THE USE OF MAGIC FINGER METHOD IN TEACHING MULTIPLICATION AMONG GRADE 3 PUPILS IN CCES

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ABSTRACT

Pupils are having difficulties in mastering multiplication skills. Thus, this quasi-experimental research aimed to determine the use of magic finger methods in teaching multiplication among Grade 3 pupils. The data was gathered through the use of self-made pre-test and post-test questionnaires and was responded by Grade 3 pupils of Cateel Central Elementary School in the academic year 2022-2023. The pretest of the experimental group and control group did not meet the expected level of multiplication skills which implied that both groups have the same level of multiplication skill. The post-test scores showed that the experimental group scored higher than the control group. The improvement of the experimental group's scores resulted after the magic finger method was implemented. Thus, it can be concluded that the magic finger method is effective in improving the multiplication skills among grade 3 learners.

Keyword : *magic finger method, multiplication mastery, mathematics*

1. INTRODUCTION

Primary school children who have not mastered multiplication, one of the fundamental abilities in the four arithmetic operations, are considered to be in danger of failing math (Stegemann & Grünke, 2014). A student's ability to acquire greater learning is demonstrably hindered by their inability to comprehend and master multiplication skills (Stegemann & Grünke, 2014). Moreover, Southwell and Penglase (2015) discovered that most elementary school pupils cannot solve multiplication issues, which prevents them from being able to describe how it functions.

Based on a 2013 study by Harkness and Thomas, students who struggle with multiplication are more likely to experience academic failure. Additionally, poor achiever groups lack the motivation to master multiplication (May & Ahmad, 2018). Mastering multiplication is a crucial ability for a student, yet most need help to grasp it. Unquestionably, poor achievers who lack enthusiasm for mastering it also experience this (Ahmat et al., 2017). Additionally, how math is taught, learned, and assessed affects students' enthusiasm for learning to multiply; moreover, some teachers need to gain the necessary expertise and use effective teaching methods (Voinea & Purcaru, 2013).

Along with addition, subtraction, and division, multiplication is a fundamental skill. For students to grasp mathematics, they must first master the four foundational skills. The mastery of mathematics is also impacted by multiplication. Unfortunately, the community is alarmed by the recent national mathematical judgment (Ramirez et al., 2013). Not only at the national level but also at the school level, this worrying scenario exists. Failure to memorize multiplication was one of the factors affecting students' achievement (Cragg et al., 2017). Accordingly, educators who taught the memorization method for understanding multiplication discovered that students lacked motivation for memorization, which negatively impacted their mathematics performance (Aunio & Räsänen, 2016). Unquestionably, students still struggle to master multiplication using memorization techniques. Students struggle with memorizing practices, so they are not motivated to learn mathematics, which gives them power (Chinn, 2013).

According to Bahadir (2017), the magic finger approach enhances students' ability to perceive material and prolongs their ability to retain it visually. Additionally, Ahmat et al. (2017) found that adopting the finger teaching technique increases student accomplishment. Due to its simplicity and ability to grab students' attention, this approach is readily accepted and used by elementary school students. The researchers are excited to investigate the application of the magic finger approach in teaching multiplication, as this has not previously been investigated by others, notably at Cateel Central Elementary School. This study investigated how well the magic finger approach works for teaching multiplication.

1.1 Statement of the Problem

The main focus of this study was to determine the effectiveness of finger method to enhance the multiplication skills among Grade 3 pupils in Cateel Central Elementary School. Thus, this study sought to answer the following question:

1. What is the level of the pre-test score between the control and experimental group in terms of multiplication?

2. What is the level of the post-test scores between the control and experimental group in terms of multiplication?

3. Is there any significant difference between the pre-test scores of the control and experimental group?

4. Is there any significant difference between the post-test result of the control and experimental group?

5. Is there any significant difference between the pre-test scores and post-test scores of the control and experimental group?

