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Implementing Kinperma Media to Improve Third-Grade Students' Mathematics Learning Outcomes in Islamic Elementary Schools

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ABSTRACT

This study aims to improve the mathematics learning outcomes of third-grade students at MI Al-Azhar Menganti Gresik through the application of Kinperma (Mathematical Multiplication Wheel) media in multiplication learning. The research employed a Classroom Action Research (CAR) design using the Kemmis and McTaggart model, which was implemented in two cycles consisting of planning, action, observation, and reflection stages. The research subjects were 23 third-grade students in the 2025/2026 academic year. Data were collected through observations of teacher and student activities, learning outcome tests, and student response questionnaires, and analyzed using descriptive qualitative and quantitative techniques. The findings indicate a significant improvement in both the learning process and student achievement. Teacher activity increased from 83% in Cycle I (good category) to 93% in Cycle II (very good category), while student activity improved from 93% to 98%, both categorized as very good. Student learning outcomes also showed substantial progress, with classical learning mastery increasing from 48% in Cycle I to 87% in Cycle II. In addition, student responses toward the use of Kinperma media improved from 81% (good category) to 90% (very good category), reflecting increased motivation, interest, and understanding of multiplication concepts. These results demonstrate that Kinperma media effectively facilitates concrete, interactive, and student-centered learning aligned with the cognitive development characteristics of elementary school students. Therefore, Kinperma media is feasible and effective as an alternative instructional medium to enhance mathematics learning outcomes, particularly in multiplication materials at the elementary school level.

INTRODUCTION

Education in one of the component that determines the level of inteeligence of the nation, school and teacher are needed in carrying out innovative learning for students (Sutriyani & Widyatmoko, 2020) . Learning can be defined as the interaction of students with teachers and learning resources in a learning environment (Ulhaq et al., 2025). Therefore, the interaction of these three elements determines how effective the learning process is. In addition, education should focus on the development of all students, including knowledge, attitudes, and skills. Since the success of the learning process can be measured by student learning outcomes, all teachers and students expect good learning outcomes. Learning outcomes are the level of students mastery in accordance with the educational goals that have been set (Dewi Aisah et al., 2023).

Mathematics is a very important basic subject in helping elementary school students develop logical,organized, and critical thinking skills (Rahmalia & Safari, 2024). The purpose of learning mathematics in elementary school is for students to get to know numbers and number operations. However, students lack of understanding in calculating has an impact on their low ability to complete mathematical operations (Insiyyah et al., n.d.) in addition, many students consinder mathematics as a difficult and abstract lesson, especially in the material of multiplication calculation operations. This difficulty generally occurs because the learning process is still carried out in a conventional way and does not involve a direct learning experience. As a result, students' motivation to learn is low and the learning outcomes obtained are not optimal (Sri Rahayu & Tatat Luswati, 2022).

At the elementary school level, the concept of multiplication should be taught through concrete and fun learning activities. According to Piaget's theory of cognitive development, elementary school students are at the concrete operational stage, which is the stage where children more easily understand concepts through real objects and direct activities (Himmawan & Juandi, 2023). Therefore, it is necessary to use learning media that is able to bridge abstract mathematical concepts with students' real learning experiences so that learning becomes more meaningful. The selection of learning media is also determined from the characteristics of students and learning objectives in addition to students' learning styles also need to be considered, because each child's learning style is different (Agustin et al.,

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2024).

Learning media has an important role in creating an active learning atmosphere and directly involving students. Media packaged in the form of educational games can increase students' interest, motivation, and activeness in participating in mathematics learn (Agrini & Agustin, 2023). One of the media that can be used is the Kinperma (Mathematical Multiplication Wheel) media, which is a learning tool in the form of a millwheel designed to help students understand the concept of multiplication in a fun and interactive way (Anwar & Kalaka, 2024). This is in line with the opinion of (Agustin et al., 2024) stating that concrete and manipulative learning media are able to increase the activeness and learning outcomes of elementary school students because they are in accordance with the stages of cognitive development of students.

The results of previous research showed that the use of concrete and interactive learning media was able to significantly improve the understanding and learning outcomes of mathematics in elementary school students Asadulloh & Santoso, (2024). Research conducted by Kristianingrum and Serepinah concluded that manipulative media can help students understand the concept of multiplication more easily and improve learning completeness Kristianingrum & Serepinah, (2025). In addition, other research also revealed that mathematics learning packaged in the form of games can increase student activity and deepen understanding of mathematical concepts (Himmawan & Juandi, 2023).

