Development of RME-Based Scrapbook Media Multiplication Material for Class IV Muhammadiyah 1 Bawean Primary School

Nur Firdausi Nuzula¹*, Arissona Dia Indah Sari ², Nataria Wahyuning Subayani³
¹,²,³ Muhammadiyah University Gresik, Indonesia

Article Information

ABSTRACT

This research aims to develop RME-based scrapbook media for multiplication material in the hope of helping students increase their understanding of correct problem solving, active learning conditions and creating learning media that is appropriate to the Bawean environment. The method used in this development research is the ADDIE development method with 5 stages, namely: analysis, planning, development, implementation, evaluation. The subjects in this research were 12 fourth grade students at SD Muhammadiyah 1 Bawean. This research was taken in the 2022/2023 academic year. The results of this research are: 1) scrapbook media based on RME multiplication material was developed based on the 5 stages in the ADDIE development model, 2) scrapbook media based on RME multiplication material was declared "Very Good" by media experts with a score of 82% and by experts material with a score of 83%, 3) as well as the results of the student response questionnaire to RME-based scrapbook media, multiplication material which obtained "Positive/Good" results with a score of 81%.

This is an open access article under the CC BY-SA license.

Correspondence Author:
Nur Firdausi Nuzula, Arissona Dia Indah Sari, Nataria Wahyuning Subayani
Muhammadiyah University Gresik
Email: nurfirdausinuzula@gmail.com
1. INTRODUCTION

School base is something institution social who have obligation For practice as well as develop ability base for 6 years so that participant educate capable continue to level furthermore (Taufiq, 2019). Participant educate will trained and developed at school start from ability basic, like reading, writing and arithmetic so that become something that can beneficial for personal and social. This is in line with the aim of National Education, namely to make the nation's life intelligent. In achieving National Education goals, the government tries to improve the quality of education by adapting the curriculum to educational problems.

Curriculum according to Law no. 20 of 2003 article 1 paragraph 19 is a designed and regulated set For reach specific educational goals and made guidelines maintenance activity learning that contains purpose, content, materials lesson as well as method used (Atiah, 2020). Curriculum independent is curriculum that optimizes the participants educate capable understand concept and strengthen competence through learning diverse intracurricular activities (Kemdikbud, 2022). The independent curriculum is a new curriculum where teachers are given freedom For use various teaching tools that can customized with needs and interests Study participant educate, with the hope of learning will walk with good, precise and improving desire Study participant educate, esp learning mathematics.

Mathematics is a symbolic language that can create connection qualitative and spatial with method reason inductive nor deductive, like multiplication in form story according to Johnson and Myklebust (in Dewi & Izzati, 2020). Mathematics according to James (in Zaenah et al., 2019) is something method best For practice ability think We Because mathematics involve strength and accuracy We in think. Mathematics is important knowledge in everyday life, therefore mathematics is taught from the basics and as early as possible to be able to understand the concept of mathematics learning. However, many people say that learning mathematics considered difficult and scary as well as give participants a sense of boredom educate and consider mathematics only fixated on symbols and numbers just (Dewi & Izzati, 2020). In fact the goal learning mathematics is For help participant educate understand problems and solve them with consider other possibilities so obtain true solution true and correct.

Instructional Media is all something that teachers use for interesting attention and interest participant educate in accept information about learning and eliminating boredom and the view that mathematics is difficult. Media learning own very important role because of learning media No only Can used when there are teachers instead Can used in a way independent or together friends by participants students (Zaenah et al., 2019). One of the learning media that can be used interesting attention and interest Study participant educate is Scrapbook media. Scrapbook is a media in the form of pictures, writing or decoration Where later will pasted above paper. According to Dewi (in Zaenah et al., 2019) Scrapbook media has benefit for participant students, including : participants educate So creative, you can channel hobbies, documentation as well as available means become stress reliever and recreation.

RME (Realistic Mathematics Education) Approach according to opinion Freudenthal (in Pratiwi & Rahmawati, 2022) is linking approach mathematics with reality Because mathematics is activity man so that must near with participant educational and relevant with life real. According to Wibowo (in Wulandari et al., 2020) the RME approach is involving approach participant educate For develop understanding they with method solve and explore defined problem in involving context interest participant educate specifically learning mathematics. From both opinion on can concluded that the RME approach is approach used in learning customized math with circumstances or life real participant educate so that develop ability participant educate in explore and solve problem.