1.2 Scope and Limitation

The study focused on using the magic finger method to master multiplication, particularly in the second and third sections of the third-grade level at Cateel Central Elementary School. The researchers utilized a self-made questionnaire validated by a master teacher. The study was taken between April and May 2023, with an intervention that lasted two weeks and consisted of five sessions per week. This study focused on improving the multiplication skills of Grade 3 learners, anchored to a specific competency: finding the missing value in a number sentence involving multiplication. The intervention, specifically the magic finger method, multiplied numbers from 6 to 10. Also, the researchers focused on their stated objectives through this research.

2. REVIEW OF RELATED LITERATURE

The researcher reviewed several works of literature that had bearing on the topic of the study. This section tackles the concepts, ideas, and information relevant to the present study. This served as the researcher's guide in developing future research.

2.1 Definition of Multiplication

Cathébras et al. (2018) state that multiplication is a scalar operation that uses two different amounts. The multiplier is a scaling factor that shows how the operation changes the size, or scale, of the multiplicative unit. The new scaled value is the answer to the multiplication. The rescaled result is the product of the multiplication. However, Bahr et al. (2015) wrote that the repetitive addition of groups of identical sizes is commonly used to introduce multiplication to pupils and is viewed as a natural technique. In addition, When the situation changes, multiplication takes on new meanings. Thus, it is important to research how teachers interpret the concept of multiplication.

(Badawi et al., 2019) Whenever the number of groups and the quantity within each group are known, understanding multiplication frequently relates to a total quantity. In mathematical parlance, the multiplier is denoted by the total number of groups, whereas the multiplicand is indicated by the number of items in each group; the sum is the output. (Sanaullah et al., 2018). For instance, there are three containers of marbles, and each bag contains two marbles. In this instance, the multiplicand is two, and the multiplier is three. Six represents the complete number of marbles as a product. In the words of Siemon et al. (2015), multiplication can be interpreted as a one-to-many correspondence. For example, if each sheep is transporting three bags of wool, five sheep are carrying the wool. In this instance, the goal is to have three times as many fleece bags as sheep. Moreover, Multiplication is a mathematical operation that combines two numbers to produce a third number (the product), represented by the symbols ab, a*b, or ab (for symbols). (MacLane, 2012).

Large collections can be counted effectively using multiplication. (Corrigan and Boneh, 2017). For example, we can write 2 x 3 as 3 + 3 and understand it to be the sum of the items in the two groups, each of which has three items. This type of interpretation is undoubtedly derived from the addition process. While Al and Dave (2018) stated that the multiplier must be a whole number and that the concept of multiplication is logically connected to a repeated addition model, Multiplication problems were most often solved by pupils using equal groups of repeated addition, according to research by Lo and Luo (2012). Contrary to popular belief, multiplication is not based exclusively on repeated addition (Larsson et al., 2017).

Although equal groups constitute the basis for multiplication, Siemon et al. (2015) explained that this concept is only appropriate for small positive integers, useless for fractions and decimals, and does not hold for negative numbers. In light of this, the interpretation of multiplication as repeated addition has been expanded from the concept of times to part of a part in the multiplication of fractions, or the notion of all these raises the question of what multiplication means when it involves negative numbers (Webel & DeLeeuw, 2016). Additionally, as Verschaffel et al. (2020) state, context affects how multiplication is understood. In the words of Chin and Jiew (2019), multiplication refers to repeated addition.

On the other hand, as soon as the multiplication numbers switch to a different number system, the multiplication interpretation may need to be adjusted to fit the new context. Similarly, Chin and Jiew (2019) asserted that multiplication can have additional meanings. They looked for potential alternate perceptions by investigating two math teachers' ideas regarding the multiplication sign (x). Further, Beth (2013) focused on the performative aspect of symbolism and saw the meaning of multiplication as division. Amy (2019) became aware of the meaning shift when the multiplicand and multiplier are fractions. All of these illustrate how difficult it is to comprehend multiplication over

2.2 Problems in Mastering Multiplication

Multiplication facts are a fundamental ability in mathematics. Children should be able to perform the four fundamental arithmetic operations, but more importantly, they should be able to comprehend the concepts behind them. Children in primary school who have not mastered the fundamentals of the four arithmetic operations are considered to be in danger of failing math (Stegemann & Grünke, 2014). Such at-risk children's inability to comprehend fundamental mathematical concepts makes it harder to meet higher learning objectives (Stegemann & Grünke, 2014).

