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MoniMoney and Teams Games Tournament: Contextual Learning Innovation to Improve Numeracy Literacy in Elementary Schools

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ABSTRACT

This study was motivated by the low mathematical numeracy literacy skills of elementary school students, particularly in understanding the fractional values of currency. This condition is exacerbated by the limited use of instructional media and the application of unengaging learning models, which fail to promote active student involvement. The aim of this study is to develop the "MoniMoney" instructional media, combined with the Teams Games Tournament (TGT) model, to improve the mathematical numeracy literacy of second-grade elementary students. The study employed the Research and Development (R&D) method based on the Borg & Gall model. The research subjects consisted of 10 students for a limited trial and 22 students for a broader trial. Instruments included field notes, teacher interviews, validation sheets for media and content, as well as pretest and posttest assessments. Data were analyzed using N-Gain calculations and significance testing. The results showed that the MoniMoney instructional media was declared valid and feasible based on expert validation. Its use significantly improved students' mathematical numeracy literacy, with an average N-Gain score of 0.72 (high category). This study concludes that the MoniMoney instructional media, systematically developed and supported by the TGT model, is effective in improving students' mathematical numeracy literacy. The novelty of this research lies in the integration of Monopoly-style educational media on the topic of fractional currency values with a fun cooperative learning approach, aligned with the characteristics of elementary school students. This media has the potential to serve as an innovative solution for meaningful and contextual numeracy learning.

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1. INTRODUCTION

Mathematics is one of the fundamental fields of study that plays a central role in developing logical, systematic, and critical thinking skills from an early age. As a compulsory subject in elementary school curricula, mathematics serves not only as a tool for understanding numbers and calculations but also as a means to cultivate analytical thinking and structured problem-solving skills (Amaliyah, 2020; Indriyani & Ruqoyyah, 2022; Maya & Ruqoyyah, 2018; Sumarmo, 2015; Sundayana, 2018). Through mathematics instruction, students are trained to recognize patterns, make generalizations, and make decisions based on data and facts. These abilities are essential for facing 21st-century life challenges that demand high-level thinking skills and strong numeracy literacy. Therefore, meaningful and contextual mathematics learning at the elementary level serves as a crucial foundation for students' academic growth and life skills in the future.

Mathematics needs to be taught from an early age. Mastery of mathematics from an early age is important not only for academic achievement but also as a basis for numeracy literacy that is relevant to everyday life (Departemen Pendidikan Nasional, 2006; OECD, 2019). One of the essential competencies that elementary school students need to acquire is numeracy literacy, which refers to the ability to use, interpret, and communicate numbers in various context (Alman & Ituga, 2023; Iswara et al., 2022; Novitasari, 2022; Pratiwi et al., 2023; Rohmah et al., 2022; Septianthari et al., 2023; Wijaya et al., 2014). This ability enables students to recognize patterns, make generalizations, evaluate numerical information, and make decisions based on data and facts in everyday situations (NCTM, 2000). Therefore, meaningful and contextual mathematics learning from the elementary level becomes a fundamental foundation in shaping students who are capable of reflective thinking and competitive in the future.

Numeracy literacy is the ability that encompasses understanding, using, and evaluating numerical information, whether in the form of symbols, graphs, tables, or words (Ekowati et al., 2019). Another perspective by (Murniati et al., 2024) numerical literacy is a fundamental skill that enables students to solve contextual problems, interpret data, and think reflectively about numbers and graphs. Meanwhile, according to (Herizal et al., 2020; Rezky et al., 2022), numeracy literacy refers to the knowledge and skills needed to use various types of numbers and symbols related to basic mathematics in order to solve practical problems in diverse real-life situations. Based on the above perspective, numerical literacy goes beyond mere calculation it encompasses the ability to understand, interpret, apply, and communicate numerical information in real-life contexts. This type of literacy is crucial to be instilled from early education in order to develop citizens who think logically, critically, and are capable of making data-driven decisions.

Numerical literacy has become a strategic issue in primary education due to the low numerical abilities of Indonesian students, as indicated by both national and international assessments. According to PISA 2022 data, the average mathematics literacy score of Indonesian students ranked 69th out of 81 countries, with only 18% of Indonesian students reaching Level 2 or higher in mathematical literacy-far below the OECD average of 69% (OECD, 2023). These findings are in line with the results of the National Assessment by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek, 2022), which revealed that the majority of primary school students are still unable to independently apply basic mathematical concepts to solve contextual problems.

One of the more challenging topics for lower-grade elementary students is the value of fractional currency, which requires skills in reading symbols, understanding equivalence, and performing addition and subtraction with money in fractional form. According to (Ruqoyyah, 2021; Satriawan, 2021), the value of fractional currency represents a medium of exchange that holds value for other goods, can be stored like a valuable item, and has comparable levels to indicate quality for humans.

Money also plays an important role as a unit of measurement and can serve as a means to assess an individual's level of competence (Hakim & Ridwan, 2023).

