The Effectiveness of Teaching Materials for Graphic Organizers in Reading in Elementary School Students

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Abstract. A teacher must be able to develop teaching materials in learning because it is a professional demand that can provide meaningful and enjoyable learning. The purpose of this study was to describe the effectiveness of developing graphic organizer teaching materials in reading in grade 4 of elementary school. The graphic organizer is a learning media used to read learning. This is a development research with consisting of 4 stages namely defining, designing, developing, and disseminating research results. Aspects namely need analysis and student analysis. In needs analysis, some analyzes were carried out covering curriculum, concepts, and assignments. While in the analysis of students looking at the suitability of teaching materials developed with the level of development of students. The design phase of teaching materials was made to plan the implementation of learning indicators, the average indicator was 95, and the learning objectives aspect was 93. The development phase was tested in SDN 38 Kota Pekanbaru with an average reading ability of 87.5, so it can be concluded that the effectiveness of teaching materials for graphic organizer in reading is very decent to use.

Keyword: Graphic Organizer, Reading, Teaching Material

1. Introduction

Reading and writing are the most important children's skills in elementary school, these skills are developed after the child enters formal education. Reading plays an important role in understanding a reading given by the teacher, not just limited to Indonesian text but generally in the form of other subject texts (Kurniaman, 2018). The ability to read and write at the elementary school level is part of language skills. Language is a means to acquire knowledge and at the same time part of the culture, as well as means
of communication (Magfirah, 2018). Language limits are the limits of the world. The reading experience of those who are literate in more than one language is highly complex. This makes the reading experience a phenomenon that is not easily understood (Chong, 2017). In the process of reading for understanding are divided between low-level understanding and high-level understanding (Grabe et al., 2011). Low-level understanding involves linguistic processes such as word recognition, syntactic parsing, and semantic formation while high-level understanding includes mental processes such as joining information to form the meaning of text, inference, interpreting and evaluating text in accordance with the purpose, filling, and expectations of the reader background (Susani, 2018). Basically, at low-level understanding, readers identify and retrieve information in the text and use their linguistic knowledge to make meaning and simple interpretations of words, phrases, and sentences (Khamkhong, 2018). Reading is essentially not only getting information in a text, but reading is an activity or cognitive process in the form of finding information and being able to re-disclose information obtained in a reading text (Kurniaman, 2018). Reading and graphic organizers are very closely related to students understanding of reading texts. There are many different forms of graphic organizations are made, including diagrams, flowcharts, concept mapings, semantic maps, and some other schematic designs. In addition, the characteristics also vary from each Graphic Organization. However, all forms of Graphic Organizer have several geometrical shapes (lines, flat shapes), text, images, etc. All of that, there are 4 basic formatting formats, namely hieraki / network trees, concept / spider maps, sequence / fishbone maps, and circles maps (Miftah et al., 2016). Teaching students in reading must build background knowledge, preview and predict, retell and summarize, ask questions, use organizers of graphic organizers, engage in inferential reasoning, clarification of vocabulary, visualize, and/or monitor understanding can improve students' understanding (Swanson, et al. 2015). Reading is also able to develop critical thinking which signifies student intelligence (Sobkowiak, 2016).

