Incorporating Contextualized Drill Cards in Daily Instructions: Basis for Institutionalization

Lynette P. Rue*, Lorraine B. Deseo, Denelyn F. Prodigalidad

Department of Education, Division of General Trias City, Cavite, Philippines

***Correspondence author**

DOI: https://dx.doi.org/10.47772/IJRISS.2025.90600054

Received: 27 May 2025; Accepted: 30 May 2025; Published: 28 June 2025

ABSTRACT

This action research investigates the impact of incorporating contextualized drill cards into daily instruction on the numeracy skills of Grade 3 learners at Gen. Artemio Ricarte Memorial School in General Trias City. Prompted by national and local assessment results showing poor student performance in fundamental mathematical operations, the study aimed to develop and implement an intervention aligned with the Most Essential Learning Competencies (MELC). Contextualized drill cards, customized to individual learner needs and designed to address addition, subtraction, multiplication, and division, were administered for 5–10 minutes during daily lessons, three times a week over a three-week period. A pre-test and post-test design was employed to assess changes in learner performance. Findings revealed a significant improvement in numeracy levels, with mean scores rising from 37.37 to 47.2 out of 50. Statistical analysis using a paired t-test confirmed a significant difference ($t = 5.51$, $p = 0.000$), indicating the effectiveness of the intervention. The study concludes that contextualized drill cards are a valuable instructional tool that can enhance learners' mastery of basic mathematical operations and supports their broader implementation across similar educational settings.

Keywords: contextualized drill cards, numeracy skills, fundamental operations, mathematics intervention

INTRODUCTION

For the past years, poor performance of our country in the international and regional assessment results were observed. For instance, the Philippines ranked last among the 79 participating countries in reading and second to the last in science and mathematics (PISA 2018) and also the lowest among the 58 countries in the conducted TIMSS last 2019 (Magsambol, 2020). Even before the pandemic, Mathematics obtained the lowest LOA results based on the gathered data every quarter together with English subjects.

As defined by Merriam-Webster, numeracy means having the ability to understand and work with numbers. It goes beyond mastering basic mathematical concepts to application of mathematics to real-world situations which require analytical and critical problem-solving skills and to use mathematics to understand non-mathematical contexts (Theatre, 2018; Tout, 2020; Tout, 2022).

The Division of Gen.Trias City conducted and administered the contextual Division Numeracy Assessment tools last Sept. 2022. Based on the gathered data, results of large percentage or the majority of the students are non-numerator. This tool is used to assess whether the acquired the necessary numeracy level based

on MELC. As DepEd (RO No. 10, s.2020) released the Most Essential Learning Competencies (MELC) last 2020, students need to attain those competencies and skills in Mathematics as required in their actual grade level which are considered "numerates" as defined operationally in this paper, otherwise, considered nonnumerates. Since the numeracy schools is quite alarming with majority (60% and above) of the students are non-numerates (do not possess the numeracy skills for their actual grade level), schools were crafting and implementing intervention for the nonnumerates and the division provided and division project SINULID that focuses on reading and numeracy, along those interventions, materials were developed and mostly conducted remedial classes. As response to the conducted FGD to the math teachers, lack of mastery on the basic operations is one

of the main causes of low numeracy level specifically for key stages 2 to 4.

The purpose of this study is to determine and test the inclusion of contextualized drill cards as part of daily instructions. The drill cards will be made applicable to the learners with only desired number of items unlike in the commercial A1, S1, and others. This will include a step-by-step processes towards the development of the numeracy level of the learners. This will be done as the practice of the learners which will be a required in the 5 to 10 minute-time in the daily instructions.

Statement of the Problem

This research will evaluate the effect of integrating contextualized drill cards in daily instructions. Specifically, this will answer the following research questions:

1. What is numeracy level of the learners considering the 4 fundamental operations?
2. What is the numeracy level of the learners in the 4 fundamental operation after incorporating the drill cards in daily instructions?
3. Is there a significant difference in the numeracy level of learners before and after incorporating the contextualized drill cards in daily instructions?
4. Are the contextualized drill cards increase the numeracy level of the learners?

Significance of the Study

The results of the study were beneficial to the following:

Teachers. The study provides teachers with an effective and manageable strategy to address learning gaps in mathematics. Contextualized drill cards can be seamlessly integrated into existing lesson plans, allowing teachers to provide differentiated instruction without sacrificing time for new content. It empowers educators to monitor student progress closely and respond to learning needs with appropriate materials.

