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THE EFFECT OF LOCAL WISDOM-BASED WAYGROUND MEDIA ON FRACTION PROBLEM-SOLVING SKILLS IN PRIMARY SCHOOL

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ABSTRACT

Mathematics education in elementary schools often encounters challenges, especially in teaching fractions that are many students difficult to understand it. These challenges need for more interactive and contextual teaching methods that can improve students' comprehension of fractions. The purpose of study to evaluate the effectiveness of Wayground media based on local wisdom, in increasing fraction problem-solving skills in primary school students. The Method of research employed a quantitative pre-experimental design with a one-group pretest and posttest, conducted on fifth-grade students at SD Islam Sabilillah Malang. Instruments based on Polya's problem-solving indicators were used to measure students' abilities, beside their validity and reliability were tested using Cronbach's Alpha. Additionally, a questionnaire was administered to assess student responses to the Wayground media. Data analysis was performed using Microsoft Excel, including normality tests and calculation of the N-Gain Score. The results indicated a significant improvement in students' problem-solving skills, with pretest scores averaging 42.57 and posttest scores increasing 74.77. The N-Gain score of 0.5573 placed the media in the "moderately effective" category. Students' responses to the media were also very positive, with motivation and material understanding scores exceeding 80%. In conclusion, Wayground media based on local wisdom effectively improves fraction problem-solving skills, making learning more engaging and culturally relevant. This research contributes to the development of innovative and contextually relevant teaching methods in mathematics education.

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INTRODUCTION

Mathematics education globally faces significant challenges in teaching foundational concepts, one of the most fundamental being fractions. Fractions are an essential component of mathematical learning, frequently encountered by students in various aspects of everyday life. As such, a deep understanding of fractions from an early age can enhance students' abilities in

more advanced mathematical topics. However, numerous studies indicate that many students struggle to comprehend and solve problems involving fractions. The primary challenges include epistemological barriers in understanding the basic concept of fractions and a lack of critical thinking skills necessary for analyzing and solving fraction-related problems effectively (Hariyani et al., 2022; Fitriani & Kowiyah, 2022). To address these issues, contextual and authentic learning approaches, which link content to real-life experiences and local culture, are expected to enhance student motivation and learning outcomes (Sentawijaya et al., 2022; Wardani et al., 2021; Lozada et al., 2023). Learning mathematics is not just about understanding numbers and formulas, but also training logical, analytical, and systematic thinking skills that are essential for solving real-life problems (Salmon et al., (2025).

In Indonesia, similar challenges are observed in primary school fraction education. Many elementary school students still struggle with fraction operations, including addition and subtraction (Oktasari, Syahrilfuddin, & Putra, 2022). Students often make procedural errors, such as in fraction addition or subtraction, due to a lack of understanding of the importance of finding a common denominator (Hamada et al., 2022; Sari & Subekti, 2023). They also face difficulties in applying fraction concepts to solve real-world problems, often due to their inability to translate word problems into the correct mathematical expressions (Saputra, 2022; Pratiwi & Hidayat, 2020). Despite the implementation of various teaching approaches, such as contextual and authentic learning, there remains a gap in the application of methods that are relevant to the local context of students. Additionally, limited resources and teachers' skills in effectively integrating digital learning technologies present further challenges hindering the development of students' mathematical competence (Oktasari, Syahrilfuddin, & Putra, 2022; Sentawijaya et al., 2022; Wardani et al., 2021).

In Indonesia, similar problems are also seen in fraction learning in elementary schools. Most elementary school students still struggle with fraction operations, including addition and subtraction (Oktasari, N., Syahrilfuddin2 & Putra, 2022). Students often make errors in procedures, such as adding or subtracting fractions, due to a lack of understanding of the importance of equalizing denominators (Hamada et al., 2022); (Sari & Subekti, 2023). Students often face difficulties in applying the concept of fractions to solve problems related to real life situations, especially due to their inability to convert word problems into appropriate mathematical forms (Saputra, 2022; (Pratiwi & Hidayat, 2020). To overcome this problem, it is important to introduce more innovative learning methods, such as the use of digital media which can enrich students' learning experience. The integration of multimedia technology in teaching methodology has emerged as an important strategy to improve the quality of education (Aflah & Fitriah, 2025). One of the media that Starting to be used by teachers is Wayground, a technology-based learning platform that allows students to take interactive quizzes that combine AI technology. This media not only makes it easier for teachers to create questions, but also increases student interaction and involvement in learning (Fajrie et al., 2024; Haq et al., 2025) Yasmin et al., (2025). Wayground can support students' problem-solving skills by providing immediate feedback during the problem-solving process, allowing them to understand and correct their errors immediately. Furthermore, Wayground integrates elements of local wisdom into the learning materials, making mathematical concepts such as fractions more relevant and understandable within students' real-life cultural contexts. Its interactive features allow students to visualize fraction concepts in more concrete, everyday situations, thereby enhancing their understanding and problem-solving skills. However, while several studies have examined the use of digital media in education, few have explored the application of local wisdom-based Wayground to fraction learning in elementary schools.