Although teaching multiplication is difficult at all grade levels, several special technology characteristics enhance multiplication learning in novel and engaging ways (Schrum & Levin, 2016). In groups of underachievers, there needs to be more enthusiasm for learning to multiply. The method used for teaching, acquiring, and evaluating mathematical information affects students' enthusiasm for learning multiplication (Voinea & Purcaru, 2013). Even though mathematics is a crucial topic for students, some may find it challenging to understand. This also occurs among math students who perform poorly and do not care about the topic. A good method or strategy must be established since it can encourage students' thought processes or cognitive abilities to learn fundamental mathematical concepts (Ahmat et al., 2017).

Math is taught in schools by drilling and memorizing rules and processes (Abdullah et al., 2014). To learn math, students need these. However, rote learning could occur if facts are memorized without consideration of how mathematical meanings change and procedures are followed without thought. As a result, students can be unable to resolve complex difficulties. In order to properly identify learning opportunities for pupils, mathematics teachers must first grasp how the multiplication algorithm functions (Whitacre & Nickerson, 2016). However, it does not help students tackle real-world problems when they can solve ordinary multiplication operations using multiplication tables and facts.

However, Thanheiser (2015) discovered that while aspiring elementary educators can answer multiplication problems, they cannot describe how they did so. Harkness and Thomas (2013) mentioned the alternate multiplication technique in another paper; likewise needed to figure out why it worked. As a result, math teachers must use flexible and sensible reasoning when doing arithmetic (Whitacre & Nickerson, 2016). Additionally, children can comprehend multiplication concepts by comprehending the basic notions of mathematical processes (Burris, 2005). Understanding multiplication requires much effort (Chin & Jiew, 2019).

According to Pettersson and Andrews (2017), it was challenging for teachers to teach multiplication as repeated addition, especially when dealing with the multiplication of decimals and numbers with several digits. In actuality, using repeated addition alone to solve multiplication issues is insufficient. Children should create a mental model that they can use flexibly to tackle symbolic difficulties (Qu et al., 2021). Because they represent three quantities equally, rectangular arrays have long been used to help students understand multiplication principles (Hurst & Hurrel, 2016). Further, Primary school mathematics must include teaching multiplication. According to Johnson and Schneider (2015), the development of multiplication marked the shift from an additive to a multiplicative style of thinking. (Hurst & Hurrel, 2016). However, Only approximately 30% of the at-risk pupils surveyed in Moser Opitz's (2013) study were able to solve a problem using the manipulative approach, and very few at-risk children profit from work done with multiplicative arrays, even though in their second year, all students had mastered multiplication using rectangular arrays. Children in primary school who have not mastered the fundamentals of the four arithmetic operations are considered to be in danger of failing math (Stegemann & Grünke, 2014).

Multiplication is one of the East and West regions of Kavango's primary schools that insufficiently covers the fundamental concepts. Repetitive addition may cause issues as a person switches between different number systems, such as negative integers and fractions (Zhang et al., 2014). However, they both view the concept of repeated addition as beneficial and continually work to expand their comprehension based on it in new circumstances. (Lamon, 2020). In order to execute composite abilities, mathematics offers the opportunity to develop tool and component skills (Johnson & Street, 2013). Theories must support the tactics that educators create. This addresses the difficulties brought on by the worldwide loss of numeracy abilities (Everingham et al., 2017). Through a continuous and collaborative inquiry into teaching techniques, educators can improve multiplication teaching (Lin et al., 2017).

