

MATHEMATICAL COMPETENCY OF TEACHERS TEACHING MATHEMATICS AT MINDANAO STATE UNIVERSITY – SULU

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ABSTRACT. This comprehensive study investigates the mathematical competency of teachers at Mindanao State University, assessing their proficiency, pedagogical strategies, and preparedness for effective mathematics instruction. Employing a mixed-methods approach, the research combines quantitative assessments, such as standardized tests and performance evaluations, with qualitative insights. Findings reveal that while many teachers have a solid grasp of fundamental mathematics, there are significant gaps in advanced topics and innovative teaching strategies. Competency levels vary across departments and years of experience. The study emphasizes the need for continuous development to improve teachers' mathematical skills, which in turn enhances student engagement and performance. It recommends specialized training programs and curriculum enhancements, advocating for institutional support to foster lifelong learning among educators, ultimately aiming to elevate the quality of mathematics instruction and student achievement at the university.

KEYWORDS: *Understanding, Competency, Mathematical knowledge, Teachers, Proficiency*

ARTICLE DETAILS

JEAS-00068; Received: November 3, 2025; Accepted: November 17, 2025; Published: November 30, 2025

CITATION:

Sapal, Mulyadi S., Bacla-an, Ramonito E., "Mathematical Competency Of Teachers Teaching Mathematics At Mindanao State University-Sulu". *Journal of Education and Academic Settings*, 2(1). DOI: 10.62596/2pmg8t72

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Introduction

One of the main issues in raising the standard of mathematics instruction is instructors' mathematical proficiency. To meet the demands of the pupils, mathematics as a discipline requires proficient and knowledgeable math teachers. Teachers of mathematics who are competent must have a solid understanding of the subject that goes beyond what they teach. They need to be well-versed in mathematical concepts. In addition to having a thorough understanding of the subject matter, a proficient math instructor must be knowledgeable about the various computing techniques and approaches [Cornelius, 1982].

A solid repertory of mathematical content is essential for every math teacher. Continuous content upgrading is required in order to do this. This idea is in line with the study of (Castro FLT, Ventura BLO, Estajal, RS, et al. 2024), which found that the process was ineffective because the subject mastery was inadequate. Teachers in the field of mathematics need to improve themselves not only by attending seminars on in-service training but also by exploring and appreciating recent trends and practices in mathematics education. For a math teacher to succeed in his teaching career, ongoing professional development is crucial. It helps promote their mathematical competence. Moreover, the length of teaching experience has something to do with

teacher competence. According to Valdez (2002), the teacher's length of teaching experience can enrich his repertoire of knowledge and skills.

In order to meet the challenge of mathematics instruction, qualified math teachers are required. To reach the department's ultimate aim of producing quality graduates, math teachers must be competent in their subject. Only when schools are able to create quality graduates will quality education be attained. The entire school system could employ qualified teachers to accomplish this. Guerrero (1993) emphasized that the caliber of instructors employed by the system is thought to be a determining factor in the quality of education. Every math instructor should prioritize the student as a learner in the teaching-learning process.

Sulu placed second to last out of seven divisions in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) according to the results of the Regional Secondary Achievement Test (2016). Sr. According to Colonel (1981), kids' low mathematical proficiency is attributed to their teachers' inadequate training. As a result, several math majors are unable to even instruct a challenging secondary algebra course. Caipang (2002) backed this theory by claiming that teachers' inadequate mathematical proficiency could be the cause of students' poor performance.

While it is true that teachers are math majors and minors, Abangolan (1995) concurred that their prior knowledge may not be adequate. The aforementioned facts and data prompted the researcher to carry out this study. They may have forgotten what they have learnt or may not have taken them seriously, which accounts for their insufficiency. He believes that since instructors continue to play a significant role in the development of students' cognitive abilities, it is necessary to ascertain the competency level of mathematics teachers, especially among the chosen public secondary schools in the Division of Sulu.

Research Questions

- 1) What is the extent on mathematical competency of teachers teaching mathematics at Mindanao State University Sulu, in the context of:
 - 1.1 Algebraic Expressions and Operations;
 - 1.2 Sentence in Two Variables;
 - 1.3 Linear Relationship; and
 - 1.4 Systems of Linear Equations/Equalities?
- 2) Is there a significant difference in the extent on mathematical competency of teachers teaching mathematics at Mindanao State University Sulu when data are grouped according to their demographic profile in terms of:
 - 2.1 Parent's Educational Attainment; and
 - 2.2 Parent's Monthly Income?
- 3) Is there a significant correlation among the sub-categories subsumed under extent of mathematical competency of teachers teaching mathematics at Mindanao State University – Sulu in terms of Algebraic Expressions and Operations, Sentence in Two Variables, Linear Relationship, and Systems of Linear Equations/Equalities?

