

Improving the Skill of Subtracting One-Digit Number of Kindergarten using Mathdali

KELVIN JAY Z. GUARO

Cesareo Villa-Abrille Elementary School

Abstract:- The primary objective of this study was to enhance the subtraction skills of Kindergarten pupil by implementing the Mathdali approach. The research was carried out at a public elementary school with the school ID 129555 in the Davao Central District, Division of Davao City, and involved a male Kindergarten learner as the key participant. The Mathdali approach was chosen as an intervention to target the improvement of subtracting one-digit numbers. This approach was designed to reinforce the mastery of subtracting one-digit numbers by encouraging the child to respond with speed and accuracy. By consistently completing worksheets over time, the child was expected to practice and ultimately achieve mastery in subtracting one-digit numbers.

The study employed a descriptive research design within a classroom-based setting, utilizing researcher-developed worksheets as the primary instrument for conducting pre- and post-assessment tests on the pupil. Data was collected through the use of 10-item pre- and post-assessment tests and was subsequently presented through tables, with the first column containing the timeline data, the second column displaying the scores, and the third column providing observations. Following the intervention, the progress of the participant was carefully identified and documented based on the collected data. The findings of the study suggest that the applied Mathdali approach effectively improved the skills of subtracting one-digit numbers in the kindergarten setting. The results of this study indicate that the Mathdali approach, implemented over fifteen days using workbooks containing one-digit numbers, serves as an effective tool for enhancing the skills of subtracting one-digit numbers in the Kindergarten classroom. The study provides valuable insights into the potential effectiveness of the Mathdali approach as an intervention for improving fundamental mathematical skills in young learners.

Keywords:- Mathdali, Improve, Intervention, Mastery, Davao City.

I. INTRODUCTION

Subtracting one-digit numbers has long been the dilemma of children aged five years old. Some kids understand the basic ideas of numbers and math, while others struggle with basic counting, number recognition, symbol comprehension, quantity distinction, and addition concepts. Before beginning increasingly difficult arithmetic activities, students must develop and comprehend these abilities. In my class specifically in meeting time two, when I checked the outputs of my twenty-nine learners in

kindergarten, one of them consistently returned the worksheets without an answer and always sat in the chair and teary-eyed. I noticed that when I administered the activity sheets, he was uneasy and had a band of pleas in answering the subtracting one-digit numbers, and found his answers incorrect, which was a significant source of distraction for me. He would frequently fail to complete the task of subtracting one-digit numbers, and in some situations, he would submit no output at all. In line with this observation, I discovered that this learner received discouraging results in all previous tasks. This unsettling scenario pushed me to look into the problem's primary source.

Throughout our parent consultation, I have proved that my learner is confounded in mathematics and loses interest, which causes the concept of subtraction to be unclear and unappealing to him. Not all pupils appreciate the worksheets because they contain limited activities for students to complete the tasks, not to mention the plain and unattractive black-and-white pages. Therefore, I created a colorful workbook specifically designed for him to address this issue, filled with a picture theme for each activity sheet. Both of his parents work in a cafeteria and cannot assist him in completing the assignment at home. They are impatient when teaching their child and lack of strategy for digging further into the child's knowledge of the topics. The child's situation is affected since he would not be able to ask questions nor receive clarifications about the exercises in the assignment due to a lack of learning resources and guidance at home.

I feel sorry as I have learned the several reasons that affected him. I cannot imagine how difficult it must be for him to do even a simple subtraction problem in the learning activity sheets independently. The child cannot complete simple subtraction without his parents' instruction, and he would wait for them until his parents return home late at night and, sadly, the child is already asleep. As his teacher, I fully recognize the need and wholeheartedly accept my responsibility to assist him in any way I can.

In the fourth quarter, I used Mathdali, an activity workbook that I created as an intervention tool to help my students improve their Subtraction skills. I carefully checked the answers and provided my pupil with clear instructions. The content of the workbook was organized in a logical order so that learners could freely follow along and gradually comprehend more subtraction techniques. For instance, learners were given a series of activities that eventually helped him master the skill of subtraction. The math workbook contains one-digit numbers that correspond to the theme of each activity, as well as a series of well-developed subtraction exercises. Learners could work on

their subtraction skills until they became acquainted with doing them.

With this strategy, I was able to help my learner who was struggling with basic mathematics, and I ensured that no one in my class was left behind. I hoped that this intervention would help my learner become more prepared for the next phase of learning mathematics in subtracting one-digit numbers.

I was confident that I was not the only one who had encountered similar issues. I was fully aware that everyone was adjusting to the new set-up since they didn't have prior knowledge of the concept. I used the resources I had to reach out to my students and assist them in coping with the obstacles that this pandemic had brought.

