

The Development of Teaching Materials Using Local-Based Through Guide Inquiry Learning Model to Improve Learners' Critical Thinking Ability in Fourth Grade Elementary School

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Abstract

This study aims to develop module of teaching materials local-based through guided inquiry learning to improve critical thinking skills, test the effectiveness, and the difference in the average value of posttest and critical thinking skills. The subject of this research is the fourth grade students of Elementary School 1 Kota Raman. The instruments that used were tests and observation sheets to measure student learning outcomes and critical thinking skills. The final product of this research is teaching material as a module that has been validated by material experts, media experts, and linguists. The results showed that the materials developed could be used in curriculum 2013 which is effective in improving critical thinking skills, and the average of posttest score and critical thinking ability of students who use local-based teaching materials through guided inquiry learning model is higher than the average posttest score and critical thinking ability of students who do not use local-based teaching materials through guided inquiry learning models .

Keywords: teaching materials, locality, guided inquiry learning, and critical thinking

1. Introduction

Success in learning depends on the ability of the teacher in planning, determining the learning objectives of students, through the use of teaching materials or supporting tools and learning models to develop the potential of students. Teaching materials are an important component in learning. Teaching materials are needed as guidelines for activities in the learning process as well as a substance component that is taught to students. Through the use of teaching materials, learning programs can be carried out more regularly because teachers as education implementers will obtain clear material guidelines.

Relevant education must respect and develop local virtues, the values contained in a community can be a guide for schools in designing character education. Teaching materials are facilities used by the students to make direct contact with the environment and the cultural elements that they are learning by introducing local tourism through local-based teaching materials, because local tourism affects education, social, economic and cultural aspects. Nature provides a variety of learning resources that varies, it needs proper use in the form of packaging teaching materials and adapted to learning materials. The teaching material used in this study is a locality-based module, where the material contained in it contains the elements of local values so that students more understand the advantages of their area. In addition to raising local wisdom, this teaching material can be an alternative support for training critical thinking skills in students, so that students can easily understand a problem that they encounter in their daily lives.

Thinking activity is an activity that is always done by humans. As students, thinking activities are the main things that support the learning process, including critical thinking. According to Rajendran (2013: 20) critical thinking ability is a process of intellectual discipline activities by skillfully conceptualizing, implementing, analyzing, synthesizing, and evaluating information. Ennis in Demir et al. (2011: 547) defines that critical thinking as a reasonable and deep way of thinking when deciding what students do. In addition to the use of teaching materials, one way to improve critical thinking skills is to use the guided inquiry learning model.

According to Lee (2012: 5) guided inquiry learning is a series of teaching processes that determine simple practices by developing conceptual frameworks, models, and development rubrics as an important first step. The process of thinking and learning of students at this stage is largely through real experience that starts from the process of interaction of students with objects (objects) not with symbols, ideas or abstractions, in other words at this stage students have not been able to do abstract thinking processes so that it still needs teacher guidance. Based on this explanation, this study will develop local-based teaching materials with guided inquiry learning model.

The alternative that used in improving critical thinking skills is by (1) Producing local-based teaching materials through guided inquiry learning models for fourth grade of Elementary School students. (2) Producing local-based teaching materials through a guided inquiry learning model that is effective in improving the critical thinking skills of fourth grade of Elementary School students. (3) Determine the difference in the average score of posttest results and critical thinking skills between students who use local-based teaching materials through guided inquiry learning models with students who do not use local-based teaching materials through guided

inquiry learning models in fourth grade of Elementary School.

2. Method

The type of research that used in this study is a development research that refers to the development method of Borg & Gall (1983: 775) with steps: 1) Collection of research information, 2) Planning, 3) Development of initial product forms, 4) Trial initial stage, 5) product revision, 6) main field test, 7) product revision, 8) operational field test, 9) final product revision, and 10) dissemination and implementation. The subjects of the trial in this study were 3 validator lecturers, 10 students were testing the small group of Rantau Fajar in Elementary School 1. 20 students in the control group and 20 students in the experimental group in a large group trial of Elementary School 1 in Kota Raman.

The data collection stage in this development is by questionnaire, observation, and test. The data collection through questionnaires is aimed at the validation test of material experts, media experts, and linguists. Observation sheets are used to determine the improvement of critical thinking skills in the learning process, while the tests are used to determine the learning outcomes of students.