The topic of fractional currency values is closely related to students' mathematical literacy skills. This material supports the strengthening of students' mathematical literacy by presenting real-life contexts. This aligns with (Ruseffendi, 2006), who stated that mathematics learning connected to students' daily lives such as the use of money-helps them better understand the meaning and application of mathematical concepts. Currency materials, particularly those involving fractional values, provide opportunities to apply addition, subtraction, multiplication, and division in real-world situations, which are key aspects of mathematical literacy (OECD, 2018). Furthermore, research by (Firman et al., 2020) indicates that using contexts familiar to students such as simple financial transactions can enhance conceptual understanding and numeracy literacy. Students not only learn about currency values but also about decision-making, estimation skills, and the flexible use of numbers. Therefore, teaching fractional currency values contributes to reinforcing students' mathematical literacy by providing meaningful contexts, increasing learning relevance, and fostering the development of critical thinking and numeracy skills.

In practice, mathematics instruction in lower elementary grades is still largely dominated by lecture-based methods and the use of textbooks, which tend to be abstract and offer limited opportunities for concrete learning experiences (Destrinelli et al., 2018; Lumintang & Dewi, 2024). The lack of innovative instructional media also contributes to low student motivation and understanding, especially in numeracy-related topics. Therefore, there is a need for contextual, enjoyable learning strategies that encourage active student engagement.

One innovative approach that can be used is the development of an educational board game based on Monopoly, combined with a cooperative learning model. The MoniMoney learning media, developed in this study, is an adaptation of the monopoly game specifically modified for the topic of fractional currency values. According to Sihotang (2022), monopoly is a relatively enjoyable and easy-to-play game that can capture players' attention and encourage them to engage. A key element in the learning process is the teacher's attention to students, as this enables better understanding of the material and overall improved performance. The MoniMoney media is enriched with elements of numeracy literacy questions, transaction simulations, and tournament-style gameplay, allowing students to engage in active, enjoyable, and meaningful learning (Amelia et al., 2023; Chanifah et al., 2019; Hui & Mahmud, 2023; Vijayakumar & Kulkarni, 2020). Monopoly-based media can also enhance students' creative thinking skills, encourage active participation in the classroom, foster confidence in expressing personal opinions, and support communication skills in presenting ideas and solutions to the problems they encounter. This media is not merely used for playing games, but also serves as a tool to help students understand the material embedded within the gameplay (Handayani & Ubaidillah, 2022). Moreover, Monopoly-based media has been shown to increase student participation in the learning process, create a more effective learning environment, and foster a more enjoyable learning atmosphere at school (Prabali & Sukmana, 2021).

In addition to engaging media, the learning model used is also a key factor in the success of the learning process. The Teams Games Tournament (TGT) model is a type of cooperative learning that has been proven effective in increasing students' motivation, participation, and learning outcomes through elements of games and competition (S. Damayanti & Apriyanto, 2022; Slavin, 2015). This model integrates group discussions, educational games, and team tournaments, fostering both collaboration and healthy competition in the classroom (Herpratiwi et al., 2019; Suciati, 2020; Tran, 2015). This model engages all students in activities regardless of their social status, promotes peer tutoring roles, and provides learning resources through games (Hanifa & Budiman, 2023; Suhernilawati & Kusuma, 2024). In line with the view of Matitaputty et al., (2023), the collaborative learning approach of Teams Games Tournament

encourages active participation and teamwork among students throughout the learning process. This model facilitates group learning, gameplay, and peer interaction within teams to achieve learning objectives. Meanwhile, according to (Dewi & I Dewa Putu, 2023) the TGT model is a collaborative learning approach that involves students in various team activities with a competitive spirit. Based on the above explanations, it can be concluded that the Teams Games Tournament (TGT) model can be implemented by forming groups of five to six members, with each member committed to supporting one another to create a positive and enjoyable learning experience.

The Teams Games Tournament (TGT) learning model consists of five learning stages, namely: 1) delivering classroom presentations, 2) engaging in peer group learning, 3) conducting games, 4) holding tournaments, and 5) awarding the group with the highest or best score (Febrianti, 2020). According to another view (Sururi & B S, 2022), the steps in the TGT learning model include: 1) preparation, 2) classroom presentation, 3) group Q&A sessions, 4) games and tournaments, 5) recording the scores achieved, and 6) summarizing the activities carried out. Based on these perspectives, the steps of the Teams Games Tournament model used in this study are: 1) classroom presentation, 2) peer group learning, 3) game activities, 4) tournament activities, and 5) awarding the group with the highest or best score.

Previous studies have shown that the combination of educational games and the TGT model can enhance students' conceptual understanding, engagement, and positive attitudes toward mathematics (Arifin et al., 2020; H. Damayanti et al., 2025; İnaltun et al., 2014; Veloo et al., 2018). Another study conducted (Iffah et al., 2024) at SDIT Qoshru Al-Athfal showed that implementing the TGT model with the assistance of interactive Wordwall media significantly improved the numeracy skills of fifth-grade students. Similarly, a study by (Ariza et al., 2024) applied the TGT model using a snakes and ladders game as a medium for fifth-grade students at SD Negeri 18 Pendopo. The results demonstrated a significant increase in students' mathematics learning outcomes, with mastery learning improving from 46.15% in the first cycle to 76.92% in the second cycle. Furthermore, research by (Radhlyatul et al., 2023) showed that using the TGT model with a smart wheel media enhanced fourth-grade students' mathematics achievement. Likewise, a study by (Hasanah et al., 2025)), which implemented the TGT model using sticky notes in the Pancasila Education subject, also yielded significant learning outcomes. Another study was also explained by (Nilasari et al., 2024), in which the use of the TGT model supported by interactive PowerPoint media was found to improve the mathematics learning outcomes of second-grade students. Based on these studies, there is still a lack of research specifically developing Monopoly-based educational games integrated with the TGT model for teaching fractional currency values in the context of numeracy literacy for second-grade elementary students. This highlights the contribution and novelty of the present study.