I knew that by introducing Mathdali as an intervention to strengthen my learners' one-digit subtraction skills, especially those who live in low socioeconomic environments, I was able to support them better. Teachers who were in the same boat as I, could apply the method because it was simple to imitate and was based on the concept of preparing workbooks for our loved ones.

II. ACTION RESEARCH QUESTION

This study intends to improve my learner's Skill in Subtracting One-digit number. It aims to respond to the following query in particular:

How can I use Mathdali to help my pupils become more proficient at subtracting one-digit numbers?

III. INNOVATION, INTERVENTION, AND STRATEGY

The Mathdali workbook was an intervention to improve my learner's skill of subtracting one-digit numbers, using the supplied learning resources and the agreement of the parents to devote sufficient time to support their child in completing the job at home. This helpful workbook provided various activities to help my learners learn in the classroom, from home, or stay sharp during breaks.

In implementing this intervention tool, I first oriented the parents of my learners on the mechanics of interventions. Participants of this classroom-based action research took a baseline test to be used as my baseline data. After the intervention, the same baseline test was given as participants' post-data. After his class in the morning, my learners came to school to answer the exercises in the workbook under my guidance and supervision. This intervention took 45 minutes per day and lasted for 4 weeks. I also recorded the speed and accuracy of the learners to monitor their progress.

Santa Monica (2022) argued that kindergarten was one of the most crucial years in your pupils' lives. It introduced young learners to various abilities that they would use throughout their school careers and beyond. As a result, to appeal to the students, I had to use successful teaching tactics. I had to select effective teaching strategies that would entice my students to perform better academically.

According to researchers, early math achievement in kindergarten was shown to predict eventual academic performance to some extent (Jordan et al., 2009). Essential elements of intervention were identified and incorporated into study protocols by Gersten et al. (2009) in response to a growing body of research on early numeracy development for challenged kids. Teachers in the treatment group were in charge of instructing the supplemental intervention during their experimentation in small groups (three or four students) during the instruction session.

Inadequate access to educational resources, such as whiteboards, charts, posters, blocks, cards, clay, crayons, chalk, and other like items, is crucial to kids' learning. Effective utilization of resource materials might significantly increase a class's impact. Many teaching aids stimulated students' interest and encouraged active participation in their mathematical studies (Herward, 2009).

According to Fouquet (2022), doing workbooks at home gave pupils lots of practice on many different classroom abilities. Along with topic matter, kids practiced skills like attention, concentration, and handwriting. Workbooks were only helpful if the child used them. Getting the child engaged in selecting workbooks is one of the best ways to set them up for success with workbooks.

Teaching strategies should have been child-centered rather than teacher-centered, according to Clark and Steir (1988), who also thought that teachers should change up their tactics to improve student achievement. Parents should have been encouraged to take a more active role in their children's intellectual, social, and emotional development by every school. Parental participation came in two flavors: on-school involvement and involvement at home (Zellman & Waterman, 1998).

According to Velez et al. (1997). Parent-child involvement was a strong foundation for academic accomplishment. The higher the intellectual achievement, the stronger the ties, particularly when it comes to educational issues.

IV. ACTION RESEARCH METHODS

A. Participants, Additional Data, and Information Sources

A male Kindergarten pupil in Davao Central District, Division of Davao City, whose school ID number was 129555, was the main participant in this study. He was selected based on the third quarter's performance task scores as well as the low-performing score determined from his Tracking Progress Report and one-digit subtraction. Throughout the whole study, the main sources of data and information were used before, during, and after observations. The study was carried out in April of 2023.

B. Data Gathering Methods

To get his approval and support for the study, the researcher wrote the principal of the school a letter of authorization. The parents were interviewed after permission. Parental consent was acquired before the commencement of the research. Activity sheets were used to monitor the learner's task accessibility frequency, and his

progress was followed by recording his performance task scores.

Finally, the data that had been gathered before, during, and following the implementation of the intervention was compared and examined by the researcher. After conducting the study protocol assessments, the researcher adhered to ethical norms in handling participants and data, including but not limited to privacy and confidentiality, informed consent procedure, risk, benefits, and biosafety.

C. Plan for Data Analysis

Baseline data observations, data during the implementation of the intervention, and post-data observations were interpreted using tabular presentations and elaborated through reflective analysis.

V. DISCUSSION OF RESULTS

A. Baseline Data Observation

This action research utilized the use of baseline information, which demonstrated the data before and after the intervention procedure. The data was collected through the use of 10-item pre- and post-assessment tests. The data collected was presented through tables, with the first column containing the timeline data, the second the scores, and the third the observations.

A bar graph was used to further demonstrate the difference between the learner before and after the intervention with the use of Mathadali Workbook.