Literature

Successful mathematics instruction is produced by qualified math teachers. They must possess mathematical expertise that goes beyond what they instruct (Cornelius, 1982). Teachers who possess sufficient mathematical expertise can design a variety of exercises that help pupils become more proficient in the subject. When it comes to creating learning exercises that cater to each student's unique needs, those who are incompetent lack creativity. A teacher must have the

requisite aptitudes, competencies, and subject-matter expertise in addition to ongoing professional development in the discipline in order to be considered mathematically competent. According to Blanton et al. (2002), in order for instructors to perform well, they require significant long-term professional development regarding the subject area. Math teachers must be knowledgeable and stay up to date on the latest developments and trends in the field.

Teachers of mathematics ought to have formal education. This would lessen issues, challenges, and ineptitude in arithmetic instruction (Battad, 1981). Only when a teacher is proficient in mathematics can effective mathematics instruction be achieved. Therefore, a teacher with sufficient mathematical expertise can design a variety of exercises to help students understand the value of mathematics. According to Secretary of Education Richard Riley (1998) at the American Mathematical Society convention, 28% of high school math teachers in the United States do not have a major or minor in mathematics. High school math teachers are in great demand. The U. The S. In his State of the Union speech, President Bill Clinton suggested that the state compel incoming teachers to take a "Competency Test" that would demonstrate their subject-matter expertise and teaching skills. He also suggested phasing out the practice of assigning instructors to subjects for which they are ill-prepared.

One method of evaluating teachers' cognitive abilities and knowledge is the competency test. According to Flippo and Foster (1989), competency testing is regarded as a trustworthy way to determine fundamental knowledge that has a big impact on teachers' efficacy. "The New Teacher Act" was passed into law in Taiwan. These acts were designed to increase the qualities of school teachers that can reflect social inquiry and to offer a variety of approaches to train exceptional teachers in a variety of fields. Regular evaluation and semester evaluation are the two ways that students' teaching performance is assessed.

The final grade is the average of the two scores, both of which must be higher than 60. An oral exam and a practical teaching were two of the evaluation techniques (Leou, 1998).

If a candidate passes the Licensure Examination for Teachers (L.E.T.), the education department in our nation permits them to practice their profession and their skills. A licensed teacher must be certified by the Professional Regulation Commission (PRC). Private colleges and universities are accredited by the Philippines Accrediting Association of Schools, Colleges, and Universities (PAASCU), while the Accrediting Agency of the Chartered Colleges and Universities of the Philippines (AACUP) was established to standardize the nation's state colleges. The purpose of these accrediting organizations is to guarantee quality control for all postsecondary educational establishments. All of the nation's current higher education institutions should adhere to the national standard to guarantee that their graduates are competent in a variety of fields.

According to Badilla (2000), a child's performance is significantly impacted by the proficiency of their secondary school math teacher. Having completed graduate courses is a component of competence. According to Chico (1986), competency tests are an effective technique for teachers to increase their proficiency in teaching mathematics. Their advantages and disadvantages were also made clear. The proficiency of the math teacher may have a significant impact on the pupils' performance. According to Paculanang, Sr. (1987), in order for math teachers to be effective, they must always stay up to date with advancements in the field.

In her study on the mathematical proficiency of fourth-year high school students and instructors, Tambangan (2001) recommended that competency tests be administered to teachers in order to keep them informed and focused. This suggests that educators must possess sufficient knowledge and abilities to instruct the subject. A competent math teacher is one who understands the nature of mathematics as a discipline, is knowledgeable about the subject matter and content

required for effective instruction, and is cognizant of the characteristics of students (Simbulan, 1995).

When evaluating a math teacher's competency, a number of things must be taken into account. One is the teachers' educational background; Battad (1981), Romato (1999), and Recabo (1999) emphasized that math teachers should have a formal education. By studying advanced mathematics studies and developing their professional skills, they must expand and enhance their knowledge and abilities in teaching mathematics courses.

According to Valdez (2002), it is impossible to establish that a teacher's performance is influenced by his professional traits. Teachers of mathematics can expand their range of knowledge and abilities through their duration of teaching experience and academic training. According to Guinares (1986), student achievement across all subject areas is significantly correlated with the educational background of the teacher. The mean achievement value was higher for students taught by highly qualified educators. Having completed graduate courses is one example of such competency.

