment are all components of critical thinking skills in education today (Plotnikova & Strukov, 2019).

Furthermore, critical thinking skills can be caused by a range of cognitive and intellectual abilities that an individual possesses. Identifying issues, arbitrating an idea, avoiding any biased considerations, devising tactics to support a cause, making intelligent decisions, and addressing needs are examples of these talents (Birgili, 2015). Critical thinking skills is also connected with different levels of skill based on a person's aptitude and wisdom to reason, determine, and solve problems (Mahanal et al., 2019). Meanwhile, Vaughter (2016) expounded on the concept of critical thinking, stating that every high-quality critical thinking outcome should be transformed into real-world action.

III. METHODOLOGY

A quantitative research strategy was applied in this work, along with correlational development methodologies. Evaluative and correlational approaches were used in the study design, with ideas used to characterize students' performance in mathematics of a given occurrence.

A correlational method was used to uncover meaningful correlations. This study described the respondent profile as well as their mathematics performance in their future track or strand.

A. Population and Locale of the Study

A total of 247 respondents out of 640 total population were taken as respondents. Simple random sampling technique was used in the selection of the respondents.

The sample size required to produce a statistical power of at least 0.90 with the specified alpha of 0.05 and a correlation *p* of 0.2 as medium size was revealed by the G*power analysis for the one-tailed correlated t-test.

IV. RESULTS AND DISCUSSION

Table 1 Mathematics Performance of Grade 10 Students

Level of Mathematics Performance of Grade 10 Students

Score	Frequency	%	Level
41-50	0	0.00	O
31-40	37	14.98%	VS
21-30	60	24.29%	S
11-20	147	59.51%	F
1-10	3	1.21%	P
Total	**247**	**100.00**	

Mean = 20.80 SD = 4.85

Based on the result, there were 37 students who got a score ranging from 31-40 out of 50 item tests or 14.98% of the respondents belongs to very satisfactory level of mathematical abilities. However, there were 147 students or 59.51% who got scores ranging from 11 - 20 which indicates that their level of performance in mathematics is fair. The composite mean of the scores is 20.80 with the standard deviation 4.85 indicates that the Grade 10 students of Narvacan National Central High School performed fairly in Mathematics.

Table 1 also implies that the students can't well interpret data, answers questions and statements, can't well examine ideas and detecting argument working and arriving at the answers on their own thinking and can't well evaluate questions to arrive answers. However, most of the Grade 10 students got a satisfactory level of performance in Mathematics. The Table reveals that 60 out of 247 respondents or 24.29 % got the score of 21 -30. This signifies that the students have a good understanding in verbal description of problem situations and can give some numerical answer to a stated question by making relationship between quantities.

Table 2 Preferred senior high school track/strand.

Frequency and Percentage Distribution of the Respondents' Preferred Senior High School Track/Strand

PREFERRED TRACK/STRAND	f	%
STEM	94	38.06%
ABM	8	3.24%
HUMSS	112	45.34%
TVL	33	13.36%
Total	**247**	**100.00**

As shown in table 2, the Humanities and Social Sciences (HUMSS) strand has the highest frequency among the preferred strands with 112 or 45.34% strands followed by Science, Technology, Engineering, and Mathematics (STEM) the strand with a frequency of 94 or 38.6 percent. While the Accountancy, Business, and Management strand has a frequency of 8 or 3.24 percent. This implies that HUMSS are the best fit for the respondents because of their interests, talents, and personality. "Public Awareness" is demonstrated to be the most efficient technique for students to become acquainted with the consequences of HUMSS students' Mathematical abilities on their academic self-esteem.

Table 4 Relationship between the Profile of the students along with their Mathematics Performance.

Pearson's Correlation Between the Profile of the Students and their Mathematics Performance

Students' Profile	*Computed r*	*P-values*
Age	0.1135	0.0750*
Sex	0.0515	0.4204*
Parents' Educational Attainment		
Mother	0.1949	0.0021*
Father	0.1485	0.0195*
Parents' Occupation		
Mother	0.3380	<0.00001**
Father	0.1567	0.0137*

**significant @ 0.01

*significant @0.05

Table 3 shows that there is a significant relationship between the father's occupation of the respondent and the mathematics performance of the respondents at a 0.05 level of significance.

The result also presents a highly significant relationship between the mother's occupation of the respondent and the mathematics performance of the respondents at 0.01 levels of significance.

The Mathematics Performance and the Track Preference of Grade 10 Students

Table 3 implies that parents with low or high occupational status can have an impact on students' mathematical performance. Students' mathematical abilities are influenced by their parents' work. This is explained by the fact that most parents of blue-collar workers have limited free time and are unable to continue guiding their children.