Graphic organizers have proven to be powerful teaching and learning tools that can help students grasp new concepts and save valuable time for teachers. they provide a strong visual picture for students and support their ability to learn facts, information, and new terms (McKnight, 2013). When readers make a prediction, they use what they know about the text and their prior knowledge to figure out what will happen next in the story or what a character might do. Explain to students that making predictions is what good readers do because it helps them to think hard about the story and to get to know the characters. Tell them that when they make predictions, they are detectives, using many clues to help form a hunch. Students can use the title, the illustrations, and the text as evidence to support their predictions. High-level thinking occurs when students find support for their predictions because they have to choose explicit and inferred details. After reading, ask
students to confirm their predictions and adjust them if what they thought did not match the text (Robb, 2003). Graphic organizers, also named as visual maps, enable the use of skill areas of the brain entirely, help overcoming the information load and allow the information and resources to be collected in one place. Besides, they increase creativity providing flexibility in thinking and help the individuals perceive the information entirely. Moreover, they clarify the thoughts by means of relationships and organization, help the individuals solve problem, make decision and go into action and also they develop memory and comprehension (Kansızoğlu, 2017). Graphic organizers have been classified into five major categories according to their structures: ‘‘star web, chart matrix, tree map, chain, and sketch. Graphic organizers have also been classified into eight categories according to their purposes for learning (Sam et al., 2013). This organizer can be used to help students improve their research and problem-solving skills. students are trained to plan their research and investigation of a topic and thus promote their ability to learn and think independently (Buehl, 1995).

A teacher must be able to make teaching materials to provide students with tools to help students on the path to higher achievement in their reading comprehension. Development of teaching materials to create a learning atmosphere for students (Suarman, et., al, 2018). Graphic organizers that target elements of critical and creative thinking help develop students in their ability to understand and understand the meaning of a text. The advantages of developing graphic organizer media-based teaching materials for students can organize information in a good way, can easily summarize information, focus on relationships between information, express their opinions easily, and be able to make an overview of the main topics (Davies et al., 2002). Reading requires the relationship of other variables that support learning (Lu et al., 2015) reading comprehension is a different skill according to each individual, depending on intelligence, and cultural background (Torres, 2009). Teachers’ teaching efficacy consisting of teacher’s efficacy in providing effective instructions and giving special attention (Kristiana et al., 2018). The development of teaching materials is a professional expertise of teachers in teaching so that they are able to facilitate learning in accordance with the learning objectives. Developing teaching materials requires the cognitive abilities of a teacher in analyzing curriculum, indicators and learning objectives (Prihandoko, et al, 2018). The teacher factor matters to students’ learning and teacher quality is a crucial factor in promoting effective learning (Wichadee, 2010). Empirical studies have consistently shown that teacher quality is an important feature of schools that drives students’ achievement (Ali, et al. 2016). A teacher must also be able to be in pedagogic competence as one of the abilities in managing learning, so as to be able to create creative learning (Moradkhani, 2017). Children's preparation in cognitive, social, and language is different, to prepare for a very important future (Chairilsyah et al., 2018). Therefore
the development of graphic organizer teaching materials must be able to develop children's cognitive, social, and language so that the purpose of this study is to describe the effectiveness of developing reading teaching materials with a graphic organizer in class 4 elementary school.

2. Methodology

This study used a type of development research or commonly known as developmental research. Development research can be interpreted as a series of processes or steps to develop an effective product and in the form of learning materials, media, learning strategies to be used in schools, and not test theories (Sugiyono, 2012). This research develops teaching materials to read understanding of media-based graphic organizers in class 4 of elementary school. The development model used refers to the 4-D model which consists of 4 stages, namely define, design, develop, and disseminate. The following are explained the steps taken in the development of teaching materials to read the understanding of media-based graphic organizer in class 4 elementary school (Thiagarajan et al., 1974).

Define Stage

In the context of developing teaching materials the defining phase is done by: Curriculum analysis is to examine the current curriculum, namely the Kurikulum Tingkat Satuan Pendidikan (KTSP). The analysis carried out is useful to determine the competencies that will be developed into a teaching material design, from the results of the analysis the researcher establishes basic competencies and makes indicators of learning achievement. As well as analysis of the characteristics of learners, things that are taken into consideration are the academic abilities of class 4 students of elementary schools, in relation to the development of these teaching materials, the academic abilities of fourth grade students of elementary schools need to be known to compile teaching materials that are appropriate to the level of thinking ability of class 4 students. After analyzing the curriculum with what is suitable with the development of class 4 students, continued by analyzing the material by identifying the main material that will be developed, collecting, and selecting relevant material, and rearranging it systematically. The material that the researcher chose to use in the development of teaching materials reads the understanding of media-based graphic organizers in accordance with the material in class 4 elementary school. The next stage of converting the results of the analysis at the material analysis stage became a more specific goal of developing teaching materials for reading understanding of media-based graphic organizers in class 4 elementary school.