Based on the aforementioned background, this study aims to: 1) Explore the development process and feasibility of the MoniMoney learning media using the Teams Games Tournament model to enhance numeracy literacy in the topic of fractional currency values for second-grade elementary students; and 2) Examine the improvement in mathematical numeracy literacy among second-grade elementary students whose learning utilizes the MoniMoney media combined with the Teams Games Tournament model.

2. METHODS

This study employs the Research and Development (R&D) method. According to (Sugiyono, 2011), the R&D method is a research approach used to produce a specific product and test its effectiveness. The product developed can take the form of instructional tools, media, or models designed to solve particular problems in education. Another perspective by Waruwu (2024) explains that the R&D

method is a research approach aimed at producing innovations, such as new products or enhancements of existing ones, redesigned to be more attractive and beneficial.

The development procedure of the MoniMoney media used in this study refers to the research and development strategy steps proposed by (Borg & Gall, 2003), which have been modified as follows: (1) data collection and preliminary study, (2) initial product design this stage involves planning the development design for the MoniMoney learning media product, (3) product validation conducted by experts in the relevant field, (4) product revision based on expert feedback from the validation stage, (5) limited trial aimed at determining the effectiveness of the developed learning media, (6) product revision based on input from teachers regarding further development, and (7) wider trial conducted in the same manner as the limited trial.

This research was conducted at an elementary school located in Bandung Regency, specifically at Sayati Village, Margahayu District, Bandung, West Java, Indonesia. The research subjects for the limited trial consisted of 10 students divided into 2 groups. Meanwhile, the subjects for the wider trial included all second-grade students, totaling 22 students, 12 of whom were female and 10 male.

The instruments used in this study include field notes, interview sheets, media and material validation sheets, as well as test instruments designed to assess students' mathematical numeracy literacy. Field notes were used to record or document events and observations during the classroom learning process. In addition, field notes also served to capture feedback or critiques in the form of suggestions provided by teachers regarding the MoniMoney media developed during its implementation in the field. Meanwhile, teacher interviews were used for needs analysis and data collection.

Another instrument used in this study was the expert validation sheet for media and content. The number of media and content expert validators was two for each. The media validation sheet was used to evaluate and assess the product developed by the researcher. The following is the blueprint of the expert media validation instrument:

Table 1. Blueprint of the Expert Media Validation Instrument

Aspect	Indicator	Number of Items
Media Characteristics	Illustration	2
	Media Quality and Appearance	6
	Attractiveness	2
	Technical	2

Another validation sheet used in this study is the material validation sheet. The material validation sheet is used to assess and validate the instructional content applied through the learning media. The following is the blueprint of the expert material validation instrument.

Table 2. Blueprint of the Expert Material Validation Instrument

No	Aspect	Indikator
1	Content	Alignment of media with Core Competencies (KI) and Basic Competencies (KD)
		Indicators match the material
		Completeness of the material
		Breadth of the material
		Conceptual accuracy
		Practice questions are useful to assess students' understanding
		Appeal of media content
		Visual design with images

		Media content is relevant to each learning session
2	Presentation	Logical sequence of concepts
		Accuracy of images related to the material
		Clarity of the material
		Accuracy of content or concepts
		Clarity of activities and exercises

The next instrument used in this study is the test instrument. This test instrument is designed to measure students' mathematical numeracy literacy. The test consists of 7 essay questions that were first trialed and analyzed for validity, reliability, discriminating power, and difficulty level. The following is the table of the test instrument used:

Table 3. Test Instrument for Mathematical Numeracy Literacy Skills

No	Learning Indicator	Numeracy Literacy Indicator
1	Able to solve practical problems in various	Identifying various denominations of coins.
2	everyday situations using different	Identifying various denominations of paper
	numbers and symbols related to basic	money.
3	mathematics.	Comparing values of paper money
4		denominations.
5	Able to interpret data presented in various	Ordering values of paper money denominations.
6	formats (graphs, tables, charts).	Ordering values of coin denominations.
7	Able to interpret the results of an analysis	Determining equivalencies among different
	to make estimations and draw	currency denominations.
	conclusions.	

The test instrument used was followed by statistical testing of the pretest and posttest results to determine the effectiveness of the MoniMoney instructional media in improving students' mathematical numeracy literacy skills. The statistical tests employed included the normality test, which was conducted to assess whether the pretest and posttest data were normally distributed. If the data were normally distributed, the subsequent analysis used the Paired Sample t-Test to determine whether there was a significant difference between the pretest and posttest scores. If the data were not normally distributed, the Mann-Whitney test was used instead. Additionally, the N-Gain test was employed to measure the improvement in students' mathematical numeracy literacy skills.