Table 4. Relationship Between the Students' Mathematics Performance and Their Preferred Track/Strand

Pearson's Correlation Between the Mathematical Performance and their Preferred Track/strand

PREFERRED TRACK/STRAND	*Computed r*	*P-values*
STEM	.386**	.000
ABM	0.096	.134
HUMSS	-.291**	.000
TVL	-.167**	.009

**significant @0.01

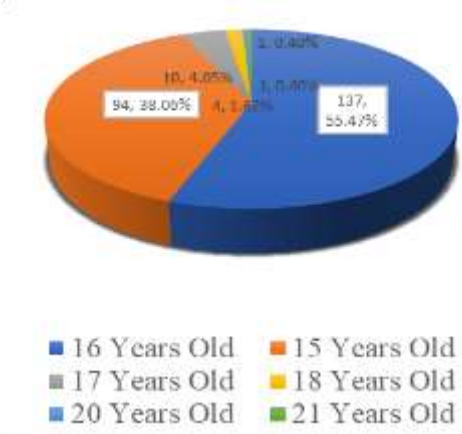
*significant @0.05

Based on Table 4, the computed *r* of 0.386 with a *p*-value of 0.000 (<0.01) indicates a significant relationship between mathematics performance and STEM, HUMSS and TVL tracks/strands. STEM is chosen by students who have good mathematics skills. The result reveals the lower their arithmetic proficiency, the higher they prefer HUMSS, and the greater their math performance, the higher they choose STEM strand. This means that if their mathematics skill is poor, they choose HUMSS.

However, the result shows no significant relationship between the mathematics performance and ABM strand with a computed *r* of 0.096. This implies that ABM strands seeks to strengthen mathematical abilities, decision-making, and time management skills, in addition to familiarizing students with business management ideas.

Figure 2. Age of the Respondents

Presents the age of the respondents.



The pie chart shows that most respondents are 16 years old, with 137 registered or 55.47% of the total population, while 1 or 0.40% are 20 and 21 years old.

This implies that the respondents are of the typical Senior High School entry age. It also signifies that most of them are of school-age. Those who are older than the other students, on the other hand, may experience the consequences of attending a school that is older than their peers.

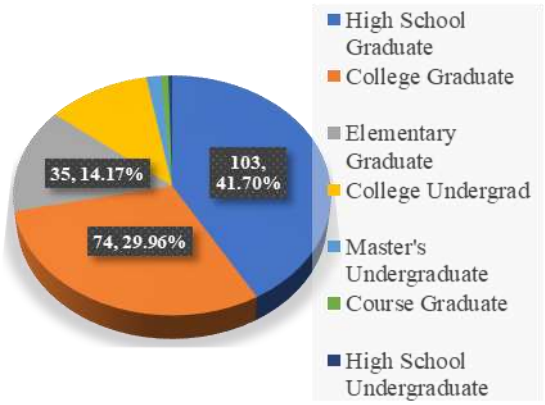
Figure 3. Distribution of Sex of the Respondents

Reflects the sex of the respondents.

The pie chart plainly shows that females outnumbered males, 126 to 121, or 51.01% of the overall population. This could be linked to the fact that girls are more interested in going to school than boys. This is supported by the studies of Escalona (2015) and Barcelona (2017), as indicated by Garcia (2020), in which females outnumber males.

Furthermore, Dela Cruz (2018) mentioned in his summary of Philippine education that there are more females than males in higher education. However, the findings of Milan (2018) contradict the result of the past study where there are more boys than girls.

Figure 4.1 Father's Educational attainment

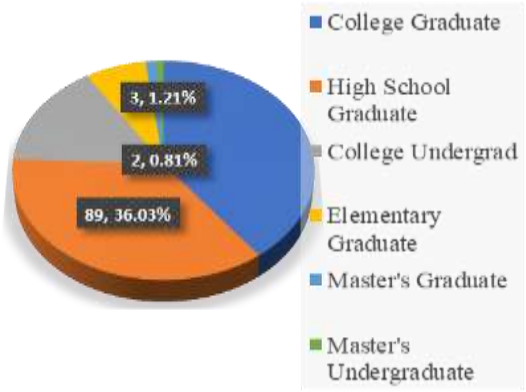


Furthermore, the data shows that only a few fathers were unable to complete formal schooling. This means that fathers can help their children with homework and projects at home.

