

Factors Affecting the Numeracy Learning Skills of Key Stage 2 Learners

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Abstract:

This study aimed to determine the factor affecting the numeracy learning skills of Key stage 2 learners of a medium-sized division in a third-class component city in Southern Negros during the School Year 2023-2024. The independent variables included in this study were age, sex, civil status, highest educational attainment, length of services and number of trainings in mathematics. For the factors, the areas included were Content Knowledge and Pedagogy, Language and Skills Proficiency, Mathematics Anxiety and Learning Interest. Factors Affecting the Numeracy learning process of key stage 2 learners in Learning Interest registered the highest mean seconded by Mathematics Anxiety while Content Knowledge and Pedagogy got the lowest mean score. Factors affecting the Numeracy learning process of key stage 2 learners in the Area of Content Knowledge and Pedagogy, Language and Skills Proficiency, Mathematics Anxiety and Learning Interest were interpreted as with great extent. The younger, single, lower-educated, shorter in-service respondents, and few trainings in mathematics assessed that all the indicators with great extent with higher mean or a slight difference score compared to the other groups. In the extent of factors affecting the numeracy learning skills of key stage 2 learners according in the areas of Content Knowledge and Pedagogy, Language and Skills Proficiency, Mathematics Anxiety and Learning Interest when grouped and compared according to variables. There was no significant difference that existed when teacher-respondents were grouped according to age, civil status, highest educational attainment, length of service and number of trainings in mathematics. There was significant difference in the extent of factors affecting the numeracy learning skills of key stage 2 learners according to the area of Mathematics Anxiety when grouped according to highest educational attainment.

Keywords: Learning Skills, Mathematics Anxiety, Numeracy

Introduction:

The Department of Education issued directives to enhance the numeracy skills of learners via Department Order No. 12, Series of 2015. According to Yang (2022). In 2022, the Assessment, Curriculum and Technology Research Centre collaborated with the Department of Education to evaluate the K to 12 curriculum. It provided technical assistance for large-scale assessments, including the PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study).

Latiban and Mendez (2022) identified environmental elements, particularly the social environment, as a determinant of numeracy acquisition, encompassing the child's interactions with peers in school and the community. The emotional climate reflects how much a child's relational needs are met at home. They also asserted that a healthy learning environment is essential for a child in school and home settings.

Furthermore, significant findings in Wali's (2018) study indicate that the home environment plays a crucial role in developing children's numeracy skills, as they encounter many formal and informal experiences at home. Parental engagement significantly influences the learner's success. Parents assume the responsibilities of motivators, resource providers, overseers, mathematics content advisors, and mathematics learning counsellors.

A recent informal poll in the division where this study will take place reveals that learners face challenges, as indicated by a weighted mean average of 84.65 across all nine districts in Mathematics. This outcome is deemed satisfactory, although significantly lacking in the requisite competencies for the subject. As a guidance counsellor, the researcher aimed to ascertain the behavioral patterns of learners, parents, and teachers that have led to the apparent deficiency

in numeracy skill acquisition. Given that the country ranks third lowest among Asian nations in the PISA tests, it is crucial to identify the factors influencing the numeracy learning process of students.

Current State of Knowledge

The effectiveness of teachers is the most critical school resource influencing students' success, especially in mathematics. Prior studies have connected teacher elements with multiple aspects, including teacher quality, effectiveness, teaching methods, experience, traits, credentials, and knowledge. Nonetheless, understanding the prevailing influences on teachers has been limited in the last five years of research, particularly regarding mathematics performance. Recognizing the primary influences of teachers on students' math success is crucial. This is because stakeholders can develop effective strategies for enhancing students' mathematics performance based on the information (Maamin, 2021).

As children mature, language aids their capacity to recognize and comprehend the symbolic characteristics of numbers. For instance, a caregiver or educator will indicate the numeral 1, name it, and display one item or picture. Children subsequently discover that the numeral 1 signifies one object. Language aids students in transitioning from tangible math skills grounded in physical items to a more symbolic math proficiency centered around numerals (Carey & Jacobson, 2021).

From a different viewpoint, Wahyumi (2021) claimed that humans are inherently social beings. Being social creatures, humans require language. Consequently, language plays a significant role in life. Language activity is a trait of humans; they can reflect and act freely. Humans can express everything through language. Language will persistently be utilized and will never be divorced from human existence. Ferdinand de Saussure states that in Lyons, as Suyitno (2022) noted, language can represent everyday ideas and functional language. In terms of a concept, language refers to a sentence formed by a collection of words, with each word carrying meaning. For instance, the term motor pertains to the definition of a vehicle with two wheels.

David (2021), a faculty member at the University of the Philippines, examined how the language of instruction influences educational outcomes, particularly during the initial years of formal education. Several studies indicate that students face double challenges when the language employed in instruction, whether in math or science, differs from their home language. If students learn best when they understand the language of instruction, it makes sense to use their native language, particularly in the initial grades. Kids from Filipino middle-class households seem to face no issues with English being the only language of instruction in elementary school and throughout all educational levels. Most of them are born and raised in homes where two languages are spoken. For them, employing the native language in the classroom represents a backward step, similar to compelling students to acquire new knowledge in an inappropriate language.

As per Siy (2021), choosing an official language for instruction in a bilingual nation like the Philippines often sparks debate during policy formulation. On one hand, Filipino learners have been educated in English with English-written textbooks to equip them for a world where cultural boundaries are gradually fading. Conversely, the Philippines has 181 spoken languages, and many students would consider one of these languages their mother tongue.

The term "math anxiety" refers to concern or apprehension regarding doing math computations. An individual experiencing math anxiety might feel anxious about dealing with numbers, which complicates their ability to think clearly. Researchers believe that, for individuals with math anxiety, the fear of performing math surpasses working memory capacity. This brain region retains brief information that an individual requires while performing a task. When an individual cannot utilize their working memory as usual, it can hinder their ability to do mental calculations. This could create a false belief that they struggle with math, which may heighten their anxiety (West, 2022).

