

FACTORS AFFECTING NUMERACY SKILLS

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ABSTRACT

This study aimed to determine what factors affect the numeracy skills of the Grade 4 students. This study used a descriptive correlational quantitative research design, which examines the relationships between factors affecting numeracy skills and the level of numeracy skills of students. The research instrument used was a survey questionnaire containing two parts: the summative test for the level of numeracy skills and the survey questionnaire for the factors. The respondents of this study were 21 Grade 4 students of Owabangon Elementary School during School Year 2021-2022. Mean, standard deviation, and Pearson-r was used as the statistical tools in this study. The research findings signified that the level of numeracy skills of respondents was low. Whereas, the level of practice of factors affecting numeracy skills, namely: student-related factors, environmental factors, and teacher factors, were frequently and consistently evident. This study revealed that there was a significant difference in the level of practice on the factors affecting numeracy skills. Also, this study's result showed a moderate relationship between the level of numeracy skills and factors affecting numeracy skills. Among the factors that affect numeracy skills, the teacher factor, in terms of encouraging cooperation and participation, was the problem that affected students' level of numeracy skills. The result implied that some actions must be taken, especially for classroom teachers. With that, a proposed intervention called "Promoting the Use of Cooperative Learning Strategy in the Classroom: A Seminar for Teachers" to support and encourage teachers in promoting the use of cooperation and participation in the classroom to improve the numeracy skills of students was recommended.

Keyword: *Numeracy skills, factors, environmental factor, student-related factor, teacher factor*

1. INTRODUCTION

Education has provided individuals with sufficient reasons to choose which learning themes will be preserved and maintained throughout their lives. The foundation subjects allow students to begin anew and see life from a different perspective. However, according to Education Scotland (2019), Mathematics, out of all the learning areas in basic education, presents students with problems that arise from within or from without, which consequently affects numeracy skills.

According to United Nations Relief and Works Agency (2013), numeracy is a skill that involves confidence and the ability to deal with numbers and measurements. It necessitates a working knowledge of the number system, a set of computational skills, and a desire and capacity to solve number issues in various situations. Numeracy also requires a practical understanding of how data is obtained by counting and measuring and then presented or depicted in graphs, diagrams, charts, and tables. Additionally, Ofsted (2018) has highlighted the importance of early mathematical instruction on young children's ability development on the impact of prior achievement on future academic success on the need to focus on numeracy. However, some students still have a low level of numeracy skills. With that, this study aimed to determine the factors that affect the numeracy skills of students. In addition, the researcher would also like to determine the significant relationship between the level of numeracy skills of

respondents and the factors affecting numeracy skills. This study is beneficial not only to students but also to teachers and parents. This research also helps deliver vital information regarding students' numeracy skills.

2. REVIEW OF RELATED LITERATURE

This chapter presented the relevant literature that the researcher considered to strengthen the importance of the present study.

2.1 The Definition of Numeracy Skills

Numeracy, according to Victorian Curriculum and Assessment Authority (2017), is the knowledge, skills, practices, and attitudes that learners need to do math in a variety of situations. It involves perceiving and comprehending the world's mathematical functions. Many people's numerical experience in daily life includes number, estimation, and calculation (Raymundo, 2013). Numerical agreement, familiarity, and critical thinking get extremely advanced and developed as learners grow (Kurmaniak, 2021). These abilities enable students to use arithmetic to make informed decisions and solve problems effectively.

Orpwood, Schmidt & Jun (2012) stated that numeracy skills are, in a sense, more important now than they ever have been. Also, Essential Skills Ontario (2012) echoes many of these abilities, dividing numeracy into five dimensions that reflect everyday use: 1) money math, or the ability to make financial transactions such as paying bills; 2) scheduling, budgeting and accounting, or planning for the best use of money and time; 3) measuring and calculating quantities, areas, volumes and distances; 4) data analysis; and 5) numerical estimation. Furthermore, according to United Nations Relief and Works Agency (2013), numeracy is a skill that incorporates confidence and competence with numbers and measurements. It requires an understanding of the number system, a repertoire of computational skills and an inclination and ability to solve number problems in a variety of contexts (Central Foundation, 2022).