2.3 Effectiveness of MFM on Mastering Multiplication

Based on Mutlu et al. (2020), the finger knuckle counting method involves rhythmically counting integers while using the finger knuckles. Jay and Betenson (2017) found that evaluating the goal of an intervention known as finger training is to advance quantitative abilities. The intervention's finger-training component was successful in raising participants' diagnosis ratings. The intervention's game count component successfully raised non-symbolic size comparison scores but did not raise mathematical skills (Anderson, 2013). In the case of Jay and Betenson (2017), the two intervention variants that integrated the finger training and number game components effectively enhanced quantitative participant data abilities compared to controls and had a sizable effect size.

Sixtus et al. (2020) studied the Western and Middle Eastern populations' propensities for finger counting. From a neurocognition and mathematical education standpoint, finger counting or using finger-based representations to apply fundamental numerical and arithmetic principles (Liudmila, 2017). In light of this, finger counting offers multimodal information that conveys both the cardinal and ordinal components of numbers from a neuropsychological standpoint. According to the evidence, finger training improves multiplication skills, and youngsters with superior finger-based numerical representations demonstrate better arithmetic skills (Soylu et al., 2018).

Extensive Numerical representations with fingers are advantageous for the later development of numbers, as indicated by neurocognitive researchers (Barrocas et al., 2020). To get children to stop counting on their fingers, research in mathematics education suggests encouraging mentally based numeral representations (Baccaglini-Frank & Maracci, 2015). Therefore, to accomplish numerical operations, mathematics education advises initially using finger counting, then concrete, organized representations, and eventually mental representations of numbers. Bertillo (2020) discussed the alternate proofs of finger multiplication, which generalize the results of the strategies of mathematicians.

Barrocas and Company (2020) also mentioned the important definitions, notions, and examples of finger multiplication. It elucidates the justifications with procedures delineating the proposition, proof, and example, along with a pictorial representation of finger multiplication. Moreover, teachers can diversify their teaching and learning approaches by including other methods of learning multiplication in the mathematics curriculum (Moller et al., 2013). The problem with education today is that teachers need to be bold in using novel approaches developed through study or invention by others (Fugate et al., 2013). The study also demonstrated that alternative approaches can improve pupils' performance, particularly in multiplication skills.

Bahadir (2017) wrote that using the magic finger method helps students visualize and increases their capacity to retain visual information for longer. Additionally, Ahmat et al. (2017) found that adopting the finger teaching technique increases student accomplishment. Due to its simplicity and ability to grab students' attention, this approach is readily accepted and used by elementary school students. According to Idris et al. (2016), this approach improved students' grasp of mastering multiplication and actively included them in the learning process. When the results show a good influence, Palupi et al. (2022) explain how this strategy has been demonstrated to reinforce the fundamental ideas of multiplication for children. A Japanese citizen invented the cross method, which is being applied today. For kids, the idea of a game-like approach will make more sense. The teacher will pose questions, and the students will compete to answer them. The students actively engage in the learning process (Flores, 2016).

Primarily a detrimental habit that parents and teachers should quickly abandon or actively discourage, finger-counting is a typical and healthy intermediate step in developing sophisticated problem-solving skills (Stegemann & Grünke, 2014). Because finger counting may be a requirement rather than a choice for some students, children with varied characteristics are at the core of the issue of finger counting in mathematics instruction. Therefore, it is important to understand their personalities before encouraging kids to give up finger counting. Additionally, other approaches can be used to get around finger counting's drawbacks (Neveu et al., 2014).

Therefore, finger counting should be a transitional step rather than a barrier to developing mental arithmetic abilities. According to Bahadir (2017), visualization in mathematics instruction may benefit students in both the cognitive and affective domains. For this reason, incorporating imagery into mathematics instruction beginning in the first grade will provide it with a fresh perspective (Presmeg, 2020). Visualization is a good way to engage students, inspire them, concretize learning, give it meaning, assist students in organizing their knowledge, and link concrete and abstract ways of expressing ideas (Seker, 2016).