Table 1: Pre-intervention Assessment Scores

WEEK	PRE-INTERVENTION ASSESSMENT SCORE	OBSERVATIONS
1	0	No attempts to answer the worksheets.
		Teary-eyed, possibly indicating a perception that studying numbers is a form of punishment.
		Knows how to count and he seemed to have only memorized the numbers and did not fully understand the concept.
		Had trouble recognizing the numbers.
2	1	Showed a lack of understanding of the concept of subtraction.
		Demonstrated a lack of focus.
3	3	Although he made attempts, he took a long time to analyze each problem.
		Still showed no focus.
		Difficulty in counting down and identifying numbers.
4	2	Just guesses the answer and not properly performing the operation.
		Simply guessed the answer and did not perform the operations correctly.
		Needed visible counting aids, such as a finger, but still provided incorrect answers due to poor counting skills.

Note: Assessment is a 10-items worksheet bearing 1 point on each correct answer.

Table 1 presented the scores and observations of my learner in the 4-week pre-intervention assessments.

The table showed that my learner performed poorly because of the following main reasons: difficulties in number recognition, identifying the value of numbers, unsatisfactory counting skills, loss of interest, and not understanding the concept of subtraction itself. These underlying factors had hindered my learner from getting high scores, as he only got 0 to 3 points for the 4-week pre-intervention assessments.

In addition, my learner also had a negative impression of the worksheets with just plain numbers and problems, as he had a teary-eyed reaction to the first and second times I gave him the worksheets, and he left them with no answers. On the other hand, in the third and fourth assessments, I observed that he was just guessing the answer and was trying to count using his fingers but rearranged the order of the numbers every time.

Furthermore, it was evident that during the assessments, he had no interest in learning the task and just submitted the worksheets without learning.

B. During the Implementation of Intervention

Table 2: Post-intervention Assessment Scores

WEEK	POST-INTERVENTION ASSESMENT SCORE	OBSERVATIONS
1	4	Colorful visual presentation of math problems caused a more child-friendly worksheet that helped the child not to fear it (no teary-eyed or crying).
		Starts to recognize the value and figure of numbers.
		Gradually understands the idea of subtraction and recognizes the operation.
2	6	Focus was improved.
		Uses the illustrations in the worksheet for counting.
3	9	Excitement in receiving another worksheet was evident.
		Enjoys answering problems with the use of illustrations and with the help of word problems.
		Recognition of numbers was improved.
		Skills in counting down improved and understands the idea of subtraction more.
4	9	Actively using the illustrations in counting.
		Answers were more accurate.
		Engagement with the worksheet was far more better
		Can answer simple problems mentally without the help of actual illustrations (but still takes time).

Note: Assessment is a 10-item worksheet bearing 1 point on each correct answer.

Table 2 presented the scores and observations on my learner in the 4-week post-intervention assessments.

It was shown in the table that the interaction of my learner with the worksheets had improved as his focus on solving the problems had increased. Likewise, his counting skills were far better than his previous performance, as he recognized the value and the figures of the numbers with the

help of the visual illustrations and the interactive tasks in the worksheets. My learner also exhibited excitement upon receiving another worksheet, as he enjoyed counting and exploring the varied and colorful diagrams.

As has been demonstrated, the overall performance of my learner improved with the help of the Mathdali workbook.