Math anxiety is common, but it does not have to be a permanent problem. Tools and therapies can assist you in altering your perception of math issues. Lockett (2022) noted that Math anxiety impacts millions of children, teens, and adults globally. In the United States, studies indicate that approximately 17% of the population experiences math anxiety. The early math skills of children are crucial for their future academic success. A fascination with mathematics during the early years will likely foster a positive mindset towards later mathematical education, ideally maintaining ongoing interest in mathematics and its study. Nonetheless, methods of teaching early mathematics in the initial years are usually initiated by adults, which may not engage children's interest effectively. Considering the significance of children's motivation and ongoing engagement, the research presented here aimed to ignite children's curiosity in real-life mathematical issues (Yeshe, 2021). Tanner (2021) highlighted the approaches for engaging all children in positive, significant math experiences. In this manner, involvement in math can be significant and beneficial for every child. Additionally, educators should guarantee that math is filled with opportunities for creativity and narrative. Adults should exhibit interest in children's reasoning to foster their early mathematical growth.

Theoretical Framework

This study was anchored within the Cognitive Appraisal Theory, a psychological model guiding the exploration of how college students assess situations and interpret them, particularly in the context of mathematics performance. Primary appraisal, focused on the significance and relevance of mathematics in academic and future career performance, is fundamental. Positive attitudes enhance motivation, while negative attitudes may lead to avoidance and anxiety. The Cognitive Appraisal Theory of Stress, emphasized by Jiang and Wang (2022), extends this framework to stress-related factors in mathematics education, emphasizing cognitive appraisal, stressor management, and outcomes.

When faced with mathematics issues, some students find it fascinating and entertaining, while others sense anxiety and dread. These disparities in attitudes and emotions toward mathematics can impact a student's cognitive assessment of the subject. Mathematics attitude, mathematics anxiety, and mathematics resilience are three fundamental components that contribute to the mental evaluation of mathematics. These elements can have a significant impact on a student's math achievement. Mathematics attitude, mathematics anxiety, and mathematics resilience are all essential components of mathematical cognition. These elements significantly impact an individual's attitude to mathematics and overall performance in the subject. Understanding how these components interact might provide valuable insights into improving mathematical learning and performance.

Educators and parents must create a positive mathematics attitude, alleviate mathematics anxiety, and build mathematics resilience to support students' cognitive assessment of mathematics and improve their performance. Additionally, findings by Hunt and Maloney (2022) indicated that the enhancement of prior math experiences is a factor in the relationships between math anxiety, resilience, and attitudes. This concise conceptual framework integrates multiple dimensions, providing a nuanced understanding of how college students navigate and excel in mathematics performance within the Cognitive Appraisal Theory.

Objectives of the Study

This study aimed to determine the extent of factors affecting the numeracy learning skills of Key Stage 2 Learners in a medium-sized Division in Southern Negros for the School Year 2023-2024 and the results will serve as basis for an intervention plan.

Methodology:

This describes the methodology that was followed in carrying out the study. This section detailed the research design to be used, the respondents who participated in the study, the data gathering instrument, its reliability and validity tests, data gathering procedure, analytical schemes, and statistical tools.

Research Design

This study utilized the descriptive research design. The descriptive research design is a scientific method that involves observing and describing the behavior of a subject without influencing it in any way. Descriptive research is frequently employed as a precursor to quantitative research designs, and the general overview provides valuable insights into which variables are worth testing quantitatively (Shuttleworth, 2021). The objective of descriptive research is to provide an accurate and systematic depiction of a population, situation, or phenomenon. When the goal of research is to determine characteristics, frequencies, trends, and categories, descriptive research is a suitable option (McCombes, 2022).

Respondents of the Study

The study's respondents were the 120 public elementary school teachers distributed in 25 schools within the said district. Since the total number of respondents is easily manageable, the researcher used total enumeration. The respondents were only the Math teachers for Key Stage 2 learners.

Purposive sampling was used in this study. Purposive sampling is a non-probability method for obtaining a sample where researchers use their expertise to choose specific participants to help the study meet its goals. These subjects have particular characteristics that the researchers need to evaluate in their research question (Espiritu, 2021).

Data Gathering Instrument

The researcher gathered the needed data for this study by constructing a research-made survey questionnaire to determine the factors affecting the numeracy skills of learners and teachers, which will be subjected to validity and reliability testing. The questionnaire will consist of two parts:

Part 1 gathered the respondents' socio-economic profile, such as age, civil status, highest educational attainment, and length of service for profiling purposes.

Part II of the questionnaire covered 32 items comprising its four (4) areas: Knowledge Content and Pedagogy, Language Skills, Mathematics Anxiety, and Learning Interests, with eight (8) items each.

The respondents were asked to rate each item with a numerical score and description, from 5 being the highest with a description of "Always," 4 "Often," 3 "Sometimes," 2 "Rarely," and 1 as "Almost Never".

Validity

Validity is defined as the extent to which a concept is accurate. The extent to which the interpretations of a test's results are justified is known as validity, depending on the specific purpose for which the test is designed (Carlson, 2021). Forth, the five-point scale was established to rate each item's validity (Morgan, 2022). The Mean Score Range from 4.50-5.00 with Verbal Interpretation of "Excellent", 3.49-4.49 "Very Good", 2.50-3.49 "Good", 1.50-2.49 "Poor," and 1.00-1.49 as "Very Poor". The instrument was correctly verified using the scale created by Carter Good and Douglas Scates, and the mean value of 4.80 was interpreted as excellent, making the instrument valid.

