Vol. 15, No. 01, pp. 417-429, 2025 DOI: 10.23960/jpp.v15i1.pp417-429

Jurnal Pendidikan Progresif

e-ISSN: 2550-1313 | p-ISSN: 2087-9849

http://jurnal.fkip.unila.ac.id/index.php/jpp/

Development of NumeriUNO Media in Improving Mathematics Learning Outcomes of Grade III Students

Ananta Destian Murtiana*, & Sigit Yulianto

Department of Elementary School Teacher Education, Universitas Negeri Semarang, Indonesia

*Corresponding email: anantadestian@students.unnes.ac.id

Received: 21 February 2025 *Accepted: 03 March 2025* *Published: 21 April 2025*

Abstract: Development of NumeriUNO Media in Improving Mathematics Learning Outcomes of Grade III Students. Objectives: This study aims to develop, and test the feasibility, effectiveness, and practicality of NumeriUNO card learning media to improve mathematics learning outcomes. **Methods:** The research model used is Research and Development (R&D) with the Borg & Gall development model. The research approach used in this study is a pre-experiment method with a one-group pretest-posttest design. Data collection techniques used to test techniques (pretest-posttest) and non-tests in the form of interview results, questionnaires, observations, score lists, and documentation. **Findings:** Media expert validation amounted to 92.3% and material experts amounted to 92.6% with very feasible criteria on both. The practicality test is shown by the results of students' responses 92% and by teachers 90%, with very positive categories in both. There is an increase in learning outcomes by 34.2 points, from the pretest results of 46.6 and posttest of 80.8. The effectiveness of the media is evidenced by a significant difference in the results of the two-sided t-test p (<0.001), the effect size value (Cohen's D) is 2.12, with a very large category of effects, n-gain of 0.6261 with a moderate category, and 77% of students experience learning completeness. **Conclusion:** The learning media of the NumeriUNO Card has proven to be not only feasible but also effective in improving students' mathematics learning outcomes on the multiplication of numbers. The use of games in learning increases student engagement, motivates them, and creates a more enjoyable and interactive learning experience.

Keywords: NumeriUNO card, mathematic, learning outcomes.

To cite this article:

Murtiana, A. D., & Yulianto, S. (2025). Development of NumeriUNO Media in Improving Mathematics Learning Outcomes of Grade III Students. *Jurnal Pendidikan Progresif*, *15*(1), 417-429. doi: 10.23960/jpp.v15i1.pp417-429.

INTRODUCTION

Mathematics is a subject that is always studied and is urgently needed in various scientific and academic fields (Rosmiandini et al. 2023). Its very high urgency makes mathematical knowledge must be mastered as early as possible, especially at the elementary school level (Nuryami et al. 2021). In each level of education, mathematics has different activities. Mathematics learning in elementary school includes the following activities: 1) tracing patterns and correlations; 2) creativity, which requires imagination, intuition, and discovery; 3) problem-solving exercises; and 4) using mathematics as a means of communication (Dwi Hastuti et al. 2019).

Mathematics is a science that has abstract and systematic characteristics, which often makes students find it difficult to understand the concepts taught (Adrian and Apriyanti 2019). This difficulty has an impact on students' low interest in learning Mathematics, which in turn also affects their

learning outcomes (Putri and Safrizal 2023). Many schoolchildren in Indonesia consider mathematics to be a difficult subject, which is in line with the Program for International Student Assessment (PISA) report from the Organization for Economic Co-operation and Development (OECD). In 2022, Indonesian students obtained a lower score compared to the PISA results in 2015–2018, which was 366 points. The score is also far below the average score of OECD member countries, which is around 465-475 points. With a score of 366, the mathematical skills of Indonesian students enter level 1a (OECD and PISA 2023). From this, Indonesia needs to improve its mathematics skills as early as possible and remove the stigma that mathematics is difficult.

In teaching mathematics in elementary schools, fostering students' interest in learning mathematics is a challenge as well as a difficult task for teachers. Teachers must foster students' interest in learning mathematics by creating a colorful teaching environment (Pang 2020). Therefore, teaching skills are a challenge for teachers in creating, reinventing, changing, and innovating to enable students to understand and assimilate subjects (Berticelli, Pinto, and Migliavacca 2016).