3. FINDINGS AND DISCUSSION

Findings

This research was conducted at an elementary school located in Bandung Regency, West Java Province, with the aim of examining the development process of the MoniMoney instructional media using the Teams Games Tournament (TGT) model for the topic of fractional currency values. MoniMoney is a numeracy-based Monopoly game developed by the researcher to encourage students to be more active and creative, and to help them enhance their numeracy literacy skills in mathematics-specifically in the topic of fractional currency values, which is often considered challenging for second-grade elementary school students.

The first stage is data collection and preliminary study. In this stage, the researcher conducted activities to understand the learning process by exploring, investigating, and gathering relevant data. Activities included a needs analysis of students, interviews with second-grade elementary school teachers, followed by observations, literature reviews, identification of learning processes, and data collection based on variables related to learning obstacles. The researcher then analyzed the results of

the observations and interviews, reduced the data, and recorded key findings. Based on the collected data and field notes, the researcher concluded that second-grade elementary students showed low learning outcomes in mathematics, particularly in the topic of fractional currency values. The main causes included teacher-centered learning and the lack of instructional media, which made the learning process feel dull or monotonous. This issue arose because developing instructional media requires sufficient time and funding, and also due to the teacher's age since the teacher was elderly or senior, they found it difficult to create or implement instructional media in their teaching.

As a result of this condition, students' enthusiasm for learning declined. This became the main reason the researcher decided to develop the MoniMoney instructional media-to support both teachers and students in mathematics learning, particularly in the topic of fractional currency values. Moreover, the MoniMoney learning media is also intended to help boost students' motivation and engagement during the lesson, as second-grade elementary students are typically only able to grasp concepts through the use of concrete objects. To ensure students become more active in the learning process, the researcher employed the Teams Games Tournament (TGT) model as a treatment alongside the use of the MoniMoney media.

The second stage of this research is the initial product design. In this stage, the researcher developed a design plan for the MoniMoney instructional media. The design of the MoniMoney learning media was created using the Canva application to make the media appear more realistic and visually engaging. In addition, the researcher planned and prepared the tools, materials, and the overall concept for using the MoniMoney media. The following is the design of the MoniMoney instructional media:

Figure 1. MoniMoney Game Board

Figure 2. MoniMoney Tournament Board

Figure 3. General Fund Game Card

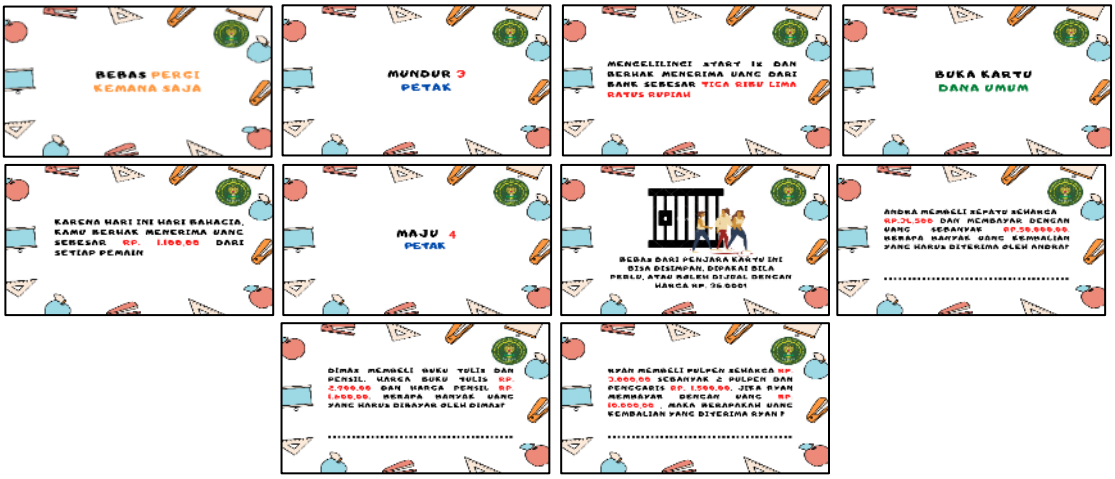

Figure 4. Chance Game Card

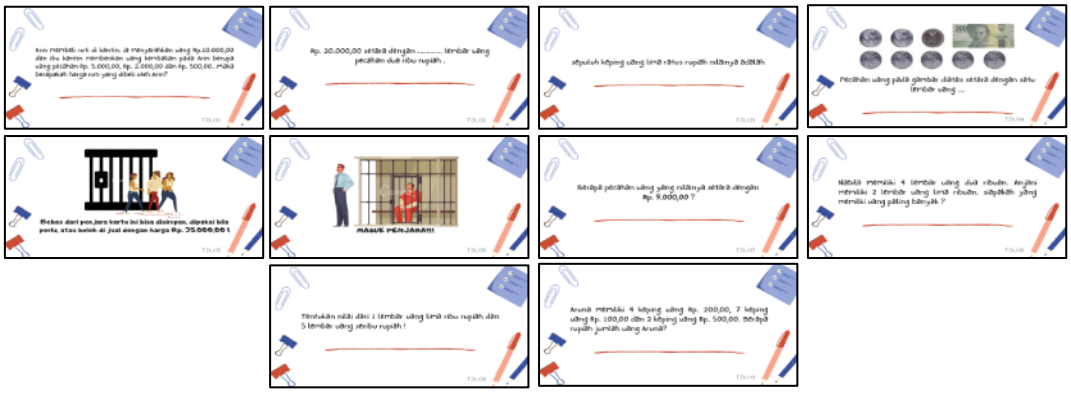

Figure 5. General Fund Tournament Card

Figure 6. Chance Tournament Card

Figure 7. Property Game Card

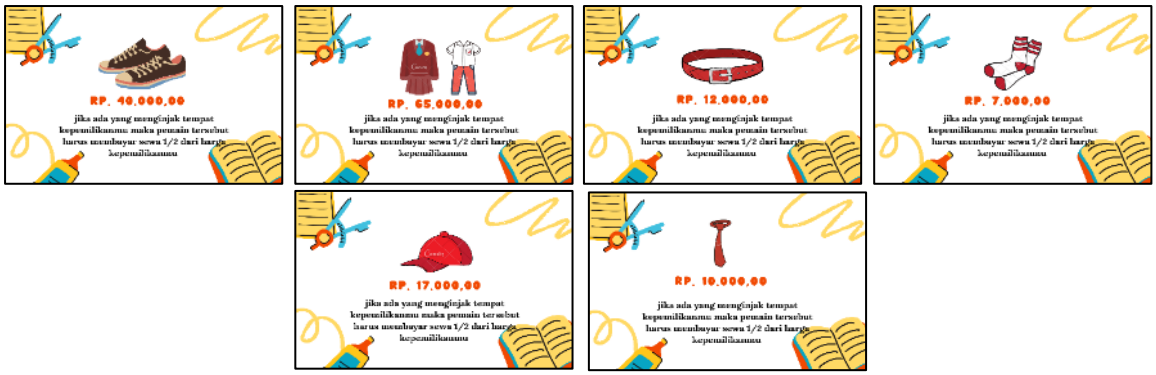

Figure 8. Property Tournament Card

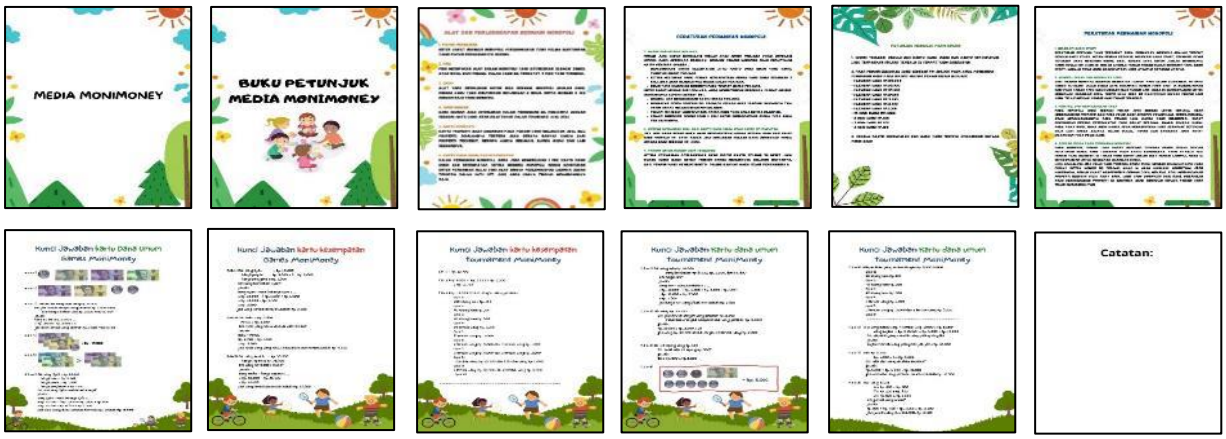

Figure 9. Game Instruction Card

The third stage is product validation. The product that has been fully developed and designed in tangible form is then validated by one expert in media and one expert in subject matter. The following is the table showing the results of the subject matter expert validation.

Tabel 4. Results of Material Validation

No	Aspect	Indicator	Validator 1		Validator 2	
			Score	Criteria	Score	Criteria
1	Content	1. Alignment of media with KI and KD	4	Very Good	4	Very Good
		2. Indicators aligned with the material	3	Good	4	Very Good
		3. Completeness of content	3	Good	4	Very Good
		4. Breadth of content	3	Good	4	Very Good
		5. Concept accuracy	4	Very Good	4	Very Good
		6. Exercises measure student understanding	4	Very Good	3	Good
		7. Attractiveness of content	4	Very Good	4	Very Good
		8. Visual design with images	4	Very Good	4	Very Good
		9. Content relevance to each lesson	4	Very Good	3	Good
		10. Logical sequence of concepts	4	Very Good	3	Good
		11. Relevance of images to the material	4	Very Good	4	Very Good
2	Presentation	12. Clarity of material	3	Good	4	Very Good
		13. Accuracy of content or concept	4	Very Good	4	Very Good
		14. Clarity of activities and questions	4	Very Good	4	Very Good
Total Score			**52**		**53**	
Percentage			**92,85%**		**94,64%**	

Table 1 shows the results of material validation. The first validator's assessment indicated that the MoniMoney instructional media, using the Teams Games Tournament model to enhance numeracy literacy, received a score of 52, with a percentage of 92.85%. The second validator gave a score of 53,

with a percentage of 94.64%, indicating that this instructional media falls into the "very valid" category. Subsequently, media validation was conducted by an expert. The following is a diagram presenting the results of media validation by the expert.