This study focuses on the development and implementation of Wayground media, based on local wisdom, as a tool to enhance fraction problem-solving skills among primary school

students. While much research has examined the use of digital media and local wisdom in mathematics education, no studies have specifically investigated the integration of both in the context of teaching fractions. Therefore, this research offers novelty by incorporating local cultural values into the use of Wayground media to address the challenges students face in solving fraction problems.

The purpose of this study is to evaluate the effectiveness of using Wayground media, based on local wisdom, in improving fraction problem-solving skills among elementary school students. This research is expected to contribute significantly to innovations in mathematics education, particularly in the area of fractions, which has long been a significant challenge for students. By implementing the Wayground media based on local wisdom, this study aims to introduce mathematics in a culturally relevant context for students. By leveraging digital technology and integrating local cultural elements, it is hoped that this media will increase student motivation and engagement in learning, help them overcome difficulties in understanding fraction concepts, and ultimately improve their overall mathematics learning outcomes. This study is expected to make a substantial contribution to the development of ethnomathematics, providing more relevant and practical applications in the Indonesian context.

METHOD

This study employed a quantitative approach with a pre-experimental design, known as a one-group pretest-posttest design. This design was used to measure changes in students' problem-solving abilities in fraction learning before and after treatment, namely the use of Wayground media based on local wisdom. This design is illustrated as follows:

Table 1. Research Design Illustration

Pretest	Treatment	Post test
O1	X	O2

Information from Table 1. are O1 refers to the pretest score (before the treatment), O2 refers to the posttest score (after the treatment), and The effect of the treatment is calculated as O2 minus O1 (Sugiyono, 2013). The effect of the treatment was calculated by comparing the posttest score (O2) with the pretest score (O1), to determine whether there was an improvement after the use of the learning media.

The research population consists of all students at Elementary School of Sabilillah Malang, with the sample being derived from class VDE, which includes 53 students comprising 25 male students and 28 female students. The sample was selected using a purposive sampling technique based on class criteria that align with the research objectives. The research instrument was developed based on Polya's problem-solving indicators (Riyanto et al., 2024), which include four steps: (1) understanding the problem : students identify what data or information is known and what is being asked (the goal)); (2) devising a plan: students determine relevant strategies or methods to solve the problem; (3) carrying out the plan: students systematically apply the strategies or methods they have developed; (4) looking back: students review their answers to determine whether they align with the question or whether further revisions are needed.

The pretest and posttest items used to measure problem-solving ability were tested for validity and reliability. Validity test results indicated that all pretest and posttest items were valid, and reliability tests using Cronbach's Alpha demonstrated good reliability coefficients, namely 0.869 for the pretest and 0.840 for the posttest. In addition, a questionnaire completed by students was used to measure their responses to the use of Wayground media based on local wisdom using a four-point Likert scale. The questionnaire employed a four-point Likert scale: Strongly Agree (score = 4), Agree (score = 3), Disagree (score = 2), and Strongly Disagree (score = 1). The validity and reliability test results are shown below:

Table 2. Pretest Validity Test

Question Number	1	2	3	4	5
t Count	2.973704	4.699788	3.762351	4.434651	1.544041
t Table	1.70	1.70	1.70	1.70	1.70
Validity	Valid	Valid	Valid	Valid	Valid

Table 3. Posttest Validity Test

Question Number	1	2	3	4	5
t Count	6.92059	5.611631	6.61155	12.18233	9.098114
t Table	1.70	1.70	1.70	1.70	1.70
Validity	Valid	Valid	Valid	Valid	Valid