2.2 Development of Early Numeracy and its Significance to Future Numeracy Skills of Students

Early math and numeracy are the general understanding of numbers and basic mathematical concepts as stated by (Harris & Petersen 2019); (Toll & Van Luit 2014). These are skills such as counting, comparing and contrasting, describing shapes and positions and problem solving. According to the findings of Harris & Petersen (2019), students who are exposed to and master early math abilities at a young age are more likely to succeed in school. Student who enter Kindergarten low in math skills tend to continue to perform below their peers in later grades. Math learning and intervention needs to happen before Kindergarten. These students, especially at-risk students, need to opportunity to build a strong foundation at a young age.

Clerkin and Gilligan (2018) also performed a study Arithmetic achievement in fourth grade is linked to numeracy activities at home with young children and attitudes toward math. They discovered that early childhood numeracy play was strongly and positively associated to fourth-grade math attitude. Students who were exposed to arithmetic activities at an early age developed a more positive attitude toward math in general. The cheerful attitude lasted at least until fourth grade. Furthermore, they found that students with a negative attitude toward math in fourth grade also were achieving at a lower level. This shows that early numeracy play is directly linked to positive attitudes toward math which leads to higher achievement in upper elementary math classes. Parents are the first teachers in a child's life and their time devoted to introducing numeracy activities at a young age is shown to pave the way for their child's math future.

2.3 Factors Affecting Numeracy Skills

One factor affecting numeracy learning can be environmental factors, it may be the social environment, which is the child's relationship with others in school and community. Emotional environment, which is how well the child's relational needs at home (McGuire, 2022). Angela (2018) said that in a school or home setting, a positive learning environment is crucial for a child. Also, major findings in the study of Wali (2015) was found that home environment plays vital role in developing children numeracy skills development because children undergo certain formal and informal experiences at home. Parental involvement is a huge factor in the learner's achievement. In a study of Cai et al. (2016), parents play the roles of motivators, resource suppliers, monitors, mathematics content advisers, and mathematics learning counselors, according to them.

Footprints (2022) said that the classroom should be a dynamic and engaging place to be for the students. Hannah (2013) said that if there is too much structure set in place it can stifle creativity, and if there is not enough structure it can lead to distractions and little focus. On the contrary, a classroom with fresh, warm air can create an atmosphere conducive to learning (Burke and Samide, 2013). However, without an organized classroom, even a generously sized room can diminish students' sense of ease and autonomy and limit their learning (Responsive Classroom, 2016). Additionally, cluttered or unorganized room can be distracting and impede learning and furniture should be arranged in such a way that there is little traffic throughout the day and so that it appears organized (Angela, 2013). Also, Math teachers' behaviors have had much impact on encouraging the students towards mathematics (Khayati & Payan, 2014).

Manoah, Indoshi and Othuon (2011) confirmed that students' attitudes about mathematics have a direct impact on their academic achievement. Further, White (2011) said that individual attitudes regarding the issue can also influence numeracy acquisition. In contrast, Uok and Langat (2015) found that students who had positive attitudes towards mathematics did not affect their mathematics score. Similarly, Krukru (2015) found that in Nigeria, instructional materials have a significant impact on academic performance. He claims that using instructional materials makes it easier to present a lesson and improves teaching and learning. The usage of instructional materials aids students in better understanding a subject's concept. As a result, students who are taught using instructional resources do better than students who are taught without them, as added by (Adalikwu & Lorkpilgh, 2013).