On the other hand, Idris, Hussain, & Ahmad, (2020) stated that fathers' education and profession have an impact on children's academic achievements. The father's career and education have a direct impact on the revenue for the family that has a direct and strong relationship with the facilities available for children at home, which has an impact on their academic achievement. A father's education enhances a child's odds of pursuing higher education, but the influence of mother education is far deeper and more significant than the function of an educated father in children's academic performance.

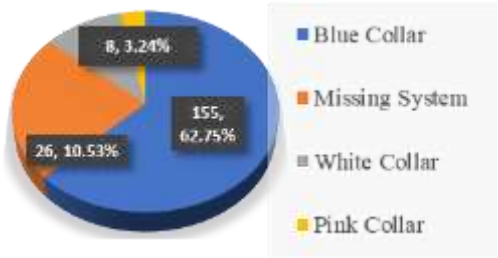
Additionally, a father's engagement had a positive effect on a child's achievement independent of the child's gender, race, school year age, or home income. With this, it is indicated that early poverty had a considerable negative impact on educational performance (The Guardian society September 20,2023).

Figure 4.2 Mother's Educational Attainment



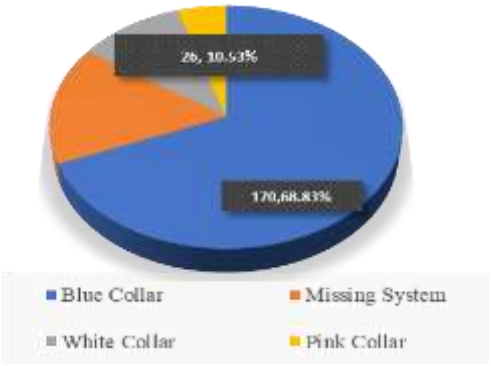
As reflected from the graph, most mothers (39.68%) are college graduates. The item high school graduate received the second largest proportion of 36.03, and only a few (0.81%) have started their master's degree. This could imply that mothers can assist their children in their education.

Figure 5.1 Father's Occupation



The figure also shows that 3.24% of fathers work in the service industry-waiters, retail clerks, salespersons, certain unlicensed assistive employees, and many other employments involving human relations. This finding supports the study of Barcelona (2018), which was highlighted by Garcia (2020), who discovered that the parents of her study were semi-skilled - farmers, fisherman, housekeepers, laborers, and other non-professional occupations.

Figure 5.2 Mother's Occupation



According to the data, 68.83% or 170 mothers work in blue collared jobs, which are members of the working class who perform manual labor and are paid an hourly wage or a piece rate for the quantity of work done. This could imply that the mother is preoccupied with how to serve the family. White collar positions with clerical, administrative, and management functions have the third largest number (10.53%). This statistic implies that mothers can earn a living by working alongside their husbands. This result confirms the study of Garcia (2020) who discovered that mothers chose to work alongside their husbands to earn a living.

V. CONCLUSION

Majority of the respondents are of the age of a typical senior high school. Most respondents are female students. A great percentage of occupations of the respondents' parent are blue collared jobs. Most mothers of the respondents are college graduates while most fathers are high school graduates. Students in Grade 10 perform fairly in mathematical. The Grade 10 students preferred Humanities and Social Sciences (HUMSS) as their preferred track for Senior High School. The respondents' parents' occupation is a predictor of their mathematics performance. Math proficiency among pupils and the STEM, HUMSS, and TVL tracks/strands are significantly correlated. Their preferred strand, Accountancy and Business Management (ABM), and their ability in mathematics do not correlate.

VI. RECOMMENDATION

Students of all ages should prioritize education with the best assistance from their parents.

Using e-books in mathematics learning could allow students to gain more easily from the technical advantages of mathematics learning over technology-free ways, enhancing students' learning and enjoyment while also improving mathematics education overall. Teacher should guide and assist their students in choosing the proper and acceptable path for them, and they must be open minded for the students who wish to contact them in moments of doubt and difficulty in decision-making for their career paths. With gender inequalities in mathematics, the inferior gender's learning will be impacted, and comparable consequences may occur in their counterparts.

As a result, teachers can encourage healthy competition based on individual skills and abilities rather than groups. One method of delivering great education is to give equitable educational opportunities for students regardless of gender, ethnicity, race, religion, or other factors. Teachers should encourage students' mathematical abilities to increase their academic achievement in mathematics, and with the help of parents, rigorous career counselling can be given and implemented in school through the school head's mandate.