Based on results observations and interviews at SD Muhammadiyah Satu Bawean, stated that school the apply 2013 curriculum as curriculum the reference. Observation This carried out on participants educate Class IV of Muhammadiyah One Bawean Elementary School, received results that the learning process refers to one media/ teaching material. With So, you can said that the teacher hasn't try apply different media/ teaching materials. That matter give rise to method learning which refers to methods conventional (lectures and questions answer), so that the learning process takes place become not enough active.
Apart from that, based on the observation process, it was obtained phenomenon that 5 out of 12 participants educate experience difficulty in understand stages / methods solution problem with Correct in material learning multiplication. Problem that, you can missed with it uses RME approach. Support exposure by, (Fitria, 2020) state that the RME approach is originating approach from real thing or life daily participant educate, so can make it easier participant educate in understand learning mathematics. This was also done by previous researchers (Pratiwi & Rahmawati, 2022) entitled "Development of RME-Based V-Mau Media in Concept." Multiplication As Addition Repeating”.

The RME approach can combined with other media/ teaching materials. Because with use of learning media otherwise, expected can interesting attention as well as stimulate participant educate to be more active in the learning process. Set behind phenomenon the research This lift title “Development of RME Based Scrapbook Media for Multiplication Material Class IV of Bawean One Muhammadiyah Elementary School”.

2. METHOD

Types of research This is study development which uses the ADDIE development model developed by Robert Maribe Branch (2009) (in Ratnasari, 2020). The ADDIE development model includes 5 stages that is: Analysis, Design, Development, Implementation, Evaluation (Ulfa et al., 2021). Study development This will carried out at SD Muhammadiyah 1 Bawean class IV in 2022/2023 teachings. The subjects in this research were 12 students and media and material validators.

The data collection techniques used were observation and interviews conducted in an unstructured manner as well as expert validation (media and material experts) and student response questionnaires. The data analysis technique is carried out using the following formula:

1. Media validity analysis

Validation This used for means finish repair so that realize more learning media products superior and useful. There are two assessment instruments for media validity, namely media validation and material validation. Validation results expert both media and material use scale likert with evaluation criteria consists from 1 to 5 score. Media validity is calculated with calculation as following:

\[ P = \frac{\sum x}{N} \times 100\% \]

Source : Sugiyono, 2016(dalam Rahmawati, 2020)

Information :
P : Valid percentage gain
\( \sum x \) : The total value of all answers which are given each source person
\( N \) : The total of all ideal values Criteria media validity in table under This :

<table>
<thead>
<tr>
<th>No</th>
<th>Achievement Level</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7 6 - 100%</td>
<td>Very good</td>
</tr>
<tr>
<td>2.</td>
<td>5 1 - 75 %</td>
<td>Good</td>
</tr>
<tr>
<td>3.</td>
<td>36 - 50%</td>
<td>Enough Good</td>
</tr>
<tr>
<td>4.</td>
<td>( \leq 3 )5%</td>
<td>Not good</td>
</tr>
</tbody>
</table>

Source : Arikunto, 2010(dalam Rahmawati, 2020)

2. Analysis of student responses

Student responses were obtained from distributing questionnaires given by researchers. In the questionnaire the using a multilevel Lijntert Scale where in each question media users provide score. The categories in the questionnaire selection are listed in the table below:

Table 2. Questionnaire Selection Categories
3. RESULT AND DISCUSSION

Research result

Result of study This is exposure about study Scrapbook media developer RME based. Study This carried out on March 28 2023 at SD Muhammadiyah 1 Bawean. Types of research This is study development with using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model developed by Robert Maribe Branch (2009)(dalam Ratnasari, 2020)

1. Analysis Stage

At stage This researcher do analysis moreover formerly For get existing information at school. Stage analysis This includes 3 studies, namely :