2.4 Difficulties of Students in Numeracy

According to the Ministry of Education (2011) report, findings of the Primary School Assessment Test (UPSR), Malaysian elementary school pupils have difficulty answering questions that need numeracy understanding, particularly those that involve fundamental and problem-solving calculations. This supported by the findings from the Trends in International Mathematics and Science Study (TIMSS) in 2010 which demonstrated that Malaysian pupils are less familiar with questions demanding understanding, such as those that need the application of real-world knowledge, such as money titles, lengths, and weights. He also noted that headlines including the words numeracy, geometry, number, algebra, and data are less dominated by pupils. Also, Guinocor and company (2020) stated that in the Philippine setting, educational modules in mathematics contain a specific topic and instructional plan standards to empower understudies to create consistent and numerical abilities expected to get it the fundamental mathematical concepts. However, low performance in this discipline is still evident (Almerino, P., et.al., 2020) and low achievement of students in learning mathematics is still perceived as a continuous problem (Mushtaq, 2013).

Meanwhile, the Philippines ranked 2nd from the bottom among the participating countries in the recent Programme for International Student Assessment (PISA) 2018 according to DepEd - National Report of the Philippines (2019). This alarming result revealed that Filipino students recorded a mean score of 353 points in Mathematics Literacy which is significantly lower than the OECD mean of 489 points. It is also reported that only 1 out of 5 Filipino students or approximately 19.7% attained at least the minimum proficiency level (Level 2) in Mathematics Literacy. Additionally, in 2016, "57 per cent of the grade six candidates gained mastery of Mathematics in the Grade Six Achievement Test and only 44 per cent of those candidates passed the CSEC Mathematics, falling from 62 per cent in the previous year" (Buddo, 2017). In addition, the result of this study was supported by Care, E. and friends (2015) that the participation of the Philippines in TIMSS reported that the performance of Filipino students in national and international surveys on mathematics and science competencies lag behind its neighboring countries like Singapore, South Korea, Hongkong, Chinese Taipei and Japan.

2.5 Ways to Improve Numeracy Skills

Learners need to become familiar with the critical thinking ability with which they can solve problems in their current circumstances (Widodo, 2018). According to Krisdiana and company, (2019), teachers should utilize the use of worksheets-based learning so the learners may improve critical thinking. In the study by it is shown that students' critical thinking skills are increased by worksheet-based learning, and they are excellent. Another study shows that Team Accelerated Instruction can further develop numerical critical thinking abilities. It is important to plan visual learning media to make learning more successful (Widodo, 2019; Bernard, 2019). Next, is that teachers' assistance has a significant impact on the cognitive, behavioral, and emotional elements of students' numeracy skills in a Math class. Teachers should encourage students to love math activities (Liu, 2018). It is also noted that teachers' efficacy

is related to the learners' performance and accomplishment (Gulistan, 2017). One of the teaching traits a teacher should possess is the ability to nurture new approaches for evaluating the kind of information, abilities, and manners that children and society require. According to Kelly (2020) that the key to success in the field is a teacher's ability to organize the lesson, the classroom, and the students. Also, a teacher's ability to organize and prioritize classroom materials and schedules makes for successful teacher-student learning and efficacy (Mendez, 2019).

Additionally, according to the study of Sharma (2016), teacher support plays a significant role to generate a learning environment and induce the academic achievement and attainment of learners. Oluwasanmi (2012) proved through his research that in cooperative learning, students are more motivated to learn. They also tend to possess a higher self-esteem and they are less worried in learning Mathematics (Chan and Idris, 2017). Research has shown that when compared to traditional learning with lectures and individual performance, cooperative learning provides higher student achievement (Anwar et al., 2020). According to LoBello (2009), students who listen in class gain a better understanding of the content the teacher presents and can identify the fundamental knowledge which helps them build up prior knowledge especially in Math. Further, Iwankovitsch (2010) said that students with strong listening skills don't just retain more information, but they are also less likely to feel unprepared and frustrated in class. Additionally, improved listening skills can lead to improve a student's belief that they can succeed in class (Graham, 2011). Also, a student with a positive attitude towards math is more confident when learning math, enjoys math, motivated to do more, actively engages during math lessons, gets more practice, and achieves more (Kennedy, 2019).