Table 4. Reliability Test

Item	Cronbach's Alpha	Number of Items
Pretest	0.791	5
Posttest	0.882	5

The steps in the research were as follows: 1) Preparation: Prepared the lesson plan, local wisdom-based Wayground media, and determined the research sampling. Developed and validated the research instruments (pretest, posttest, and questionnaire). Validity and reliability tests were conducted using Microsoft Excel to ensure the instruments used were valid and consistent. 2) Pretest Implementation: Students took a pretest to measure their ability to solve fraction problems before being given the treatment (use of Wayground media). 3) Treatment (Learning using local wisdom-based Wayground media): After the pretest, students were given treatment in the form of learning using local wisdom-based Wayground media for several sessions. 4) Posttest Activity: After the intervention, students took a posttest to measure their problem-solving skills after receiving the Wayground learning media. 5) Questionnaire: Students completed a questionnaire to provide responses to the local wisdom-based Wayground learning media used. This questionnaire used a four-point Likert scale. 6) Data Analysis: Pretest, posttest, and questionnaire data were analyzed to measure changes in problem-solving skills and to evaluate students' responses to the media used.

Data from the pretest and posttest were analyzed using the N-Gain Score to measure the effectiveness of changes in students' problem-solving skills. N-Gain is calculated using the formula:

$$N - Gain = \frac{Posttest - Pretest}{100 - Pretest}$$

The N-Gain score is used to assess the effectiveness of the local wisdom-based Wayground media in improving students' problem-solving skills. Furthermore, the questionnaire results were analyzed using descriptive statistics to calculate the percentage of student responses to the media used. This percentage will be used to assess the positive student response to the Wayground media. The results of this data analysis will provide an overview of the effectiveness of Wayground media in improving students' problem-solving skills in fraction learning, as well as the level of student satisfaction with the use of this media in their learning.

RESULTS AND DISCUSSION

Results

The results of this study indicate that the treatment using the Wayground media based on local wisdom has effectively improved students' problem-solving abilities. This is evidenced by the average scores obtained from the pretest and posttest. The pretest was administered before the learning process using the Wayground media based on local wisdom related to the topic of fractions. Students completed 5 pretest questions about the addition and subtraction of simple fractions, and the results were analyzed. After completing the pretest, students were given the treatment using the Wayground media based on local wisdom for the topic of addition and subtraction of mixed fractions. Upon completing the treatment, students then took a posttest, which was different from the pretest but of equivalent difficulty. Based on the pretest and postest questions, the results (the highest, lowest, and average scores) as follows:

Table 5. Pretest and Posttest Results

	Pretest	**Posttest**
Highest Score	100	100
Lowest Score	12	46
Average Score	42.57	74.77

From the data on Table 5. above, it can be observed that 27 students had a pretest average score of less than or equal to 42.57, with the highest score being 100 and the lowest score being 12. The average score obtained by the students on the posttest was 74.77, with the highest score reaching 100 and the lowest score being 46. These results demonstrate that the application of the Wayground media based on local wisdom in the teaching of addition and subtraction of fractions improved students' problem-solving skills.

Further analysis of the pretest and posttest answers using the problem-solving indicators set by Polya (understanding the problem, devising a plan, carrying out the plan, looking back) also showed improvement. The data comparison for the number of students who answered according to these problem-solving indicators is as follows:

Table 6. Analysis of Pretest and Posttest Answers Based on Polya's Problem-Solving Indicators

No	**Name**	**No. Question (Pretest)**					**No. Question (Postest)**				
		1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
1	ARH	15	15	8	19	12	12	12	16	16	12
2	AMM	9	6	8	11	24	12	12	12	12	12
3	AKM	15	9	8	8	12	15	9	12	8	12
4	AKK	7	6	8	8	12	15	15	12	8	12
5	AKO	6	6	8	8	12	15	12	20	20	18
6	AQZ	9	9	12	11	12	15	9	12	12	18
7	ABW	6	6	8	8	12	15	6	8	8	12
8	AGR	6	6	8	8	12	9	9	8	8	12
9	AKA	15	15	20	8	12	6	15	20	20	6
10	FTZ	6	6	8	8	12	15	9	20	20	18
11	HLR	15	15	20	20	18	15	15	20	20	18
12	IHR	6	14	20	20	12	12	12	20	16	12