Design Stage
At this stage the teaching material was designed to read media-based graphic organizer understanding. Things that are done at this stage are: a) Compile a criteria test, design test questions as an action to find out the ability to read comprehension. b) Selection of media that is appropriate for the purpose, using teaching materials to read the understanding of media-based graphic organizer that researchers have developed namely teaching materials. The researcher includes the initial design of teaching materials with media graphic organizer. The product which is the initial design of teaching materials is called draft I. c) Selection of the form of presentation of learning, learning activities will be carried out by following the syllabus guidelines and RPP that the researcher designs. At the time of learning activities researchers will use teaching materials with media graphic organizers that researchers develop.

**Develop Stage**

This development phase of teaching material for graphic organizers in reading in elementary schools consists of two stages that must be carried out, namely:

a) **Expert appraisal**
   Is a technique to validate or assess the feasibility of product design or in this study assessing the feasibility of teaching materials that have been designed by researchers. In this study involved four validators who mastered the substance of class 4 reading ability of elementary schools, learning media, language and the teacher class 4 of SDN 38 Pekanbaru. In this study the validator aims to validate or test the feasibility of class 4 reading teaching materials. Validator examines the feasibility of teaching materials from didactic, construction, and technical requirements as well as provides advice on deficiencies that are still present in teaching materials that aim to further refine the teaching materials that researchers develop.

b) **Developmental Testing**
   Is a trial activity of teaching material on the target of the real subject. In this study the trial was limited to one class, namely class 4 at SDN 38 Pekanbaru. Before conducting a trial of teaching material products students are first given a test to find out the students' initial knowledge of the material to be studied. After the test is given a trial product teaching materials are carried out with students observing and discussing the activities contained in the teaching material, and students fill out the response questionnaire provided by the researcher as an assessment of teaching materials. The results of this trial are to find out whether the instructional material developed is good for use by class 4 elementary school students. After a trial of the product, a second test is conducted to find out the students' understanding of the material that has been studied using the teaching materials that the researchers developed.
Disseminate Stage

Dessiminate stage in three activities, namely validation testing, packaging, diffusion and adaption. But at this stage researchers only conduct validation testing activities. The stage of validation testing, the revised product at the development stage is then implemented on the real target which aims to get a response to the teaching material that the researcher develops. Dissemination was carried out in class 4 at SDN 38 Pekanbaru and teachers at SDN 38 Pekanbaru.

Data Collection Technique

Data collection techniques used in this study are 1) Questionnaire, before the questionnaire is disseminated, it is validated to the validator namely instructional media experts, reading material experts, language experts, and class 4 teachers before conducting field trials. The aim is to get an assessment and input about the instructional material developed so that the teaching material is valid and worthy of limited testing. 2) Questionnaire on student responses, which are shared with students after students take part in learning using developed teaching materials. The purpose of using this questionnaire is to get student response data on teaching materials that will be used to determine whether or not the quality of teaching materials is good.

Data Analysis Technique

Data analysis techniques are the process of systematically searching for and compiling data obtained by organizing data into categories describing it into units, synthesizing, composing into patterns, choosing which ones are important and which will be studied, and making conclusions so that they are easy to understand by yourself or others. Descriptive analysis was used to analyze the qualitative data, while statistical analysis was used to analyze quantitative data, which was the calculation of the validation questionnaire scores, tests, and student response questionnaires. The data analysis is as follows:

Quantitative Data Analysis

Validation Data
The validation aspects assessed by the validator are made in the form of a rating scale. The type of scale that researchers use is the Likert scale. This Likert scale provides broadness to the validator in assessing the teaching material that the researcher develops. Questionnaire validation is determined by the average score given by the validator with a
predetermined score of 1-4. The categorization of assessments to be given by the validator is shown in table 1.

