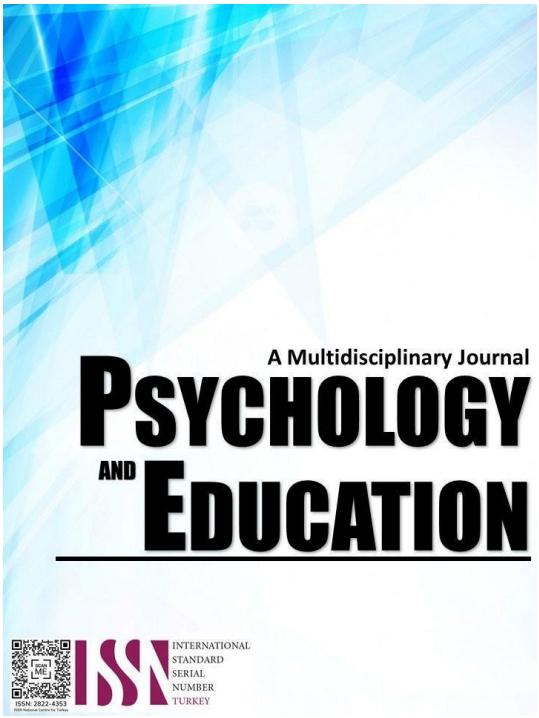
MULTI-TAB X (MULTIPLICATION TABLE EXPRESS): IMPROVING MULTIPLICATION SKILLS OF LEARNERS IN KEY STAGE 1



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Research Article

MULTI-TAB X (Multiplication Table Express): Improving Multiplication Skills of Learners in Key Stage 1

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Abstract

The study presented the results and findings of MULTI-TAB X (Multiplication Table Express), an innovation that taught multiplication skills in a fun and engaging way using manipulatives to make meaningful learning. The participants of the study were three (3) learners, consisting of one (1) Grade 2, and two (2) Grade 3 of La Suerte Elementary School in School Year 2022-2023. Data gathering methods used were teacher-researcher-made LEGNA pre-test and post-test, and Individual Multiplication Tracking Tool. Data were analyzed using graphs and overall percentage scores.The progress of the non-numerates was shown using the checklist of the Individual Multiplication Tracking Tool and the results of the teacher-researcher-made LEGNA pre-test and post-test. The researchers utilized the overall percentage of scores gained from the beginning to the end of implementation. These were presented through line graphs to illustrate the effectiveness of the innovative remediation. Based on the consolidation of the Individual Multiplication Tracking Tool, overall percentage scores were 65% (week 1&2), 74% (week 3&4), and 87% (week 5&6), and on the results of the LEGNA pre-test and post-test started from 20% to 80%. Therefore, MULTI-TAB X (Multiplication Table Express), a manipulative, that was user-friendly helped to increase the mastery skills and improve the multiplication skills of the non-numerates of key stage 1 learners of La Suerte Elementary School Year 2022-2023.

Keywords: *MULTI-TAB X, Non-numerates, Multiplication Skills, Innovation*

Introduction

The learning gap among pupils was evident as the face-to-face classes started after a couple of years of distance modular learning. Numeracy was one of its main problems. There were difficulties and lower interest in learning numbers, especially in the four fundamental operations. We, the teachers of La Suerte Elementary School of Matanao II District noticed the learner's problems in key stage 1 (Grades 2 and 3) in multiplication. Some could not even compute 1 digit multiplication of numbers 1 to 10 (e.g., A pupil bought 5 banana cues worth 5 pesos each, how much will he pay?), in this simple situation, they can be cheated. It was also sad that during Mathematics class, learners said that the subject was difficult, and they would rather play. We were so concerned about this matter because their mathematical skill was at risk. Hence it needed much attention and intervention.

The pre-test results of LEGNA (Localized Early Grade Numeracy Assessment) S.Y. 2022-2023 specifically in multiplication showed: in Grade 2, 10 out of 48 pupils, and Grade 3, 9 out of 50 got the correct answer. This meant 80% of Grade 2 and 82% of Grade 3 got the wrong ones. As we checked the papers, 5% of the learners were unable to answer any item in the multiplication part. And out of the four fundamental operations, multiplication and division got the lowest percentage.