According to Amba (1991) and Baguio (1993), math teachers should continue their education, particularly to earn a master's degree in mathematics education. This will enhance their secondary maths instruction. Teachers who completed units toward a Master of Arts degree demonstrated more competence than those who did not (Jama, 2000). A key factor in raising the proficiency levels of math teachers is their professional development. Through contextualized instruction, the incorporation of multimedia and creative outputs, and scaffolding strategies that increase the accessibility and significance of reading, instructors displayed adaptive responses (Chavez JV, Samilo PJE, Cabiles NVA, et al. 2025). Effective and efficient math teachers are able to complete the course requirements. Being proficient in mathematics is essential since it requires pupils to perform at a high level and possess understanding of mathematical pedagogy and subject.

The teaching experience is another factor that should be taken into account when evaluating teachers' mathematical proficiency. Teachers with more years of experience are typically seen as proficient in the subject matter. Jama (2000) found that teachers with six years or more of teaching experience are more competent than those with five years or less.

The corpus study (1996) also discovered that teachers gain experience and effectiveness as they continue in the teaching profession. According to Papelaras's (2000) research, teachers with greater experience outperformed those with fewer years of service. Tortola et al. (1999), however, found that length of service had no bearing on the growth of instructors' expertise.

Conventional wisdom views teaching experience as a benefit that is positively correlated with teaching success (Barnes, teaching produces people with higher mathematics proficiency), followed by those with five to nine years of teaching experience (Bayagna, 1997). Another element that may have an impact on teachers' proficiency in any topic is in-service training. According to Steen (1994), educators must have both a thorough comprehension of the subject matter and the chance to learn in a way that is consistent with research or student learning. The NCTM (1989) standards emphasized the importance of good math teachers continuing to explore new mathematical concepts through professional development.

According to the National Commission on Excellence (quoted by Romato, 1999), 79% of instructors had not completed at least 60 hours of professional training in workshops in more than ten years, which is why there are so few science and math teachers. Manuel (2000) looked into how well in-service training improved instructors' competency. He discovered that in-service training significantly improves teachers' proficiency. One area of professional development that may lead to successful and efficient teaching is in-service training and seminars.

According to Wilson and Berne (1999), there is a growing effort to investigate efficient methods of implementing professional development because teachers' learning is frequently fraught with danger. In order to meet the demands of both society and students, math teachers must engage in ongoing professional development. Teachers who stay up to date on trainings, seminars, workshops, and other associated activities pertinent to professional development enhance their teaching strategies, according to Tating (1988). Additionally, they enhance the fun and significance of teaching and mastering mathematics.

A professional development program was started in 2000 by the University District Schools of Columbus, Ohio's College of Education, School of Teaching and Learning. Following the program's duration, the results showed that both math teachers and pupils had benefited. Students' achievement dramatically rose as a result of the shift in classroom instruction toward reform. The researcher's ideas for the study's conceptualization came from the evaluated literature and relevant studies. For example, Cornelius, Blanton, et al.'s study in Ulanang provided the researchers with ideas for testing and evaluating math teachers' proficiency.

Similar to the variables used by Valdez (2002), Tambangan (2001), Battad (1981), et al., these studies emphasized the significance of variables to assess mathematical competence of teachers. Other related variables included educational qualifications, length of teaching experience, and in-service training attended. Since all of the respondents in this survey were high school students, their year levels are the only differences. In order to discover pertinent theories, principles, and researchers who directly relate to the current topic, related literature and studies are categorized.

Teachers do more than just impart knowledge. According to Riessman (1991), teachers' roles in the classroom have changed from being instructors to managers and facilitators of the learning process. In this regard, kids must be trained and motivated to overcome solitude. The student, the subject content, and the context—that is, the community and society at large—are the three elements of a teaching-learning scenario. According to Fonacier (1982), teaching mathematics requires knowledge of the subject. Teachers need to be somewhat knowledgeable about the fundamental concepts and abilities. In order to promote structured thinking habits in youngsters, educators must provide opportunities for students to enhance their reasoning skills.

It was believed that classroom success and a teacher's proficiency in mathematics were associated (Mijan, 1988). Improving aspiring teachers' attitudes toward success in math content courses has been the subject of several research. Theoretically, Gines and Oregana (1974) conducted a replication research with children aged three to five from Hospicio de San Jose, Manila. They verified that kids used new perspectives to solve the issue. An individual's capacity for getting insights increased with his level of intelligence and experience.