3. METHODOLOGY

3.1 Research Locale and Duration

The study was conducted at Cateel Central Elementary School, particularly with the Grade 3 pupils of the School Year 2022-2023. The Grade [3] classrooms are in buildings [15] and [16], on the front and right sides of building [21]. The school is located at Castro Ave., St. Población, Cateel, Davao Oriental, with zip code 8205. The school consists of K–6 grades. Additionally, the intervention lasted for two weeks, from April to May 2023, and consisted of five sessions per week

Figure 1. Research Locale Map of Cateel Central Elementary School

3.2 Research Design

This study utilized a quantitative research design, specifically a quasi-experimental design that covered a control and experimental group, to showcase the efficacy of the implemented intervention. Yapo et al. (2020) state that quantitative research is acquiring and analyzing numerical data. It can be applied to uncover patterns and averages, create theories, investigate causality, and extrapolate results to larger groups. A quasi-experimental design, conversely, tries to show a causal connection between a dependent and independent variable (Thomas et al., 2022). In addition, the researchers firmly believe this was the most appropriate research design for this study.

3.3 Respondents of the Study

The respondents to this study were the two sections of the third-grade level at Cateel Central Elementary School. The respondents were grouped into experimental and control groups. The experimental group was from Grade [3] Trustworthy, with [20] respondents, and the control group was from Grade [3] - Integrity, with [17] respondents. The researchers and the research adviser jointly tossed a coin to determine the experimental or control group. The groups were composed of all pupils under the set [1] class schedule of the week.

3.4 Research Instrument

Researcher-made Pre-test and post-test questionnaires were utilized as the major tools in data collection. The questionnaires that were used underwent validity and reliability testing. It was established using content validity as certified by an expert in the field after matching the questionnaire's content to the curriculum guide. At the same time, reliability was established through the conduct of a pilot test at Sta. Filomena Elementary School before administering it to the actual respondents of the research study at Cateel Central Elementary School. Further, the content of the questionnaires was anchored to a specific competency covered by the K–12 curriculum guide. It has twenty (20) items consisting of multiple choices, matching type, fill-in-the-blank, and true or false.

4. RESULTS AND DISCUSSION

This chapter presents the results and discussion of the study. The results are discussed thoroughly, and the order is based on the study’s statement of the problem.

4.1 Level of Third Graders’ Multiplication Skills in the Pre-Test

The data was obtained by administering a pre-test. It was to determine the pre-test score in terms of multiplication skills among third graders. Table 2 summarizes the scores of the experimental and control groups of third graders' multiplication in the pre-test. The control group had a grade percentage of 40.59, and the experimental group had a grade percentage of 35.75, in which the third graders did not meet the expected level of multiplication skill.

Group	Total Score	Standard Deviation	Mean	Grade Percentage	Remarks
Control	20	1.13	8.12	40.59	Did not meet expectation
Experimental	20	1.85	7.50	35.75	Did not meet expectation

Table-2 Level of pre-test scores between the control and experimental groups

Results in Table 2 showed that the control group had a mean score of 8.12 with an equivalent grade percentage of 40.59, which means it did not meet expectations. Similarly, the experimental group had a mean score of 7.50 with an equivalent grade percentage of 35.75, which means it did not meet expectations. The result showed that both the control and experimental groups did not meet expectations, which means they failed based on their scores in the pre-test. It implied that students in both groups had poor background knowledge of multiplication.

Villamor et al. (2019) revealed the variables influencing students' proficiency in basic multiplication. It was stated that the teaching ability of teachers The students' mastery of mathematics is affected. It implies that the most important things that affect how well students do in math are the techniques and methods used to teach the classes. Also, regarding individual aspects, the students' motivation or focus impacts how well they can acquire basic multiplication. Motivation or concentration was the best predictor of pupils' mathematical achievement.