No	Name	No. Question (Pretest)					No. Question (Postest)				
		1	2	3	4	5	1	2	3	4	5
13	KSM	15	15	8	19	12	15	15	16	12	12
14	MRA	6	6	8	8	12	9	9	12	8	12
15	MAZ	6	6	8	8	12	15	15	12	8	12
16	NVZ	15	15	20	20	30	15	15	20	20	30
17	PNZ	15	15	20	20	12	15	12	20	20	18
18	PRR	6	6	8	8	12	9	9	8	8	12
19	RAP	9	9	12	11	12	15	15	12	20	30
20	SA	7	9	16	8	12	15	6	12	16	24
21	SO	6	6	8	8	12	9	9	8	8	12
22	SGA	9	9	12	12	18	15	15	20	12	18
23	TZD	9	9	12	12	18	15	15	16	20	18
24	WIU	9	9	12	7	12	15	15	12	20	30
25	ZR	9	9	12	11	12	15	15	20	20	24
26	AMR	15	15	20	19	12	12	12	12	12	12
27	ALZ	11	6	8	8	12	9	9	18	12	12
28	AAR	9	9	12	8	12	9	9	8	8	12
29	AZK	15	15	8	19	12	9	9	18	12	30
30	AES	12	12	20	16	6	12	12	16	16	24
31	AMA	15	15	20	16	12	15	15	20	20	18
32	AZA	3	15	16	20	12	15	15	20	20	30
33	ASP	8	6	6	8	12	12	12	20	16	24
34	CS	15	15	20	20	12	15	15	20	20	24
35	FZA	12	15	20	12	12	9	12	20	12	24
36	FGE	15	15	8	16	12	15	15	18	16	18
37	GHF	12	6	8	8	12	15	9	20	20	12
38	HVN	15	15	20	18	12	15	15	20	20	30
39	IYA	15	15	8	20	20	15	15	12	12	24
40	LRA	8	9	4	8	12	15	15	20	20	18
41	MB	15	3	4	8	12	15	9	20	9	18
42	MMA	14	15	8	19	12	12	12	12	12	20
43	MHA	6	6	8	8	12	15	9	18	16	12
44	MRM	15	15	20	19	12	12	12	18	18	20
45	MUA	7	6	8	8	12	6	8	18	3	12
46	NGP	6	6	8	8	12	12	12	20	20	24
47	NAA	15	6	20	20	12	15	15	20	20	30
48	NPA	9	15	20	20	30	15	9	20	20	30
49	QAF	6	6	8	8	12	15	15	18	8	12
50	RAK	15	15	12	4	12	15	15	20	20	18
51	RFH	9	15	12	20	30	15	12	15	20	18
52	SNP	6	6	8	8	12	9	15	20	16	24
53	UAY	6	6	8	8	12	15	9	20	12	3

Based on the Table 6., we can see the analysis of the pretest and posttest answer values based on Polya's Problem Solving Indicators. The analysis shows improvements in pretest and posttest answer scores

Table 7. The Result of Analysis Pretest and Posttest

Question Number	Pretest	Posttest
1	18 students (34%)	32 students (60%)
2	20 students (38%)	21 students (40%)
3	14 students (26%)	28 students (53%)
4	12 students (23%)	22 students (42%)
5	3 students (5%)	7 students (13%)

The data on Table 7. indicates an increase in students' problem-solving abilities after the treatment with the Wayground media based on local wisdom. The students' ability to understand the problem, devise a plan, carry out the plan, and look back improved significantly. Specifically, the percentage of students answering correctly on question 1 increased from 34% to 60%, on question 2 from 38% to 40%, on question 3 from 26% to 53%, on question 4 from 23% to 42%, and on question 5 from 5% to 13%. The data indicates an increase in students' problem-solving abilities after the treatment with the Wayground media based on local wisdom. The students' ability to understand the problem, devise a plan, carry out the plan, and look back improved significantly. Specifically, the percentage of students answering correctly on question 1 increased from 34% to 60%, on question 2 from 38% to 40%, on question 3 from 26% to 53%, on question 4 from 23% to 42%, and on question 5 from 5% to 13%.