Based on the results of initial observations in grade III of MI Al-Azhar Menganti Gresik, it is known that most students still have difficulty in understanding the multiplication of numbers 1 to 10. This can be seen from the low value of student learning outcomes and the lack of active participation during the learning process. Teachers still use lecture methods more without utilizing various learning media, so that students become passive and less enthusiastic in learning.

Based on these problems, efforts are needed to improve the learning process through the application of innovative learning media and in accordance with the characteristics of elementary school students. Therefore, this class action research aims to improve the mathematics learning outcomes of third grade students of MI Al-Azhar Menganti Gresik by applying Kinperma media to multiplication materials. This research is expected to make a positive contribution to improving the quality of mathematics learning in elementary schools and become a reference for teachers in choosing and using effective learning media.

Therefore, the researcher decided to research this matter which is contained in the title “The Implementation of Kinperma Media to Improve Mathematics Learning Outcomes of Grade III Students of MI Al-Azhar Menganti Gresik”.

LITERATURE REVIEW

Mathematics learning in elementary school has an important role in developing students' logical, systematic, and creative thinking skills, especially in mastering basic calculation operations such as multiplication. However, multiplication material is still one of the topics that is quite challenging for students because it is abstract. As a result, many students have difficulty understanding the concept of multiplication in depth. In these conditions, the use of learning media that is concrete or manipulative has proven to be more effective than conventional learning without media, because it is able to help students visualize mathematical concepts more clearly and improve understanding and learning outcomes (Putri & Sari, 2025). This is in line with the research of (Fathicha & Agustin, 2025) learning media that is manipulative and involves students' physical activities is able to increase learning involvement and make it easier for children to understand concepts.

Various studies show that concrete learning media on multiplication materials helps students understand the relationships between numbers through hands-on learning experiences. The use of concrete learning media is very necessary in mathematics learning because elementary school students are at the concrete operational stage and need teaching aids to help understand abstract concepts such as multiplication (Septiani et al., 2025). Kusumaningrum and Kaltsum's research proves that the use of Multiply Card as a multiplication learning medium is able to improve mathematics learning outcomes of elementary school students, which is shown by an increase in the average score of post-test compared to pre-test (Kusumaningrum & Kaltsum, 2022). In addition, other research has also shown that manipulative media, such as multiplication boards and abacus, provide significant differences in student learning outcomes and engagement compared to learning without media (Izza et al., 2025).

From the point of view of cognitive development, elementary school students aged 7–12 years are at a concrete operational stage according to Piaget's theory. At this stage, students learn more effectively through hands-on activities and manipulation of real objects. Therefore, the use of concrete learning media is very important in mathematics learning so that students can build an authentic and meaningful understanding of concepts. Concrete media functions as a tool that makes it easier for students to internalize mathematical concepts, especially the concept of multiplication (Mengkido et al., n.d.)

Other research also strengthens these findings, such as the use of TAKALINTAR educational game media which has been proven to be able to improve students' numeracy skills in multiplication materials in grade III of elementary school, characterized by a significant increase between pre-test and post-test scores and high N-gain scores (Ardelia et al., 2024). Similar results were also found in a study at Madrasah Ibtidaiyah which showed that manipulative media is

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effective in improving students' understanding of the concept of multiplication (Nugroho et al., 2022)

Overall, the literature review shows that concrete-based and manipulative-based mathematics learning media has a very important role in improving concept understanding, learning motivation, student involvement, and mathematics learning outcomes in elementary schools, especially in multiplication materials. Media such as multiplication boards, multiplication cards, and various other manipulative media have been shown to be more effective than learning without media. These findings form a strong foundation for the development of innovative learning media such as Kinperma (Mathematical Multiplication Wheel), which is designed to support multiplication learning in a concrete, interactive, and fun way.