<table>
<thead>
<tr>
<th>Assessment Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Very Good</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Less Good</td>
</tr>
<tr>
<td>1</td>
<td>Not Good</td>
</tr>
</tbody>
</table>

The guidelines for calculating the percentage of questionnaire validator scores are as follows: \( Ps = \frac{n}{N} \times 100\% \)

Where:

- \( Ps \) = Score percentage
- \( n \) = Number of scores obtained
- \( N \) = Maximum score

The criteria for making decisions in the validation of teaching materials with media graphic organizers can be seen in Table 2.

<table>
<thead>
<tr>
<th>Average Interval Score (%)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>81 – 100</td>
<td>Very Decent</td>
</tr>
<tr>
<td>61 – 80</td>
<td>Decent</td>
</tr>
<tr>
<td>41 – 60</td>
<td>Enough Decent</td>
</tr>
<tr>
<td>21 – 40</td>
<td>Less Decent</td>
</tr>
<tr>
<td>0 – 20</td>
<td>Not Decent</td>
</tr>
</tbody>
</table>

**Analysis of Student and Teacher Response Questionnaire Data**

After obtaining student and teacher response data, the data is then searched for on average with a predetermined score of 1-4. Categorizing student and teacher responses is shown in Table 3.

<table>
<thead>
<tr>
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<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
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</tr>
<tr>
<td>3</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Less Good</td>
</tr>
<tr>
<td>1</td>
<td>Not Good</td>
</tr>
</tbody>
</table>

The guidelines for calculating the percentage of student and teacher response questionnaire scores are as follows: \( Ps = \frac{n}{(N)} \times 100\% \)
Ps = Score percentage  
n = Number of scores obtained  
N = Maximum score  
Student response scoring criteria can be seen in Table 4.

Table 4. Scoring Criteria of Student and Teacher Response

<table>
<thead>
<tr>
<th>Average Interval Score (%)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>81 – 100</td>
<td>Very Good</td>
</tr>
<tr>
<td>61 – 80</td>
<td>Good</td>
</tr>
<tr>
<td>41 – 60</td>
<td>Enough Good</td>
</tr>
<tr>
<td>21 – 40</td>
<td>Less Good</td>
</tr>
<tr>
<td>0 – 20</td>
<td>Not Good</td>
</tr>
</tbody>
</table>

3. Results and Discussion

The results of this study will be presented on the development of teaching materials for reading media-based graphic organizers in class 4 elementary school. Based on the stages of development, the description of the research results is divided into 4 parts: the defining stage, the design stage, the development phase, and the development stage. A teacher must and is able to develop teaching materials as one proof of professionalism in teaching. Creating or developing teaching materials must be able to analyze the curriculum, concepts, and tasks that we will develop in making teaching materials. Curriculum analysis is carried out with Indonesian language learning goals about reading. Curriculum analysis is carried out to see the material coverage, the objectives to be achieved from learning, and the Indonesian language learning strategy, especially reading skills that we will develop using a graphic organizer so as to be able to develop the content of teaching materials, for learning graphic organizers are able to bridge reading comprehension. The curriculum that will be developed still uses Kurikulum Tingkat Satuan Pendidikan (KTSP) which will be used in class 4 elementary school. It will be seen in the making of competency standards, basic competencies and learning objectives will be seen in the Figure 1.

After analyzing the curriculum that matches the reading comprehension material, a standard with basic competency appears. This curriculum analysis must be matched with indicators that support learning achievement so that it is formulated into three indicators in the development of teaching materials. Based on the analysis of competency standards, basic competencies, indicators of achievement of competencies, and learning objectives, the researcher then compiled reading instructional materials with media-based graphic organizers in the form of Learning Implementation Plans, and teaching materials. Next, read the text to look for words that are
poorly understood by students by searching for the meaning of the Indonesian dictionary, the main thoughts, and writing down the information obtained based on the text read. With these stages, students are expected to be able to comprehend the content of reading texts comprehensively so that they can improve their skills in understanding the content of the reading appropriately.