C. Post Data Intervention

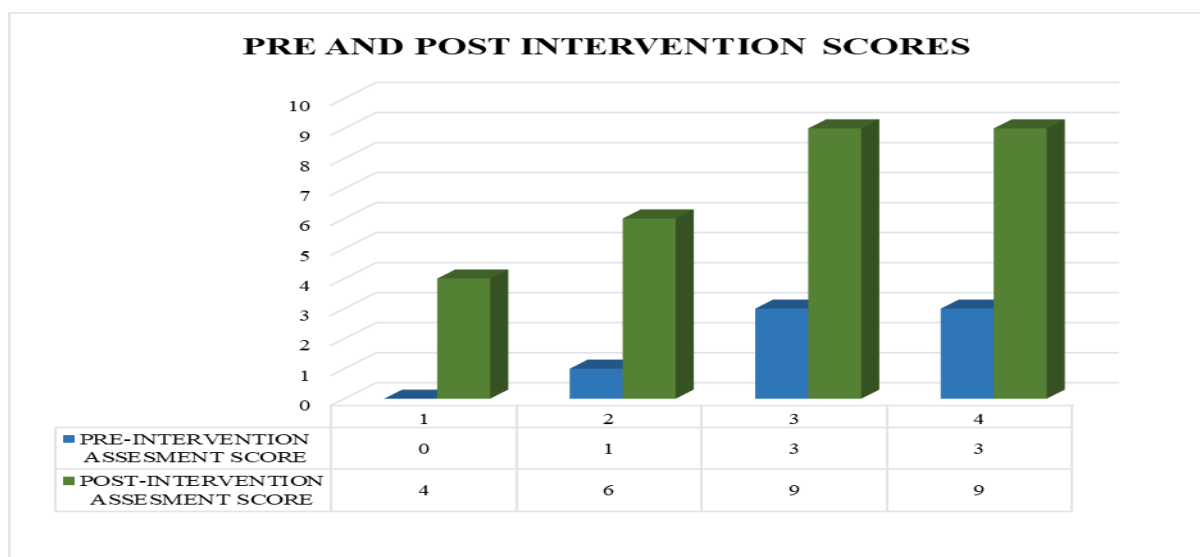


Fig. 1: Pre- and Post-Intervention Scores Comparative Graph

Figure 1 shows the comparative diagram of the scores of my learner in his assessments before and after the intervention. It was evidently visible that the Mathdali workbook had a positive impact on my learner, as his scores

in the post-intervention assessment were significantly higher than his performance in the pre-intervention assessments.

VI. REFLECTION

There were children at the age of 5 who were able to perform basic mathematical operations like addition and subtraction but it had become apparent to me that not all child was raised and learns at the same rate. There were also children at this age who were unable to perform single-digit subtraction. Learners at this age should have already had a strong foundation in this basic mathematical operation for them to be able to keep up with their peers and be ready for more challenging mathematical problems. To address this issue in my learner, I incorporated an interactive workbook to improve his skills in subtracting single-digit numbers.

The workbook that I had introduced to my learner was the Mathdali workbook, which aimed to encourage him to focus and learn the operation. During the intervention, I saw more underlying problems and factors that affected the skills of my learners. These factors started at home and should have been worked out with all the people in this environment. I always kept in mind that children have different ways of learning; hence, I had to be creative, find other ways of teaching without making my learner feel pressured, and make sure that he would really learn. So should have been the guardians of the student. But along the way, I had seen a tremendous improvement in my learner as an effect of my intervention, which had therefore continued. I realized that children were willing to learn; just find the right approach with which they would have been comfortable and participative.

Based on this study, I observed that the Mathdali workbook really had a positive impact on my learner, as his performance improved, and the results were remarkable. As a kindergarten teacher, it warms my heart to see my learners improve their skills with the aid of my help and to be one of the contributors to their strong foundation in academic excellence.

VII. CONCLUSION

The workbook has proven to be a useful and successful tool in helping challenging learners, as the study data unquestionably show. The targeted pupils' academic performance and general level of involvement dramatically improved because of the creative approach's deployment. All the detailed information and comments that were obtained throughout the study period repeatedly emphasized how the workbook improved the learning objectives and self-assurance of the students who were having difficulty learning.

This creative workbook, created especially to meet the needs of struggling learners, has not only proven to be an effective solution but also has the potential to be a game-changing method for addressing similar issues in a variety of learning environments. Sharing this successful approach provides teachers and other stakeholders with the opportunity to leverage these insights and apply similar techniques to aid children facing similar struggles. This collaborative approach fosters a supportive environment where creative solutions and best practices can be exchanged for the benefit of all students.

The study provides evidence of the importance of valuing originality and resourcefulness when meeting the educational needs of our children. It emphasizes the crucial role of creativity in developing effective solutions that address a variety of learning needs. Educators can positively and meaningfully impact the educational experiences of struggling learners by being open to new ideas and adopting a proactive approach to innovation. This approach will support the overall growth and academic achievement of the learners.

To create an atmosphere where effective and personalized techniques can be developed to serve the different needs of pupils, teachers must continue to promote a culture of creativity and cooperation moving forward. Teachers can create a more inclusive and stimulating learning environment by staying dedicated to finding and creating creative solutions. This will help them ensure that every pupil, particularly those who might be struggling, receives the greatest assistance possible.

VIII. RECOMMENDATION

Here are some recommendations that were made in consideration of the results of this action research. First, as the guardian of the learner, it was essential to keep helping the child practice the skills he had learned. They should have left ready-to-answer Mathdali worksheets for the child to practice even when they are not home and check them and correct the learner's mistakes. They had to allot time for checking before going to bed and have a brief discussion with the learner in the morning on some points that he still needs to improve on until consistency is evident. Second, teachers, particularly those who taught kindergarten, ought to have comprehended the use of Mathdali workbooks, their approaches for the learners, and the outcome. Third, the researchers who were going to conduct similar research in the future had to be creative and innovative so that they could incorporate other methods that were not accounted for in the present study. Moreover, the development of this method for the application of other mathematical operations is highly recommended.

Furthermore, this study could be used as a reference to help children and learners who are experiencing difficulties in subtracting one-digit numbers.

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