Learning media is one of the most important components in the teaching and learning process. When teaching, teachers use the use of learning media as a guide in explaining the material so that students can understand it. The use of learning media can create a psychological impact to be able to motivate and increase students' interest in learning (Wulandari et al. 2023). owever, due to the lack of teachers' knowledge about learning media, its application in the educational process is still not optimal (Hastuti, Surahmat, and Sutarto 2019).

According to Piaget (1964) defines four phases of cognitive development, namely sensory-motor (0–2 years), pre-operational (2–7 years), concrete operational (7–11 years) and formal operational stage (11–adult) (Lamb et al. 2019; Thahir 2018). At the elementary school level, children are at a concrete operational stage with the characteristics of using logic that is starting to suffice but are not able to solve problems with various variables and require specific objects or direct learning experiences (Rahmaniar, Maemonah, and Mahmudah 2021). Therefore, abstract mathematics learning needs to be supported by the use of concrete learning media.

Tong Tong Galitong Ji is a game from the city of Malang that can be used in the exploration of basic mathematical concepts (Turmudi et al. 2021). In the Philippines, the High Five card game, with the combination of UNO and Bingo Number Tower was developed in learning to improve basic math skills (Conte 2019). In a study in Makassar, the use of snake and ladder games had a positive impact on improving students' cognition (Syawaluddin, Afriani Rachman, and Khaerunnisa 2020). Furthermore, the development of language learning media based on virtual reality games has been proven to quickly improve Japanese language skills (Cheng, Yang, and Andersen 2017). Based on research conducted by Isna Wulandari, regarding the use of concrete learning media for math cards, it was found that students experienced an increase in learning outcomes in grade 5. From this, concrete learning media is considered quite effective in inviting students to learn mathematics by playing (Wulandari, Hendrian, I. P. Sari, et al. 2020). The game-based learning media developed by Rahmawati and Jamaluddin successfully improved students' understanding of mathematics. (Rahmawati and Jamaluddin 2024)

From the many studies that have been conducted, students prefer learning through games, so that the material presented can be easier to understand (Hartono et al. 2017; Qian and Clark 2016; Subhash and Cudney 2018). This shows that learning media has a great

influence on the success of the teaching and learning process, especially the use of a game as a support.

Based on the problems that have been presented, this study develops a game-based learning media by utilizing the concept of UNO cards, which are then developed into NumeriUNO cards. At the elementary school level, especially in grade III, students begin to be introduced to the concept of basic calculation operations which is the foundation for understanding more complex mathematical material at the next level. This learning media is specifically designed to help third-grade elementary school students understand the multiplication material of numbers. This study aims to examine the feasibility of NumeriUNO as a learning medium, how practical is the use of NumeriUNO learning media, and analyze its effectiveness in improving student learning outcomes. NumeriUNO is an innovation in Mathematics learning that combines elements of play in education, to make learning more interesting and dynamic for children.

METHOD

Participans

This study involved all grade III students at SD 1 Ngembal Kulon as a population. The research sample consisted of 30 students, who were selected as research subjects. The technique used in sampling was saturated sampling, where all 30 grade III students were sampled. The selection of this technique was carried out because of the relatively small population, making it possible to research the entire member without the need to conduct random sample selection.

Grade III students, aged 9-10 years, consist of 15 girls and 15 boys from diverse social and economic backgrounds with varying academic abilities. In Mathematics, particularly basic operations, some students grasp concepts well, while others struggle with addition, subtraction, multiplication, and division. These differences are influenced by teaching methods, student engagement, and the use of varied learning media.

SD 1 Ngembal Kulon was selected due to students' low achievement in multiplication. The school lacks interactive learning media, making it suitable for implementing NumeriUNO. Additionally, the school supports innovation in learning methods

Research Design

The type of research used is research and development (R&D). According to Borg & Gall, R&D is an industry-based development model in which research findings are used to design new products and procedures that go through evaluation, then revised and tested in the field to meet certain quality and effectiveness requirements. (Aka 2019).

In this study, the product produced is the NumeriUNO Card (Numeracy Through UNO), a game-based learning medium, with multiplication material. In this study, the development model used is the Borg and Gall model. This model is applied up to the eighth stage, which is carried out taking into account the time and cost limitations available in the research. The research was conducted over one month.