REFERENCES

1) Alcantara, E. C., Bacsa, J. M. P., & City, B. (2017). Critical thinking and problem solving skills in mathematics of grade-7 public secondary students. *Asia Pacific Journal of Multidisciplinary Research*, *5*(4), 21-27.
2) Alvarez, Y. (2022). Factors Affecting Senior High School Track Preferences of Grade 10 Students in the District of Morong, Division of Rizal. *Psychology and Education: A Multidisciplinary Journal*, *6*(6), 535-540.
3) Ahmed, S. F., Tang, S., Waters, N. E., & Davis-Kean, P. E. (2019). Executive function and academic achievement: Longitudinal relations from early childhood to adolescence.
4) Benbow, C. P. (1992). Academic achievement in mathematics and science of students between ages 13 and 23: Are there differences among students in the top one percent of mathematical ability? *Journal of Educational Psychology*, *84*(1), 51.
5) Butterworth, J., & Thwaites, G. (2013). *Thinking skills: Critical thinking and problem solving*. Cambridge University Press.
6) Carson, J. (2007). A problem with problem solving: Teaching thinking without teaching knowledge. *The mathematics educator*, *17*(2).
7) Cm, O., & Yavuz, F. (2017b). A Comparative study on English language teaching to young learners around the world. *Contemporary Educational Researches Journal*, *7*(3), 114–118.
8) Davis-Kean, P. E., Tighe, L. A., & Waters, N. E. (2021). The role of parent educational attainment in parenting and children's development. *Current Directions in Psychological Science*, *30*(2), 186-192.
9) F., N., Ahmad, H., F., & Ali, P. M. (2019). Effect of Motivation and Gender on Problem-solving in Student Mathematics. *Proceedings of the 1st International Conference on Advanced Multidisciplinary Research (ICAMR 2018)*.
10) Garcia, M. T. T., & Rosa, M. T. P. D. (2021). Implementation of the Junior High School Mathematics Curriculum. *Asia Pacific Journal on Curriculum Studies*, *4*(1).
11) Gepila JR, E. C., Agulto, P. S., Fetalcorin, K. F., & Elgario, S. E. (2022). Thinking Skills of ABM Senior High School Students of Philippine State University. *European Online Journal of Natural and Social Sciences*, *11*(3), pp-494.
12) Guinocor, M., Almerino, P., Mamites, I., Lumayag, C., Villaganas, M. A., & Capuyan, M. (2020). Mathematics performance of students in a Philippine State University. *International Electronic Journal of Mathematics Education*, *15*(3), em0586.
13) Hassan, A., & Abdulkareem, H. (2021). *ASEAN Journal of Educational Research and Technology*.
14) Heaven, P. C., & Ciarrochi, J. (2012). When IQ is not everything: Intelligence, personality and academic performance at school. *Personality and Individual Differences*, *53*(4), 518-522.
15) Hidayati, Y. A., Rosidi, I., & Hadi, W. P. (2019). The Identification Problem-Solving Abilities Based on Gender: Implementation Teaching Science Trough Guided Discovery Model's in Bangkalan District. *Journal of Physics*, *1227*, 012039.
16) Hoque, M. M., Khanam, S. T., & Nobi, M. N. (2017). The effects of mothers' profession on their children's academic performance: An econometric analysis. *Global Journal of Human-Social Science*, *17*(2), 01-08.
17) Idris, M., Hussain, S., & Ahmad, N. (2020). Relationship between parents' education and their children's academic achievement. *Journal of Arts & Social Sciences*, *7*(2), 82-92.
18) Ismail, S. N., Muhammad, S., Omar, M. N., & Shanmugam, K. S. (2022). THE PRACTICE OF CRITICAL THINKING SKILLS IN TEACHING MATHEMATICS: TEACHERS'PERCEPTION AND READINESS. *Malaysian Journal of Learning and Instruction*, *19*(1), 1-30
19) Journal of Educational Psychology, 111(3), 446–458. https://doi.org/10.1037/edu0000296
20) Kalla, K. (2006). Understanding the concept of age: When determining the capabilities of leaders in post-modern Organisations. *IEICE Trans. Fundam. Electron. Commun. Comput. Sci*, *79*, 1601-1607.
21) Lebosana, A. G., Balmores, R. A. B., Jebone, I. M. N., Monticalvo, J. M. V., & Picardal, M. E. M. (2019). Factors Affecting the Track Preference of Grade 10 Students at Cielito Zamora High School Academic Year 2018-2019. *Ascendens Asia Singapore–Bestlink College of the Philippines Journal of Multidisciplinary Research*, *1*(1).