According to Gerardi's (1971) research, students learn more efficiently and retain information longer when daily math instruction includes the following elements: 1) skill review; 2) concrete or tangible examples for concepts; 3) content relevance to students' interests and backgrounds; 4) students' ability/level; 5) a multisensory approach to learning; 6) a problem-solving approach; and 7) a high level of student participation. This idea is consistent with the study of (Tongkoh, Adzmina & Chavez, Jason, 2023).

Teaching mathematics can be challenging for a number of reasons. According to Ragon (1986), there are a number of factors that contribute to mathematical difficulty, including: 1) inadequate instruction is responsible for more arithmetic problems than any other factor; 2) difficulties with abstract or symbolic thinking; 3) reading problems that often require problem-solving to determine which mathematical process to perform; and 4) negative attitudes toward

mathematics. The classroom serves as a laboratory for mathematics. Teachers leverage the child's interest to make their lessons more engaging. The most crucial aspects of education are the methods and resources to be employed. Proctor (1971).

Methodology

1) Research Design

A descriptive-exploratory research design using a quantitative research method will be used to evaluate the degree of mathematical competency of math teachers at Mindanao Statue University – Sulu. This study used an exploratory qualitative research design to realize the comprehensive layout for the data collection in this study. This approach will be used since a descriptive approach gathers, examines, and verifies data. After creative investigation, description arises. It organizes the results to match interpretations, which are subsequently tested or validated (Krathwohl, 1993). Additionally, a descriptive research methodology provides the necessary information and experiences to help set up a more in-depth study by interpreting and revealing conditions that exist or do not exist (Venson, 2004).

2) Population and Sampling

One hundred (100) Mindanao State University-Sulu students from the 2022–2023 academic year served as the study's respondents. In particular, the respondents in this survey are students enrolled in the aforementioned school's mathematics major or courses as part of their academic requirements. The College of Arts and Sciences was represented by fifty (50) students, and the College of Education was represented by fifty (50) students. The distribution of the study's samples is displayed in the table below. Just 96 of the anticipated 100 responders were found by the researcher. Four (4) of the respondents stated that they were unable to locate the survey questionnaire that was provided to them.

3) Instrument

The study used a descriptive method of research. Questionnaire was the main instrument utilized in gathering the empirical data needed in this study. Interviews were also conducted to verify data collected. The students' set of questionnaires is composed of three parts. Part I Respondent's Demographic Profile (Age, Gender, Year Level, Parent's Educational Attainment, Parent's Monthly Income, and Part II Mathematical Competency of Teachers Teaching Mathematics at Mindanao Statue University – Sulu as: A – Algebraic Expression and Operations, B – Sentence in Two Variables, C – Linear Relationship and D – System of Linear Equations/Equalities. This will be used to measure their competence on the knowledge and skills in Mathematics, based on The National Secondary Education Development Program (SEDP), patterned from the work of Marita Chio (1996).

4) Data Gathering Procedure

The Sulu State College School of Graduate Studies Dean, the University Chancellor, the University Vice Chancellor for Academic Affairs, and the College/Department Deans were asked for permission to conduct the questionnaire in order to gather data. The questionnaire is personally launched, administered, and retrieved by the researcher. Following that, the data from the questionnaire will be presented, analyzed, and interpreted. After that, a final draft was sent in for revision and finalization.

5) Data Analysis

The National Secondary Education Development Program (SEDP) is the source of Marita Chio's (1996) instrument, which served as the model for this study. The validity and reliability of this standardized instrument have previously been confirmed by prior research. As a result, the current

researcher does not need to go through the revalidation and retesting procedures for this instrument's reliability.

The following statistical techniques will be used to generate the core empirical data for this study and to contextualize the generated empirical data. The statistical tools to ascertain the profile of the respondents in terms of gender, age, year level, parental educational attainment, and parental monthly income include frequency and percentage. In terms of Algebraic Expressions and Operations, Sentence in Two Variables, Linear Relationship, and Systems of Linear Equations/Equalities, students' perceptions of the mathematical proficiency of math teachers at Mindanao State University – Sulu will be assessed using the weighted mean and standard deviation. When data are categorized by gender, the t-test for independent variable will be used to identify any significant differences in the degree of students' perceptions of the mathematical competency of professors teaching mathematics at Mindanao State University – Sulu. When data are grouped by gender, age, year level, parental educational attainment, and parental monthly income, One-way Analysis of Variance (ANOVA) will be used to ascertain the significant differences in the degree of the students' perspective on mathematical competency of teachers teaching mathematics at Mindanao State University – Sulu. In terms of Algebraic Expressions and Operations, Sentence in Two Variables, Linear Relationship, and Systems of Linear Equations/Equalities, the significant correlation between the subcategories included under the extent of the students' perspective on the mathematical competency of teachers teaching mathematics at Mindanao State University – Sulu will be ascertained using Pearson product-moment correlation.