The research approach used in this study is a pre-experiment method with a one-group pretest-posttest design. This design involves one group of subjects who are given a pretest before treatment and a posttest after treatment, without a control group.

Research Procedure

This study follows eight systematic stages. First, Research and Information Collection identifies needs and theoretical foundations for product development. Next, Planning involves setting goals, and strategies, and designing the

initial learning media. In the Preliminary Product Development stage, the initial prototype is created. This is followed by a Preliminary Field Test with teachers and students to gather feedback on strengths and weaknesses. Based on this, a Main Product Revision is conducted to improve the media. The revised product then undergoes Main Field Testing to evaluate its effectiveness in a real learning environment.

Instruments

This study uses test and non-test instruments. The test instrument consists of 25 multiple-choice questions to assess students' cognitive abilities in multiplication. It covers four indicators: calculating simple multiplication (6 questions), solving word problems using multiplication (6 questions), identifying number patterns in repeated multiplication (6 questions), and evaluating multiplication results logically (7 questions). The questions were selected from a pool of 50 after validity and reliability testing on Grade IV students at SD 1 Ngembal Kulon. Validity was assessed using biserial correlation in Microsoft Excel, resulting in 25 valid questions. Reliability, calculated with the Richardson 20 formula, scored 0.88519, indicating high reliability.

To assess multiplication understanding, a simple question is given, such as, "Number pattern: 2, 4, 6, 8. If multiplied by 3, what is the last number?" For problem-solving in basic calculations, a context-based question is used, like, "Company A has 5 branches with 10 employees each, Company B has 6 branches with 15 employees each, and Company C has 4 branches with 20 employees each. Which company has the most employees?" These questions help evaluate students' understanding before and after using the learning media, allowing analysis of its effectiveness in improving mathematics learning outcomes.

For non-test instruments in the form of media validation questionnaires with 13 indicators, material validation with 17 indicators, teacher and student responses to the NumeriUNO card media that has been used, as many as ten questions. In non-test instruments, the measurement scale used is the Linkert Scale.

Data Analysis

In measuring the validity of the media, the researcher used data collection techniques in the form of media validation questionnaires and material validation. Media validation questionnaires are given to media experts to assess aspects of suitability of learning objectives, clarity and neatness of media, interactivity, proportional size, and ease of use. Meanwhile, the material validation questionnaire is used by material experts to evaluate the suitability of the material with learning outcomes, the suitability of the material with the learning objectives, the scope of the material, the clarity of the content of the material, the suitability of the content with the curriculum, the clarity of presentation, and the relevance of the material in improving student understanding.

In the validity measurement, the data will be analyzed qualitatively and quantitatively. Quantitative data in the form of questionnaire results that have been filled out by expert validators are then analyzed descriptively. Descriptive statistics are data that provide an overview of the basic nature of the data in a study, such as mean and standard deviation (Mishra et al. 2019).

The calculation of the results of media and material validation is carried out by calculating the number of raw scores obtained, dividing by the maximum score, and then multiplying by 100 to get the frequency percentage value. The results of this analysis are interpreted by categorizing the scores in the following ranges, 86% – 100% categorized as very good, 76% – 85% as good, 60% – 75% as moderately good, 55% – 59% as not good, and 0% – 54% as very poor.

Qualitative data in the form of input and suggestions from validator experts are used as a

reference for improving the media developed, which is analyzed in a qualitative descriptive manner. Inputs from media experts and subject matter experts are grouped by indicators and re-evaluated to ensure that the revisions have improved the quality of the media before being implemented in large-scale trials.

The practicality test involved teacher and student response questionnaires, analyzed using descriptive statistics to assess perceptions of *NumeriUNO* media. Responses used a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The data were calculated to determine frequency percentages and average scores. Scores were categorized as: very positive (82%–100%), positive (63%–81%), moderately positive (44%–62%), not positive (25%–43%), and very unpositive (0%–25%).

The effectiveness of the media was tested using pretest and posttest data and analyzed with SPSS 30. The analysis included a normality test (Shapiro-Wilk), followed t-test, effect size, and n-gain tests.

The hypothesis in this study is the media considered effective if over 75% of students pass the Learning Objectives Achievement Criteria in the posttest.

■ RESULT AND DISCUSSION

The development model used in the research is adapted from the Borg & Gall development model which consists of eight stages that are carried out systematically, namely Research & Problem, Data Collection, Early Design Development, Expert Validation, Design Revision, Early Test, Product Revision, and Field Test.