Reliability

Reliability pertains to the degree of consistency in scores or responses across different administrations of a measurement tool and among various sets of items (Bueno, 2016). Therefore, the self-made questionnaire was subjected to a reliability test to ensure the research instrument's accuracy, stability, and predictability.

Cronbach's alpha indicates the average correlation among all the items that make up the scale. Cronbach's alpha assesses internal consistency, indicating the degree of interrelation among a group of items. It is regarded as an indicator of scale reliability. An alpha value that is "high" does not indicate that the measure is unidimensional. In most research contexts, a reliability coefficient of 0.70 to 1.0 is deemed "acceptable" (Abad et al., 2023).

To establish the reliability of the research instrument, the survey questionnaire was pilot tested on thirty (30) teachers in another cluster within the same division. These 30 reliability respondents are not part of the actual respondents. The reliability of the questionnaire was evaluated using the Cronbach's Alpha test, which produced a score of 0.834. This score is considered good, indicating that the instrument is reliable.

Data Gathering Procedure

The researcher carefully followed the following steps in gathering the needed information and data for this study:

First, the researcher submitted a letter to the Schools' Division Office asking permission to conduct the study and addressed to the School's Division Superintendent. The approved letter was duplicated for distribution to the twenty-five (25) school heads within the cluster where this study was conducted.

The data gathering instrument was distributed soon after all approvals from both SDS and School Heads were obtained. The instrument was administered outside school hours so as not to distract the teachers from their regular school routine. The respondents were allowed three (3) days to answer and return the hard copies of the instrument. An accomplished data gathering instrument was encoded and tallied to the pre-formatted Excel file for easier tabulation.

Research Ethics Protocols

The researcher directed all procedures. Before collecting the data, participants were asked to confirm their willingness to participate in the research through an informed consent form. Only those teachers who signified their intent to participate in the research were given a survey questionnaire. Likewise, data collection proceeded once the Research Ethics Clearance was received. The researcher made every effort to ensure no participant's information was recorded. To ensure confidentiality, the researcher coded the names of participants and stored them in an electronic file. This file was only available to the researcher, and all data was recorded using the code. The records of the responses were properly and privately kept, protecting the data's confidentiality, and only the researcher had access to the information.

Prior to collecting data, informed consent was secured from the chosen respondents. During the initial stages, all participants were informed that their data would be secured and kept confidential, and that the final data would be stored, analyzed, and reported without identifying information. The details were fully anonymized for privacy purposes. The voluntary nature of participation of the respondents in research requires the researchers to inform each respondent that they may discontinue participation in an ongoing research study without penalty or loss of benefits to which they may be otherwise entitled. A respondent can leave a research study at any time. When withdrawing from the study, the respondent should let the researcher know that they wish to withdraw and may provide the reason(s) for leaving the study, but they are not required to provide their reason. Participation in this research endeavor does not foresee harm, but provision for mental health support will be given should the respondents experience any psychological distress.

The principle of voluntary participation mandates that individuals should not be forced to participate in research. Subjects must provide consent voluntarily, comprehend their requests, and be competent to consent. It is entirely voluntary to take part in this study. Participants can choose whether or not to engage in this research.

The researcher observed the Data Privacy Act of 2012 to ensure complete confidentiality and the secrecy of the information provided by the respondents. The identity of the respondents had been completely covered up for their protection, and disclosure of their identities was barred. Respondents' responses to the survey questionnaire were only for the researcher's consumption. The questionnaires containing essential information derived from the respondents would be disposed of by manual shredding after the publication of this research. Electronic documents containing basic information would be stored and encrypted to remain inaccessible to unauthorized users.

Analytical Schemes

In the analysis of the data, various procedures were employed based on the objectives of the study:

Objective No. 1 used the descriptive analytical scheme to determine the profile of the respondents in terms of age, civil status, highest educational attainment, length of service, and number of Trainings in Mathematics

Objective No. 2 utilized the descriptive analytical scheme to determine the extent of factors affecting the numeracy learning skills of key stage 2 learners in the areas of Content Knowledge and Pedagogy, Language and Skills Proficiency, Mathematics Anxiety, and Learning Interest.

Objective No. 3 utilized the descriptive analytical scheme to determine the extent of factors affecting the numeracy learning skills of key stage 2 learners when grouped according to the aforementioned variables.

Objective No. 4 utilized the comparative analytical scheme to determine if there is a significant difference in the extent of factors affecting the numeracy learning skills of key stage 2 learners when grouped according to the variables.

Results and Discussion:

This section deals with the presentation, analysis, and interpretation of data gathered to carry out the objectives of this study. All these were made possible by following specific procedures to give the exact data and solution to each problem.

Profile of the Respondents According to the Variables: Age, Civil Status, Highest Educational Attainment, Length of Service, and Number of trainings in Mathematics

Table 2
Profile of Respondents

Variables	Categories	Frequency	Percentage
Age	Younger (below 43 years old)	68	56.7
	Older (43 years old and above)	52	43.3
	Total	120	100.00
Civil Status	Single	30	25.0
	Married	90	75.0
	Total	120	100.00
Highest Educational Attainment	Lower	76	63.3
	Higher	44	36.7
	Total	120	100.00
Length of Service	Shorter (below 15 years)	71	59.2
	Longer (15 years and above)	49	40.8
	Total	120	100.00
Number of Trainings in Mathematics	Few (below 5 trainings)	65	54.2
	Many (above 5 trainings)	55	45.8
	Total	120	100.00*

Table 2 shows the profile of the respondents in terms of age, where 68 or 56.7% were younger (below 43 years old), and 52 or 43.3% were older (43 years old and above). Regarding civil status, 30 or 25% were single, and 90 or 75% were married. Regarding the highest educational attainment, 76 or 63.3% belonged to lower respondents, and 44 or 36.7% belonged to higher respondents. Moreover, according to length of service, 71 or 59.2% were categorized as shorter tenure respondents (below 15 years) and 49 or 40.8% as longer tenure respondents (15 years and above). Lastly, 65 or 54.2% of trainings in Mathematics were categorized as having few trainings (below 5 trainings), and 55 or 45.8% having many trainings (above 5 trainings). Understanding the age bracket of a population yields insights into the factors affecting the numeracy learning process. In this study, the number of younger and older respondents was unequal. It is essential to determine the marital status of the respondents because it can

affect how they answer the survey. In this study, the majority of the respondents were married. Factors affecting the numeracy learning skills, such as family men and women, are expected to differ from those of the unmarried respondents. According to the data, many inexperienced teachers work in the public sector. It is a sign that more young professors are engaged in academic life and actively working to advance students' education.