- a. Needs analysis

  Analysis need done for know needs that exist in the school at the time learning taking place. Analysis This done with method observations and interviews at SD Muhammadiyah 1 Bawean in class IV by researchers. For results Analysis need This done at the time learning mathematics, where moment teacher learning only using teaching media in the form of book. On analysis need This researchers too do non-formal interview with the teacher regarding “what moment learning Once use other learning media ?” and the teacher answered “not yet Once”. Observations made by researchers at the time learning mathematics find that ongoing learning not enough give rise to liveliness on participant educate. Based on results on researcher conclude that necessity something possible innovation interesting participant educate for active in learning.
b. Analysis curriculum

Analysis This used For identify the current curriculum model implemented at SD Muhammadiyah 1 Bawean. Based on observations made researcher to device learning at SD Muhammadiyah 1 Bawean as well as interview towards teachers obtain results that SD Muhammadiyah 1 Bawean Still use 2013 curriculum. From the book mathematics participant educate No explained stages in solution problem with Correct.

Analysis curriculum this can also be done help researcher For can develop appropriate media with KI and KD in the 2013 curriculum. Application of scrapbook media RME-based will implemented in 1 lesson with use reference for the 2013 curriculum RPP.

c. Analysis participant educate

Analysis participant educate carried out by researchers To use For know How behavior participant education and abilities solution problem participant educate to problem mathematics. Based on observations made researcher that moment learning participant educate listen to the teacher but No all participant educate can solve problems with correct stages. Participant educate can answer problem with correct answer However No use stages solution problem.

2. Design Stage

At stage this, researcher choose material in accordance with KI and KD curriculum 2013. Materials included in Customized scrapbook between implementation study with material ongoing learning at school. Election material This is also customizable with existing problems moment learning taking place. Materials listed in this Scrapbook media is material multiplication that discusses stages solution related problems with get up flat square, square long and triangular.

At stage this researcher make Scrapbook media design with determine size paper, color, content / material and writing. This Scrapbook Media made with exists a number of sections, namely front cover, information (KI, KD and Indicators), content / material discussion multiplication, content / material discussion get up flat, task and back cover. This scrapbook media design made through Canva online application.

3. Development Stage

Stage development This is stages Where media design developed become goods So. This Scrapbook Media will shaped like book print. Scrapbook media RME-based material multiplication A4 size, ivory paper which has Power stand strong and good absorb ink. Existing goods/media made will validated moreover formerly so that the media is created can implemented moment learning. Media validated into 2 criteria, namely : media validation and validation material.

Media is validated by 2 validators for each criterion. The assessment carried out by the validator will calculated in a way together, so 2 results the validator's assessment will get 1 mark end. The instrument for this validation is a validation sheet created by the researcher. The following aspects will be assessed by the validator: media validation (physical/visual, media practicality, power pull media and power media hold) and material validation (Scrapbook material, language and presentation).

RME-based scrapbook media obtains multiplication material mark from validation media expert I and media II (PGSD lecturer at Muhammadiyah Gresik University) totaling 123. The media validity value is calculated with use formula \( P = \frac{\sum x}{N} \times 100\% \)which means the value 123 divided by 150 times 100%. So the results obtained from this calculation are 82% in the "Very Good" category. Material validation was carried out by PGSD lecturers at Muhammadiyah University Gresik (validator I) and teachers at SD Muhammadiyah 1 Bawean (validator II) with the total scores obtained as big as 83. The media validity value is calculated with use formula \( P = \frac{\sum x}{N} \times 100\% \)which means a value of 83 divided by 100 times 100%. So the results obtained from calculation the is 83 % with “Very Good” category.

4. Implementation Stage

Stage implementation done after do development and validation towards Scrapbook media RME based. Stage This done For know How response participant educate / value practical towards Scrapbook media RME based. At stage implementation of scrapbook media based on
RME material multiplication applied in 1 lesson. When you first learn participant educate given problem contextual. Where participant educate can answer problem with Correct. However, No with use step solution problem. In stages, This researcher guide participant educate For can use step solution problem until participant educate understand. After delivery material participant requested for give the response towards scrapbook media RME-based material multiplication on the sheet questionnaire given. Questionnaire sheet given with objective For know mark practical media.