METHOD

The type of research used by the researcher is the type of Classroom Action Research (PTK) with the Kemmis and Mc Taggart model approach. According to Parnawi in Setiawan, Classroom Action Research is a form of improving the quality of the learning process, so these activities must look more efficient, creative, effective, and innovative which are believed to be better than previous activities (Setiawan et al., 2023). The PTK model of Kemmis and Mc Taggart has two cycles with each cycle having four stages, namely planning, implementation, observation, and reflection. The implementation of action and observation activities is carried out at the same time. If the implementation of the two cycles has not reached the research target, then the researcher needs to carry out additional additional cycles until a conclusion is reached. To clarify the steps of the research process, you can see the following figure:

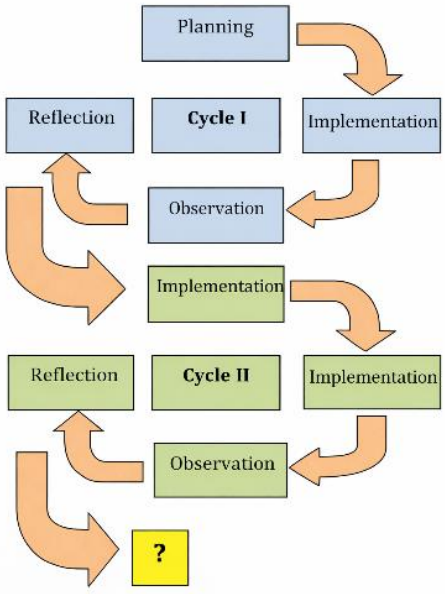


Figure 1. System model of Aztion-Research Process Kemmis and Mc Taggart (Arham, 2020)

The subject of this research is the third grade students of MI Al-Azhar Menganti in the 2025/2026 academic year, which totals 23 students, consisting of 11 male students and 12 female students. The setting of this research was carried out in the third grade room of MI Al-Azhar Menganti in the subject of Mathematics.

Data collection techniques and instruments in this study include observation, to find out the activities of teachers and students, tests, to measure students' abilities, student response questionnaires, to find out students' responses to learning media applied in the learning process, and documentation, in the form of photos and videos of learning activities and student work results. The instruments used include teacher activity observation sheets, to find out the teacher's activities in the implementation of the learning process, and student observation sheets, to find out students' activities and activeness during the learning process, and learning outcome test questions, used to determine the level of student understanding and know the completeness of student learning, as well as student response questionnaires, to measure responses, interests, understanding, motivation, and student satisfaction with the use of Kinperma media in learning mathematics of multiplication operation materials.

The Data Analysis Technique in this study uses qualitative descriptive analysis for observation data on teacher and student activities, as well as student response questionnaires and quantitative descriptive analysis for student multiplication ability test data, by calculating the average score and percentage of student learning completeness.

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The formula used by the researcher to calculate the observation value of teachers and students, as well as the completeness of student learning outcomes is as follows:

$$P = \frac{f}{N} \times 100 =$$

Description:
P = Value
f = Total turnover score
N = Maximum number of scores

To determine the improvement in student learning outcomes on each test at the end of the cycle, by calculating the average class with KKM 75 using the following calculation formula:

$$M = \frac{\sum x}{\sum n}$$

Description:
M = Class average score
$\sum x$ = Number of grades students get
$\sum n$ = Number of students

Table 1. Criteria for Assessing Student Learning Outcomes

No	Percentage of Succes Rate	Criteria
1	85% - 100%	Excellent
2	75% - 84%	Good
3	60% - 74%	Less
4	≤ 59%	Very Less

Sumber: (Arikunto, 2021)

RESULT

Maximum classroom management through the role of the teacher as a facilitator who is not only able to master the material, but the teacher must be able to know the character of each student by applying learning models, methods, and media that are in accordance with the learning objectives (Agustin, 2023). Teacher activities have a very important role in the success of the learning process, because teachers function as designers, implementers, as well as directors of students' learning activities. Teacher activities that are well planned and implemented will help students understand learning materials in a more structured and meaningful way (Novitasari, 2022). Therefore, in this study, teachers' activities were observed to find out the extent to which mathematics learning using Kinperma media could be carried out in accordance with the goals that had been set. Teacher activities were observed during the implementation of mathematics learning using Kinperma Media in the multiplication operation material of 1-10. Observation of teacher activities is carried out by observers using observation sheets arranged based on the learning stages that have been determined as follows:

Table 2. Teacher Activities

No	Activites	Observed Aspects	Score		
			Cycle I	Cycle II	Average
1.	**Introduction**	The teacher opened by saying greetings	**4**	**4**	**4**
		The teacher asks the class leader to lead the prayer	**4**	**4**	**4**
		Teachers ensure the readiness of students before starting lessons	**3**	**4**	**3,5**
		Teachers make attendance of students	**4**	**4**	**4**
		Teachers connect new material with learners' experiences	**3**	**4**	**3,5**
		The teacher explains the learning objectives to be taught	**4**	**4**	**4**
2.	**Core Activities**	Teacher prepares Kinperma media	**3**	**4**	**3,5**
		The teacher explained the concept of multiplication using Kinperma Media	**3**	**4**	**3,5**

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		Teacher gives an example of the use of Kinperma Media	**3**	**3**	**3**
		Teachers guide students directly	**3**	**3**	**3**
		Teacher conducts questions and answers to students	**3**	**3**	**3,5**
		Teachers manage the classroom and condition students during learning	**3**	**4**	**3,5**
3.	**Closing Activities**	The teacher reflects and strengthens the concept of multiplication	**3**	**3**	**3**
		Teachers and students conclude the material learned	**3**	**4**	**3,5**
		The teacher closes the lesson by reciting the Prayer and saying greetings	**4**	**4**	**4**
		Quantity	**50**	**56**	**53,5**
		Average	**3,333333**	**3,733333**	**3,566667**
		Prosentase	**83%**	**93%**	**89%**

Based on the results of observations in the first cycle, teacher activities obtained a percentage of 83%. This percentage shows that the teacher's activities have met the set success indicator, which is 80%, and is in the good category. In the first cycle, teachers have carried out the learning stages according to the plan, starting from the preliminary activities, core activities, to the closing. Teachers have also introduced Kinperma media and guided students in its use. However, in the first cycle, there are still several things that need to be improved, such as the clarity of material explanations and class management so that all students can be more focused and actively participate in learning.

After reflection and learning improvement, teacher activity in cycle II experienced a significant increase to 93% and was in the very good category. This improvement shows that teachers are increasingly able to manage the classroom well, provide more concise and easy-to-understand explanations, and make more optimal use of Kinperma media. Thus, the teacher's activities in cycle II not only meet, but also exceed the success indicators, which has a positive impact on the smooth learning process.

Student activities during learning reflect the level of involvement of students in participating in the learning process. Active students tend to understand the material more easily because they are directly involved in learning activities. Therefore, student activities were observed to find out the extent to which students participated in the use of Kinperma media, discussed in groups, and responded to questions and directions from teachers. The results of student activities carried out by peers in the first and second cycle of learning are as follows:

Table 3. Students Activities

No	Activities	Observed Aspect	Score		
			Cycle I	Cycle II	Average
1.	**Introduction**	Students answer greetings and recite Do'a	**4**	**4**	**4**
		Students respond to the reception given by the teacher by answering questions	**3**	**4**	**3,5**
		Students pay attention to the teacher's motivation about the importance of learning multiplication operations	**3**	**4**	**3,5**
		Students listen to the learning objectives conveyed by the teacher	**4**	**4**	**4**
2.	**Core activities**	Students observe Kinperma media	**4**	**4**	**4**
		Students listen and understand the concept of multiplication using Kinperma Media explained by the teacher	**3**	**4**	**3,5**
		Students understand the example of using Kinperma Media explained by the teacher	**4**	**4**	**4**
		Students show enthusiasm when observing learning	**3**	**4**	**3,5**
		Students are given direct guidance by teachers	**3**	**4**	**3.5**
		Students and teachers ask questions and answers related to multiplication material	**4**	**4**	**4**
		Students work on evaluation questions given by teachers	**4**	**4**	**4**

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		Students are able to explain the results of the work on the questions	**3**	**3**	**3**
3.	**Closing Activities**	Students respond to reflection activities given by teachers	**3**	**4**	**3,5**
		Students and teachers conclude the learning material	**3**	**4**	**3,5**
		Students and teachers end the learning by reciting the Prayer and saying greetings	**4**	**4**	**4**
		Quantity	**52**	**59**	**52**
		Average	**3,466667**	**3,933333**	**3,714286**
		Prosentase	**93%**	**98%**	**87%**

The results of observations in the first cycle showed that student activity obtained a percentage of 93% with the very good category. This percentage shows that student activity has exceeded the 80% success indicator. In the first cycle, students looked enthusiastic in participating in learning, interested in using Kinperma media, and active in group discussion and question and answer activities. However, there are still some students who need guidance in order to participate more equitablely.