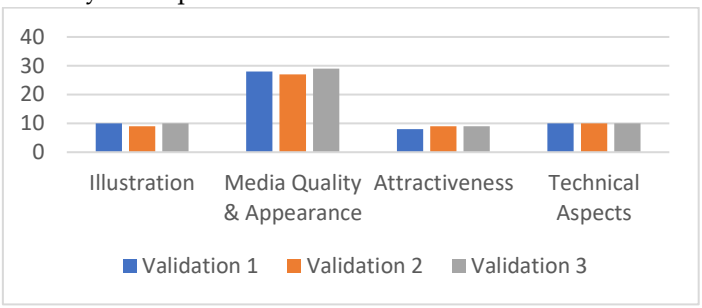

Figure 10. Validation Score Data from the First, Second, and Third Media Validators

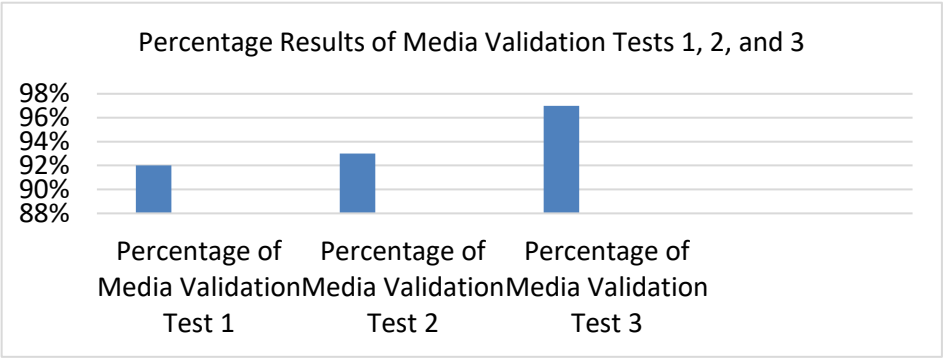

Figure 11. Percentage Results of Media Validation 1, 2, and 3

Figure 11 shows that the first validation test resulted in a score of 92%, the second validation test yielded 93%, and the final validation test achieved 97%. Based on the results of these three validation tests, it can be concluded that the MoniMoney media is highly valid for use with second-grade elementary school students and is ready to be implemented in trial testing.

The fourth stage is product revision. The MoniMoney media that required revision was improved by the researcher in both the design and the physical product. The revised media included the game cards, which initially used all capital letters these were changed to standard lowercase formatting to avoid confusion for students when reading the text. In addition, the color scheme was made more vibrant to better capture students' attention.

The fifth stage is the limited trial. The limited trial conducted by the researcher took place at an elementary school located in Sayati Village, Margahayu District, Bandung Regency. The trial was carried out in a second-grade class, but only 10 students were involved. These students were then divided into 2 groups, with 5 members in each group.

The limited trial activity began with the administration of a pretest, followed by learning activities using the MoniMoney media. This trial was conducted over three sessions using the Teams Games Tournament (TGT) model, focusing on the topic of fractional values of currency. Each session followed the TGT learning steps: explanation of the material by the teacher, group division, playing the MoniMoney game, conducting a tournament phase using the MoniMoney media, and awarding students. In the first session, the lesson focused on the fractional value of coins. The second session covered the fractional value of paper currency. The third session addressed the equivalency of fractional currency values. The limited trial concluded with a posttest to assess student learning outcomes. The following section presents the results of the normality test on students' numeracy

literacy abilities, as measured by pretest and posttest data.

Table 5. Normality Test Results of Students' Numeracy Literacy Skills in the Limited Trial

Numeracy Literacy Skill	Test	*Test of Normality*					
		Kolmogorov-Smirnov			*Shapiro-Wilk*		
		Statistic	Df	Sig.	Statistic	Df	Sig
	Pretest	.142	10	.200	.934	10	.489
	Posttest	.181	10	.200	.970	10	.895

The normality test using the Kolmogorov-Smirnov method showed that both the pretest and posttest data yielded the same significance value of 0.200. Since the significance value for both datasets is 0.200 > 0.05, it can be concluded that both sets of data are normally distributed. Following this, a hypothesis test was conducted. The following table presents the hypothesis test results for the limited trial.