Learners. This study highlights the importance of consistent, targeted practice in mastering the four fundamental operations. The integration of contextualized drill cards helps learners reinforce their mathematical skills in a focused and engaging manner, allowing them to progress according to their individual needs. The improvement in post-test scores demonstrates that learners benefit from structured, personalized interventions embedded in daily instruction.

For School Leaders and Curriculum Planners. School administrators and curriculum developers can use the findings to institutionalize the use of contextualized learning materials as part of regular instructional strategies. The success of this low-cost, sustainable intervention supports its scalability across grade levels and schools within the division or beyond.

Department of Education. The research supports ongoing efforts to improve foundational literacy and numeracy as outlined in national programs such as Bawat Bata Bumabasa (3Bs) and Project SINULID. It reinforces the need for context-based, data-driven strategies aligned with the Most Essential Learning Competencies (MELC), contributing to broader educational reforms aimed at addressing the country's poor performance in international assessments.

Future researchers. This study can serve as a guide for parallel or in-depth research on current topics.

LITERATURE REVIEW

Numeracy is a fundamental life skill required for success in school and in everyday life. It includes not just basic arithmetic skills, but also the ability to evaluate, use, and analyze quantitative data in a variety of circumstances (Tout, 2020; Tout, 2022). Theatre (2018) stressed that numeracy necessitates a thorough comprehension of mathematical ideas and their application to real-world problems.

Assessments conducted both domestically and abroad in the Philippines repeatedly show that students' numeracy

abilities are lacking. According to the 2018 Programme for International Student Assessment (PISA), the Philippines performed among the lowest in science and mathematics and last in reading (Department of Education [DepEd], 2019). In a comparable manner, the 2019 Trends in International Mathematics and Science Study (TIMSS) ranked the nation last in the world (Magsambol, 2020), suggesting that Filipino students have long struggled to grasp fundamental mathematical concepts.

By reducing the curriculum and emphasizing fundamental abilities like numeracy, the Department of Education implemented the Most Essential Learning Competencies (MELC) to close learning gaps both during and after the epidemic (DepEd, 2020). Assessment results, however, nevertheless indicate that a sizable portion of children are categorized as "non-numerates"—those who do not possess the arithmetic skills required for their grade level.

The use of systematic, repeated practice to develop mastery is supported by educational philosophies. According to Thorndike's Law of Exercise, learning is strengthened by repetition, especially when students are developmentally ready to pick up the skill (Kavalkovich, 2017). Drill-based interventions have been used for a long time in mathematics education to increase computational fluency, particularly in the four basic operations of addition, subtraction, multiplication, and division.

Increasing engagement and academic achievement has also been demonstrated to be possible through contextualization, which is the practice of adjusting learning materials to the experiences and local surroundings of the learners. Learners are more likely to understand abstract ideas and apply them in meaningful ways when mathematical problems are made relevant to their cultural and real-world contexts (DepEd, 2002). This method is consistent with constructivist learning theories, which hold that information is actively created through interaction with the environment and past knowledge.

The current study builds on these frameworks by introducing contextualized drill cards as a numeracy development intervention. In contrast to generic resources, these drill cards are created based on diagnostic evaluations and in line with MELC, allowing students to practice specific and pertinent skills. This approach, which is integrated into regular education, attempts to support steady skill development and sustained enhancement of numeracy performance.

METHODOLOGY

This study utilized a quantitative action research design to evaluate the effectiveness of contextualized drill cards in improving the numeracy skills of Grade 3 learners at Gen. Artemio Ricarte Memorial School in General Trias City. A total of 50 purposively selected learners identified as “non-numerates” based on a pre-assessment were involved. The intervention consisted of customized drill cards focused on the four fundamental operations—addition, subtraction, multiplication, and division—administered for 5 to 10 minutes, three times a week over a three-week period. Each learner received differentiated drill cards based on their diagnostic results, with items arranged by increasing difficulty and aligned with MELC. A validated 50-item numeracy test was used as both pre-test and post-test to measure improvement. Data were analyzed using descriptive statistics (mean, percentage, and standard deviation) and inferential statistics through a paired t-test to determine the significance of the learners’ improvement, with a significance level set at 0.05.

RESULTS AND DISCUSSION

The results of the problems presented were summarized on the following table.