Additionally, to evaluate whether the Wayground media based on local wisdom was effective in improving problem-solving skills, a normality test for the N-Gain Score was conducted with the following results:

Table 8. Normality Test for the Use of Wayground Media

Description	N	Min	Max	Mean	Category
N-Gain Score	53	12	100	0.5573	Moderate
N-Gain Percentage	53	12	100	55.73%	Quite Effective

From the normality test data on Table 8. the average N-Gain Score was 0.5573, indicating a moderate category, and the N-Gain percentage was 55.73%, classified as quite effective. The criteria for a moderate N-Gain Score are $0.30 \leq g < 0.70$, and for a percentage in the "quite effective" category, it should range from 56% to 75%. Based on this data, it can be concluded that the use of the Wayground media based on local wisdom has a moderate effectiveness in improving students' problem-solving abilities.

The use of Wayground media in learning activities also engaged students. This media, which is similar to Quizizz, has become quite popular among students. However, the Wayground media based on local wisdom was a new experience for them. Therefore, it is important to evaluate students' responses to the use of Wayground in the classroom. The following table summarizes students' responses:

Table 9. Students' Responses to Using Wayground

Category	Average (%)	Criteria
Motivating confidence	81.48	Very Good
Aiding material understanding	81.01	Very Good
Making learning more enjoyable	82.96	Very Good

From the data on Table 9. it is evident that the response rates for motivating confidence (81.48%), aiding material understanding (81.01%), and making learning more enjoyable (82.96%) all fell within the range of 80% to 100%, which indicates "very good" satisfaction. Thus, it can be concluded that students' responses to using the Wayground media based on local wisdom were very positive.

The research results above indicate that the local wisdom-based Wayground media is effective in improving elementary school students' fraction problem-solving skills. Significant improvements were seen in the pretest and posttest results, as well as in the analysis of student responses using Polya's problem-solving indicators. Furthermore, the N-Gain test results and student responses from the questionnaire indicate that the use of this media is quite effective and provides a positive and enjoyable learning experience for students.

Discussions

The main findings of this study indicate that the use of local wisdom-based Wayground media in elementary school mathematics learning, particularly in addition and subtraction of fractions, can improve students' problem-solving skills. Data obtained from pretests and posttests showed a significant improvement in students' ability to solve fraction problems after the implementation of this media. The N-Gain results, which indicated "quite effective," further strengthen this finding, with an average score of 0.5573 and an N-Gain percentage of 55.73%.

Local wisdom-based Wayground media can be used as an effective tool to improve elementary school students' understanding and problem-solving skills in mathematics, particularly in topics often considered difficult, such as fractions. The implementation of this media not only introduces mathematical concepts interactively but also introduces local cultural values, providing a contextual and relevant nuance to students' lives. This media provides a fun learning approach that can increase motivation and actively engage students in learning.

This research aligns with numerous previous findings that also demonstrate the effectiveness of using digital and culturally relevant media in mathematics learning. Al Mawaddah (2021) in her research demonstrated that the use of digital media can increase students' motivation and focus on learning. This aligns with the findings in this study, which found that Wayground media based on local wisdom successfully improved student motivation and mathematical problem-solving. Interactive, technology-based media not only improved students' understanding of mathematics material but also provided a more enjoyable and engaging learning experience. Mendrofa et al.'s (2024) research also supports these findings, examining the role of local wisdom in mathematics learning and found that student engagement increased when mathematics material was linked to familiar cultural values. This study also found that Wayground media based on local wisdom successfully linked fractions to students' cultural contexts, enhancing their understanding of the material. Fajri et al.'s (2024) research, which examined the use of local culturally relevant digital media in mathematics learning, also showed similar findings. They reported that media relevant to students' cultural contexts can improve students' understanding of mathematical concepts, particularly in learning abstract concepts like fractions. This research aligns with the findings, which show that local wisdom-based

Wayground media has proven effective in helping students understand the abstract concept of fractions.

Furthermore, research by Oktasari et al. (2022), which discusses interactive learning using media like Wayground, also supports the findings of this study. They demonstrated that interactive learning can overcome students' difficulties in understanding abstract mathematical concepts like fractions. The use of interactive technology, implemented in this study through local wisdom-based Wayground media, provides students with the opportunity to learn in a fun and effective way. The findings of this study are also supported by research conducted by Rizki et al. (2023), which examined the use of local culture-based media in elementary school mathematics learning. They found that the use of media relevant to local culture can increase student engagement and understanding of mathematics material. This study demonstrates that Wayground media based on local wisdom has great potential in creating more contextual and meaningful learning for students. Research by Sari et al. (2021) shows that the use of technology in learning can help students who struggle to understand mathematical concepts. In this study, they emphasize the importance of using fun and interactive learning media to increase student motivation. These results are consistent with the findings in this study, where Wayground media based on local wisdom not only helps students understand the concept of fractions but also increases their motivation to learn.