After having the results of LEGNA, we came to realize that remediation on numeracy must be implemented. Most specifically, regarding learners' difficulty in multiplication. It was important to develop learners' ability to fast, effortlessly, and correct recall to improve their efficiency which was necessary for mathematics solving problems and facts (Mc Vancel et. al., 2018). To successfully perform high-level math facts correctly and quickly, one needed to develop multiplication skills (Stein et al., 2006; Reys, et al., 2009).

Therefore, we agreed to address this problem by presenting innovative materials that could improve learners' key stage 1 multiplication skills. By doing such, with full implementation under the guidance of dedicated co-teachers, we, the researchers were confident to achieve our target to improve our slow learners, the non-numerates in Mathematics specifically in multiplication using MULTI-TAB X (Multiplication Table Express). Accordingly, learners would be more independent if they had a good understanding of multiplication. We understood that without their multiplication skills, they could not proceed and perform division and could not gain high-level mathematical skills.

Research Questions

This action research was conducted to develop and improve the multiplication skills of learners in key stage 1 of La Suerte Elementary School, School Year 2022-2023. Specifically, this answered the question:

1. How does MULTI-TAB X (Multiplication Table Express) help to improve the multiplication skills of learners in key stage 1(Grade 2 & 3)?

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Literature Review

To see a child learning in Mathematics gives delight to every teacher. Thus, we, the researchers convened and agreed to address learners' difficulties, especially in multiplication. We want to teach the skill in a fun way using our innovation MULTI-TAB X (Multiplication Table Express) to make meaningful learning.

Figure 1. *MULTI-TAB X prototype screen*

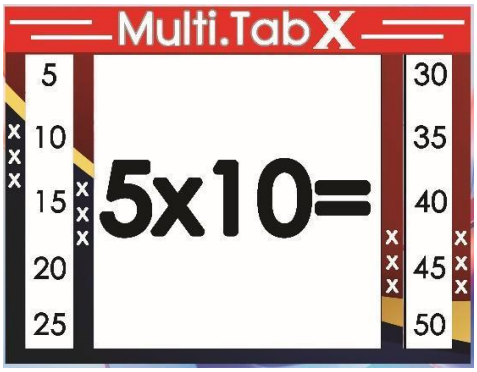


Figure 2. *MULTI-TAB X prototype with inserted changeable flashcards (factors and multiples of their product)*

MULTI-TAB X (Multiplication Table Express) was adapted from the original multiplication table of the Scottish Mathematician and Physicist, John Leslie. It was an enhanced and manipulative version. Its prototype had the appearance of a computer tablet and was innovated by Arman Emnace, an advocate of numeracy. It was created specifically to help students master multiplication skills. Since the skip counting numbers were displayed on both the left and right side of the screen, it was a user-friendly manipulative that allowed students to quickly respond to the multiplication question that was presented in the screen-like area. These skip-counting numbers were alternatives to get the right product of the given factors.

There were three levels of MULTI-TAB X (Multiplication Table Express), Easy, Average, and Difficult levels. In the Easy Level, all skip-counting figures were shown on the side of the screen of the manipulative from left to right. This was where they skip-counted to get the correct answer to the given number sentence. Next at the Average Level, there were missing skip-counting figures on each side of the screen but provided with random figures. The learners filled in the missing skip-count figure to give the correct answer. And lastly, at the Difficult Level, there were no skip-counting figures provided on the screen. The learners would give the correct answer without options on each side.

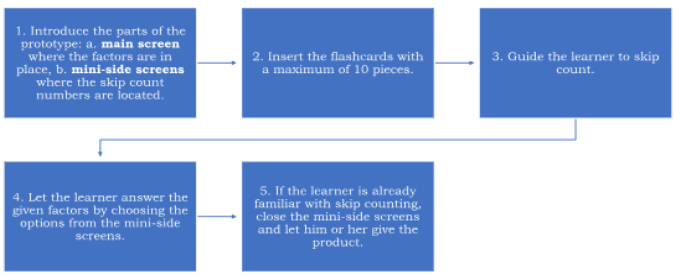


Figure 3. Processes on how to manipulate MULTI-TAB X

This was implemented during the conduct of remedial classes at La Suerte Elementary School in key stage 1 (Grades 2 & 3) for 6 weeks.

