

Development of Edu-Monopoly Based on Numeration of Mixed Arization Operation Materials for Elementary School

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Abstract: *Research purposes development This (1) knows the process of developing educational media - based on monopoly numeracy material operation count mixture , (2) knowing eligibility development of edu -monopoly based media numeracy material operation count mixture . (3) knowing implementation and response student against development of edu -monopoly based media numeracy material operation count mix . Research development This adapted from the ADDIE development model (Analysis , Design, Develop, Implementation, Evaluation), but limited to the stage Implementation (Implementation). Data collection method using instrument study questionnaire validation material , questionnaire media validation , and questionnaires response students . Data analysis techniques used in the study This use quantitative data analysis For know eligibility products and analysis descriptive For describe the process and results development product . The result of study This show that (1) product results development of edu -monopoly based media numeracy material operation count mixture developed through four stage that is stage Analyze (analysis beginning , analysis students , analysis material , analysis objective learning) , Design (designing appropriate learning media with need students) , Development (in the form of product results development of edu -monopoly based media numeracy material operation count mix) , Implementation (trial) product). (2) Results of the feasibility test product development through validation media experts get results percentage 79% with "Eligible" category , results validation expert material get results percentage 82.5% with "Eligible" category , then validation Language experts get results percentage 85% with "Eligible" category . Then the results from development edu -monopoly based media products numeracy as Supporter in activity learn on the material operation count mixture For student Class IV. (3) Implementation process media and response games student to product development of edu -monopoly based media numeracy material operation count mixture.*

Key Words: Edu-Monopoly , Numeracy , Operation Calculate Mixture

Introduction

Learning mathematics in school base aiming For understand draft mathematics that will used For finish problems in life everyday. Many difficulties are faced student in learning mathematics like lack of interesting during the learning process mathematics ongoing. Mathematics is gate and lock science that becomes subject important in development other sciences. Mathematics is one of field the study given to student since sitting in education Elementary School (SD) up to to the level education tall (Fiantika et al., 2022) . Mathematics must mastered by students so that can solve a problem Good in said knowledge knowledge and also in life daily For in the future.

Interesting learning can improved back, teacher can evaluate the learning process from various aspects. Teachers can improve learning strategies, methods learning until tool learning process support that can make learning more interesting , one of them is that teachers can utilise learning tools / media use support the learning process taking place (Fauzan, dkk, 2024). Especially learning lack of mathematics requested by many student Because his learning not enough interesting. Therefore that teacher is highly recommended using media to make atmosphere class that was passive become more active.

Numeracy is ability counting use understanding analyze data (Yustitia, dkk, 2023). Lack of understanding student to question numeracy result in low ability in numeracy students, things This can due to Because lack of ability understanding and use various type related symbols and numbers with mathematics in practice question (Pramulia, dkk, 2025). Therefore that, media is needed for accommodate learning that makes student interested , research create *edu -monopoly* based media numeracy in material operation count mixture school base .

Learning media used as intermediary so that learning more effective. Media can also make it easier concepts abstract become concrete to make it easier understanding students . In learning as a process of interaction between student with teachers and resources Study other need supported proper use of media (Hasiru et al., 2021) . Instructional Media There is a number of kinds that can help the learning process. Various kinds of learning media simple such as audio media, visual media, still visual media, audiovisual media, various media , images , maps and globes. Based on matter said, researchers mean to utilizing game media educative shaped monopoly to make it easier student in Study mathematics on the material operation count mixture .

Monopoly of a game with purpose For control plot from purchase, rental in system economy that has simplified. Another opinion according to Mangelep, dkk (2023) monopoly is One game board and players race For gather riches through One implementation system game with enter brain questions that will be answered by participants games. Based on study previous Lestari et al., (2021) monopoly media development relevant with research that will be done , results research 85% successful with existence lack from a number of indicators that get mark smallest .

With existence Development Development *Edu – Monopoly* based on Numeracy in Operations Material Count Mixture For create interesting learning and students know concepts base do question mathematics on the material operation count mixture.

Method

Study This use type R&D research. Sugiyono in Gumantan & Mahfud, (2020) state that study development mentioned as research and development or commonly called (*research and development*). The R&D method is method research that produces innovation Good a product new or develop products that have been There is For more draw the right one with objective learning from main discussion certain Muqdamien et al., (2021) . In the study This using the ADDIE model developed by Branch, (2009) which consists of of 5 stages covering *Analyze* (Analysis), *Design* (Design), *Development* (Development), *Implementation* (Implementation), *Evaluation* (Evaluation). In research This will develop *edu -monopoly* based media numeracy material operation count mixture as process activity support Study student.