Test	Mean	Sd	t-value	p-value	Remarks
Pre-test	37.37	5.75	4.51	0.000	Significant
Post test	47.2	3.38			

The numeracy skills of the students before the inclusion of drill cards obtained a mean value of 37.37 and a standard deviation of 5.75 out of 50-item test. Since the samples are already Grade 3 learners, the numeracy skills for the four fundamental operations are already “nearly mastered”. After the 3-week intervention wherein

the learners were given drill cards every day before each lesson, their numeracy skills increased to 47.2 mean value and the standard deviation was reduced to 3.38. Learners' numeracy skills is now equivalent to "highly mastered" and the standard deviation implies that they have almost the same scores as to the mean value.

The comparison between the pre-test and post test showed that the two tests are significantly different with t-value of 5.51 and p-value of 0.00. This means that the learners improved their numeracy skills after the 3-week intervention of drill cards. Although the learners performed quite well during the pre-test, there is still improvement needed. The main role of the drill cards is to let the learners master the fundamental operations in Mathematics which is attained in this paper. It can be concluded that the contextualized drill cards improve the performance of the learners in terms of numeracy skills.

CONCLUSION

Based on the gathered findings, the following are concluded:

1. The Grade 3 learners nearly mastered the four fundamental operations as the results of the pre-test. Although the scores are considered good, there are still skills that needs to be mastered.

2. The post-test results showed as increased in the scores of the learners after the inclusion of drill cards in the daily instruction and resulted in highly mastered competencies.

3. Significant difference was observed between the pretest and post which indicates significant improvement in the skills of the learners specifically in the fundamental operations.

4. The inclusion of contextualized drill cards in daily instruction improved the numeracy skills of the learners. This means that learners' constant practice contributed in the mastery of the competencies.

RECOMMENDATIONS

Based on the results of the action research, several simple and practical recommendations can be made. First, schools are encouraged to use contextualized drill cards regularly, especially in Grades 1 to 6, to help learners build strong numeracy skills. These drill cards can be used as a regular part of daily lessons, for 5 to 10 minutes, to give students more practice in basic math operations.

Teachers should also be supported in making and updating these drill cards based on the needs of their students. It would be helpful to create a shared collection of drill cards that teachers can use, edit, and improve together. To make sure all teachers can use the cards well, training and workshops should be given, and teachers should have regular meetings to share their experiences and ideas.

It's also important to regularly check the progress of students using pre- and post-tests. The results should help teachers decide how to better support their learners. Involving parents by sending home simple versions of the drill cards and explaining how they can help their children practice at home will make the intervention even more effective.

This strategy may also be useful in other subjects like English and Science, where students can also benefit from short, focused drills. Finally, more studies should be done to see how effective the drill cards are in the long run and in different schools. These recommendations aim to continue improving students' numeracy skills and support teachers in making learning more effective.

Ethical Considerations

This research was conducted in accordance with ethical guidelines and principles for research involving human subjects. Ethical approval was obtained from the relevant ethics committee prior to data collection. All participants were informed of the study's purpose, their voluntary participation, and their right to withdraw at any time without consequence. Written informed consent was obtained from all participants, including parents or guardians of minor participants.

Conflict of Interest

The authors declare no conflicts of interest in the conduct and publication of this research. No financial or personal relationships influenced the outcomes of this study.

Data Availability

The data collected for this research are not publicly available due to privacy and confidentiality concerns.

REFERENCES

1. DepEd Order No. 25 . (2002). Implementation of the 2002 Basic Education Curriculum . Department of Education.
2. Kavalkovich, S. (2017, May 14). The Law of Exercise and Readiness in Teaching. Retrieved August 21, 2020, from Sol Vibrations: https://solvibrations.org/law-exercise-readiness-teaching-revised-version/
3. Philippines PISA 2018 National Report . (2019). Department of Education.
4. Tout, D. (2020). Evolution of adult numeracy from quantitative literacy to numeracy: Lessons learned from international assessments. International Review of Education, 66(1), 117–134. https://doi.org/10.1007/s11159-020-09831-4
5. Sakurai, J., Sawatzki, C., & Tout, D. (2018). Real life numeracy contexts – the spark to ignite mathematics learning. Teacher Magazine. https://www.teachermagazine.com/au_en/articles/real-life-numeracy-contexts-the-spark-to-ignite-mathematics-learning