The pupils' learning how to solve multiplication number sentences was one of the prerequisites for gaining high-level mathematical skills (Gurganus, 2017). Accordingly, MULTI-TAB X was innovated to achieve the goal of teachers to improve the multiplication skills of key stage 1 learners. In addition, the success of this research would increase the numeracy rate of the school. The effectiveness of MULTI-TAB X (Multiplication Table Express) to aid the learning gap among learners would be utilized by researchers' co-teachers to help each learner, especially the slow learners, the non-numerates of La Suerte Elementary School.

Methodology

Research Design

Participants

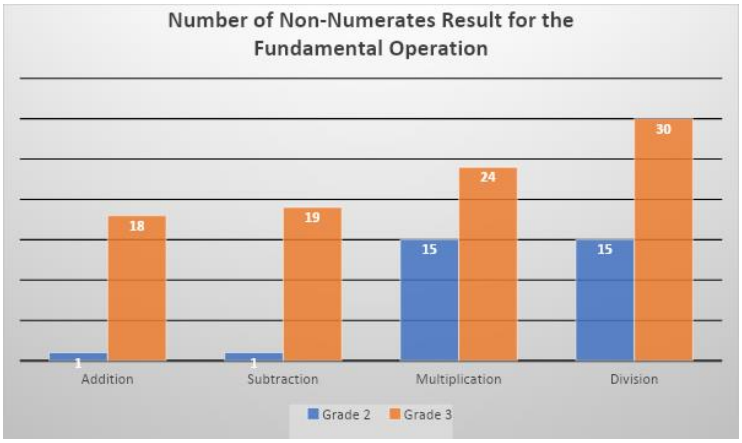
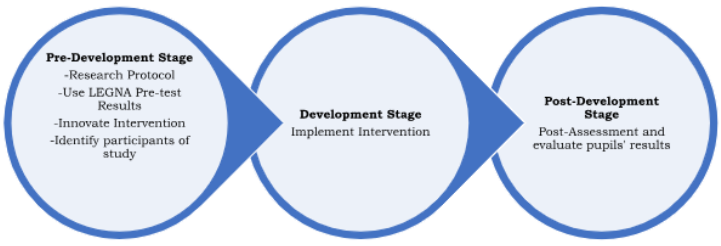


Figure 4. Showed the LEGNA S.Y. 2022-2023 Number of Non-Numerates Results for the Fundamental Operations among 98 Pupils (48 Grade 2, and 50 Grade 3)

The participants of this research were three (3) learners of La Suerte Elementary School. We picked one (1) in each section of Grade 2-Daisy, Grade 3-Lily, and Grade 3-Orchids, who scored lowest in multiplication during the conduct of LEGNA S.Y. 2022-2023 as shown in Figure 4. We also observed during classes that they were inattentive, timid, and had a short attention span. They had difficulty in answering multiplication facts which was why they had to master multiplication skills to bridge their numeracy gap.

Instruments

Procedure



Pre-Development Stage

The researchers sent a letter to the school principal of La Suerte Elementary School requesting permission to conduct the study of MULTI-TAB X (Multiplication Table Express): Improving Multiplication Skills of Learners in Key Stage 1. The letter was signed by the School Research Coordinator and the school principal. Then, the researchers drafted their research proposal and submitted it to the division office for evaluation by the Research Committee. Also, the researchers asked permission from the parents of three participants of the study and assisted them with their difficulties in multiplication skills. This was done by sending an approval letter that was signed by the parents and the learners themselves. An assent letter was handed to the participants, explained to them so they could understand

the goal of the study, and they signed it.