Research & Problem

Before product development is carried out, researchers search for information on potential problems that occur at the research site. The first stage of this research was carried out at SD 1 Ngembal Kulon, by conducting observations. Observations are important to carry out as preliminary data collection in accordance with the study topic (Herzamzam 2021). In creating meaningful learning strategies, it is important to pay attention to student's needs and interests, which are analyzed by filling out a needs questionnaire by students (Hidayah, Sumarno, and Dwijayanti 2023).

Mathematics learning at SD 1 Ngembal Kulon faces several challenges, including low student engagement, weak understanding of multiplication concepts, and poor learning outcomes. The teacher-centered expository approach limits classroom interaction, while the lack of effective learning media further hinders comprehension. As a result, 16 out of 30 students (53.33%) did not meet the minimum learning mastery score of 75.

Data Collection

At the beginning of the study, data was collected through interviews and questionnaires with teachers and students to identify the needed learning media for multiplication. Teachers reported difficulty teaching multiplication using the expository model, which relies on verbal explanations like discussions and lectures. Expository is a learning strategy that focuses on delivering material through verbal, such as discussions and lectures in learning (Napitupulu et al. 2022) . Students easily became bored and were less engaged, often preferring to play rather than listen. Given the abstract nature of mathematics, expository learning was deemed less effective, highlighting the need for concrete learning media to improve understanding.

Based on the questionnaire, 77% of students struggle with mathematics, and 83% find multiplication lessons boring. However, 87% believe learning would be more interesting through games, and 77% are familiar with UNO cards. Since students tend to lose focus when

only listening to the teacher but enjoy playing UNO with friends and family, researchers chose a familiar game as a learning medium.

Early Design Development

After completing the identification of the problem and knowing the needs of teachers and students, at this stage the process of designing learning media as a solution to the problems that have been found is carried out. At the product design stage, several activities are carried out, including designing learning media designs, preparing rules for playing and questions, making pictures and cards, and packaging.

The concept of the NumeriUNO Learning Media is inspired by the UNO Card game that is known in general. However, in the NumeriUNO media, there are components of cards that are modified so that they have different functions, the purpose of which is adjusted to the material being developed.

The preparation of rules in playing NumeriUNO cards is generally the same as ordinary UNO card games, only there are some additional rules that are adjusted to the needs of using media to support students in memorizing multiplication. When the player who is playing puts down the card, not only the color or number is considered, but also the multiplication problem that is in the upper and lower corners, must be answered correctly immediately while putting. If the answer is incorrect, the player must take 1 card from the existing pile, as well as if the player does not have the card, must take 1 more card.

In the design of game learning media, the media must be integrated appropriately into education, prioritizing the goal of learning itself (Gloria et al. 2018). The entire design of the NumeriUNO card was created with the help of the Canva application. The following researcher describes the completeness of the design of the NumeriUNO Card Learning Media:

Figure 1. The instruction card

The instruction card. The instruction card in the game NumeriUNO serve as a guide for players in understanding the rules and mechanics of the game. It contains a large number of cards, instructions on how to play the cards, as well as the consequences of each type of action card, such as +2 cards, reverse cards, and skip cards.

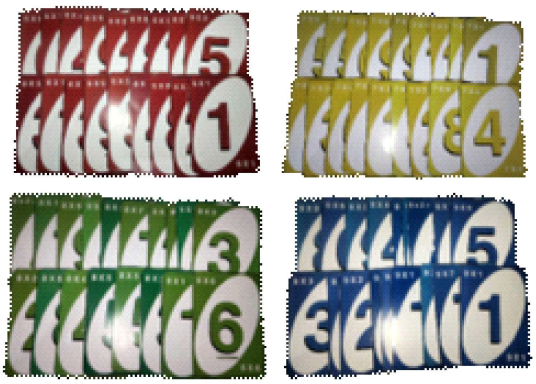

Figure 2. Number cards

Number Cards, In the NumeriUNO Card learning media, each card color has its own specific function. The color on the card is used as an indicator of a certain multiplication group to make it easier for students to remember and distinguish each multiplication operation. In this case, red is used to represent the multiplication of six, yellow for the multiplication of seven, green for the multiplication of eight, and blue for the multiplication of nine.