Furthermore, another easy way for parents to help their children is to set up a distraction-free zone where they can do their homework. Parents can assist children in creating a space and time for them to return to their duties, as well as giving necessary tools for homework assignments (Patall, Cooper, & Robinson, 2008). However, Solari and Mare (2011) said that the lack of a comfortable, quiet space can lead children to have difficulties studying and reading, affecting their school performance. Oftentimes, the emphasis on math in schools is on abilities, instead of tackling its uses and importance, that is why some learners cannot appreciate the subject well (Larkin, 2016). Number-related activities can be done at home that will uphold the mathematical skills of the children through different board games or card games (Zippert and Rittle-Johnson, 2019). Dimakos, Tyrlis, and Spyros (2012) stated the parent influences a child's ability to learn numbers. Additionally, parents can be urged to utilize home numeracy encounters to the advancement of their kids' numeracy skill (Cheung, 2018).

3. METHODOLOGY

This chapter described the methods and procedure that the researcher employed in the conduct of the study. This section consists of the research locale, research design, research instrument, respondents, research procedures, and data analysis.

3.1 Research Design

The researcher used a descriptive-correlational research design in the said study. Descriptive correlational design was used in research studies that aim to provide static pictures of situations as well as establish the relationship between different variables (McBurney & White, 2009). The researcher utilized this design by interviewing the respondents to determine the relationship on level of numeracy skills and factors affecting numeracy skills.

3.2 Research Instrument

The researcher used two (2) sets of questionnaires. The first set of questionnaires was an assessment type and research-made, a 63-item test which was based on the competency of Math curriculum guide of Grade 4.

The second set of questionnaires was a researcher-made questionnaire. The respondents were asked to rate each item along a five-point scale ranging from 5 (Always) to 1 (Never).

3.3 Respondents of the Study

The respondents of this study were Grade 4 students in Owabangon Elementary School. There was only one section of Grade 4 students in the said school, with a total of 21 students with 12 boys and seven girls.

4. RESULTS AND DISCUSSION

The data gathered from the respective respondents regarding their level of numeracy skills and the factors affecting numeracy skills were meaningfully presented and critically analyzed in this chapter. Furthermore, this chapter discusses the results obtained from analyzed data with a supported review of related literature from previous studies.

4.1 Level of Numeracy Skills of Respondents

Presented in Table 3 was the level of numeracy skills of respondents based on the summative test results. The result in the table revealed that greater number of students have low level in terms of numeracy. There were few students who have good results but none of them had an outstanding performance in the test based on their results.

Table 3. Level of numeracy skills of the respondents

| Grade Descriptor | Grade Scale | Frequency | Percentage |
|---------------------------|-------------|-----------|------------|
| Outstanding | 90-100 | 0 | 0 |
| Very Satisfactory | 85-89 | 1 | 4.8 |
| Satisfactory | 80-84 | 3 | 14.3 |
| Fairly Satisfactory | 75-79 | 3 | 14.3 |
| Did Not Meet Expectations | Below 75 | 14 | 66.7 |

This study confirmed the analysis of Kelantan State Education Department (2012) that students are still struggling to identify the operations that will be utilized to answer the questions on the mid-level arithmetic test, particularly in identifying the operational basis for use in problem solving with words (Hugar, 2011). Also, Guinocor and company (2020) stated that in the Philippine setting, educational modules in mathematics contain a specific topic and instructional plan standards to empower understudies to create consistent and numerical abilities expected to get it the fundamental mathematical concepts.

However, low performance in this discipline is still evident (Almerino, P., et.al., 2020) and low achievement of students in learning mathematics is still perceived as a continuous problem (Mushtaq, 2013). In addition, the result of this study was supported by Care et al. (2015). The participation of the Philippines in TIMSS highlighted how Filipino students in national and international surveys on mathematics and science competencies lag behind its neighboring countries like Singapore, South Korea, Hongkong, Chinese Taipei, and Japan.

4.2 Level of Practice of Factors Affecting Numeracy Skills

Table 4 revealed that the level of practice of factors affecting numeracy in terms of student-related factors was frequently in remarks based on the result of the mean as seen in the table. This means that most respondents frequently have good performance in mathematics like doing extra efforts to learn mathematics, studying the lesson and listening attentively. The result was aligned with the study of White (2011) which said that individual attitudes regarding the issue can also influence numeracy acquisition.