Development Stage

After obtaining permission to conduct the study from the school principal, and after the research proposal was approved by the research committee, the innovative intervention was administered. Upon approval, the researchers conducted MULTI-TAB X (Multiplication Table Express) as remedial classes for the identified participants. The researchers prepared the instructional materials specifically the MULTI-TAB X manipulatives, and they gathered the three participants in one classroom in every remediation schedule. Also, they made an assessment tool for Pre-test and Post-Test on Multiplication which was patterned to LEGNA, and got it checked and verified by the District Mathematics Coordinator. The administration of the assessment tool was uniform to the original one which was time-bounded where participants should answer in ten seconds only in each item number. Researchers administered the Pre-test to assess the multiplication skills of the identified participants. Then, they introduced the MULTI-TAB X (Multiplication Table Express) to them. In the first two weeks, the skip-counting figures were seen on the screen from left to right. Then, in another two weeks, there were missing skip-counting figures provided on the screen. In the final two weeks, the skip counting figures were not provided to assess if learners improved their multiplication skills.

Post-Development Stage

Lastly, the researchers conducted a post-test which was patterned to LEGNA tools, and its administration was time-bounded. The tools were researchers-made and underwent quality assurance by the District Mathematics Coordinator. The results would show the progress in the learners' multiplication skills after the six-week remediation of MULTI-TAB X.

Ethical Considerations

To fulfill the ethical requirements of the study, the teacher-researchers complied with all the applicable legal and ethical requirements about the conduct of the research. This study implemented several crucial features that safeguard the rights of the participants: guaranteed that their information would remain confidential and treated with the utmost respect, assured that they would remain anonymous which the teacher-researchers carefully observed.

Results and Discussion

To impart meaningful learning was the greatest goal of the completion of the implementation of this action research. The researchers observed significant improvements in the multiplication skills of the learners. Thus, this section further illustrated the discussion of the results of the MULTI-TAB X innovative remediation and was shown using line graphs of the Individual Multiplication Tracking Tool, and the researchers made LEGNA Pre-test and Post-Test S.Y. 2022-2023.

MULTI-TAB X bridged the multiplication skills gap of the identified Grade 2 and Grade 3 learners of La Suerte Elementary School which was evident from week 1 up to week 6 of the full implementation of the innovative remediation. The use of the manipulative of MULTI-TAB X was engaging with fun activities that made the participants more excited to participate. The identified participants were gathered every Friday during their remedial class schedule. The researchers introduced the MULTI-TAB X to them and were provided with printed copies of its prototype with skip-counting figures on each side. The copies were allowed to be brought at home for further familiarization. Their progress was checked and recorded using the Individual Multiplication Tracking Tool. In the first two weeks when the easy level of MULTI-TAB X was implemented, their overall percentage score was 65% only, it was observed that participants had low scores since they were not yet familiar with the skip-counting numbers and took time to count the numbers on each side.

In the next two weeks (weeks 3 and 4), the medium level, only random skip-counting figures could be seen on the screen of the prototype where they filled in the missing ones to give correct answers to the given multiplication sentences. Also, participants were given time to practice with their co-participants using the changeable numbers of the MULTI-TAB X manipulative. The one who got more correct answers was the one to lead them. It added more excitement to their activities and accelerated their interest in getting more correct answers. Progress was observed for their overall percentage scores increased by 9%, from 65% (week 1 & 2) to 74% (week 3 & 4).

In the final two weeks (week 5 and 6), the difficult level, no more skip-counting figures could be seen on its screen only the multiplication sentences. Participants gave answers without the options on each side. Progress was more evident for their overall percentage scores increased by 13%, from 74% (week 3 & 4) to 87% (week 5 & 6).

The application of MULTI-TAB X, the innovative remediation with manipulatives enhanced the mastery skills of the multiplication table and therefore improved the multiplication skills of the key stage 1 learners. Moreover, studies reveal that using manipulatives in the classroom is essential since it benefits the learners studying within the subject area of mathematics (Liggett, 2017).