Jordan et al. (2013) stated that Primary school students who have not mastered the fundamentals of the four arithmetic operations are said to be at risk of failing math classes. Such at-risk children's inability to comprehend basic mathematical concepts makes it harder to meet higher learning objectives (Stegemann & Grünke, 2014). Additionally, Southwell and Penglase (2015) learned that most elementary students cannot find the solutions to multiplication problems, so they cannot explain how it works.

In support of that, Voinea & Purcaru (2013) state that due to a lack of interest on their part in learning, multiplication arises in groups of low performers. The method used to teach, learn, and evaluate mathematical information affects children's interest in learning multiplication. However, Mathematics is an extremely crucial topic for a student, and some may experience challenges in learning it. This is also a common problem among children who struggle with mathematics and lack interest in this subject.

According to Whitacre and Nickerson (2016), for mathematics instructors to effectively instruct multiplication, they must first have a solid understanding of how the algorithm for multiplication operates. Only then will they be able to determine which learning opportunities are most beneficial for students. However, school children who can do standard operations for multiplication based on multiplication tables and multiplication facts are only sometimes better equipped to address difficulties they would encounter in real life.

4.2 Level of Third Graders' Multiplication Skills in Post-test

The scores that were obtained in this research and underwent statistical analysis were from the post-test conducted. Table 3 shows the level of post-test scores between the control and experimental groups.

Group	Total Score	Standard Deviation	Mean	Grade Percentage	Remarks
Control	20	3.01	16.60	83.20	Satisfactory
Experimental	20	0.94	19.30	96.25	Outstanding

Table-3 Level of post-test scores between the control and experimental groups

Table 3 presents the post-test scores for the control group, which is 16.60, which means satisfactory, and the experimental group, which is 19.30, which means outstanding. Based on the results, the researcher concluded that the students' multiplication skills improved to the level of the experimental group's post-test scores compared to the pre-test. This was especially true given that the experimental group's performance was outstanding. It clarifies why the magic finger method succeeded in this situation.

In this connection, as students received instruction regarding the magic finger method, Per Stegemann and Grunke (2014), it is unnecessary for parents and instructors to forbid children from counting on their fingers or to see it as a burdensome habit that must be quickly abandoned. Rather, A normal and healthy intermediate step in developing complex problem-solving abilities is counting on one's fingers.

Additionally, Jay and Betenson (2017) revealed that a finger training intervention is being tested to enhance numeric skills. The intervention's finger training component successfully raised participant finger knowledge scores. The intervention's number of game components was successful in helping third graders' multiplication abilities. Additionally, the intervention that included finger training and number game elements effectively enhanced participants' quantitative abilities compared to controls and had a significant effect size (Jay & Betenson, 2017).

Bahadir (2017) wrote that The finger method helps students see what they are learning and helps them remember what they see for a longer time. Ahmat et al. (2017) also found that students do better on tests when the finger method is used to teach. This method is easy for elementary school students to understand and use because it is not complicated and can get their attention. Idris et al. (2016) also say that this helped students learn multiplication and kept them interested in the process.

Cognitive learning theory is founded on the concept that students apply the new strategy they have learned, the magic finger method, to help them learn and master multiplication (Anderson, 2017). Moreover, it will encourage students as they continue to develop their problem-solving and multiplication skills. Piaget stated that making small changes to that knowledge to cope with the difficulties they encountered in mastering multiplication would greatly help their learning process (Mubarik et al., 2018).

4.3 Difference between Control and Experimental Groups in Pre-Test

Table 4 shows the mean comparison of pre-test scores between the experimental and control groups. This determines the significant difference between the control and experimental groups regarding multiplication skills. As shown in the interpretation, there is no significant difference between the control and experimental groups in the pre-test. This means that both groups have the same level of multiplication skills.