Table 4. Results of Student Response Questionnaire

<table>
<thead>
<tr>
<th>No</th>
<th>Question</th>
<th>SS</th>
<th>S</th>
<th>K.S</th>
<th>T.S</th>
<th>STS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I understand existing material in Scrapbook media</td>
<td>4</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>I understand step solution problem</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>I understand example question solution problem</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>I find the medium easy carried and used</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>I find the medium easy saved</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>I feel media size too small</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>I feel the media uses composition appropriate color</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.</td>
<td>I'm involved active in learning mathematics</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9.</td>
<td>I found linkages question with problem in life daily</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10.</td>
<td>I am pleased Study using Scrapbook media RME based</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>57</td>
<td>40</td>
<td>6</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

Information:
SS = Strongly agree (score 5)
S = Agree (score 4)
K.S = Disagree (score 3)
T.S = Disagree (score 2)
STS = Absolutely not agree (score 1)

From table 4 obtained results questionnaire response participants educate towards Scrapbook media RME-based. Acquisition results This will calculated with use formula, as following:

\[
P_D = \frac{(5 \times SS) + (4 \times S) + (3 \times K.S) + (2 \times T.S) + (1 \times STS)}{(5 \times \Sigma n) \times \text{jumlah peserta didik}} \times 100\% \\
P_D = \frac{(5 \times 57) + (4 \times 40) + (3 \times 6) + (2 \times 6) + (1 \times 11)}{(5 \times 10) \times 12} \times 100 \\
P_D = \frac{285 + 160 + 18 + 12 + 11}{600} \times 100\% 
\]
Based on calculation with formula the show that Scrapbook media RME- based acquiring mark percentage of 81% with "Very Good" criteria. These results has fulfill criteria evaluation ≥ 61%. For can stated that Scrapbook media RME- based has mark practical / responsive positive according to (Alfiansyah & Hakiky, 2021). In other words, Scrapbook media RME based earn response positive from participant educate fourth grade at SD Muhammadiyah 1 Bawean.

5. Evaluation Stage

Stage final from study development with the ADDIE model is stage evaluation. Criteria in do evaluation towards the media, namely if evaluation from validators (media and materials) no reach percentage value that has been determined as well as repair in accordance comments and suggestions from validators (media and materials). RME material based scrapbook media multiplication This has obtain very good assessment from validator (media and material), then evaluation This done in accordance with validator comments and suggestions. Following evaluation / improvement of media based Validator comments and suggestions:

Evaluation obtained from media expert ie cover front of Scrapbook media can added identity level school, writing in the media too small and editorial sentence not enough clear. Evaluation obtained from expert material is start book with information (KI, KD indicator funds), provide activity Where participant educate can follow using scrapbook media, subtitles explained. That suggestion given by experts material I, where researcher Already revise the scrapbook media so that obtain more assessment good and can tested field. Comments on suggestions provided by experts material II is scrapbook media based on this RME will more Good If reproduced / enlarged so Can used together.

Discussion

Study This produce learning media Where Instructional Media Alone is tool help in learning For stimulate mind and skills participant educate so that push activity conducive learning (L. Pratiwi et al., 2018). Instructional Media Alone own Lots type form as stated by Sulaiman (in Toni et al., 2017) that learning media there are audio, visual, audio-visual, audio motion visual, audio still visual and semi-motion audio. Instructional Media made in accordance with need moment learning or material learning.

In research This is the learning media created is a visual medium, ie form book. Visual media itself also has it Lots one of a kind for example is Scrapbook media. Scrapbook media is a learning media that is made from results creativity in paste images, writing and decorations that contain material learning and can interesting participant educate For follow learning. Learning media can also be done mixed and matched with approach learning for example is RME (Realistic Mathematics Education) approach. According to Freudhental (in Pratiwi & Rahmawati, 2022) the RME approach is linking approach mathematics with reality Because mathematics is activity man so that must near with participant educational and relevant with life real. Based on presentation above can said that researcher do Scrapbook media development RME -based material multiplication. In research development This researcher using the ADDIE model which goes through 5 stages, namely stage analysis (analysis), stage planning (design), stage development (development), stage implementation (implementation), and stages evaluation (evaluation).

At stage analysis researcher analyze 3 aspects that is analysis needs, analysis curriculum and analysis participant educate. Of the 3 analyzes carried out by researchers can concluded that learning mathematics that occurs in class IV of SD Muhammadiyah 1 Bawean Not yet Once using learning media others, learning taking place not enough active, participant educate Can finish problem However No with use stages solution problem with correct and stages solution problem No included in book participant educate.