It indicates that the teachers are progressing toward prioritizing their professional development. In addition, teachers who attended graduate school were given the chance to re-evaluate themselves and, as a result, could be re-ranked and could upgrade their salary and compensation.

Factors Affecting the Numeracy learning process of key stage 2 learners in the Area of Content Knowledge and Pedagogy, Language and Skills Proficiency, Mathematics Anxiety, and Learning Interest

Table 3

Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy

Areas	Mean	Interpretation
A. Content Knowledge and Pedagogy		
As a teacher, I		
1. Introduce ideas for teaching numeracy, such as place value teaching with base-10 blocks and manipulatives.	4.05	Great Extent
2. Demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts.	3.61	Great Extent
3. Give students ample time to practice numeracy exercises in every learning stage,	4.00	Great Extent
4. Introduce students to fundamental ideas and abilities starting at the abstract level, such as manipulating symbols and numbers.	4.00	Great Extent
5. Play games like sorting, counting, and matching, and reading stories that contain numbers.	4.04	Great Extent
6. Add some excitement to the learning process by using Interactive number games found on websites and applications.	4.16	Great Extent
7. Take advantage of every chance to assist students in developing their numeracy abilities by showing them real-world applications of math.	3.97	Great Extent
8. Urge students to practice their number skills during free time.	3.72	Great Extent
Overall Mean	3.95	Great Extent

Table 3 shows the factors affecting the numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy. The overall mean score is 3.95, interpreted as Great Extent.

Item No. 6 obtained the highest mean score of 4.16, which states "Add some excitement to the learning process by using Interactive number games found on websites and applications," interpreted to a great extent. At the same time, Item No. 2 got the lowest mean score of 3.61, which states "Demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts," interpreted to a great extent.

This result conforms with Bhandari (2021), who conducted a study on teachers' preparedness for different learning modalities. Although some teachers were not ready for the sudden shift in educational setup, they opened they adopted one or a combination of learning modalities, such as blended learning and online learning. These teachers could cope with challenges by brainstorming with co-teachers, using previous experience, and using positive thinking.

Table 4

Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Language and Skills Proficiency

Areas	Mean	Interpretation
B. Language and Skills Proficiency		
As a teacher, I		
1. keep students interested, incorporate interactive games, dance, singing, and art.	3.85	Great Extent
2. combine language acquisition and numeracy learning by using sensory experiences.	3.63	Great Extent
3. teach learners the skills to concentrate while learning Math.	4.08	Great Extent
4. help develop learners' skills to organize and solve problems.	4.04	Great Extent
5. give exercises that will help learners master language skills and comprehend word problems.	4.26	Great Extent

6. give consistent exercises to improve language and processing speed (fluency).	3.98	Great Extent
7. teach learners to relate the concept of more, less, smaller, bigger, etc. using language and physical objects.	3.98	Great Extent
8. make use of the symbolic character of numbers to assist students in recognizing and comprehending their uses.	3.80	Great Extent
Overall Mean	3.99	Great Extent

Table 4 shows the factors affecting the numeracy learning skills of key stage 2 learners in the Area of Language and Skills. The overall mean score is 3.99, interpreted as Great Extent.

Item No. 5 obtained the highest mean score of 4.26 which states "give exercises that will help learners master language skills and comprehend word problems interpreted as great extent, while Items No. 2 and 10 got the lowest mean score of 3.63 which states "combine language acquisition and numeracy learning by using sensory experiences" interpreted as great extent and make use of the symbolic character of numbers to assist students in recognizing and comprehending their uses.

This result implies that teachers try to give exercises that will enhance the numeracy skills of learners by mastering language skills and comprehending word problems. Results also revealed that teachers find it difficult to inculcate and integrate language acquisition and numeracy learning by using sensory experiences in honing the numeracy skills of learners. Making use of the symbolic character of numbers to assist students in recognizing and comprehending their uses was seldom initiated by the teacher. Integrating language acquisition and numeracy learning through sensory experiences helps solidify the numeracy skills of learners. This approach leverages different senses to create more engaging and memorable student learning experiences. By using a variety of sensory inputs, educators can help students grasp numerical concepts more deeply and retain them for longer. Engaging multiple senses like sight, sound, touch, taste, and smell can significantly enhance learning and memory retention. This is because the brain processes information more effectively when it receives input through multiple channels.

To ensure that their pedagogical skills are relevant in language and numeracy. Adopting these new methods of delivering knowledge may take a little while for some teachers who are not ready for virtual activities—agreed with the result of Elliott (2023) that constant exposure to these activities certainly changes their skills and mindset. Lapinid et al. (2022) stated that teachers must connect concepts to concrete experiences that can deepen student understanding, and more enjoyable and stimulating learning can lead to higher levels of engagement and motivation. When confronted with mathematical assignments, these reactions to mathematics can be linked to individuals' cognitive appraisal process. Cognitive appraisal is the process of evaluating and interpreting a situation. Litwic-Kaminska (2023), which in turn determines one's emotional and behavioral responses. In mathematics, cognitive appraisal significantly impacts students' attitudes, motivation, and performance (Forsblom et al., 2022).