Group	Mean	Standard Deviation	t-value	p-value	Interpretation
Control	8.12	1.13	-0.2853	0.3892	Pre-test scores between the two groups do not differ significantly.
Experimental	7.50	1.85			

Table-4 Mean comparison between pre-test scores of control and experimental group

As observed, the pre-test scores of the control group show 8.12, while the experimental group shows 7.50. The findings implied that the pre-test between the control and experimental groups did not differ significantly, which means that both groups have the same level of knowledge about multiplication; thus, there is a need to improve the multiplication skills of the third graders. Based on the findings, the third graders need to understand multiplication problems. It was supported by the study of Whitacre and Nickerson (2016), which argues that rote learning may be the consequence of activities such as memorizing information without an awareness of changes in mathematical meanings and performing procedures without sense-making to complete a task. Learners might be unable to answer problems that are not routine. Therefore, for mathematics instructors to effectively teach multiplication, they must first understand how the algorithm for multiplication operates. Only then will they be able to devise effective teaching strategies for their students. However, schoolchildren who can do standard operations for multiplication based on multiplication tables and multiplication facts are not necessarily better equipped to address difficulties they would encounter in real life.

Multiplication is one of the basic operations not well addressed in primary schools (Zhang et al., 2014). He went on to say that it is clear that the concept of repeated addition becomes troublesome as a person travels from one number system to another, such as when moving from negative integers to fractions. He said this was plain. However, they both consider repeated addition a supporting conception, and they make a concerted effort to construct their understanding in accordance with the concept of repeated addition as it is applied to various novel circumstances (Lamon, 2020).

4.4 Difference between Control and Experimental Groups in Post Test

Table 5 compares the post-test scores of the control and experimental groups. This answers the question about any significant difference between the control and experimental groups in the post-test. The experimental group showed higher scores than the control group.

Group	Mean	Standard Deviation	t-value	p-value	Interpretation
Control	16.60	3.01	-3.5110	0.0012	Post-test scores between the two groups differ significantly.
Experimental	19.30	0.94			

Table-5 Mean comparison between post-test scores of control and experimental group

As observed, the post-test scores of the control group have a mean score of 16.60, and the experimental group has a mean score of 19.30, which shows that without using the intervention, the respondents' multiplication skills differ significantly from the post-test scores after the intervention process, which is the magic finger method. In connection with the result, the act of finger-counting can be considered a typical and beneficial transitional phase in the progression of advanced problem-solving abilities, as opposed to being viewed as a detrimental behavior that necessitates immediate abandonment or strict discouragement by parents or teachers (Stegemann & Grünke, 2014).

The focal point of the discourse surrounding finger counting in mathematics education revolves around students possessing diverse characteristics, as it may be imperative rather than discretionary for certain individuals.
It is claimed Piaget (1960) that this supports the notion that the optimal method of imparting knowledge to a learner is by enabling them to employ the most efficient cognitive strategy for encoding information (Cacioppo et al., 2013). Also, Piaget's Cognitive Learning Theory entails that humans learn from thinking, learn from our experiences, and improve our multiplication skills through learning and using new strategies to master them (Pea, 2018). Using their fingers to manipulate, they can readily find the answers since, per Giudici et al. (2021), finger counting is a successful method for finding solutions to multiplication facts. Therefore, MFTM is a viable option for students to acquire multiplication facts. As a result, students can benefit from the Magic Fingers Teaching Method (MFTM), which emphasizes manipulative techniques and student participation in calculating the product of multiplication facts. Learning multiplication facts is more effective when courses incorporate physical and mental reflection. Marshark, Lang, and Albertini (2002) used the story "Tell me, and I will forget; show me and I will remember; involve me and I will understand" to illustrate their point.
Additionally, Palupi et al. (2022) help to explain that This tactic has been shown to help children understand the fundamentals of multiplication, and research suggests that employing it with third graders has a good effect on students' multiplication skills (Flores, 2016).

4.5 Comparison between Pre-test and Post Test Scores among Respondents

Table 6 compares the pre-test and post-test of the experimental and control groups. This is to determine the significant difference between the pre-test and post-test scores of the experimental and control groups. The result implied that the group that received the intervention had a greater score than the group that did not. It can be seen in the table that the scores of the experimental group increased after the use of the magic finger method.