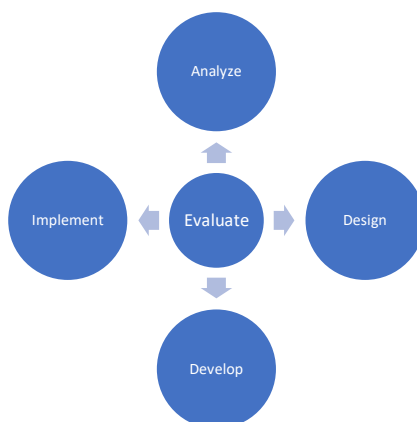


Figure 1 Stages of Development Process *Edu-Monopoly* Based Numeracy

Research data analysis techniques This use technique quantitative and descriptive data analysis . Quantitative data the obtained from results validity or the eligibility given by the validator, while the descriptive data obtained from results input and suggestions from the validator. The validation sheet filled out by the validator is obtained in form percentage with scale measurement use scale likert , whereas For analyze the data then answer can given score in accordance table following :

Table 1Assessment Scores

Category	Scale
Very good	4
Good	3
Not good	2
Very bad	1

Total results assessment conducted by validator refers to the scale Likert furthermore counted use formula as following :

$$P = \frac{\sum x}{\sum xi} \times 100 \%$$

So that from results calculation , then can determine results categorized calculations with criteria as following :

Table 2 Validation Result Criteria

Score	Criteria Eligibility
01.00-50.00%	Very Poor
50.01-70.00%	Not good
70.01-85.00%	Good
85.01-100%	Very good

Results and Discussion

Research result This is A product in the form of monopoly media based on numeracy material operation count mixture For student class IV. This media product used as tool process activity support learn so that students motivated and enthusiastic in implementation learning mathematics. Research This is type study *Research and Development* (R&D) with the ADDIE development model which is abbreviation from *Analyze* (Analysis), *Design* (Design), *Development* (Development), *Implementation* (Implementation), *Evaluation* (Evaluation). In research This done until stage *Implementation* .

1. Development Process *Edu-Monopoly* Based Numeracy Operation Count Mixture

Following is explanation of the results data Development of *Edu-Monopoly* Based Media Numeracy of Operational Material Count Mixture based on stages ADDIE model development.

1. Stage *Analyze* (Analysis)

a. Analysis beginning

Analysis early in the research This that is find and determine problem the basis of learning at SDN Ngagelrejo I / 369 Surabaya. In learning mathematics is eye a very bad lesson liked by many student with various reason, then from that teacher has obstacles in the learning process ongoing.

b. Analysis Student

Analysis student This aims to know the characteristics of students , in the matter, this is very necessary to the skills and requirements needed for students on the material operation count based on numeracy in class IV at SDN Ngagelrejo I/369 Surabaya. Researcher observe that lack of interest Study moment classroom learning. *Pre-test* results to obtain KKM result ≥ 70 , with average score 61% from 20 students.

c. Material Analysis

Subjects studied is mathematics, in chapter 1 there are material operation count mixture . On the material This discuss challenge operation related count with addition , subtraction , multiplication even division. The purpose of learning in chapter 1 numbers count up to 10,000 as following:

Table 3 Learning Objectives

Learning objectives
Student capable determine results summation number count up to 1,000
Student capable determine results subtraction number count up to 1,000
Student capable determine results multiplication number count up to 100
Student capable determine results distribution number count up to 100

Table 4. Achievements Learning

Achievements Learning
Student show understanding and intuition numbers (<i>number sense</i>) in numbers count up to 10,000. They can reading , writing , determining mark place , compare , sort , use mark place , do composition and decomposition number said . They can also finish problem related with money using thousands as unit . Student can do operation addition and subtraction number count up to 1,000. They can do operation multiplication and division number count up to 100 .

d. Media Analysis

Educators at SDN Ngagelrejo 1/396 Surabaya have obstacle when the teacher explains question story material operation count mixed , teacher wants give fun learning so that it doesn't monotonous and learning more effective in accordance Merdeka curriculum . From the description on can concluded For develop a learning media material operation count mix . Expected product *edu* media development - *monopoly* based on numeracy on the material operation count mixture.