Teaching materials needed by the teacher to facilitate in presenting reading learning in class 4 elementary school and facilitate students to absorb information from text that is read optimally. Teaching materials are adapted to the standards of competence and basic competencies established by the curriculum, then arranged according to the reading stage and graphic media organizer. Teaching materials developed are adapted to the characteristics of student development. Teaching materials on teaching materials are developed referring to the results of the analysis of competency standards and basic competencies as well as the indicators that have been formulated. Next, designing the tasks that will be done by students, firstly given a discourse that students will read with the text will be Long according to the competency standards and basic competencies that will be developed. The presentation in the discourse that students will read is shaped like a house using a graphic organizer that gives an idea of what will be discussed in the next text. At the top before the discourse, there are instructions for students what will be done in reading the discourse. Presentation of images or discourse designs such as homes to give an idea of the greenhouse effect. The exercises or tasks contained in this teaching material are an exercise in
the reading process, which consists of pre-reading, reading, and post-

Validation of Teaching Materials

The instructional material designed is then validated by the validator. Validation was carried out by three validators from universities and three from elementary school teachers. In this activity, experts and practitioners are asked to assess the teaching materials that have been made. Assessment includes content, presentation, and language. The validator is asked to provide an assessment as well as suggestions for improvements to the learning plan, and the instructional materials that have been designed. Validators chosen by researchers are experts in the field of Indonesian language and experts in the field of basic education. Before making the instrument validated by experts to determine the feasibility of the instrument, then the instructional materials are designed by analyzing the curriculum, students will be used as limited distribution, and Learning Implementation Plans analysis as material for practice in the field.

Validation of Learning Implementation Plans

Validation of the implementation of the shopping plan is an action taken by a validator to measure the extent of conformity to several aspects including identity, competency standards, basic competencies, formulation of indicators, formulation of learning objectives, selection of learning materials, selection of sources and learning media, preparation of learning activities and assessment.

<table>
<thead>
<tr>
<th>No</th>
<th>Rated aspect</th>
<th>Average %</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Suitability of indicators with basic competencies</td>
<td>100</td>
<td>Very Decent</td>
</tr>
<tr>
<td>2</td>
<td>Using clear operational verbs</td>
<td>95</td>
<td>Very Decent</td>
</tr>
<tr>
<td>3</td>
<td>Formulation of indicators from a simple level to a complex one</td>
<td>90</td>
<td>Very Decent</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>95</td>
<td>Very Decent</td>
</tr>
</tbody>
</table>

The average validity of the indicator formulation aspects in Learning Implementation Plans is 95 with very valid categories. This means that the indicators formulated are in accordance with Basic Competencies, have used clear operational verbs and indicators have been formulated from simple levels to complex ones. The formulation in the implementation plan of learning is very important to implement learning by using graphic organizer teaching materials, seen from the suitability of indicators with
basic competencies in the appropriate curriculum. Furthermore, validation of aspects of learning objectives contained in teaching materials that are in accordance with the implementation plan of learning that is based on the curriculum. Validation results will be seen in Table 6.

Table 6. Learning Implementation Plans Validation Results for Aspects of Learning Objectives

<table>
<thead>
<tr>
<th>No.</th>
<th>Rated aspect</th>
<th>Average %</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The formulation of learning objectives does not lead to multiple interpretations</td>
<td>90</td>
<td>Very Decent</td>
</tr>
<tr>
<td>2</td>
<td>The formulation of complete learning objectives meets the criteria A = Audience B = Behavior C = Condition D = Degree</td>
<td>98</td>
<td>Very Decent</td>
</tr>
<tr>
<td>3</td>
<td>Formulation of sequential learning goals logically from the easy to the difficult</td>
<td>90</td>
<td>Very Decent</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>93</td>
<td>Very Decent</td>
</tr>
</tbody>
</table>