Figure 3. Wild cards

Wild Cards, the NumeriUNO Card is also equipped with Action Cards that are designed to add variety in the game and improve interaction between students. These Action Cards are of several types, among which are the reverse cards, which change the direction of the turn of the play; +2 card, which requires the next player to take two additional cards; as well as a skip card, which causes the next player to lose their turn.

Figure 4. Card packaging

Card Packaging, On the packaging, there is the inscription "NumeriUNO: Multiplication Mathematics Learning Media", which serves as the main identity of this learning media. The graphic design of the packaging is made attractive by displaying an illustration of the NumeriUNO card to give an idea of the contents of the card.

Expert Validation

In the design validation stage, the product is developed through two media validation tests and a material validation test. The results of the two validation tests are then calculated using the frequency percentage.

After the quantitative data is calculated, then the results of the calculation are converted into qualitative values in the form of eligibility criteria.

NumeriUNO media was assessed based on several criteria, including the suitability of learning objectives, clarity, neatness, interactivity, proportionality, and ease of use. The validation results from media experts showed a score of 92.3%, categorizing it as "Very Feasible." Similarly, material experts provided a score of 92.6%, evaluating aspects such as alignment with learning outcomes, relevance to learning objectives, material scope, clarity of content, curriculum compatibility, and effectiveness in enhancing student understanding. These high validation scores indicate that the NumeriUNO card media meets the necessary quality standards and can be effectively implemented in the learning process without requiring significant revisions. The results of the media validation and material validation key tests are presented in the following Table 1.

Table 1. Results of the media and material validation feasibility test

Indicator	Media Validator	Material Validator
Total Score	48	63
Maximum Score	52	68
Percentage	92.3%	92.6%
Criteria	Very Feasible	Very Feasible

The research conducted in Lamongan, the development of UNO card media for long unit materials, received a very decent score from experts, namely material experts of 95.23% (very feasible), and media experts of 87.50% (very feasible) (Ulfah, Tri Azizah., Wahyuni, Eva Ari.,

Nurtamam 2021). It can be concluded that the feasibility of media and materials in this study has a high level of validity and is comparable to previous research. This shows that the media and materials developed are of good quality and can be used in the learning process.

Design Revision

The validation results from media experts confirmed that the NumeriUNO design was appropriate and did not require revisions. However, suggestions were given to improve the durability of the packaging by using thicker paper. This is important as the main users are children aged 9–10 years. According to Eliason & Jenkins in (Safira and Ifadah 2020), effective learning media should match children's interests and abilities, be engaging, versatile, durable, safe, simple, and attractive. Using thicker paper will make the packaging sturdier, more durable, and comfortable for students.

Product Trial

In this trial stage, it was carried out twice, namely a small-scale trial and a large-scale trial. Small-scale trials tend to produce more beneficial results than large-scale studies because they are usually more controlled by stricter regulations (Cheung and Slavin 2016). A small-scale trial was conducted with 6 Grade III students from Ngembal Kulon Elementary School, selected heterogeneously: two with high, two with medium, and two with low cognitive abilities. After the trial, students and teachers completed a response questionnaire with 10 questions about the NumeriUNO Card learning media.

The results of the small-scale trial response questionnaire, it was found that teachers gave a response of 90% with very positive criteria, while students gave a response of 92% with the same criteria. This shows that the learning media of the NumeriUNO Card is well received by teachers and students. A high percentage indicates that this media is considered effective, interesting, and useful in supporting the learning of multiplication of numbers. Thus, the NumeriUNO Card has good potential to be used on a wider scale.

Table 2. Results of the large-scale trial student and teacher response questionnaire

Respondents	Percentage	Criteria
Teacher	90%	Very positive
Students	91%	Very positive

Based on the results of the large-scale trial response questionnaire, teachers gave a response of 90% with very positive criteria. As many as 8 out of 10 indicators received a strongly agreeable category, showing that NumeriUNO has many advantages in learning. This media is considered effective in delivering multiplication material, increasing student participation and motivation, and making learning more enjoyable. The design is attractive and the instructions are easy to understand for teachers and students.

Students responded very positively with a percentage of 91%. The answer "strongly agree" received a score of 68% which included the aspect that this media is easy for students to use, makes learning fun, and interesting, increases enthusiasm, and reduces boredom so that it can help students to more easily understand the multiplication material of numbers.