In cycle II, student activity again increased to 98% and remained in the very good category. Almost all students are actively involved during the learning process. Students seemed more confident, dared to ask questions, and were able to work together with their groupmates in solving multiplication problems using Kinperma media. This improvement shows that learning that is designed in a more targeted and interactive way is able to increase student engagement to the maximum.

The results of student activities that increase, affect the learning outcomes of students through multiple-choice questions given by teachers. The learning outcomes of students can be seen in cycle I and cycle II in the table as follows:

The increased student activity influenced student learning outcomes through multiple-choice questions given by the teacher. Student learning outcomes can be seen in cycles I and II in the following table:

Table 4. Post-test Result

NO	NAME	RESULTS OF CYCLE I SCORE	RESULTS OF CYCLE I ISCORE
1.	Manggala Alfatih	50	70
2.	Adam Alfiansyah	80	100
3.	Adiba Shakila Atmarini	80	100
4.	Ainayya Fathiyyaturahma	80	100
5.	Al Mahyra Aprilia	73	93
6.	Anindita Syifa Rahmadani	73	93
7.	Arqi Maliq Zafran Ghifari	80	100
8.	Arzan Kinza Ravindra Wibowo	80	100
9.	Cheryl Assyifa Putri Negara	60	100
10.	Davin Al Azka Lazuardi	60	100
11.	Dhica Aprilio Putra Hakim	80	100
12.	Fariza Zaina Nazeefah	80	100
13.	Farzana Syafa Azkadina	53	73
14.	Izzy Rasendriya Andriansyah	67	87
15.	Muhammad Arsyad Ibrahim Shafaq	70	100
16.	Muhammad Ja'far As Shodiq	80	100
17.	Muhammad Rafardhan Miftahur Rohman	50	70
18.	Nafisha Inara Zhufairah Arifin	80	100
19.	Najma Ramadhani Antoro	80	100
20.	Nur Alifah Cahyaning Putri	63	100
21.	Qaisara Adzkiyya Zareen Almahyra	80	100
22.	Rich Adi Arkenzio	73	100
23.	Zaki Arkananta Ramadhan	73	100
	Quantity	**1645**	**2186**
	Average	**71,5**	**95**
	Completion Percentage	**48%**	**87%**

Based on the results of the post-test in the first cycle, the percentage of student learning completeness was 48%. These results show that classical learning completeness has not met the 80% success indicator. The low percentage of

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completeness in the first cycle shows that some students still have difficulty in understanding the concept of multiplication, even though the activities of teachers and students are already in the good and very good category. Therefore, learning improvements are needed in the next cycle so that students' understanding can be improved.

After learning improvements were made in cycle II, students' learning outcomes experienced a very significant increase. The completion rate increased to 87%, which means that it has exceeded the set success indicators. This improvement shows that the use of Kinperma media accompanied by more intensive teacher guidance is able to help students understand the concept of multiplication in a more concrete and systematic way, so that it has a direct impact on improving student learning outcomes.

Student responses are measured through student response questionnaires given in each learning cycle. The results of student responses in cycles I and II can be presented in the following table 5:

Table 5. Student Response Questionnaire

No	Indicator	Score	
		Cycle I (%)	**Cycle II (%)**
1	**Student Interest**		
	I feel happy to take part in mathematics learning using Kinperma media	80	90
	Kinperma media makes learning multiplication material more interesting	82	92
	I feel curious and interested when using Kinperma media	79	89
	I became more enthusiastic about learning mathematics with Kinperma media	81	91
2	**Material Understanding**		
	I find it easier to understand multiplication material after using Kinperma media	80	90
	I can determine the multiplication result more easily by using Kinperma media	82	91
	Kinperma media helps me answer multiplication questions easily	83	92
	I can relate multiplication material to examples in everyday life	78	89
3	**Student Involvement**		
	I am active when participating in learning when teachers use Kinperma media	81	90
	I dare to try and use Kinperma media in front of the class	80	89
	I participated in answering the teacher's questions during the learning	82	91
	I enjoy working with friends when using Kinperma media	80	90
	Average	81	**90**

The results of the student response questionnaire in the first cycle showed a percentage of 81% in the good category. This percentage shows that the students' response has met the 80% success indicator. Students in general feel interested and happy to participate in learning using Kinperma media, although there are still some students who have not fully shown high enthusiasm.