Figure 2 Media Edu-Monopoly

2. Stage Design

Products produced in research This namely media *edu* - based *monopoly* numeracy which can seen in the picture following:

Media edu -monopoly based numeracy this is designed use application canva use picture hobby. The design of this *edu -monopoly media* is made as attractive as possible. Possible with colorful for students interested and have a sense of curiosity know tall about *edu -monopoly media*. This media equipped with opportunities and public funds in accordance with. In the *edu media -monopoly* exists picture plot hobby, each picture hobby the own card questions and cards different answers. This media also has card rules used when the media will be used .

3. Stage Development (Development)

At the stage validation product development of *edu-monopoly* based media numeracy tested by six validators, namely expert validators material mathematics, media expert validator and expert validator language. From the results validation by experts, then will data obtained in the form of quantitative and qualitative. Quantitative data obtained from questionnaire evaluation with use scale Likert , while qualitative data in the form of evaluation or addition criticism and suggestions that come from from the validator.

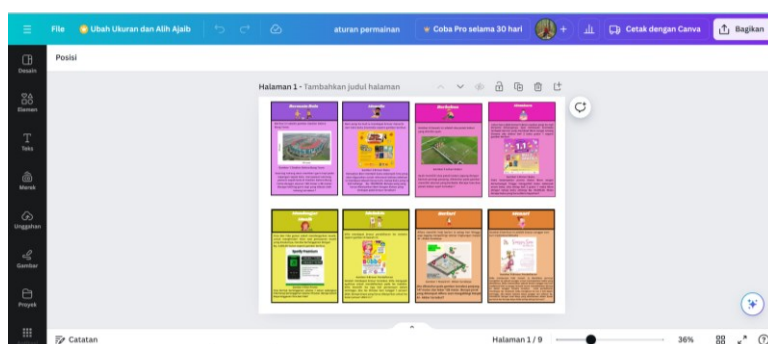


Figure 3 *Edu-Monopoly* Media Question Card Design

Table 3Media Expert Validation Results

Eligibility Type	Score	Maximum score	Percentage (%)	Information
Appearance	21	24	87.5	Valid
Presentation	6	8	75	Valid
Use	6	8	75	Valid
Development	18	24	75	Valid
Total	51	64	79	Valid

Table 4Results of Material Expert Validation

Eligibility Type	Score			Information
	Score	Maximum	Presentation	
Content / Material	28	32	87.5	valid
Language Eligibility	19	24	79.1	valid
Appearance	35	40	87.5	valid
TOTAL	82	96	85.4	valid

Table 7 Results of Language Expert Validation

Eligibility Type	Score	Maximum Score	Percentage	Information
The language used in the media is clear	8	8	100	Very Valid
The sentences used in the questions are easy to understand.	6	8	75	Valid
Conformity of language with good and correct Indonesian language rules	6	8	75	Valid
The language used is able to encourage curiosity in students	6	8	75	Valid
Language suitability to students' critical thinking level	7	8	87.5	Very Valid
TOTAL	33	40	82.5	Valid

Based on calculation results validation expert material above , obtained mark end level validation by 85.4%, based on calculation results validation media experts above , obtained mark end level validation by 79%, and the calculation results validation expert Language above , obtained mark end level validation by 82.5%. From the results validation the can show results eligibility product development of *edu -monopoly* based media numeracy stated worthy used .

4. Implementation Stage (Implementation)

At the stage implementation this is the test that was conducted researcher is a trial product , as following :

a) Small Scale Trial

Trials scale small with involving two teachers from SDN Ngegelrejo I / 369 Surabaya and three colleague peer as feasibility in developing *edu - based monopoly* media numeracy in material operation count mixture class IV SDN Ngagelrejo I / 396 Surabaya. Be aware test results product scale small from introduction and use results product development of *edu - based monopoly* media numeracy get very good response from some teachers and friends colleagues . In activities distribution questionnaire response There are suggestions and comments written in the comments column questionnaire the as following : Juanita Purnamasari : " *Yes, I have. good , students the more easy and fun in Study mathematics with method play while learning* ". Tetty Dwi Mayasari .: " *Very interesting The meaning of the media created , the material contained in the media is also appropriate with learning* ". Firda Husnia : " *The material in Edu - Monopoly media is appropriate with material class IV. It has been very effective used For learning and enough interesting attention students* ". Ananda Nasution: " *Edu -media monopoly deserves used in activity learning , size in accordance with need students , easy media operated and very interesting* ". Nia Putri Karimah: " *The game worthy played , effective For Study student in learn material operation count given mixture* " .