Table 5
Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Mathematics Anxiety

Areas	Mean	Interpretation
C. Mathematics Anxiety		
As a teacher, I...		
1. promote cooperative learning opportunities where learners solve arithmetic problems together.	4.12	Great Extent
2. allow students to group themselves and discuss or share their thoughts. This will make them	4.15	Great Extent
understand that others have the same struggle to reduce anxiety.		
3. provide personalized instruction to individual learners teachers must understand their learning styles, preferences, and areas of difficulty.	4.03	Great Extent
4. approach and talk to learners personally to help build their self-confidence, develop their skills and reduce mathematics anxiety.	3.37	Moderate Extent
5. use online tools, and physical manipulatives (such as counters, blocks, or geometric shapes) to show to learners that mathematics concepts are indeed tangible and engaging.	4.11	Great Extent
6. utilize the interactive experiences of learners to give them a good jump-off for lasting engagements with them.	4.36	Great Extent
7. provide a space for students where they can tell a story about their issues and problems in Math.	3.90	Great Extent
8. discuss Mathematics anxiety and help normalize it among learners and emphasize that it's okay to struggle. Show empathetic support to learners.	3.89	Great Extent
Overall Mean	4.05	Great Extent

Table 5 shows the factors affecting the numeracy learning skills of key stage 2 learners in the Area of Area of Mathematics Anxiety. The overall mean score is 4.05, interpreted as Great Extent. Item No. 6 obtained the highest mean score of 4.36, which states "utilize the interactive experiences of learners to give them a good jump-off for lasting engagements with them," interpreted to a great extent. At the same time, Item No. 4 got the lowest mean score of 3.37, stating, "approach and talk to learners personally to help build their self-confidence, develop their skills, and reduce mathematics anxiety."

To reduce anxiety in learners, educators can implement strategies like creating a supportive and structured classroom environment, teaching relaxation techniques, and fostering a growth mindset. This can include reducing noise, providing quiet spaces, and allowing flexible seating arrangements. Teachers must privately deliver feedback on assignments and behavior to avoid public embarrassment, acknowledge and validate students' feelings when distressed or anxious, and offer calm support.

Additionally, providing opportunities for social connection and open communication about anxiety can help alleviate stress. In addition to numeracy skills, attitudes, anxiety, and resilience are significant independent variables influencing academic performance (Hannula, 2021). Mathematics anxiety can negatively influence learning, while mathematical resilience, rooted in positive psychology, can promote favorable viewpoints despite mathematical difficulties. Mathematics anxiety can be caused by various factors, including negative experiences with mathematics, a lack of confidence in one's mathematical abilities, and societal stereotypes about mathematics being a difficult subject. Mathematics anxiety is a psychological condition characterized by feelings of fear, tension, and apprehension when faced with mathematical tasks. It is estimated that approximately 20% of the population experiences mathematics anxiety to some degree (Luttenberger et al., 2022), and it can have a significant impact on students' performance in mathematics.

Emotional responses such as stress, apprehension, and unease, stemming from interpersonal interactions and communication skills, can exert detrimental influences in various scenarios, spanning from educational environments to achievements in academic and professional domains. These emotional reactions also extend their influence on educational processes associated with developing mathematical skills, which are instrumental in fostering analytical thinking (Serim, 2022).

Mathematical anxiety has been recognized as a global issue that affects mathematical learning at all ages and educational levels. Dreger and Aiken identified "Anxiety to Numbers" as a form of specific anxiety associated with calculus rules and other numerical operations experienced by many university students (Acevedo et al., 2021). Reyes (2024) found a substantial inverse association between academic success and mathematical anxiety. Students experiencing math anxiety deal with additional problems when completing math assignments, such as worries, agony, and fear of the subject, influencing their judgment of their ability to tackle the course material (Delgado & Kassim, 2021).

Table 6
Factors Affecting the Numeracy learning skills of key stage 2 learners in the Learning Interest

Areas	Mean	Interpretation
Learning Interest		
As a teacher, I ...		
1. integrate numeracy into everyday situations that resonate with learners. Explore math concepts through cooking, shopping, or planning activities.	3.68	Great Extent
2. incorporate numeracy into scenarios from daily life that students may relate to like sports, cooking, or any other fields.	4.35	Great Extent
3. gain insight into their interests, passions, and preferences to tailor your instruction and apply this understanding to modify arithmetic exercises.	4.19	Great Extent
4. offer several ways for learners to complete math tasks. Allow learners to pick a topic or projects related to their interests to improve engagement and ownership.	4.23	Moderate Extent
5. encourage learners to explore mathematical ideas freely and ask them to share it in the class. This will help fuel their interests.	4.06	Great Extent
6. reinforce numeracy ideas via actual items, graphs, and visual representations. Sensual encounters improve comprehension.	4.10	Great Extent
7. actively link literacy and numeracy by reading math-related stories or writing about mathematical experiences.	3.98	Great Extent
8. explore online apps that combine math with their interests like music, sports, or animals.	4.03	Great Extent
Overall Mean	4.08	Great Extent

Table 6 shows the factors affecting the numeracy learning skills of key stage 2 learners in the Area of Learning Interest. The overall mean score is 4.08, interpreted as Great Extent. Item No. 2 obtained the highest mean score of 4.35, which states "incorporate numeracy into scenarios from daily life that students may relate to, like sports, cooking, or any other fields," interpreted as a great extent. In contrast, Item No. 1 got the lowest mean score

of 3.68, interpreted as with great extent, which states that teachers “integrate numeracy into everyday situations that resonate with learners and explore math concepts through cooking, shopping, or planning activities”. This implies that integrating numeracy into everyday situations, like cooking or shopping, can make math concepts more relatable and enjoyable for learners, which teachers do not pay much attention to. This approach helps students connect abstract mathematical ideas to real-world scenarios, fostering a deeper understanding and application of numeracy skills. Teachers must incorporate activities into daily life, and numeracy becomes more than just a school subject; it becomes a valuable tool for understanding and interacting with the world around us.