Table 6. Hypothesis Test Results of Students' Numeracy Literacy Skills in the Limited Trial

Paired Sample Test									
Numeracy Literacy Skill	*Paired Differences*					T	Df	Significanse	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval Of The Difference				One-Slided P	Two-Slided P
				Lower	Upper				
	-35.40000	15.01999	4.74974	-46.14465	-24.65535	-7.453	9	<,001	<,001

The hypothesis test results for the pretest and posttest scores in the limited trial yielded a significance value of 0.001. Since the two-tailed significance value (0.001) is less than 0.05, Ha is accepted and Ho is rejected. Based on this assumption, there is a significant difference in student outcomes before and after using the MoniMoney instructional media with the Teams Games Tournament model on the topic of fractional currency values for second-grade elementary students. The next step is to perform the N-Gain test. The following table presents the N-Gain test results.

Table 7. N-Gain Test Results of Numeracy Literacy Skills in the Limited Trial

No	Student	Score		N-Gain Score	N-Gain Percentage	Criteria
		Pretest	*Posttest*			
1	S1	50	98	1,00	100%	High
2	S2	43	88	0,82	82%	High
3	S3	35	85	0,79	79%	High
4	S4	50	85	0,73	73%	High
5	S5	38	75	0,62	62%	High
6	S6	53	93	0,89	89%	High
7	S7	65	80	0,45	45%	Moderate
8	S8	78	82	0,20	20%	Moderate
9	S9	60	93	0,87	87%	High
10	S10	38	85	0,78	78%	High
Average				**0,72**	**72%**	**High**

The N-Gain test data shows that 8 students achieved results categorized as "High", while 2 students were categorized as "Moderate." The effectiveness of implementing the MoniMoney learning

model to improve students' numeracy literacy can be determined based on the N-Gain percentage. The obtained N-Gain percentage of 72% falls into the "Effective" category.

The sixth stage of this study is product revision. After completing the limited trial of the MoniMoney instructional media in a second-grade elementary class, a product revision stage was conducted. However, no revisions were suggested by the teacher or based on the limited trial results. Therefore, the MoniMoney media was deemed ready for broader implementation and was subsequently tested with all second-grade elementary students.

The seventh stage of this study is the wider trial. The procedures in this broader trial were the same as those in the limited trial, with the only difference being the number of student participants, which increased to 22 students. The normality test results for students' numeracy literacy skills in the wider trial can be seen in the table of pretest and posttest data below.

Table 8. Normality Test Results of Students' Numeracy Literacy Skills in the Wider Trial

Numeracy Literacy Skill	Test	*Test of Normality*					
		Kolmogorov-Smirnov			*Shapiro-Wilk*		
		Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig**
	Pretest	.141	22	.200	.948	22	.294
	Posttest	.151	22	.200	.941	22	.204

The normality test data using the Kolmogorov-Smirnov method showed that both the pretest and posttest yielded the same significance value of 0.200. Since the significance value of 0.200 > 0.05, both data sets are considered to be normally distributed. Following this, a hypothesis test was conducted. The following table presents the hypothesis test results from the wider trial.

Table 9. Hypothesis Test Results of Students' Numeracy Literacy Skills in the Wider Trial

Paired Sample Test									
Numeracy Literacy Skill	*Paired Differences*					T	Df	Significanse	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval Of The Difference				One-Slided P	Two-Slided P
				Lower	Upper				
	-32.22727	12.67142	2.70156	-37.84547	-26.60908	-11.929	21	<,001	<,001

The hypothesis test results for the pretest and posttest scores in the wider trial showed a significance value of 0.001. Since the two-tailed significance value of 0.001 < 0.05, Ha is accepted and Ho is rejected. Based on this analysis, it can be concluded that there is a significant difference in learning outcomes before and after the implementation of the MoniMoney instructional media using the Teams Games Tournament model on the topic of fractional currency values for second-grade elementary students. The next step is to perform the N-Gain test. The following table presents the N-Gain test results.

Table 10. N-Gain Test Data Results in the Wider Trial

No	Student	Score		N-Gain Score	N-Gain Percentage	Criteria
		Pretest	*Posttest*			
1	S1	45	85	0,75	75%	High
2	S2	75	98	1,00	100%	High
3	S3	60	80	0,53	53%	Moderate
4	S4	60	80	0,53	53%	Moderate

5	S5	45	88	0,81	81%	High
6	S6	53	93	0,89	89%	High
7	S7	73	85	0,48	48%	Moderate
8	S8	60	93	0,87	87%	High
9	S9	60	75	0,39	39%	Moderate
10	S10	50	93	0,90	90%	High
11	S11	43	88	0,82	82%	High
12	S12	35	70	0,56	56%	Moderate
13	S13	50	88	0,79	79%	High
14	S14	38	93	0,92	92%	High
15	S15	53	80	0,60	60%	High
16	S16	65	80	0,45	45%	Moderate
17	S17	78	93	0,75	75%	High
18	S18	60	85	0,66	66%	High
19	S19	38	85	0,78	78%	High
20	S20	45	93	0,91	91%	High
21	S21	60	90	0,79	79%	High
22	S22	45	85	0,75	75%	High
Average				**0,72**	**72%**	High

The N-Gain test results show that 16 students fell into the "High" category, while 6 students were in the "Moderate" category. The average percentage obtained from the N-Gain test was 72%, which falls under the "Effective" category.