Among the descriptions, listening attentively to the teacher had the highest mean in the table. On the contrary, the least observed inside the classroom based on the result of the mean were students feeling sleepy and bored during Math lessons. The result was aligned to LoBello (2009) which said that students who listen in class gain a better understanding of the content the teacher presents and can identify the fundamental knowledge which helps them build up prior knowledge especially in Math.

Table 4. Level of practice of factors affecting numeracy in terms of student related factors

| Description | Standard Deviation | Mean | Remarks |
|---|--------------------|------|------------|
| 1. I do well in Mathematics. | .67 | 3.95 | Frequently |
| 2. I do extra effort to learn Mathematics. | .97 | 3.67 | Frequently |
| 3. I listen attentively to the lecture of my teacher. | 1.07 | 4.38 | Always |
| 4. I actively participate in the discussion, answering exercises and/or clarifying things I did not understand. | 1.15 | 4.14 | Frequently |
| 5. I am feeling sleepy and bored during Math lessons. | 1.54 | 3.19 | Seldom |
| 6. I prepare and study for quizzes and tests. | 1.07 | 4.05 | Frequently |
| 7. There are reference materials (e.g. books, internet, others) while I'm learning. | 1.09 | 3.76 | Frequently |
| Average | .53 | 3.88 | Frequently |

According to Iwankovitsch (2010), students with strong listening skills don't just retain more information, but they are also less likely to feel unprepared and frustrated in class. Additionally, improved listening skills can lead to improve a student's belief that they can succeed in class (Graham, 2011). Also, a student with a positive attitude towards math is more confident when learning math, enjoys math, motivated to do more, actively engages during math lessons, gets more practice, and achieves more (Kennedy, 2019).

Flautaud in Table 5 the statistical findings on the level of practice of factors affecting numeracy in terms of environmental factors. Angela (2018) said that in a school or home setting, a positive learning environment is crucial for a child. The table showed that the practice was frequently evident based on the overall mean. This revealed that the environment of student was good. The classroom condition was free from disturbance, distractions, good classroom arrangement, and the atmosphere was frequently and always good for learning. Gilavand (2016) said that the learning environment has a significant impact on students' learning outcomes.

Table 5. Level of practice of affecting numeracy in terms of environmental factors

| Description | Standard Deviation | Mean | Remarks |
|---|--------------------|------|------------|
| 1. My classroom is free from noise and disturbance. | .73 | 4.14 | Frequently |
| 2. I am distracted by other visual items inside the classroom. | 1.32 | 2.38 | Rarely |
| 3. The arrangement of seats in the classroom is appropriate. | .75 | 4.19 | Frequently |
| 4. The good atmosphere in the classroom motivates me as a learner. | 1.12 | 3.43 | Frequently |
| 5. I am pleased with my classroom physical condition. | .91 | 4.33 | Always |
| 6. My family help me in my math assignments. | 1.22 | 3.90 | Frequently |
| 7. I am comfortable in studying at home. | 1.35 | 3.67 | Frequently |
| 8. I prefer finishing and studying my assignments first before watching any television program. | 1.40 | 3.19 | Seldom |

| | | | |
|--|------|------|------------|
| 9. During the time of learning, my parents/guardians give me household chores. | 1.22 | 3.24 | Seldom |
| Average | .53 | 3.61 | Frequently |

This result was aligned with the claim of Rohatgi & Scherer (2020) that positive school atmosphere and motivation are linked to academic outcomes, as school climate is linked to instructional quality and student achievement. Additionally, every teacher knows that a safe, clean, comfortable and attractive classroom can stimulate learning and help build a classroom community (Teacher Version, 2020). While at school children are exposed to various types of noise including external, environmental noise and noise generated within the classroom (Shield and Dockrell, 2008) which reported that noise has detrimental effects upon children's performance at school (Environment Health Perspectives, 2014), including reduced memory, motivation, and numeracy ability (Shield and Dockrell, 2008). Moreover, based on the result shown in the table, the home environment of the students was also motivating for numeracy learning. The table revealed that the family were supportive. This result was congruent to the study of Dimakos, Tyrlis, and Spyros (2012) which stated the parent influences a child's ability to learn numbers. Additionally, parents can be urged to utilize home numeracy encounters to the advancement of their kids' numeracy skill (Cheung, 2018). Also, the table showed that the home was less disturbing and the child was comfortable in answering activities at home. According to Solari and Mare (2011) that the lack of a comfortable, quiet space can lead children to have difficulties studying and reading, affecting their school performance.