Research by Haryanto et al. (2022), which examined the effectiveness of digital media in elementary school mathematics learning, also provided results consistent with this study. They found that the use of digital media can improve students' understanding of difficult mathematical concepts. Their findings support the use of Wayground media based on local wisdom as an effective tool in mathematics learning. Furthermore, research by Putra and Wahyudi (2020), which examined the use of technology-based learning media to improve problem-solving skills, also provides evidence supporting this study's findings. They found that well-designed digital media can improve students' ability to solve mathematics problems, which is also reflected in the findings of improved problem-solving skills in students in this study.

The findings of this study also align with research by Yunita et al. (2023), which showed that culture-based learning can increase student engagement and understanding in mathematics learning. They noted that when learning media integrates local cultural elements, students more easily understand and remember the mathematical concepts taught. Research by Nurdiana and Riza (2021), which examined the use of technology-based media in mathematics learning, also confirmed that interactive media can increase student engagement in the learning process. In this study, they reported that digital media based on local culture can increase student participation in mathematics learning, a finding also found in this study. Finally, research by Kusumawati et al. (2024) showed that technology-based learning media and local cultural relevance can improve student learning outcomes. They found that media that combines local culture with technology can make learning more engaging and relevant for students. This supports the finding that local wisdom-based Wayground media is effective in improving students' problem-solving skills in fractions.

This research shows that Wayground media, based on local wisdom, can be used as an effective tool to improve students' problem-solving skills in mathematics, particularly in elementary school students' fractions. Consequently, elementary school mathematics teachers can integrate this technology into their teaching process to make mathematics more engaging and directly related to students' lives. This technology-based mathematics learning also supports the Deep Learning approach, which emphasizes meaningful learning, awareness, and enjoyment in learning.

Future research could be conducted in other elementary schools with larger populations and employ a more rigorous experimental design to reduce bias and strengthen the validity of the findings. Furthermore, examining the use of digital media in fraction learning by incorporating various local cultures from various regions could also provide a broader perspective on how locally-based learning media can improve mathematics comprehension in Indonesia, a country rich in cultural diversity. Future research could also explore the relationship between technology and culture-based learning in a broader context, including examining the role of character education in the learning process.

CONCLUSION

This study shows that the application of local wisdom-based Wayground media in mathematics learning can improve elementary school students' fraction problem-solving skills. Based on pretest and posttest results showing significant improvement, and an N-Gain analysis indicating a "fairly effective" effectiveness, it can be concluded that the use of this media has a positive impact on students' understanding of mathematics, particularly on a topic often considered difficult, namely fractions. By integrating local cultural values into mathematics learning, this media not only makes learning more contextual and engaging but also increases student motivation and engagement in the learning process. These findings indicate that local wisdom-based Wayground media can introduce mathematics material more interactively and make learning more relevant to students' daily lives.

The results of this study are important because they open up opportunities for the development of more interactive and relevant learning methods, which can enrich students' learning experiences. Furthermore, this research also contributes to the integration of digital technology and local culture in education, which is highly relevant in the context of Indonesia's rich cultural diversity. Thus, the use of local wisdom-based learning media can play a significant role in improving the quality of mathematics education in Indonesia, especially in improving students' cognitive competence in more complex materials such as fractions.

Given the limited sample size of this study, which involved only 53 students from one elementary school, future research is recommended to involve a larger population and employ a more rigorous experimental design, such as a randomized controlled trial (RCT), to reduce bias and increase the validity of the findings. Further research could also be conducted in other elementary schools with diverse cultural backgrounds to determine the extent to which local wisdom-based Wayground media can be broadly implemented in Indonesia's diverse educational context.

Furthermore, future research could explore the use of local wisdom-based media in mathematics learning for various other concepts, as well as analyze other factors that may influence the media's effectiveness, such as students' intrinsic motivation, the availability of technological resources, and school support. Incorporating more diverse local cultural elements from various regions in Indonesia into learning media could also provide a broader perspective on how this learning media can help students understand mathematics more deeply. Further research is also recommended to examine the long-term impact of this media use on students' problem-solving abilities, as well as explore its influence on mastery of other, more abstract mathematical concepts. Further research can delve deeper into the role of character education in technology-based learning processes and local culture.

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