Results

Question 1. What is the extent of mathematical competency of teachers teaching Mathematics at Mindanao State University – Sulu in the context of algebraic expressions and operations, sentence in two variables, linear relationships, and systems of linear equations/equalities?

Table 1.1 Level of Mathematics Performance in terms of Algebraic Expressions and Operations

| Algebraic Expressions and Operations | Mean | SD | Interpretation |
|---|--------------|-----------|-------------------------|
| 1) Translating into Mathematics symbols. | 4.490 | .768 | Highly Competent |
| 2) Using variables. | 4.424 | .763 | Highly Competent |
| 3) Evaluating algebraic expressions. | 4.270 | .732 | Highly Competent |
| 4) Writing rules in symbols. | 4.410 | .762 | Highly Competent |
| 5) Identifying polynomials. | 4.050 | .813 | Highly Competent |
| 6) Adding and subtracting polynomials. | 4.113 | .939 | Highly Competent |
| 7. Multiplying polynomials. | 4.001 | .940 | Highly Competent |
| 8. Dividing polynomials | 4.133 | .849 | Highly Competent |
| 9. Using algebraic expressions and operations | 4.440 | .723 | Highly Competent |
| AVERAGE | 4.259 | | HIGHLY COMPETENT |

Legend:(5) 4.50–5.00=Extremely Competent; (4) 3.50–4.49=Highly Competent; (3) 2.50–3.49=Competent; (2) 1.50–2.49=Less Competent; (1) 1.00–1.49=Not Competent.

Table 1.1 in terms of algebraic expressions and operations, it showed that the respondents indicated *highly competent* in all statements. Among those they indicated *highly competent* are; translating

into Mathematics symbols (mean = 4.490, SD = .768); writing rules in symbols (mean = 4.410, SD = .762); and using algebraic expressions and operations (mean = 4.440, SD = .723). The average mean of 4.259 means that the teachers teaching Mathematics at Mindanao State University – Sulu are *highly competent*.

Table 1.2 Level of Mathematics Performance in terms of Sentence in Two Variables

| Sentence in Two Variables | Mean | SD | Interpretation |
|--|--------------|------|-------------------------|
| 1) Recalling solutions of sentences in one variable. | 4.400 | .827 | Highly Competent |
| 2) Graphing in a coordinate plane. | 4.413 | .762 | Highly Competent |
| 3) Working with sentences in two variables. | 4.132 | .849 | Highly Competent |
| 4. Graphing in two solutions in two variables. | 4.240 | .830 | Highly Competent |
| 5. Using graphs to solve the problems. | 4.410 | .762 | Highly Competent |
| AVERAGE | 4.319 | | HIGHLY COMPETENT |

Legend: (5) 4.50–5.00=Extremely Competent; (4) 3.50–4.49=Highly Competent; (3) 2.50–3.49=Competent; (2) 1.50–2.49=Less Competent; (1) 1.00–1.49=Not Competent.

Table 1.2 in terms of sentence in two variables, the respondents indicated *highly* Using graphs to solve the problems *competent* in all statements. Among those they indicated highly competent are; using graphs to solve the problems (mean = 4.41, SD = .762); graphing in a coordinate plane (mean = 4.413, SD = .762); and recalling solutions of sentences in one variable (mean = 4.400, SD = .827). The average mean of 4.319 means that the teachers teaching Mathematics at Mindanao State University – Sulu are *highly competent*.

Table 1.3 Level of Mathematics Performance in terms of Linear Relationship

| Linear Relationship | Mean | SD | Interpretation |
|--|--------------|------|-------------------------|
| 1) Relations. | 4.412 | .762 | Highly Competent |
| 2) Relations that are functions. | 4.560 | .765 | Extremely Competent |
| 3) Representing the functions. | 4.470 | .767 | Highly Competent |
| 4) Obtaining the slope of a line. | 4.483 | .767 | Highly Competent |
| 5) Obtaining the equation of a line. | 4.450 | .694 | Highly Competent |
| 6) Using functions in problem solving. | 4.560 | .519 | Extremely Competent |
| 7) More on graphs of linear functions. | 4.184 | .808 | Highly Competent |
| AVERAGE | 4.446 | | HIGHLY COMPETENT |

Legend: (5) 4.50–5.00=Extremely Competent; (4) 3.50–4.49=Highly Competent; (3) 2.50–3.49=Competent; (2) 1.50–2.49=Less Competent; (1) 1.00–1.49=Not Competent.