In cycle II, the results of the student response questionnaire increased to 90% and were in the very good category. This increase shows that most students feel more motivated, more confident, and easier to understand multiplication material through the use of Kinperma media. The positive response of these students shows that learning that involves concrete media and direct activities is able to create a fun and meaningful learning atmosphere.

DISCUSSION

The implementation of mathematics learning by utilizing the Kinperma (Mathematical Multiplication Wheel) media shows the occurrence of active interaction between teachers and students during the learning process. Kinperma media allows students to be directly involved in understanding the concept of multiplication through the activity of spinning a wheel, observing the numbers that appear, and determining the results of multiplication concretely. The direct involvement of students in this learning process helps them build a gradual and logical understanding of concepts (Anggraini & Susilowati, n.d.). Learning that provides real experience has been proven to be able to increase student involvement while strengthening the understanding of abstract mathematical concepts (Mei et al., 2020).

The use of Kinperma media was assessed in accordance with the characteristics of mathematics learning in the material of multiplication calculation operations 1–10 in class III of MI Al-Azhar Menganti Gresik. This media presents the concept of multiplication in visual and concrete form, so that students not only memorize the results of

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multiplication, but also understand the process of forming these results. With the existence of concrete media, it is easier for students to associate the concept of multiplication with the learning experience they experience directly (Mengkido et al., n.d.). In addition, the success of learning is also influenced by the role of teachers in designing and implementing learning in a structured manner. Teachers not only play the role of delivering material, but also as facilitators who direct learning activities, manage classes, and choose and use learning media that are in accordance with the goals and characteristics of students (Eka Agustin & Zaeni, 2024).

The results of observations of student activities show that the use of Kinperma media is able to encourage students to be more active in learning. Students look more focused, dare to express opinions, and are enthusiastic in participating in learning activities, especially when using Kinperma media to solve multiplication problems. Group discussion activities and presentations of work also help students develop mathematical thinking and communication skills. This condition shows that learning with the help of Kinperma media is able to create a more meaningful learning experience for students.

The increase in teacher and student activities has a positive impact on students' mathematics learning outcomes. The learning outcome data showed an increase in learning completeness from cycle I to cycle II. Based on the results of the reflection, it can be concluded that the use of Kinperma media is effective in helping students understand the concept of multiplication of numbers 1-10, increase student activity, and create a more interesting and fun learning atmosphere. With the achievement of the success indicators that have been set, the learning actions in this study are declared successful and feasible to be applied as an alternative mathematics learning media in grade III of MI Al-Azhar Menganti Gresik.

CONCLUSION

The application of Kinperma (Mathematical Multiplication Wheel) media in mathematics learning of multiplication operations material 1–10 has proven to be effective in improving the quality of the process and learning outcomes of third grade students of MI Al-Azhar Menganti Gresik. The use of this media is able to increase the activities of teachers and students to reach the very good category, creating more concrete, interactive, and meaningful learning. The increase has a direct impact on student learning outcomes, which is shown by the increase in the percentage of classical learning completeness from 48% in cycle I to 87% in cycle II, as well as the response of students who are in the good to very good category. With the achievement of all success indicators, Kinperma media is declared feasible to be used as an alternative mathematics learning media to increase the activeness and learning outcomes of elementary school students, especially in multiplication materials. In addition to improving learning outcomes, the application of Kinperma media also provides positive pedagogical implications in mathematics learning in elementary schools. This media assists teachers in implementing student-centered learning and supports student characteristics at the concrete operational stage. The use of Kinperma media encourages the creation of a fun learning atmosphere, increases motivation, confidence, and active involvement of students in the learning process. Therefore, Kinperma media not only functions as a learning tool, but also as an innovative learning strategy that can be applied sustainably. This study recommends the use of Kinperma media and the development of similar manipulative media in other mathematics materials to improve the quality of learning and learning outcomes of elementary school students.

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