Data on the effectiveness of students is obtained from whether or not learning outcomes increase after using teaching materials. The effectiveness test is used to see student learning outcomes and critical thinking skills. Based on the effectiveness test using n-gain, it was found that the learning outcomes and critical thinking abilities of students who used local-based teaching materials through guided inquiry learning models were higher than the learning outcomes and critical thinking abilities of students who did not use local-based teaching materials through guided inquiry learning models. There is an increase in student learning outcomes before (pretest) and after (posttest) using local-based teaching materials through guided inquiry learning models.

Data on the effectiveness of the use of teaching materials was obtained from the pretest-posttest given to students in fourth grade A in Elementary School 1 in Kota Raman as an experimental group, and students in fourth grade B in Elementary School 1 in Kota Raman as a control group. The average n-gain of the two groups compared to which is greater.

The effectiveness test of teaching materials is analyzed using validity, reliability, power difference, difficulty level and normalized n-gain value analysis. Furthermore, the n-gain value is interpreted using normalized gain tables according to Sundayana (2015: 151).

Table 1. Normalized Gain Categories

Percentage	Interpretation
$-1,00 \leq g \leq 0,00$	There has been a decrease
$g = 0,00$	Permanent
$0,00 < g < 0,30$	Low
$0,30 \leq g < 0,70$	Medium
$0,70 \leq g \leq 1,00$	High

Test the difference using the t test formula (t-test). Difference test is used to determine whether or not there is a difference in the average score of posttest results and critical thinking skills between students who use local-based teaching materials through guided inquiry learning models with students who do not use local-based teaching materials through guided inquiry learning models in fourth grade of Elementary School. The hypothesis testing in this study uses the pooled variance t-test statistical formula as follows.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad (1)$$

Information:

\bar{X}_1 : Average value of data in sample 1

\bar{X}_2 : Average value of data in sample 2

S_1^2 : Sample standard deviation 1

S_2^2 : Sample standard deviation 2

n_1 : Number of sample members 1

n_2 : Number of sample members 2

Source: Sugiyono (2016: 273)

3. Results and Discussion

3.1 Research result

The results of this development study are local-based teaching materials through guided inquiry learning models. The material developed is the theme of the 8 areas where I live, the sub-theme of the uniqueness of the area

where I live is in fourth grade of Elementary School. The results of each stage of the development procedure are as follows:

3.1.1 Initial Information Collection

The initial stage of the research was carried out by collecting data in the form of information on the learning process of Elementary School 1 Kota Raman. This is used as a material for consideration and basic principles in the development of teaching materials based on the acquisition of empirical data on how the profile and subject to be studied.

Based on the results of preliminary research conducted in the form of interviews and questionnaires needs in September 2017 carried out on Principals and fourth grade teachers and students at Elementary School 1 in Kota Raman, North Raman District, East Lampung Regency, the initial data was obtained as follows: Elementary School 1 in Kota Raman already appropriate with the curriculum 2013 since the first curriculum 2013 was applied, the teaching materials used are in accordance with the curriculum 2013, but teachers only use printed books or textbooks purchased from publishers as the only source of learning, learning emphasizes more on memorization and has not optimized the ability students to build their own knowledge, have not used a varied learning model so that the learning activities of students tend to be monotonous, the teacher has not developed teaching materials that have local wisdom insight into East Lampung Regency as a means to introduce the local wisdom of East Lampung Regency to students. The students are only given exercises that are contained in the student's book, so that the students are less trained to think about solving problems.

Based on the results of the preliminary study, it is necessary to develop local wisdom-based teaching materials through guided inquiry learning models. Through the development of teaching materials it is expected to be able to improve the critical thinking skills of fourth grade students.

3.1.2 Planning

Planning local-based teaching materials through guided inquiry learning models include the preparation of teaching material frameworks, the preparation of material presentation sequences, and the preparation of evaluation tools.

3.1.3 The development of Teaching Materials

The follow-up of the draft at the planning stage, followed by steps to develop teaching materials. Preparation of teaching materials is based on aspects of content and presentation.

3.1.4 Initial Product Trial

Initial product trials were carried out by validating material, media and language aspects. Tests on material, media and language experts were validated through questionnaires by Lampung University lecturers. Material validation obtained a value of 91.96. Media validation gets a value of 95.45. Language validation has a value of 90.38. Validation Experts also provide advice and input on local-based teaching materials through guided inquiry learning models and make improvements according to recommendations for improvement of product validation results.