Table 1.3 in terms of linear relationships, the respondents indicated *extremely competent* to *highly competent* on the different statements. For *extremely competent*, the statements are; relations that are functions (mean = 4.560, SD = .765); and obtaining the equation of a line (mean = 4.560, SD = .694). For *highly competent*, some of the statements are; representing the functions (mean =

4.470, SD = .767); and obtaining the equation of a line (mean = 4.450, SD = .694). The average mean of 4.446 means that the teachers teaching Mathematics at Mindanao State University – Sulu are *highly competent*.

Table 1.4 Level of Mathematics Performance in terms of System of Linear Equations/Equalities

| System of Linear Equations/Equalities | Mean | SD | Interpretation |
|--|--------------|-------|-------------------------|
| 1. Kinds of linear system. | 4.190 | .966 | Highly Competent |
| 2. Solving systems of linear equation by substituting. | 4.243 | .830 | Highly Competent |
| 3. Solving systems of linear equations by elimination. | 4.310 | .850 | Highly Competent |
| 4. Using systems of linear equations to solve word problem. | 4.270 | .900 | Highly Competent |
| 5. Solving systems of linear equations by graphing. | 4.042 | .905 | Highly Competent |
| 6. Graphical solutions of systems of linear inequalities. | 4.340 | .916 | Highly Competent |
| 7. Using systems of linear inequalities to solve word problem. | 4.110 | 1.014 | Highly Competent |
| AVERAGE | 4.215 | | HIGHLY COMPETENT |

Legend:(5) 4.50–5.00=Extremely Competent; (4) 3.50–4.49=Highly Competent; (3) 2.50–3.49=Competent; (2) 1.50–2.49=Less Competent; (1) 1.00–1.49=Not Competent.

Table 1.4 in terms of systems of linear equations/ equalities, the respondents indicated *highly competent* in all statements and some of these statements are; graphical solutions of systems of linear inequalities (mean = 4.340, SD = .916); Using systems of linear equations to solve word problem (mean = 4.270, SD = .900); and solving systems of linear equation by substituting (mean = 4.243, SD = .830). The average mean of 4.215 was interpreted as *highly competent*.

Question 2. Is there a significant difference in the extent of mathematical competency of teachers teaching Mathematics at Mindanao State University – Sulu when data are categorized according to age, gender, year level, parent’s educational attainment, and parent’s average monthly income?

Table 2.1 t – test for Significant Difference in the Extent of Mathematical Competency in terms of Gender

| | t | Df | Sig.(2-tailed) | Mean difference | 95% confidence interval of the difference | |
|--------|--------|----|----------------|-----------------|---|-------|
| | | | | | Lower | Upper |
| Gender | 33.988 | 95 | .000 | 1.656 | 1.56 | 1.75 |

Significant at .05 level

Table 2.1 The t-test was used for gender since there are only two categories. The value of t = 33.988 is greater than the p= .05, 2- tailed tests. It means that the null hypothesis is accepted. There is no significant difference in the extent of mathematical competency of teachers teaching Mathematics at Mindanao State University – Sulu when data are group according to their gender. The result implies that regardless of gender, the teachers teaching Mathematics at Mindanao State University – Sulu are highly competent to handle the subject.

Table 2.2 ANOVA for Significant Difference in the level of Mathematics Performance in terms of Age, Year Level, Parent’s Educational Attainment, and Parent’s Average Monthly Income

| | Sum of Square | df | Mean Square | f | Sig. |
|------------|---------------|----|-------------|---|------|
| AGE | | | | | |

| | | | | | |
|--|--------|----|-------|-------|------|
| Between Groups | 2.371 | 3 | .790 | 1.356 | .261 |
| Within Groups | 53.619 | 92 | .583 | | |
| Total | 55.990 | 95 | | | |
| Year Level | | | | | |
| Between Groups | 1.550 | 1 | 1.550 | 2.296 | .525 |
| Within Groups | 63.408 | 94 | .675 | | |
| Total | 64.958 | 95 | | | |
| Parent's Educational Attainment | | | | | |
| Between Groups | 3.293 | 3 | 1.098 | 1.947 | .127 |
| Within Groups | 51.863 | 92 | .564 | | |
| Total | 55.156 | 95 | | | |
| Parent's Average Monthly Income | | | | | |
| Between Groups | 3.705 | 3 | 1.235 | 1.338 | .267 |
| Within Groups | 84.920 | 92 | .923 | | |
| Total | 88.625 | 95 | | | |