NumeriUNO's media has several aspects that make it attractive, easy to use, and relevant to students' learning needs. The visual design is attractive, with colors and illustrations that support student engagement. Clear instructions as well as simple rules make it easy to understand. A high level of interactivity encourages active participation, while the material is in line with the curriculum and learning outcomes. In addition, this media is flexible for various learning strategies and is able to increase student motivation and understanding.

This shows that the learning media of the NumeriUNO Card still receives a very good response when applied to a wider group. Thus, the NumeriUNO Card has a high feasibility to be applied in learning Mathematics practically.

NumeriUNO Card Media Effectiveness

A large-scale trial was conducted with 30 students. Before using the NumeriUNO Card, students took a pretest to assess their initial understanding of multiplication. After learning with the media, a posttest was given to measure improvements. The pretest and posttest results were analyzed to determine the effectiveness of the NumeriUNO Card in enhancing student understanding and learning outcomes, as shown in Table 3.

Table 3. Pretest and posttest results of trials

Average of Pretest	46.6
Average of Posttest	80.8
Average Difference between Pretest & Posttest	34.2
Standar Deviation	16.06
N-Gain	.6261
N-Gain Categories	Medium

Based on pretest and posttest result, The average pretest score was 46.6, while the average posttest score reached 80.8. The difference between the pretest and posttest averages was 34.2, with a standard deviation of 16.06. The N-Gain value was 0.6261, which falls into the medium category. Which shows an increase in students' understanding after learning using the NumeriUNO Card. The improvement in learning outcomes is shown in the following figure.

In the posttest, as many as 23 out of 30 students, or equivalent to 77%, managed to achieve a KKTP score of 75. The data is visualized in the form of the following pie graph.

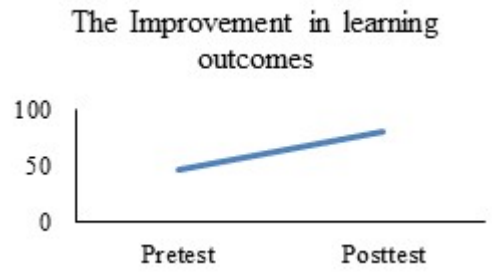

Figure 5. The improvement in learning outcomes

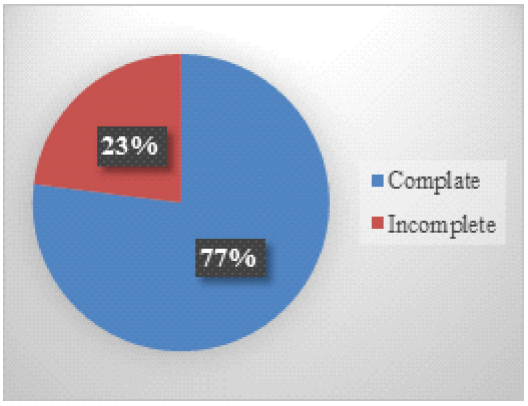

Figure 6. Percentage of posttest score completeness

Furthermore, a normality test will be carried out to find out whether the data obtained is normally distributed or not as a condition for further statistical testing. The type of statistical analysis that will be used to test the research hypothesis will be determined from the results of this normality test (Nuryami et al. 2021).

Table 4. Normality test results

Test of Normality			
	Shapiro-Wilk		
	Statistic	df	Sig
Pretest	.933	30	.061
Posttest	.934	30	.063

The Shapiro-Wilk normality test showed significance values of 0.061 for the pretest and 0.063 for the posttest, both greater than 0.05. This indicates that the data is normally distributed. Therefore, the pretest and posttest data meet the normality assumption and can be analyzed further using a paired t-test to evaluate the effectiveness of the NumeriUNO Card in learning multiplication.

Table 5. T-Test results

Paired Sample Test					
	t	df	p	CI (%)	Effect Size
Pretest-Posttest	-11.59	30	<.001	95	2.12

Based on the results of the t-test, a value of two-sided p (< 0.001) was obtained, which is smaller than the significance level of 0.05. This shows that there is a significant difference between the pretest and posttest results in the hypothesized direction. In other words, there was a meaningful increase in scores after the treatment was given. Then, the effect size value (Cohen's D) is 2.12, which indicates a very large category of effects.