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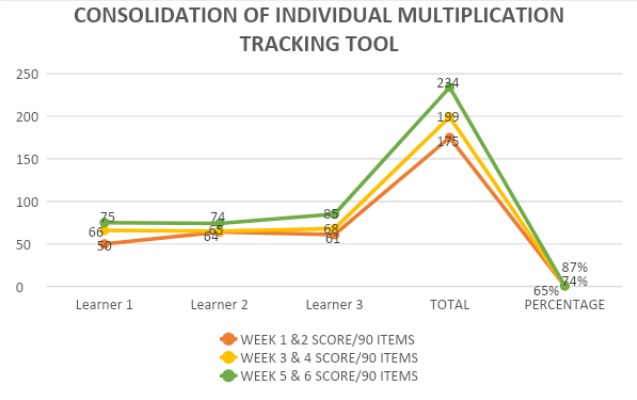

Figure 5. *Line Graph of the Consolidation of Individual Multiplication Tracking Tool of Learners 1, 2, and 3.*

Furthermore, progress was also evident from the results of the teacher-researchers-made LEGNA pre-test and post-test S.Y. 2022-2023. The conduct of the assessment was uniform to the original one which was time-bounded. The identified participants only had ten seconds to answer each item number. This was also helping in checking their improvements in multiplication skills with time limits. They scored lower in the pre-test, just 20% overall percentage score. However, increased 80% the overall percentage score in the post-test. Additionally, mastery of the skip-counting figures using the MULTI-TAB X improved the multiplication skills of the learners provided that the assessment was done time-bounded. In connection with that, the development of multiplication skills was necessary to effectively complete complex math tasks quickly and accurately (Stein et al., 2006; Reys, et al., 2009).

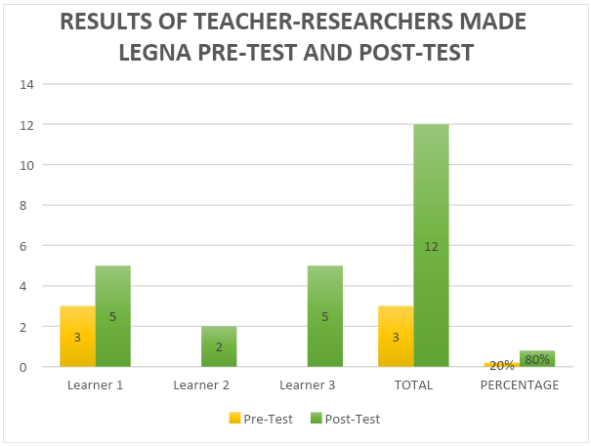

Figure 6. *Results of the Teacher-Researchers Made LEGNA Pre-Test and Post-Test School Year 2022-2023 of Learners 1, 2, and 3.*

Conclusion

The effectiveness of the innovative remediation to improving the multiplication skills of key stage 1 learners was proved by the results of the full implementation of MULTI-TAB X (Multiplication Table Express), an enhanced and manipulative version of the multiplication table. This innovation bridged the multiplication difficulty of pupils and was significant in enhancing their multiplication skills. The use of its manipulatives increased the level of interest and excitement of pupils because it was done in fun and engaging ways.

The MULTI-TAB X (Multiplication Table Express) was user-friendly and welcoming to every learner no matter what his/her multiplication skills were. It was because it had different levels of difficulties starting with the easy level with skip-counting figures provided on each side, to the medium level with random skip-counting figures found on screen, until the difficult level with no skip-counting figures was given on each side to test their learning in answering multiplication sentences. Results showed improvements in the multiplication skills of the key stage 1 learners. With this, learners would no longer have a hard time applying their learned skills in real-life scenarios, such as buying from the canteen during the recess period.

However, it was observed that out of 3 learners, only 2 passed the teacher-researcher-made LEGNA Post-test School Year 2022-2023. The one who did not get the passing score showed lower participation and was not focused during the six-week remediation. That same learner got the lowest scores yet passed in the Individual Multiplication Tracking Tool.

The researchers would suggest that MULTI-TAB X (Multiplication Table Express) would be included in the School Improvement Plan (SIP) to impart more improvement in one of the key result areas in basic education, quality. It would also be given more priority for further development of this action research. Conduct MULTI-TAB X depending on the pacing of different learners considering their different learning styles. Additionally, the researchers were willing to share all the findings and results of this action research about reproducing it in the school learning action cell. This innovation could also be digitized in future studies.

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