The suggestions and input from material experts include: learning steps in the module adapted to the stages of the guided inquiry learning model. Improve the instructions for using the learning module in accordance with the systematics of writing the module. Adding an assessment at the end of the competency test is adjusted to the module's systematic assessment. The suggestions and input from media experts include: the size of the letters in the module that is 12 with the font "Times New Roman". Change the module cover image with a more interesting image. Suggestions and input from linguists include: modules typed with type "Times New Roman" size 12 with spacing of 1.5. The table of contents is explained in more detail. Pictures are numbered along with information. The reading source is placed on the bottom right.

3.1.5 Product Revision

Based on the advice of the validator, the researcher corrected as suggested. Based on the test of material experts carried out several revisions, that is: adjusting the learning in the module to the stages of the guided inquiry learning model. Improve instructions for using learning modules in accordance with the systematics of writing modules. Adding an assessment at the end of the competency test is adjusted to the module's systematic assessment. Based on the media expert test, several revisions were carried out, that are: the font size in the module was replaced by size 12 with the type "Times New Roman". Change the module cover image with a more interesting image. Based on the linguistic test several revisions were carried out, that are: The table of contents was elaborated in more detail. Pictures are numbered along with information. The reading source is placed on the bottom right.

3.1.6 Small Group Trials

After making improvements that refer to suggestions and input from expert tests, the next is to try out small group products for 10 students in fourth grade at Elementary School 1 of Rantau Fajar which is representing high, medium, and low abilities. The results of small group trials to see the improvement of learning outcomes and students' critical thinking skills with tests and observation sheets.

3.1.7 Product Revision

Based on the results of small group trials, it was obtained an increase in student learning outcomes before and after learning using local-based teaching materials through guided inquiry learning model with a gain of 0.13 in the low category and an average critical thinking ability of 47.44 with enough categories well. It can be concluded that the local-based teaching material model of guided inquiry learning is not revised, and is feasible to be tested in large groups.

3.1.8 Large Group Trials

The subjects of the large group trial were the fourth grade A students and fourth grade B students in Elementary School 1 in Kota Raman. Fourth grade A as an experimental class and fourth grade B as a control class which is every class totaling 20 students. Before learning activities at the first meeting students first carry out the pretest and posttest at the sixth meeting. This is intended to see the effectiveness of local-based teaching materials through guided inquiry learning models in improving students' critical thinking skills. In addition to pretest-posttest questions, observation sheets are also used to see the improvement of critical thinking skills during the learning process.

3.1.9 Final Product Revision

The final product revision is done based on the results of hypothesis testing and findings in the field when the product is tested. Based on the results of hypothesis testing that has been done, it is known that the learning outcomes and critical thinking skills of students increase. There is a difference in the average gain and the ability to think critically between the control class and the experimental class, where the experimental class is higher than the control class so that it can be concluded that local-based teaching materials through guided inquiry learning model have achieved the development objectives.

3.1.10 Desimination and Implementation

The steps taken at this stage are only at the implementation stage, while dissemination is not carried out due to time and cost limitations. After the product is declared feasible to be used by validators of material experts, media experts, linguists, testing on small groups, and product revision stages, the product is implemented. The implementation phase of this product was carried out in a large group trial, namely the fourth grade students of Elementary School 1 in Kota Raman, totaling 20 students.

3.2 The effectiveness Test of Teaching Materials

The effectiveness of developing local-based teaching materials through guided inquiry learning models is seen based on the average gain. The following is a recapitulation of the results of large group trials.

Table 2. Recapitulation of learning outcomes of large group students

Experimental Class			Control Class		
Average	Progress		Average	Progress	
Learning 1	56	0	Learning 1	48,5	0
Learning 2	60,5	4,5	Learning 2	51	2,5
Learning 3	63,5	3	Learning 3	58	7
Learning 4	69,5	6	Learning 4	62	4
Learning 5	74,5	5	Learning 5	67	5
Learning 6	80,5	6	Learning 6	72	5
Pretest	57,25			56,25	
Posttest	78			69,75	
N-Gain	0,48		0,31		
Category	Medium		Medium		

Based on table 2. Recapitulation of learning outcomes of large groups is known that there is an increase in the results of pretest and posttest of students. The average gain in the experimental class is higher than the control class average gain. The average gain in the experimental class is 0.48 with the medium category and the average gain of the control class is 0.31 with the medium category.

Increasing the critical thinking ability of the experimental class is also higher than the control class. Increasing students' critical thinking skills can be seen in the following table.