Significant at .05 level

Table 2.2 Analysis of Variance (ANOVA) was used for age, year level, parent's educational attainment, and parent's average monthly income. The value of 1.356 for age is greater than the sig. value of .05, the f value of 2.296 for year level is also greater than the sig. value of .05, the value of 1.947 for parent's educational attainment is greater than the sig. value of .05, and the value of 1.338 is also greater than the sig. value at .05. It could only mean that the null hypothesis is accepted.

There is no significant difference in the extent of mathematical competency of teachers teaching Mathematics at Mindanao State university when data are group according to their age, year level, parent's educational attainment, and parent's average monthly income. The result implies that regardless of the student's profile, the teachers teaching Mathematics at Mindanao State University – Sulu are highly competent to handle the subject.

Question 3. Is there a significant correlation among the subcategories subsumed under extent of mathematical competency of teachers teaching Mathematics at Mindanao State university – Sulu in terms of algebraic expressions and operations, sentence in two variables, linear relationships, and systems of linear equations/equalities?

Table 3.1 Significant Correlation Among the Subcategories Subsumed Under Extent of Mathematical Competency of Teachers Teaching Mathematics at Mindanao State University – Sulu in terms of Algebraic Expressions and Operations, Sentence in Two Variables, Linear Relationships, and Systems of Linear Equations/Equalities

| | | Pearson r | Sig | n | Description |
|---|-----------------------|-------------|------|----|------------------|
| Algebraic Expressions and Operations | Sentence in two | .816 | .000 | 96 | Very High |
| | Linear Relationship | .848 | .000 | 96 | Very High |
| | Systems of Linear | .700 | .000 | 96 | Moderate |
| | AVERAGE | .788 | | | VERY HIGH |
| Sentence in Two Variables | Algebraic Expressions | .421 | .000 | 96 | Moderate |
| | Linear Relationship | .587 | .000 | 96 | High |
| | Systems of Linear | .464 | .000 | 96 | Moderate |
| | AVERAGE | .491 | | | MODERATE |

| | | | | | |
|---|-----------------------|-------------|------|----|------------------|
| Linear Relationships | Algebraic Expressions | .934 | .000 | 96 | Nearly Perfect |
| | Sentence in two | .738 | .000 | 96 | Very High |
| | Systems of linear | .876 | .000 | 96 | Very High |
| | AVERAGE | .849 | | | VERY HIGH |
| Systems of Linear Equations/Equalities | Algebraic Expressions | .421 | .000 | 96 | Moderate |
| | Sentence in two | .808 | .000 | 96 | Very High |
| | Linear Relationships | .700 | .000 | 96 | Moderate |
| | AVERAGE | .643 | | | MODERATE |

*Correlation Coefficient is significant at $\alpha = .05$

Correlation Scales adapted from Hopkins (2002): 0.1 = Nearly Zero; 0.1 – 0.3 = Low; 0.3 – 0.5 = Moderate; 0.5 – 0.7 = High; 0.7 – 0.9 = Very High; 0.9 – 1.0 = Nearly Perfect

Table 3.1 Pearson Product – Moment Correlation or Pearson r was used to determine if there is a significant correlation among the subcategories subsumed under extent of mathematical competency of teachers teaching Mathematics at Mindanao State University – Sulu in terms of algebraic expressions and operations, sentence in two variables, linear relationships, and systems of linear equations/equalities.

The value of $r = 0.788$ for algebraic expressions and operations was interpreted as *very high relationship* while the value of $r = 0.491$ for sentence in two variables was interpreted as *moderate relationship* at significant value of .05 two-tailed test, the value of $r = 0.849$ for linear relationships was interpreted as *very high relationship* while the value of $r = 0.643$ for systems of linear equations/equalities was interpreted as *moderate relationship* at significant value of .05 two-tailed test.