22) Ling, A. N. B., & Mahmud, M. S. (2023). Challenges of teachers when teaching sentence-based mathematics problem-solving skills. *Frontiers in Psychology*, *13*, 1074202.
23) Malaguial, P. A. (2023). *Senior High School Strands: Factors Affecting the Students' Preference*. Malaguial | ASEAN Journal of Educational Research and Technology.
24) Mamolo, L. (2019). Analysis of senior high school students' competency in general mathematics. *Universal Journal of Educational Research*, *7*(9), 1938-1944.
25) Moneva, J. C., & Malbas, M. H. (2019). Preferences in Senior High School Tracks of the Grade 10 Students. *IRA International Journal of Education and Multidisciplinary Studies*.
26) Moneva, J. C., Rozada, G. G., & Sollano, A. M. (2020). Parents Occupation and Students Self-Esteem. *Int J Res-Granthaalayah*, *7*(12), 315-24.
27) Mullis, et al. (2000). Third International mathematics and science study (TIMSS) 1999 International mathematics report. Boston College, USA International Study Center Lynch School of Education.
28) Omar, S. S., & Hussain, M. (2021). Parental occupation and its effect on the academic performance of children. *Journal of Emerging Technologies and Innovative Research (JETIR)*, *8*(8), e576-e583.
29) Pagtulon-an, E., & Tan, D. (2018). Students' mathematics performance and self-efficacy beliefs in a rich assessment tasks environment. Asian Academic Research Journal of Multidisciplinary, 5(2), 54-64.
30) Peteros, E., Gamboa, A., Etcuban, J. O., Dinauanao, A., Sitoy, R., & Arcadio, R. (2019). Factors affecting mathematics performance of junior high school students. *International Electronic Journal of Mathematics Education*, *15*(1), em0556.
31) Polit, D.F., & Beck, C.T. (2004). *Nursing research: Appraising evidence for nursing practice* (7th Edition). Philadelphia: Wolters Klower/Lippincott Williams & Wilkins.
32) Polit, D.F., & Beck, C.T. (2006). The content validity index: are you sure you know what's beingreported? Critique and recommendations. *Research in Nursing and Health*, 29(5), 489- 97. DOI: 10.1002/nur.20147
33) Ramos, J. J. R. (2018). Critical thinking skills among senior high school students and its effect in their academic performance. *International Journal of Social Sciences & Humanities*, *3*(2), 60-72.
34) Salimaco, R. J. (2020). Mathematics achievement of senior high school students: Impact of study habits and anxiety. *International Journal of English and Education*, *9*(3), 202-213.
35) Siahaan, E. Y. S., Muhammad, I., Dasari, D., & Maharani, S. (2023). Research on critical thinking of pre-service mathematics education teachers in Indonesia (2015-2023): A bibliometric review. *Jurnal Math Educator Nusantara: Wahana Publikasi Karya Tulis Ilmiah Di Bidang Pendidikan Matematika*, *9*(1).
36) Soros, P., Ponkham, K., & Ekkapim, S. (2018, January). The results of STEM education methods for enhancing critical thinking and problem solving skill in physics the 10th grade level. In *AIP Conference Proceedings* (Vol. 1923, No. 1). AIP Publishing.
37) Sturm, N., & Bohndick, C. (2021). *The Influence of Attitudes and Beliefs on the Problem-Solving Performance*.
38) Thoren, K., Heinig, E., & Brunner, M. (2016, May 16). *Relative Age Effects in Mathematics and Reading: Investigating the Generalizability across Students, Time and Classes*. www.frontiersin.org.
39) Tighe, L. A., & Davis-Kean, P. E. (in press). The influence of college education on children and parents from low-income families. Merrill-Palmer Quarterly.
40) Utami, C. T. P. (2019, March). Profile of students' mathematical representation ability in solving geometry problems. In *IOP Conference Series: Earth and Environmental Science* (Vol. 243, No. 1, p. 012123). IOP Publishing.
41) Voyles, M. J. (2011). *Student academic success as related to student age and gender*. UTC Scholar.
42) Wega, G.B (2016). Mathematics Problem Solving Skills of Grade 10 Students in Jimma Zone.
43) Wismath, S. (2014). *View of Student Perception of Problem Solving Skills*.
44) Zubković, B. R., Pahljina-Reinić, R., & Kolić-Vehovec, S. (2021). Age and gender differences in mathematics learning during school transition. *International Journal of School and Educational Psychology*, *11*(1), 20–33.
45) Zhu, Z. (n.d.). *Gender Differences in Mathematical Problem Solving Patterns: A Review of Literature*