Furthermore, among the descriptions shown in the table, it can be seen that most of the students were pleased with classroom physical condition based on the interpreted result of the mean. On the other hand, being distracted by other visual items inside the classroom had the lowest mean based on the result in table which means that it rarely happened in the classroom. This result was aligned with the study of Footprints (2022) that the classroom should be a dynamic and engaging place for the students. Hannah (2013) said that if there is too much structure set in place, it can stifle creativity, and if there is not enough structure, it can lead to distractions and little focus. On the contrary, a classroom with fresh, warm air can create an atmosphere conducive to learning (Burke and Samide, 2013). However, without an organized classroom, even a generously sized room can diminish students' sense of ease and autonomy and limit their learning (Responsive Classroom, 2016). Additionally, cluttered or unorganized room can be distracting and impede learning and furniture should be arranged in such a way that there is little traffic throughout the day and so that it appears organized (Angela, 2013).

Shown in Table 6 the statistical findings on the level of practice of factors affecting numeracy in terms of teacher factors. The table showed that based on the overall mean, the practice was always evident. This means that the teacher was able to explain the lesson clearly, organized, easily reached out, and open to suggestions. This result was supported by the study of Liu (2018), teachers' assistance has a significant impact on the cognitive, behavioral, and emotional elements of students' numeracy skills in a Math class.

Table 6. Level of practice of factors affecting numeracy in terms of teacher factors

| Description | Standard Deviation | Mean | Remarks |
|---|--------------------|------|---------|
| 1. Explains the lesson clearly. | .48 | 4.67 | Always |
| 2. My teacher uses teaching aids/devices | .48 | 4.67 | Always |
| 3. Imposes proper discipline. | .51 | 4.52 | Always |
| 4. My teacher is open to suggestions and opinions | .93 | 4.43 | Always |
| 5. My teacher is organized in presenting the lesson. | .60 | 4.57 | Always |
| 6. My teacher's method of teaching fits my way of learning | .86 | 4.33 | Always |
| 7. easily reach out whenever there were difficulties with the lesson. | .80 | 4.38 | Always |

| | | | |
|--|-----|------|------------|
| 8. My teacher provides various activities | .98 | 4.52 | Always |
| 9. My teacher encourages cooperation and participation | .81 | 3.18 | Seldom |
| 10. My teacher makes lessons interesting. | .83 | 4.10 | Frequently |
| Average | .35 | 4.40 | Always |

Moreover, among the descriptions, it was observed that an organized teacher in presenting the lesson had the highest mean and was always observed in the classroom. This was further supported by Kelly (2020) that the key to success in the field is a teacher's ability to organize the lesson, the classroom, and the students. Also, a teacher's ability to organize and prioritize classroom materials and schedules makes for successful teacher-student learning and efficacy (Mendez, 2019).

However, it was less observed inside the classroom wherein teacher encourages cooperation and participation during class discussions based on the result of the mean. Oluwasanmi (2012) proved through his research that in cooperative learning, students are more motivated to learn. They also tend to possess a higher self-esteem and they are less worried in learning Mathematics (Chan and Idris, 2017). Research has shown that when compared to traditional learning with lectures and individual performance, cooperative learning provides higher student achievement (Anwar et al., 2020). According to Hunter (2017) that through active engagement within mathematical discussions, students can move beyond simply explaining mathematics, and instead, they can generalize mathematical concepts (Hunter, 2017). Also, Zakaria and company (2010) suggest that the cooperative learning technique improves the students' performance in Mathematics. Without this, there could be a lack of constructive relationships, dialogue, and communication which are crucial (Duran et al., 2019).