Based on acquisition analysis the researcher motivated For make something matter Where can help teachers in explain stages solution problematic and interesting participant educate For active
in learning, that is with developing Scrapbook media RME-based material multiplication, with hope got it in line with opinion (Afifah & Rahmawati, 2022) that state that use of Scrapbook media in learning can interesting liveliness Because perceived use unique and new for participant educate. This media is also expected can give understanding to participant educate in understand problem caused existing material / problems in accordance with environment around participant educate. Scrapbook Media RME-based is also gaining almost result The same with research conducted by Shalsa Misherina Pratiwi and Ika Rahmawati in 2022.

After do analysis and determine what media will be developed so researcher do the second stage, namely stage planning or design. Stage planning or design This carried out by researchers with a number of stages that include p selection material For material scrapbooks, m planning content / design of Scrapbook media and making prototypes as well do guidance. Election material done For adapt with KI, KD used at SD Muhammadiyah 1 Bawean. Stage designing content / design of scrapbook media is carried out For designing about size, color, writing and layout / order material. Stage furthermore is create a suitable prototype design created with objective know the form of media that will be developed before validated as well as help For do guidance with lecturer.

Scrapbook media development process RME-based material multiplication next with stage development or development, where at stage this is the media created in accordance with design created then validated For obtain evaluation from media and materials expert so that media can used in learning. Scrapbook media based on this RME obtain very good assessment in validation tests Good from media expert with 82% and expert assessment material with assessment 83%. Stage furthermore after development with obtain very good assessment so the media can implemented or used in classroom learning.

At stage implementation of scrapbook media based on RME material multiplication applied in 1 lesson. When you first learn participant educate given problem contextual Where participant educate can answer problem with Correct However No with use step solution problem. In stages This researcher guide participant educate For can use step solution problem until participant educate understand. After delivery material participant requested For give the response towards scrapbook media RME-based material multiplication on the sheet questionnaire given. Questionnaire sheet given with objective For know mark practical media. Results obtained from distributed questionnaire showing that scrapbook media RME-based material multiplication get response positive from participant educate, p that seen from results calculation Where obtain the value of 81% is included in very good qualifications.

Stage final in the ADDIE development model is stage evaluation. Stage evaluation This is stage where the Scrapbook media is based on RME given evaluation from in terms of media and materials so it is very valid/very good For used media developed by researchers has obtain very good rating. Media evaluation is also carried out based on comments and suggestions from media validators and material validators.. For example like the writing on the material too small, no There is information level school covered by the media, several editorial missing sentences clear, added information (KD, KI, indicators and subtitles), yes added activity For paste to the media or make scrapbook media too. Rating result towards this RME-based scrapbook media The same with the results obtained researcher previously Where You're welcome get valid/very good results For used. Stage evaluation this is also done to participant educate For know response given participant educate, where the results / responses given participant educate towards this RME-based scrapbook media is response positive.

4. CONCLUSION

Based on results research, then learning media is obtained Scrapbooks RME-based material multiplication class IV. Following conclusions obtained from results study This: The process of developing this Scrapbook media done in accordance with the ADDIE development model developed by Robert Maribe Branch (2009)(dalam Ratnasari, 2020) through 5 stages, namely: analysis, stage planning (design), stage development (development), stage implementation (implementation), and stages evaluation (evaluation). Development of Scrapbook media based on RME material multiplication This developed so that obtain Very good results and response positive.
Scrapbook Media RME-based material multiplication developed by researchers validation tests were carried out. Validate this media tested by media experts and experts material. this medium said to be very valid/very good Because the results obtained from media experts are 82% and experts material get acquisition score by 83%. Response participant educate towards Scrapbook media RME-based material multiplication show response positive with acquisition mark by 81%. Response participant educate This obtained from distributed questionnaire to participant educate

Based on from results research, then researcher give advice as as follows: For teachers, yes utilize media as tool help in learning and can innovate create media that can used in learning in accordance with material learning for researchers Next, if the media is created size small (book) moment learning Can reproduced in accordance with amount participant educated in class, as well as in making questionnaire response participant educate give question that obtains high value so that obtain high calculation.

REFERENCES