Type of Test	Mean	Standard Deviation	t-value	p-value	Interpretation
Pre-Test	7.59	1.64	-17.938	0.001	Pre-test and post-test scores differ significantly.
Post-Test	18.1	2.51			

Table-6 Mean comparison between pre-test and post-test scores

Based on the overall result, the scores differ significantly in their performances between the mean pre-test and post-test scores, with a t-value of -17.938 and a p-value of 0.001. It implied that with the magic finger method, the mathematical performance shows a higher significant difference as the experimental group can carry out the results of the control group in the post-test. Moreover, it also implied that in learning multiplication, there was a significant difference from the pre-test to the post-test that was more noticeable in the experimental group. According to the research done by Thai et al. (2016), a person's working memory system, or alleged memory capacity, determines their ability to do arithmetic operations. One of the skills in arithmetic operations is the ability to multiply factual information. Arithmetic operations can only be processed if there is enough memory. Even though children have a decreased capacity for memory, after training MFTM, they do substantially better at recalling multiplication facts.
Based on the overall result, it proved that the results of the post-test administered to the students following the intervention procedure were similar to those of the study by Bahadir (2017), which states that the students that use the finger method are better able to visualize and retain knowledge visually for longer. Additionally, Ahmat et al. (2017) found that adopting the finger teaching technique increases student accomplishment. Due to its simplicity and ability to grab children's attention, this technique is readily accepted and used by elementary school pupils. In support of the result, Piaget believed that knowledge is organized into schemata, with a schema serving as the fundamental unit of knowledge. In multiplication, students use their existing knowledge to form a mental structure that an individual uses to solve multiplication problems (Sarwadi & Shahrill, 2014).
Furthermore, students will use schema to master multiplication. Piaget thought that children thought through action or internalized action arithmetic before they learned to multiply. It meant that their ability to solve multiplication problems came from the methods they had learned, as stated by Radmeh and Drake (2019).

Further, Moller et al. (2013) state that instead of being seen as a barrier to developing mental arithmetic abilities, finger counting could be seen as a transitory procedure as individuals eventually stop relying on it. Bahadir (2017) suggests that Students' cognitive and emotional development may benefit from using visualization in mathematics teaching. For this reason, including imagery in mathematics instruction beginning in the first grade will provide it with a fresh perspective (Presmeg, 2020). Visualization is a good way to engage students, inspire them, concretize learning, give it meaning, assist students in organizing their knowledge, and link tangible and abstract ways of expressing ideas (Seker, 2016). Also, cognitive learning theory is founded on the concept that students apply the new strategy they have learned, the magic finger method, to help them learn and master multiplication (Anderson, 2017). Moreover, it will encourage students as they continue to develop their problem-solving and multiplication skills. Piaget stated that making small changes to that knowledge to cope with the difficulties they encountered in mastering multiplication would greatly help their learning process (Mubarik et al., 2018).

5. CONCLUSION

Based on the findings, the researcher concludes the following:

1. The multiplication skills of Grade 3 learners in the pre-test did not meet expectations, as shown in the result, which means it failed. They lack knowledge about multiplication.

2. The pre-test scores between the control and experimental groups did not differ significantly, showing that both groups have the same multiplication skills.

3. The pre-test scores between the two groups did not differ significantly, which implies that both students have the same levels of background knowledge in terms of understanding multiplication. Given that they belonged to heterogeneous classes with a range of capacities in each class or group and capabilities as well,

4. The post-test scores between the two groups differ significantly, which implies that the control group improved through conventional teaching. However, the experimental group that received the intervention scored higher than the control group. This finding showed that the intervention effectively improved the multiplication skills of the third-grader.

5. The result shows that the pre-test and post-test scores among respondents differ significantly. The post-test was mostly associated with the experimental group that dominated the given test.

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