Almuslamani et al. (2021) found that integrating numeracy into everyday situations directly and positively affects student participation in the classroom. Likewise, it was revealed based on the results of their investigation that the students were encouraged to participate actively by asking questions, giving opinions, and discussing related topics in the lectures. Furthermore, it is essential to teach students practical study and problem-solving strategies (Karan & Brown, 2022). Many students struggle with mathematics because they lack the skills to approach and solve problems. By teaching students strategies such as breaking down complex problems into smaller, manageable steps and using visual representations, they can develop a systematic approach to problem-solving. Additionally, teaching students how to manage their time effectively and set realistic goals can help them stay organized and motivated (Wilson et al., 2021).

Factors Affecting the Numeracy learning process of key stage 2 learners in the Area of Content Knowledge and Pedagogy, Language and Skills Proficiency, Mathematics Anxiety, and Learning Interest when grouped according to Age, Civil Status, Highest Educational Attainment, Length of Service, and Number of trainings in Mathematics

Table 7

Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy According to Age

Categories	Younger		Older	
A. Content Knowledge and Pedagogy	Mean	Interpretation	Mean	Interpretation
As a teacher, I ..				
1. Introduce ideas for teaching numeracy, such as place value teaching with base-10 blocks and manipulatives.	4.06	Great Extent	4.04	Great Extent
2. Demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts.	3.60	Great Extent	3.62	Great Extent
3. Give students ample time to practice numeracy exercises in every learning stage,	3.06	Moderate Extent	3.92	Great Extent
4. Introduce students to fundamental ideas and abilities starting at the abstract level, such as manipulating symbols and numbers.	4.01	Great Extent	3.98	Moderate Extent
5. Play games like sorting, counting, and matching, and read stories that contain numbers.	4.13	Great Extent	3.92	Great Extent
6. Add some excitement to the learning process by using interactive number games found on websites and applications.	4.18	Great Extent	4.13	Great Extent
7. Take advantage of every chance to assist students in developing their numeracy abilities by showing them real-world applications of math.	4.02	Great Extent	3.88	Great Extent
8. urge students to practice their number skills during freetime.	3.75	Great Extent	3.67	Great Extent
Overall Mean	3.98	Great Extent	3.90	Great Extent

Table 7 shows the Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy According to Age. The overall mean scores are 3.98 for the younger group and 3.90 for the older group, which is a great extent. As assessed by the younger and older groups, Item 6 got the highest mean score of 4.18 and 4.13, respectively, which indicates that adding some excitement to the learning process by using interactive number games found on websites and applications has a great extent.

This implies that the younger and older respondents are less open to utilizing technology inside the classroom using various interactive number games found on websites and applications. It is very evident in today's

setting that teaching and learning have become more accessible using technology. Therefore, teachers in the 21st century must use modern technology in the classroom (Mayer, 2021). Integrating digital technology in the teaching and learning process is perceived as very effective in making learning meaningful and productive for learners. Since millennial learners, known as "digital connoisseurs," are very exposed to gadgets such as mobile phones and computers, any technology-based material, when integrated into teaching, will motivate learners to engage in the learning process. One of the technology-based materials that can be utilized in teaching is videos.

Videos are used in various asynchronous and synchronous education settings and learning scenarios for passive or active learning. According to the curriculum, the course objectives, students' learning needs, and the teaching and learning strategies, various types of audiovisual content can be employed and can enhance teaching and learning (Mayer et al., 2021; Noetel et al., 2021, as cited in Galatsopoulou et al., 2022). In addition, these videos motivated the students to participate passively in the classroom by writing notes, sitting quietly, and listening to the lecturer.

Table 8

Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy According to Civil Status

Categories	Single		Married	
Content Knowledge and Pedagogy	Mean	Interpretation	Mean	Interpretation
As a teacher, I ..				
1. Introduce ideas for teaching numeracy, such as place value teaching with base-10 blocks and manipulatives.	4.20	Great Extent	4.00	Great Extent
2. Demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts.	3.43	Moderate Extent	3.67	Great Extent
3. Give students ample time to practice numeracy exercises in every learning stage,	4.03	Great Extent	3.99	Great Extent
4. Introduce students to fundamental ideas and abilities starting at the abstract level, such as manipulating symbols and numbers.	3.77	Great Extent	4.08	Great Extent
5. Play games like sorting, counting, and matching, and read stories that contain numbers.	4.30	Great Extent	3.96	Great Extent
6. Add some excitement to the learning process by using interactive number games found on websites and applications.	4.28	Great Extent	4.11	Great Extent
7. Take advantage of every chance to assist students in developing their numeracy abilities by showing them real-world applications of math.	4.27	Great Extent	3.87	Great Extent
8. urge students to practice their number skills during freetime.	3.70	Great Extent	3.72	Great Extent
Overall Mean	4.00	Great Extent	3.92	Great Extent

Table 8 presents the Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy According to Civil Status. The overall mean scores are 4.00 for the single group and 3.92 for the married group, interpreted as a great extent.

As assessed by both groups, the single and married groups, Item No.5 got the highest mean score of 4.30, which states playing games like sorting, counting, and matching, and reading stories that contain numbers interpreted to a great extent. In contrast, Item No. 2 got the lowest mean score of 3.43, which states demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts at a moderate level and to a great extent.