Based on table 6 after the figures are analyzed, it can be seen that the three statements on the formulation aspects of learning objectives have a range of values from 90 to 98 which are in the very feasible category. Whereas for the average validity aspect of the formulation of learning objectives is 93 with very feasible categories. This means that the learning objectives that have been formulated have met the appropriate criteria, namely the formulation of learning objectives does not cause multiple interpretations, the formulation of learning objectives has met the ABCD criteria, and the formulation of learning objectives has been logically sorted from easy to difficult. The next aspect assessed is teaching material.

**Teaching Material Practicality Test Results**

After the teaching material is declared valid, the next step is to do a trial to find out the practicality and effectiveness of the instructional material developed. The trial was conducted on class 4 students of SD Negeri 38 Kota Pekanbaru. The trial was carried out 3 times of learning for the material "Finding the Text of the Mind A bit Long". The practical teaching material developed can be seen from the observation sheet of learning implementation plans implementation, the results of the practicality questionnaire analysis by the teacher and students, observation of the use of teaching materials by students, and the results of interviews with the teacher. The learning implementation plans implementation observation data is focused on seeing whether learning is carried out in accordance with the learning implementation plans that is developed and see if there are
obstacles in its implementation. Observation data on learning implementation plans implementation was taken from observation sheets obtained from two observers at each meeting. In summary, the results of observation of the implementation of the learning implementation plans can be seen in the following Table 7.

Table 7. Results of Observation on the Implementation of Teaching Materials

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Percentage of Observer Assessment (%)</th>
<th>Average (%)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>T1 82 T2 83</td>
<td>82.5</td>
<td>Very Good</td>
</tr>
<tr>
<td>II</td>
<td>T1 87 T2 89</td>
<td>88</td>
<td>Very Good</td>
</tr>
<tr>
<td>III</td>
<td>T1 91 T2 93</td>
<td>92</td>
<td>Very Good</td>
</tr>
<tr>
<td></td>
<td>Percentage of Practicality</td>
<td>87.5</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

Based on Table 7, it can be stated that the implementation of learning implementation plans at meetings I, II and III is in a very good category with a total average percentage of 87.5. Based on the results of the average implementation of the learning implementation plans, in general the implementation of reading learning using a graphic organizer is carried out according to plan.

This means that the language used in teaching materials is in accordance with the rules of the Indonesian language that is good and true and easy to understand. The results are obtained after improvements are made to the teaching materials related to the use of effective sentences and the use of language adapted to the level of development of students. A teaching material can be said to be effective if it has an effect or good influence on the achievement of learning objectives. The effectiveness of the learning process is characterized by the following characteristics: (1) successfully leads students to achieve instructional goals that have been set, (2) provides an attractive learning experience, actively engages students so as to support the achievement of instructional goals, (3) have facilities that support the learning process (Scida & Jones, 2017). The effectiveness test is done after the product is declared valid and practical. The development of this learning process requires the ability of teachers in delivering the material, so that the teachers emphasize the knowledge related to daily teaching practices (Nasir, et al, 2018). The effectiveness of teaching materials in this study can be seen from the assessment of learning outcomes and activities of students during the learning process, namely in the form of assessment of reading skills and character of students after using the resulting teaching materials. Based on the results of the effectiveness test at the development stage shows the average assessment results for reading skills have shown a good percentage.
4. Conclusion

This research is a research on developing reading material based on graphic organizer for class 4 of elementary school. Based on the development, trial, and limited distribution carried out, researchers can conclude several things, as follows: 1) Reading material based on the graphic organizer in the form of learning implementation plans and teaching materials produced in this development research is very valid in terms of content and construct. Then the implementation plan of learning and teaching materials produced in this development research can be stated practically in terms of implementation and usage. 2) Reading material based on the graphic organizer in the form of learning plans and teaching materials produced in this development research has been declared be effective for student reading skills.

References