Table 3. Increased ability of critical thinking of large group students

Experimental Class			Control Class		
Average value	Progress		Average value	Progress	
Learning 1	40,67	0	Learning 1	23,33	0
Learning 2	53,67	13	Learning 2	34,33	11
Learning 3	60	6,33	Learning 3	48,5	14,17
Learning 4	71,83	11,83	Learning 4	54,83	6,33
Learning 5	75	3,17	Learning 5	57,33	2,5
Learning 6	87	3	Learning 6	66,67	9,34
Total	388,17		Total	284,99	
Average	64,69		Average	47,50	
Category	Good		Category	Good Enough	

3.3 Difference Test

Based on the results of the calculation of the average difference test the results of the posttest results and the test of differences in critical thinking ability obtained t_{count} 3,423 and 3. To test the significance, the t_{count} value was consulted with t table with $dk = n_1 + n_2 - 2 = 20 + 20 - 2 = 38$, and a significance level of 0.05 was obtained the value of t table = 2.042. So that t_{count} the average value of the posttest result = 3.423 > t table = 2.042, and t_{count} critical thinking ability = 3 > t table = 2.042 then H_a accepted means that there is a difference in the average value of posttest results and critical thinking ability between students who use teaching materials local-based through the guided inquiry learning model with students who do not use local-based teaching materials through guided inquiry learning models in fourth grade of Elementary School.

4. Discussion

4.1 The development of Local-based Learning Materials through Guided Inquiry Learning Models

The teaching material product used is a local-based module, where the material contained in it contains elements of local values so that students more understand the advantages of their area. The content of the instructional material produced is associated with the local wisdom of East Lampung Regency using a scientific approach that is integrated with the guided inquiry learning model. The local wisdom of East Lampung Regency is inserted in the module in accordance with the Basic Competencies in the theme of the 8 areas where I live, the sub-theme of the uniqueness of the area where I live. The development of locality-based teaching materials adapts to the dimensions of knowledge proposed by Anderson & Karthwol (2001: 38), that are factual, conceptual, procedural, conceptual knowledge.

Factual knowledge that contains specific details and elements is knowledge of events, locations, people, dates, sources of information, and sort of thing. The factual knowledge contained in this teaching material in the form of the history of the establishment of East Lampung Regency, buildings or artifacts, regional dances, and tourist attractions.

Conceptual knowledge includes knowledge of categories, classifications, and relationships between two or more categories of knowledge that are more complex and organized. Procedural knowledge is knowledge about how to do something. Something starts from the problems that are often encountered until the problems are really new. Knowledge contained in teaching materials by giving students the opportunity to find out the impact of tourism or excellence in agriculture and plantations in East Lampung Regency on the lives of local people, as well as the relationship between regional dance movements with the concept of force and motion.

Procedural knowledge is often in the form of sequences of steps that must be followed, including skills, algorithms, techniques, and methods, which are generally known as procedures. Procedural knowledge includes knowledge about the criteria used to determine when to use certain procedures. Procedural knowledge is inserted in the material style and motion of objects that are associated with the local wisdom of East Lampung Regency, then students practice it to prove the effect of the force and motion of objects in accordance with the procedures contained in the teaching material. In addition to the material of force and motion, procedural knowledge is adapted to the motion of the dance area created by the students in accordance with the existing images.

The instructional material developed aims to make students understand the activities or conditions in the area where students live such as economic activities, tourist attractions, large mammals in Way Kambas National Park, the advantages of the agricultural and plantation sector, and regional dance from East Lampung Regency. This is in line with the results of Samah's research, et al. (2012) entitled "Factors Affecting Educational Tourism Development among Local Communities in the Klang Valley, Malaysia". The results of this study indicate that the socio-cultural, economic, and attitudinal effects of local-based education have an important role in citizen communication with international students, and produce several methodological and conceptual contributions to the understanding of local communities on tourism development to measure citizens' awareness and attitudes

towards tourism.

The stages of teaching materials are in accordance with the guided inquiry learning model. Six stages of the guided inquiry learning model are orientation, formulating problems, formulating hypotheses, collecting data, testing hypotheses, and making conclusions. The guided inquiry learning model is a guided learning model, it is teachers who provide problems and experimental steps to solve problems.

This guided inquiry learning model is suitable for the age of Elementary School students. This is because students will be actively involved in learning about concepts or a phenomenon through observation and data collection activities so that conclusions can be drawn. This is in line with the opinion of Colburn in Keengwe & Maxfield (2015: 240) inquiry into learning models of an environment where students are engaged in essential open-ended, student centered, hands-on activity.