This implies that both single and married respondents have coping issues in the utilization of virtual platforms and integrative activities for the delivery of quality education. This could indicate that additional technical training is needed to improve teachers' competence in online platforms. Additionally, Borromeo et al. (2021) also revealed that video presentation and interactive games as instructional material positively affect the students' academic performance regarding their written work and performance tasks in the classroom. However, only a few quality-assured multimedia resources, including videos, can be utilized to support the learning delivery in the classroom. Based on these relevant findings and literature, the researcher intends to develop and maximize the use

of instructional video clips as springboards in teaching Mathematics. With this primary goal, it is hoped that this can be a valuable tool for learners in the 21st century.

Table 9

Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy According to Highest Educational Attainment

Categories Content Knowledge and Pedagogy As a math teacher, I	Lower Mean	Interpretation	Higher Mean	Interpretation
1. Introduce ideas for teaching numeracy, such as place value teaching with base-10 blocks and manipulatives.	4.10	Great Extent	3.95	Great Extent
2. Demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts.	3.62	Great Extent	3.59	Great Extent
3. Give students ample time to practice numeracy exercises in every learning stage,	4.08	Great Extent	3.86	Great Extent
4. Introduce students to fundamental ideas and abilities starting at the abstract level, such as manipulating symbols and numbers.	3.99	Great Extent	4.02	Great Extent
5. Play games like sorting, counting, and matching, and read stories that contain numbers.	4.01	Great Extent	4.09	Great Extent
6. Add some excitement to the learning process by using interactive number games found on websites and applications.	4.17	Great Extent	4.13	Great Extent
7. Take advantage of every chance to assist students in developing their numeracy abilities by showing them real-world applications of math.	3.92	Great Extent	4.05	Great Extent
8. urge students to practice their number skills during freetime.	3.70	Great Extent	3.75	Great Extent
Overall Mean	3.95	Great Extent	3.93	Great Extent

Table 9 describes the factors affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy, according to Highest Educational Attainment. The overall mean scores are 3.95 for the lower group, interpreted as a great extent, and 3.93 for the higher group, interpreted as a great extent.

As assessed by the lower and higher groups, Item No. 6 got the highest mean scores of 4.17 and 4.13, respectively, adding some excitement to the learning process by using interactive number games found on websites and applications. Interpreted to a great extent, while Item No. 2 got the lowest mean score of 3.62 and 3.59 for both groups, demonstrating ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts interpreted to a great extent.

Table 9 revealed that one of the areas where teachers are slowly coping with is the integration of virtual platforms as a response to the needs of learners in the new normal. This could be attributed to the fact that some teachers struggle with technology use due to unfamiliarity. Further technical training may be needed to ensure that the curriculum implementation using the IT-backed platforms is appropriately implemented. This result was affirmed by Berliner (2021). He was sharp in stating that while it cannot be denied that there are other important factors such as curriculum, assessment, congested classrooms, high student teacher ratios, poor infrastructure, availability, and quality of teaching and learning materials, student nutrition, and student home and community environment influence the quality of learning.

Proficiency is a constructive mindset that plays a crucial role in learning mathematics, involving self-confidence in one's potential, persistence, an eagerness to acquire knowledge, and the capability to adapt to novel situations (Ishak et al., 2022). Proficient refers to the ability to persevere and overcome challenges in mathematics. It is the opposite of mathematics anxiety and is characterized by a positive mindset, a willingness to take risks, and a belief in one's ability to succeed in mathematics. Xenofontos and Mouroutsou (2022) have shown that students who are proficient in mathematics are likelier to persist in the face of difficulties, seek help when needed, and develop effective problem-solving strategies. They are also more likely to have positive attitudes towards mathematics and achieve higher levels of academic success.

Proficiency can be nurtured in individuals who have faced prior learning challenges or stress by deliberately emphasizing a culture of mathematical learning in both formal and informal educational settings (Johnston-Wilder et al., 2023). Measuring the adaptability of individuals with mathematical resilience involves their readiness to

experiment with fresh approaches and their ability to begin anew when confronted with different challenges and setbacks (Hutauruk & Priatna, 2021). The systematic review of empirical studies of Xenofontos and Mouroutsou (2022) indicated that mathematical resilience is conceptualized in two ways: as the coexistence of disadvantage and high mathematical achievement, and as the ability to overcome challenges and persist in the face of difficulty.

According to Harsela et al. (2021), students who displayed exceptional mathematical resilience as independent learners successfully overcame mathematical challenges through different learning strategies. Conversely, students with good mathematical resilience (at a medium level) did not significantly influence their ability to overcome difficulties in word problems by engaging in game-based learning. Moreover, mathematical proficiency in frustrated learners (classified as the medium category, partly low group) affected the complexity of solving mathematical problems. Some methods of working in mathematics can decrease students' mathematical proficiency, while others can boost it (Hutauruk & Priatna, 2021).

In a study conducted by Casinillo et al. (2022), the role of resilience in overcoming mathematical anxiety among students in the Philippines was investigated. The study indicated that students exhibited resilience and moderate anxiety levels in their learning. This suggests that students remain motivated even when facing challenging math problems, although they also experience some degree of uneasiness and worry. The study found that resilience did not necessarily reduce students' math-related anxiety. Consequently, the study recommends that teachers foster resilience and nurturing qualities like creativity, self-determination, and motivation. Furthermore, teachers should actively promote and cultivate students' interest in mathematics to alleviate anxiety when confronting mathematical challenges.