b) Large Scale Trial

After to obtain test results scale small above , researcher do stage furthermore namely trial scale big on products development of *edu - based monopoly* media numeracy to student class IV SDN Ngagelrejo I/ 369 Surabaya as many as 20 students . In the application of this media there is lack Where card answer No distributed to every group . So from That group moment discuss in workmanship card question No know Already Correct or not yet . In the distribution questionnaire response there is comments and suggestions written by students class IV D SDN Ngagelrejo I Surabaya as following : AMP " *the learning media is very enjoyable , the material is... A little difficult* ". ARH " *the game exciting the material challenging* ". ADP " *very like and easy understand "the lesson* ". AKC " *material the lesson exciting the game pleasant* ". EAS" *the lesson Why it's time fast once* ". KKA " *so more and more Like The same material This because exciting very lesson earlier* ". KNA " *I am very happy with material earlier and I Like become a bank in the game earlier* ". MHP " *no difficult to be understood the material and explanation Mrs. Azizah is very clear* ."

On trial scale big This is stage final in study this , after researcher perform validation process eligibility products that are declared valid. Next with do a trial scale small until the trial scale big show that *edu -monopoly* media can increase Spirit students and not There is product constraints development *edu - based monopoly* numeracy in material operation count mixture .

2. Eligibility *Edu-Monopoly* Based Media Products Numeracy Operation Count Mixture

Eligibility product in research This through stage validation by several validator and guardian teacher Class IV of SDN Ngagelrejo I/396 Surabaya, eligibility product development This get results calculation from media expert validator , expert validator material / content and expert validator Language . Explanation at stage *development* get results calculation validation expert material above , obtained mark end level validation by 85.4%, while results calculation validation media expert obtained mark end by 79%, and the calculation results validation expert Language obtained by 82.5%. With results acquisition the development product in research This including in category worthy For used in the learning process .

3. Response Student To Product Development of *Edu-Monopoly* Based Media Numeracy Operation Count Mixture

Response student to usage , in development *edu - based monopoly* media products numeracy This through phase two of the trial , trial scale small things done with teachers of SDN Ngagelrejo I /396 Surabaya and friends prospective teachers from PGRI Adi Buana University Surabaya, while the trial scale big done with student class IV-D SDN Ngagelrejo I/396 Surabaya, which can seen in the picture following:



Figure 4 Trial with Teachers of SDN Ngagelrejo I/396 Surabaya



Figure 5 Trial with Elementary School Teacher Education Students, Adi Buana PGRI University, Surabaya



Figure 6 Trial with Student Class IV of Ngagelrejo 1/396 Elementary School, Surabaya

The image above is documentation moment response data retrieval use development of edu - *monopoly* media gets response good and students are very enthusiastic moment using media edu - based *monopoly* numeracy in activity learning.

The development of edu-monopoly media has proven to be an effective and engaging tool for enhancing students' numeracy skills in learning activities. The integration of game-based learning, particularly through the monopoly format, has garnered positive responses from both educators and students alike (Bryant, 2018). Students have shown remarkable enthusiasm when using the edu-monopoly media during learning sessions (Kuang, dkk, 2021). This can be attributed to the interactive and competitive nature of the game, which transforms traditionally abstract numeracy concepts into concrete and relatable scenarios. The board game format provides opportunities for collaborative learning, fostering teamwork and communication among peers (Bayeck, 2020). Moreover, the sense of achievement students feel when progressing in the game motivates them to engage actively and persevere through challenges.

Edu-monopoly media bridges the gap between theoretical knowledge and practical

application. By incorporating real-life numeracy problems into the gameplay, students develop problem-solving skills and critical thinking. The repetitive practice inherent in the game also reinforces key numeracy concepts, leading to better retention and understanding.

Conclusion

Research and development conducted This produce media edu – monopoly based on numeracy in material operation count mixture Class IV at SDN Ngagelrejo I is worthy used and applied to students class IV SDN Ngagelrejo I/396 Surabaya was obtained conclusion that product media development edu – monopoly based on numeracy in material operation count mixture worthy used in the process of activity learning as tool Supporter learning . media development edu – monopoly based on numeracy in material operation count mix is categorized worthy . Response student to usage , view on development edu - based monopoly media products numeracy This get response good and students are very enthusiastic moment using media edu - based monopoly numeracy in activity learning .

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