4.3 Significant Difference on the Level of Practice of the Following Factors

Table 5 showed the significant difference on the level of practice of following factors: student related factors, environmental factors, and teacher factors. The result revealed that $p < 0.05$ which means that the three factors affecting numeracy skills of students differ significantly. Based on the result, teacher factors differ significantly from both student-related and environmental factors.

Table 5. ANOVA result among different factors

| Factors | F-value | p-value | Interpretation |
|-------------------------|---------|---------|---|
| Student Related Factors | 14.784 | 0.000 | Three factors affecting numeracy skills of students differ significantly. Post hoc analysis reveals that the following pair of factors are the one exhibiting these characteristics: <ul style="list-style-type: none"> ➤ Student Related Factors and Teacher Factors ➤ Environmental Factors and Teacher Factors |
| Environmental Factors | | | |
| Teacher Factors | | | |

This result was supported by the study of Sheridan and Bahr (2019). They argued that educators must have a thorough understanding of what it takes to be proficient and how to guide pupils toward their own meaningful and fundamental education. Also, Math teachers' behaviors have had much impact on encouraging the students towards mathematics (Khayati & Payan, 2014). Unfortunately, in teacher-led instruction, all the students are required to

learn from the teacher in the same way at the same pace (Hwang et al. 2012) so Low-achieving students, without sufficient time, are forced to receive knowledge passively (Yeh and friends, 2019)

Yilmaz, Altun, and Olkun (2010) also identified teacher factors that include connecting mathematics with real life, using instructional materials, teachers' personality, teachers' content area knowledge, bad instructional practices, lack of commitment by students' and teachers' classroom management. Other factors include teachers' emotional support (Blazar & Kraft, 2017), teachers' affective support (Sakiz, Pape, & Hoy, 2012), class activities, subject content and amount of work, scarcity of teachers, and inadequate resources (Joseph, 2013; Enu et al., 2015)

4.4 Significant Relationship Between the Factors Affecting Numeracy Skills and The Level of Numeracy Skills

Shown in Table 6 is the significant relationship between factors affecting numeracy skills and the level of numeracy skills. The result showed a moderate but significant relationship between the two variables

Table 6. Significant relationship between factors affecting numeracy skills and the level of numeracy skills

| Variables | Pearson r | p-value | Interpretation |
|-------------------------------------|-----------|---------|--|
| Numeracy Level | 0.428 | 0.053 | There is moderate but significant relationship between numeracy skills and factors affecting numeracy level. |
| Level of Factors Affecting Numeracy | | | |

The result implied that there was a relationship between numeracy skills and student related, environmental, and teacher factors. The result confirmed the study of Akyüz (2014) that school environment impacts student's performance both behaviorally and academically. Also, major findings in the study of Wali (2015) was found that home environment plays vital role in developing children numeracy skills development because children undergo certain formal and informal experiences at home.

Manoah, Indoshi and Othuon (2011) also confirmed that students' attitudes about mathematics have a direct impact on their academic achievement. Additionally, this study was congruent to the study of Sharma (2016) that teacher plays a significant role to generate a learning environment and induce the academic achievement and attainment of learners.

4.5 Proposed Intervention

This intervention was made based on the result of the study. The result revealed that the teacher factor affects more the numeracy learning of the students. This was mainly in terms of encouraging cooperation and participation in learners. With that, the proposed intervention focused on how to help teachers adopt cooperative teaching and convert the classroom into a cooperative one. The seminar or a refresher for teachers was proposed as an intervention.

Promoting the Use of Cooperative Learning Strategy in the Classroom: A Seminar for Teachers

This seminar will mainly focus on how a teacher will encourage cooperation and participation in the classroom, especially in learning numeracy. Cooperative learning was chosen for implementation at the classroom in order to increase the amount of interaction among students in Mathematics and other classes. According to Slavin (2011), cooperative learning is a teaching method in which small groups of students will be able to support each other to comprehend the lessons. Further, cooperative learning enhances students' academic outcome, relational skills, and mindset when working collaboratively with other members in group (Chen, 2018). Students were spending too much time listening to teachers or working alone to complete worksheets. By interacting with peers, it was hoped that students would increase their oral skills, help each other learn, and become less dependent on teachers.