Furthermore, an N-Gain test was carried out to determine the level of improvement in student learning outcomes after using the NumeriUNO Card learning media.

Table 6. N-Gain test results

Average Difference	N-Gain	Categories
34.2	.6261	Medium

Based on the results of the N-Gain test of 0.6261, the use of NumeriUNO card media in the multiplication of numbers shows an increase in students' understanding in the medium category. This indicates that the media is quite effective in helping students learn multiplication more interactively.

According to constructivist learning theory, students build understanding through hands-on experience (Masgumelar and Mustafa 2021). NumeriUNO, as a concrete learning tool, helps students grasp multiplication using cards and interactive games. This aligns with the idea that effective math learning starts with concrete examples before moving to abstract concepts. Furthermore, Vygotsky's theory of social learning, explains that interaction in learning plays an important role in improving understanding (Rahmawati and Purwaningrum 2022). NumeriUNO fosters discussion, teamwork, and healthy competition, reinforcing multiplication concepts. Thus, this media supports experiential and interactive learning, improving student outcomes.

Kholiqoh et al. 2022, revealed that the principles of good mathematics learning include attention and innovation from teachers, student activity, student involvement, interaction between students, and reinforcement by teachers. The NumeriUNO Card media is said to be effective because it has fulfilled the principles of the good mathematics learning process. This media is a development innovation of the general UNO card, by adapting the way of playing so that students can play an active role, be directly involved, and increase interaction between students in learning.

Game-based learning media has been proven to be able to improve student learning outcomes. This is in line with research conducted by Wulandari, Hendrian, I. Sari, et al. 2020, it was found that the game-based learning media developed, under the name of the KARTIKA card, can improve learning outcomes, with the results of the Wilcoxon test obtaining a sig value = 0.046 (á = 0.05) which shows a significant difference in the average score between the pretest and the posttest. So, this is in line with the research conducted by researchers that the use of game-based learning media is effective to be used in improving learning outcomes.

The results of data analysis show that the learning media of the NumeriUNO Card meets the criteria of feasibility, practicality, and effectiveness to be applied in learning mathematics of multiplication material. Thus, learning media has great implications for improving learning outcomes (Tempera and Tinoca 2023). The use of UNO cards in learning has been proven to stimulate students to construct and explore their knowledge more actively (Risdiyanti and Indra Prahmana 2020). This is inseparable from the

mechanics of the UNO card game which involves tactics as well as defensive and strategic elements to achieve victory in the game (Azzahra et al. 2024). Therefore, the development of NumeriUNO media based on the concept of this game can be an innovative alternative in increasing student involvement and understanding of the concept of multiplication.

This research still has limitations, namely the research sample only consists of one class in one school, so its representativeness to the general population of grade III students is still limited. The results of this study can describe the effectiveness of NumeriUNO media in the context of the schools studied, but it cannot be generalized to the entire population of grade III students with different conditions, such as learning environments, facilities, or varying curriculum in other schools.

In addition, there are various external factors that can affect student learning outcomes outside of the use of NumeriUNO media. These factors include students' initial ability, learning motivation, teacher teaching quality, learning environment, and the duration and frequency of media use.

Further research can develop NumeriUNO for other math topics like division or fractions to test its effectiveness across concepts. More rigorous designs, such as randomized controlled trials (RCTs), are recommended to enhance result validity. A more diverse sample from different schools should be considered for better generalization. Future studies can also examine the long-term impact of NumeriUNO on concept understanding and learning motivation. Additionally, developing a digital version could increase its flexibility in various learning settings.

■ CONCLUSION

The NumeriUNO Card learning media for multiplication is suitable for use, as confirmed by material expert (92.6%) and media expert (92.3%) assessments, both categorized as very feasible. Student responses were highly positive (91%), and teachers also rated it highly (90%), indicating its effectiveness in supporting learning. The media improved student understanding, with the average pretest score increasing from 46.6 to 80.8, a 34.2-point difference. The t-test showed a significant difference ($p < 0.001$), with a large effect size (Cohen's $D = 2.12$) and a medium category N-Gain (0.6261). Additionally, 77% of students met the learning mastery threshold of 75, proving the NumeriUNO Card is both feasible and effective for learning multiplication.

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