This definition explains that the inquiry learning model involves students in open-ended activities, learner-centered learning, and hands on activity. Open-ended is the nature of openness in answering questions that direct students in answering problems with many ways to stimulate intellectual abilities and experience of learners in the process of discovering something new. Hands on activity refers to the involvement of students in digging up information and asking questions, doing activities and finding, collecting data and analyzing and making their own conclusions.

Although the quality of the material developed in local-based teaching materials through guided inquiry learning model only takes one sub-theme, it still does not reduce the value that local-based teaching materials through guided inquiry learning models are alternative innovations of good teaching materials for use in learning. Local teaching materials through guided inquiry learning model are companions to the material contained in the student books in curriculum 2013, because these teaching materials are designed and developed referring to student books and teacher books. The role of this teaching material is also a supplement that supports the learning process of students.

4.2 The Effectiveness of Local-Based Learning Material Development through Guided Inquiry Learning Models

The effectiveness of a teaching material in learning is seen from the increase or not of learning outcomes after using teaching materials. The effectiveness test is used to see student learning outcomes and critical thinking skills. Based on the effectiveness test using n-gain, it was found that the learning outcomes and critical thinking abilities of students who used local-based teaching materials through guided inquiry learning models were higher than the learning outcomes and critical thinking abilities of students who did not use local-based teaching materials through guided models. inquiry learning. There is an increase in student learning outcomes before (pretest) and after (posttest) using local-based teaching materials through guided inquiry learning models. The average n-gain of the experimental class learning outcomes is greater than the control n-gain average of 0.48 in the middle class in the experimental class and 0.31 in the control class.

The results of observations of critical thinking skills of students each class amounted to 20 students, in the experimental class there were 5 students (25%) with very good categories, 9 students (45%) with good categories, 6 students (30%) with a pretty good category, and there are no students with less categories. Then, in the control class there were 3 students (15%) with very good categories, 2 students (10%) with good categories, 15 students with good enough categories, and no students with less categories.

Increasing the critical thinking ability of the experimental class is also higher than the control class. This shows that the development of local-based teaching materials through the guided inquiry learning model is effective to improve students' critical thinking skills

In line with Suwarni's opinion (2015: 90) teaching materials are printed learning media that can be used to facilitate educators and students to improve their competence. In addition to teaching materials, the use of learning models also influences students' critical thinking skills. Based on the results of the study above the critical thinking skills of students who use local-based teaching materials through the guided inquiry learning model is higher than students who do not use these teaching materials, this is because a series of learning activities involve the ability of learners to search and investigate systematically, critical, and logical so they can find knowledge, attitudes, and skills through the stages in the guided inquiry learning model.

4.3 The differences in the average value of the results of posttest results and students' critical thinking skills

Based on the results of the calculation of the average difference test the results of the posttest results and the test of differences in critical thinking ability obtained tcount 3,423 and 3. To test the significance, the tcount value was consulted with t table with $dk = n1 + n2 - 2 = 20 + 20 - 2 = 38$, and a significance level of 0.05 was obtained the value of t table = 2.042. So that tcount the average value of the posttest result = 3.423 > t table = 2.042, and thitung critical thinking ability = 3 > t table = 2.042 then H_a accepted means that there is a difference in the average value of posttest results and critical thinking ability between students who use teaching materials local-based through the guided inquiry learning model with students who do not use local-based teaching materials through guided inquiry learning models in fourth grade of Elementary School.

This is in line with the results of Simonson & Shadel's (2013) study entitled "Implementing Process Oriented Guided Inquiry (POGIL) in Undergraduate Biomechanics: Lessons Learned by a Novice". The results of his research showed that the use of POGIL (Process Oriented Guided Inquiry Learning) not only increased the material interaction of students, but also the instructor's interaction, and increased student involvement, knowledge retention, and thinking skills and high-level applications.

5. Conclusion

The conclusions of this development research are the products produced in this study are local-based teaching materials through the fourth grade guided inquiry learning model, the theme of the area where I live, the subtheme of the uniqueness of the area where I live is designed based on the curriculum 2013 and the complexity of the area where students live. Local-based teaching material products that are produced through effective guided inquiry learning models for fourth grade elementary school students. There is a difference in the average score of posttest and critical thinking skills between students who use local-based teaching materials through guided inquiry learning models with the value of the posttest results of students who do not use local-based teaching materials through guided inquiry learning models in fourth grade of Elementary School. The results of the posttest and the critical thinking ability of the experimental group (fourth grade class A of Elementary School 1 in Kota Raman) were higher than the results of the posttest and critical thinking abilities of the control group (fourth grade class B of Elementary School 1 in Kota Raman).

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