Table 10

Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy According to Length of Service

Categories Content Knowledge and Pedagogy As a math teacher, I ...	Shorter Mean	Interpretation	Longer Mean	Interpretation
1. Introduce ideas for teaching numeracy, such as place value teaching with base-10 blocks and manipulatives.	4.04	Great Extent	4.06	Great Extent
2. Demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts.	3.73	Great Extent	3.59	Great Extent
3. Give students ample time to practice numeracy exercises in every learning stage,	4.03	Great Extent	3.96	Great Extent
4. Introduce students to fundamental ideas and abilities starting at the abstract level, such as manipulating symbols and numbers.	4.00	Great Extent	4.00	Great Extent
5. Play games like sorting, counting, and matching, and read stories that contain numbers.	4.10	Great Extent	3.96	Great Extent
6. Add some excitement to the learning process by using interactive number games found on websites and applications.	4.14	Great Extent	4.18	Great Extent
7. Take advantage of every chance to assist students in developing their numeracy abilities by showing them real-world applications of math.	4.06	Great Extent	4.06	Great Extent
8. urge students to practice their number skills during freetime.	3.63	Great Extent	3.57	Great Extent
Overall Mean	3.97	Great Extent	3.96	Great Extent

Table 10 shows the factors affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy, according to Length of Service. The overall mean scores are 3.97 for the shorter group, interpreted as a great extent, and 3.96 for the longer group, interpreted as a high level.

As assessed by the shorter and longer groups, Item No. 6 got the highest mean score of 4.14 and 4.18, respectively, which indicates adding some excitement to the learning process by using interactive number games found on websites and applications to a great extent. In contrast, Item No. 10 got the lowest mean score of 3.63 and 3.57, which states to urge students to practice their number skills during free time.

The study results showed that some teachers are struggling with Content Knowledge and Pedagogy by utilizing an online portal that serves as a learning platform in the new normal. To some teachers, this may look and sound new, and their issues could be due to a sheer lack of technical skills. Others may have issues navigating prescribed platforms or portals. This was acknowledged by CHED (2021). As the Philippines ventured into a new mode of learning, several factors needed to be considered. This included teacher capacity, situation and context of the learner, and efficiency of the learning environment. These were, of course, on top of the more obvious issues of internet speed, cost of materials, and mode of delivery. The best way to move forward was to take a step back and design a strategy that engaged teachers, students, parents, school administrators, and technology-based companies. This collaborative response based on a collective vision was the kind of creative solution this novel problem warranted.

Table 11

Factors Affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy According to Number of Trainings in Mathematics

Categories Content Knowledge and Pedagogy As a math teacher, I ...	Few Mean	Interpretation	Many Mean	Interpretation
1. Introduce ideas for teaching numeracy, such as place value teaching with base-10 blocks and manipulatives.	4.05	Great Extent	4.05	Great Extent
2. Demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts.	3.60	Great Extent	3.62	Great Extent
3. Give students ample time to practice numeracy exercises in every learning stage,	4.03	Great Extent	3.96	Great Extent
4. Introduce students to fundamental ideas and abilities starting at the abstract level, such as manipulating symbols and numbers.	3.92	Great Extent	4.09	Great Extent
5. Play games like sorting, counting, and matching, and read stories that contain numbers.	4.12	Great Extent	3.95	Great Extent
6. Add some excitement to the learning process by using interactive number games found on websites and applications.	4.17	Great Extent	4.15	Great Extent
7. Take advantage of every chance to assist students in developing their numeracy abilities by showing them real-world applications of math.	4.05	Great Extent	3.87	Great Extent
8. urge students to practice their number skills during freetime.	3.75	Great Extent	3.67	Great Extent
Overall Mean	3.96	Great Extent	3.92	Great Extent

Table 11 reveals the factors affecting the Numeracy learning skills of key stage 2 learners in the Area of Content Knowledge and Pedagogy, according to several trainings in Mathematics. The overall mean scores are 3.96 for the few training groups, which is interpreted to a great extent, and 3.92 for the many training groups, which are interpreted to a great extent.

As assessed by a few and many training groups, Item No. 6 got the highest mean score of 4.17 and 4.15, respectively, which states to add some excitement to the learning process by using interactive number games found on websites and applications interpreted to a great extent, while Item no.2 the lowest mean score of 3.60 and 3.62 states to demonstrate ideas and abilities with drawings, counts, dots, and circles for learners to understand concepts.

Another intervention is to create a supportive learning environment (Berlin & Cohen, 2021). Students are more likely to develop resilience when they feel safe and supported in their learning environment. Teachers can foster this environment by encouraging collaboration and peer support. Group work and cooperative learning activities can help students build confidence and develop problem-solving skills (Tran et al., 2021).

Providing constructive feedback and recognizing students' efforts can boost their self-esteem and motivate them to persist in their mathematical learning. Furthermore, it is essential to teach students practical study and problem-solving strategies (Karan & Brown, 2022). Many students struggle with mathematics because they lack the skills to approach and solve problems. By teaching students strategies such as breaking down complex problems into smaller, manageable steps and using visual representations, they can develop a systematic approach to problem-

solving. Additionally, teaching students how to manage their time effectively and set realistic goals can help them stay organized and motivated (Wilson et al., 2021).

Conclusion:

The study found that most teacher-respondents were younger, married, with lower educational attainment, fewer years of service, and limited training in mathematics. Factors influencing the numeracy learning process of Key Stage 2 learners—including content knowledge and pedagogy, language and skills proficiency, mathematics anxiety, and learning interest—were all rated to a great extent. No significant differences were found across most teacher demographics in how these factors impacted numeracy skills, except for mathematics anxiety, where a significant difference was noted based on educational attainment. Teachers with postgraduate qualifications demonstrated more advanced strategies in managing learner anxiety. Overall, the findings highlight the strong commitment of educators to adapt and improve their pedagogy, despite challenges posed by technology and varying levels of readiness. The study recommends enhanced technical training, structured group participation in webinars, feedback systems like the Sandwich Style, and the involvement of school leadership in improving communication and support systems. It emphasizes the role of educators in developing positive math attitudes and suggests strategies like remedial exercises and parental involvement to support student learning, offering a foundation for future research on broader variables.

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