Discussion

Question 1. On the extent of mathematical competency of teachers teaching Mathematics at Mindanao State University – Sulu in the context of algebraic expressions and operations, sentence in two variables, linear relationships, and systems of linear equations/equalities

In the context of algebraic expressions and operations, sentences in two variables, linear relationships, and systems of linear equations/equalities, the math teachers at Mindanao State University – Sulu are extremely competent. The outcome merely suggests that the math teachers at Mindanao State University – Sulu are adept at handling the algebraic expressions and operations lesson. According to a study by Blanton et al. (2018), in order for instructors to perform well, they require significant, ongoing professional development related to the subject. The outcome just suggests that the math instructors at Mindanao State University-Sulu are adept at managing the lesson on sentence in two variables. Cornelius (2015) asserts that proficient math instructors create effective math instruction. They need to have a deeper understanding of mathematics than what they teach. The outcome merely suggests that the math instructors at Mindanao State University in Sulu are adept at teaching the lesson on linear relationships. Flippo and Foster (2015) state that competency tests are one method of evaluating teachers' cognitive abilities. It is regarded as a trustworthy method for determining fundamental knowledge, which has a big impact on teachers' efficacy. The outcome merely suggests that the math instructors at Mindanao State University in Sulu are adept at teaching the lesson on linear equations and equations. Paculanang Sr. (2020) claimed that in order for math teachers to be effective, they must constantly stay up to date with changes and advancements in the field. This concept is consistent with the research of (Inoferio,

Hermie & Espartero, Marcelino & Asiri, Masnona & Damin, Michelle & Chavez, Jason. 2024). Their flexibility and individualized approach increase students' access to mathematics, potentially lowering anxiety and improving the learning process. The outcome merely suggests that the math teachers at Mindanao State University in Sulu are adept at teaching the subject. Paculanang Sr. (2020) claimed that in order for math teachers to be effective, they must constantly stay up to date on changes and advancements in the field.

Question 2. On the significant difference in the extent of mathematical competency of teachers teaching Mathematics at Mindanao State University – Sulu when data are categorized according to age, gender, year level, parent’s educational attainment, and parent’s average monthly income

When data are categorized by age, gender, year level, parent's educational attainment, and parent's average monthly income, there is no discernible difference in the degree of mathematical competency of the teachers teaching mathematics at Mindanao State University – Sulu. This suggests that the teachers are highly competent to handle the subject regardless of the student's profile. The study's findings lend credence to the idea that a teacher's educational background, duration of teaching experience, and attendance at in-service training may have an impact on their mathematical competency (Pasa, 2016). This study supports the hypothesis of (Chavez, J.V., Adalia, H.G., and Alberto, J.P. 2023) that the primary predictors of parents' motivation were competence, application, reputation, and positivity.

Question 3. On the significant correlation among the subcategories subsumed under extent of mathematical competency of teachers teaching Mathematics at Mindanao State university – Sulu in terms of algebraic expressions and operations, sentence in two variables, linear relationships, and systems of linear equations/equalities

The results simply indicate that the various factors have a very high to moderate relationship with regard to the mathematical competency of teachers teaching mathematics at Mindanao State University – Sulu. There is a very high correlation in terms of algebraic expressions and operations and linear relationships, and a moderate correlation in terms of sentences in two variables and systems of linear equations/equalities. One of the courses taken by undergraduates that was seen to be highly helpful in daily life was Mathematics in the Modern World. Nonetheless, some people still thought it was a dull and challenging subject to study (Richard, Verdeflor, 2024). According to Bayagna's (2017) research, teaching experience is typically seen as a benefit that is positively connected to teaching success. According to the findings of (Espartero, Marcelino & Caldaza, Kier & Prado, Rosalina. 2024), teaching strategies necessitate teachers to concentrate more on visual and online-assisted learning in order to pique students' interest in solving mathematical problems and learning mathematical concepts. As a result, teaching produces individuals with higher mathematical achievements.

Conclusion

According to the study's findings, over half of the respondents are in their early 20s, and the majority of them are female. They are nearly evenly divided among the study's respondents, and their parents only completed a basic education and make less money to support the family. It merely demonstrated how highly qualified the math instructors at Mindanao State University in Sulu are to teach the subject. When data are broken down by age, gender, year level, parental educational attainment, and average monthly income, there is no discernible difference in the level of mathematical proficiency of math teachers. This simply indicates that the teachers perform roughly equally in the subject regardless of their profiles. The very high to high correlation in the extent of mathematical competency of teachers teaching Mathematics at Mindanao State

University – Sulu in terms of algebraic expressions and operations, sentence in two variables, linear relationships, and systems of linear equations/equalities only prove that the different mathematical competencies are closely related to one another.

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