1. The following were the discussion on how the intervention will be done:

2. Ask permission from the school head before conducting a seminar.
3. The school's teachers will be encouraged to attend the seminar. The letter of information will be sent to each teacher for their awareness of what the seminar will be about.
4. At the beginning of the seminar, there will be questions about their strategies in teaching and what they think makes the teaching effective, especially in Mathematics.
5. After the question and answer for teachers, some of the topics and activities included in the seminar will be introduced. For instance, the benefits of cooperative learning strategy in the classroom. Cooperative learning enhances better relationships between students and higher individual learning responsibility (Johnson & Johnson, 2005), self-esteem, cohesiveness, and learning skills (Azian, Mellon, Ramli, & Yusup, 2018). Harman & Nguyen (2010) also said that while discussion and cooperative learning could be a more effective teaching method for teachers to improve student learning outcomes, many traditional teaching methods such as lecture-based, demo, and competitive learning tasks are still widely used in schools worldwide. In that sense, another topic to be discussed may be how to encourage cooperation and participation in the classroom. For instance, the speaker will discuss how to convert a classroom into a cooperative one.
6. After the discussion, there will be activities. Like creating a lesson plan that promotes students' cooperation and participation or modifying the traditional daily lesson plan to encourage cooperation and participation in the classroom.

Some teachers still use the traditional approach to teaching. However, some students cannot quickly learn and catch up with the lesson in this kind of approach. Therefore, this was an integral part of being a teacher to change the ways of teaching in which students learn best. The abovementioned proposed intervention will be beneficial to help teachers promote cooperation and participation in the classroom, especially for numeracy skills improvement.

4.6 Implications of Result to Mathematics Education

Result of the study showed that student-related factor, environmental factor, and teacher factor had a significant relationship on numeracy skills of students. Among these three factors, teacher factor was seen to have major problem to students' numeracy. With this finding, it can be said that these three (3) factors were an integral part of Mathematics education since they contributed to students' learning. The result implied that some actions must be taken, especially for classroom teachers. There was a need to help each learner boost their interest and enhance their learning ability. Further, the home and school environment of the students must be supported.

According to National Center on Safe Supportive Learning Environment (2022), as teachers interact with their students, they play a very important role in establishing a safe, supportive learning environment. Further, Waterford (2018) said that when parents are engaged in their children's school lives, students have the home support and knowledge they need to not only finish their assignments, but also develop a lifelong love of learning. Teachers and parents must support and build a positive learning environment for students to actively engage in learning.

Additionally, based on the result, teachers' encouragement for cooperation and participation of students was less observed in the classroom. Thus, teachers must improve teaching strategy that will promote active learning of students in Mathematics. According to The Risers Team (2020), rather than a classroom where only the teacher speaks and the students merely listen, create one that promotes interaction, be it amongst students themselves or between teachers and students. Mathematics was a less liked subject and teachers must create ways on how to bring learning into meaningful and effective one.

4. CONCLUSIONS

In the light of the results of this study, the following conclusions were made:

1. The level of numeracy skills of respondents was found to be at a low level. This means that a greater number of respondents' grades in the summative test were remarked as did not meet expectations.
2. The level of practice of following factors affecting numeracy was frequently and always in remark. This result was obtained from the overall means of the factors.

3. There is a significant difference in the level of numeracy skills of respondents and the factors affecting numeracy skills based on the statistical findings.

4. There is a moderate but significant relationship between the level of numeracy skills of respondents and the factors affecting numeracy skills.

5. Based on the result, the teacher factor was a problem in terms of encouraging cooperation and participation. Thus, the proposed intervention named "Promoting the Use of Cooperative Learning Strategy in the Classroom: A Seminar for Teachers" was made

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