Discussion

This study aims to develop MoniMoney, an instructional media based on an educational Monopoly-style game combined with the Teams Games Tournament (TGT) learning model, to enhance numeracy literacy among second-grade elementary school students, particularly in the topic of fractional currency values. The results indicate that the developed media is not only feasible for use but also effective in improving students' numeracy literacy skills.

The development procedure refers to the Research and Development (R&D) model proposed by (Borg & Gall, 2003). The initial stage involved conducting a needs analysis in the field, which revealed that students struggled to understand the concept of monetary value, especially in fractional form. This difficulty was primarily due to conventional teaching methods that lacked concrete learning experiences. These findings are consistent with (Destrinelli et al., 2018), who stated that mathematics instruction in lower elementary grades is still dominated by lecture-based approaches and lacks contextual learning.

The media was developed with an attractive design using Canva and then validated by both content experts and media experts. The validation results indicated that the media falls into the "highly valid" category, with each validator giving a score of over 90%. The content validation also showed excellent results and alignment with the Basic Competencies (Kompetensi Dasar/KD) of the curriculum. This supports the findings of (Prabali & Sukmana, 2021), who emphasized that the success of instructional media is determined by the relevance of content, design quality, and its appeal to students.

Subsequently, the media was tested in two stages: a limited trial and a wider trial. The results of the pretest and posttest showed a significant increase in scores. In the limited trial, the average N-Gain score was 72%, which falls into the "effective" category based on (Hake, 1999) classification. Similar results were found in the wider trial involving 22 students, where 16 students were categorized as having high improvement and 6 students as having moderate improvement, further confirming the effectiveness of the MoniMoney media.

The findings of this study indicate that the MoniMoney learning media is effective in helping students improve their numeracy literacy skills. This effectiveness is evidenced by the results of the Paired Sample t-Test, which showed a significant difference between students' numeracy literacy abilities before and after the intervention, as well as a high-level improvement in ability after using the MoniMoney media. This aligns with the cognitive characteristics of lower-grade primary school students, as explained by Piaget, who stated that children at this stage are in the concrete operational phase and therefore require media that provide real and meaningful learning experiences(Santrock, 2011). MoniMoney is attractively designed as an educational game, making it capable of capturing students' learning interest and encouraging active engagement in the learning process. As a game-based learning medium, MoniMoney not only presents material in an enjoyable way but also strengthens students' understanding of fractional currency values in a contextual manner. These findings are consistent with research by (Kusumaningrum & Sarwi., 2020) which stated that game-based media can enhance the interest and numeracy skills of lower-grade students. Additionally, (Fajriati & Murtiyasa, 2023; Nurhamidah et al., 20025) affirmed that students' mathematical literacy skills can be improved through the use of contextually presented interactive media.

The TGT learning model also plays an important role in supporting the effectiveness of this media. This model emphasizes teamwork, healthy competition, and active student engagement. The integration of game-based media into the TGT model has proven to create an enjoyable learning atmosphere, promote social interaction, and strengthen students' motivation in learning mathematics. TGT provides a structured learning environment that allows each team member to support one another and learn through competitive educational games, enabling students not only to actively learn mathematical concepts but also to develop their social skills (Salam, Hossain, et al., 2015; Salam, Zulkarnain, et al., 2015; Slavin, 2015). A study by Setyawan & Suhandi (2020) also showed that the use of game-based media integrated with TGT significantly improved students' learning outcomes because the approach offered an engaging and meaningful learning experience. Another study by (Tran, 2015) confirmed that cooperative game-based learning models like TGT can enhance academic achievement as well as students' positive attitudes toward the subject matter.

Previous studies by (Arifin et al., 2020; H. Damayanti et al., 2025) support these findings, showing that game-based media can create an enjoyable learning environment, increase student engagement, and strengthen the understanding of mathematical concepts. In an international context, (Capinding, 2021; Veloo et al., 2018) also found that the use of game techniques and the TGT model had a positive impact on students' conceptual understanding and academic performance in mathematics. In addition, a study by (Astri et al., 2018) showed that the implementation of the Teams Games Tournament (TGT) model based on games was effective in increasing students' learning motivation and academic achievement. This finding is further supported by (Gillies, 2016), who stated that cooperative learning strategies such as TGT, when combined with game-based activities, can enhance students' cognitive and social engagement and help build a supportive and collaborative learning environment.

Thus, it can be concluded that the development of the MoniMoney media, which has been academically validated and empirically tested through the TGT model, has proven to be effective in enhancing numeracy literacy among elementary school students particularly in topics that require concrete understanding, such as fractional currency values. This media serves as an innovative solution for teachers in delivering complex mathematics content in a more engaging and easily understood manner for students.

4. CONCLUSION

This study concludes that the MoniMoney instructional media was developed through systematic steps based on the Borg and Gall model. The media was validated by experts and tested on second-grade elementary school students, and was proven to be both feasible and valid. The trial results indicate that MoniMoney is effective in improving students' numeracy literacy. This study supports the importance of using instructional media that aligns with the cognitive development stage of elementary school students. MoniMoney can serve as an alternative teaching aid for teachers to deliver numeracy material in an engaging and meaningful way. As a recommendation, future research is encouraged to develop similar media for different grade levels or other mathematics topics, and to integrate digital technology elements to make the media more interactive and adaptive to current educational needs.

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