Development of Etnosains Materials in 5E Cycle Learning Model Based on the Local Culture of Primary School Students

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Abstract

This development research aims to develop valid and practical Ethnoscience Teaching Materials in the 5E Learning Cycle Model based on Local Wisdom of Elementary School Students. This type of research is Research and Development, adopting the Plomp development model which consists of three stages in developing, namely (1) preliminary research or preliminary analysis, (2) the prototyping phase or the design stage, and (3) the assessment phase. Data collection in research is interviews and questionnaires / questionnaires. The data analysis technique uses a Likert scale. The results showed that the media validation was classified as good with a percentage of 76.85%. The result of language validation is good with a percentage of 71.43%. The results of the material validation category were very good with a percentage of 91.25%. Overall the results of the analysis and calculation of the questionnaire value from the expert team, Ethnoscience Teaching Materials in the 5E Learning Cycle Model based on Local Wisdom of Elementary School Students are in the very good category with a percentage of 80.33% meaning Ethnoscience Teaching Materials in the 5E Learning Cycle Model are based on Local Wisdom Elementary school students are valid and practical to use.
INTRODUCTION

Learning is the process of transaction and communication between teacher and student where the teacher acts as the educator and student as learner. Ethnoscience teaching, ideally, could actively involve students in learning. Students should be involved in various concrete activities in order to help the students to build the knowledge concept that is relevant to what they have learnt. Besides, students are required to be active and able to develop their thinking skill in problem solving. This activity could train students to be able to think scientifically.

Baker, et al (2017: 143) stated that when science learning in schools neglect the students’, they would consequently find it hard to comprehend the lesson or they only accept a part of the scientific concept taught during the learning. Cobern and Aikenhead (2016: 4) added that if the subculture of modern science is merged with the subculture of students’ daily life, science learning could strengthen students’ view on the universe that would lead to enculturation. When enculturation achieved, students scientific thinking in their daily life would improved.

Teaching material is a set of learning material that has been systematically arranged to be implemented in as well as to support the teaching and learning process. According to Prastowo (2013:16), teaching material is any kind of materials (information, tools, or text) that are systematically arranged and represent the whole image of the competence to be achieved by the students and utilized during the learning process to plan and examining the learning implementation. Considering the importance of teaching material, it is expected that teachers are able to do design and construct teaching material well. However, based on the analysis conducted on science learning at elementary schools, teachers merely teaching Natural Science subject merely by delivering what’s on a textbook that makes the learning tends to be teacher-centered.

Unfortunately, textbooks commonly do not provide the students adequate opportunities to figure out the concept they learn independently and directly explain the concept in paragraphs. Often times, students study by relying on memorizing the material presented without knowing how to implement the knowledge in a different context. Whereas self-evaluation is important for students to identify their lackness and progress in learning, textbook also do not have the feature for students to evaluate themselves. As the consequence, the learning outcomes are lower that what is expected.

One of the solutions is by designing a teaching material using a suitable learning model. Trianto (2011:54) argued that “every learning model directs the teacher in designing a teaching in helping the students in a way that the goal of teaching is achieved”. By conducting the five steps of the 5E Learning Cycle model can help in dealing with the issues happened so that it can build a teaching that can grow the interest and the curiosity of the students, giving chances to the students in performing an experiment, motivating the students in explaining the concept learned, helping the students in implementing the concept in a new situation and conducting self-evaluation to find out the strength and weakness in teaching. Eventually, the conduct of 5E Learning Cycle model is expected to be able to develop the attitude of activeness on the students in the learning process.

METHOD

This research aimed to developed a Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E for Elementary School Students. Meanwhile, this research is using the Research and Development type which adopt the Plomp development. Plomp (in Plomp and Nieven, 2013: 19) stated that there are three phases in conducting the development, that are (1) preliminary research or initial analysis, (2) prototyping phase or planning, and (3) assessment phase or scoring phase.

The Plomp model is chose because it has several strengths, those are (1) more accurate to be used in developing teaching material, (2) the description is complete and systematic, (3) before it tested, the teaching material is developed and self-revised and is consulted first by the experts, and (4) the presence of one to one evaluation and small group testing before the field experiment. In this research, the tested subject is the students of grade V in the Elementary School 58 of Lubuklinggau of
16 studentes in the Theme 8 of “Our Bestfriend: The Environment”, that is of second semester of 2019/2020.

The data collection gained from the use of questionnaires where the respondents give a tick (✓) according to their answer score on the provided table. The questionnaire used Likert scale answer for every question, that are: very good (SB), good (B), adequate (C) and lacking (K). the data analysis used in the research is the scoring technique by calculating the total score on the questionnaire that is given and is described using the Likert scale in the form of checklist. The steps that will be done are the following:

a. Gives the score from every point of question.
b. Summing the score
c. Change the score data (quantitative) into qualitative.

According to Partino (2009:21) in changing the quantitative score into qualitative score, there are several steps, those are:

1) Calculating the range of score using the formula:

\[
R = Sb - Sk
\]

Note:
R = Range
Sb = Highest score
Sk = Lowest score

2) Determining the number of Category (T)
3) The calculation of interval length of every category, with the formula:

\[
p = \frac{1}{T} R
\]

Note:
P = Interval length
T = Category
R = Range

4) Determining the limitation of category
5) Gives name or quality of every category.
6) Counting the percentage, using the formula:

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

(Rohmad in Ali, 2013:2)

Note:
P = Score percentage(%)
other references as the supplementary material in the teaching.

Aside from the issues mentioned above, the next issue is related to the level of interest of the students in studying. The interest of the students in the learning activity is supported by the learning sources used by the students. The learning sources is ought to have an attractive display so that the students are curious in learning the materials taught.

b. The Analysis of Environemntal Potential

The next thing to do is to analyze the environmental potential around the Elementary School 58 of Lubuklinggau City. Based on the analysis result, it is gained the fact that the environment around the school has rice field, ponds, and river. Besides, there is also economical activities such as trading and agriculture, so that the environment supports the development of Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E for the students of Elementary School 58 of Lubuklinggau City.

c. The Analysis of Curriculum and Material

The curriculum that has been applied in the learning process is the curriculum of 2013, so that the teaching approach used is the theme-based. The material of the second semester on theme 8 is “our bestfriend: the environment” that is mentioned in the Curriculum of 2013 on the Core Competence (KI) and the Basic Competence (KD), where the KD contains 5 teaching content that is Bahasa, Natural Science, Social Study, Civic Education, and SBdP. Every learning content in the KD require the students to achieve the KKM score set that is 70.

d. Analysis of Students

Students grade V of Elementary School 58 of Lubuklinggau City like the learning process that is done directly and is concrete. The students also want the Worksheet that is colorful and contain many pictures.

e. Identifying the Goal

The population in this research is grade V of Elementary School 58 of Lubuklinggau City with the number of 16 students. The gap in this research is seen that before using the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” the score of the students has not achieved the KKM yet. This is influenced by the coursebook used is the only reference used without any supplementary source. The material presented in the coursebook has not sho the local wisdom such as the custom and the culture around the students, so that the students need the supplementary books that contain the local wisdom so that it is easier in understanding the material given in the learning process. Thusm the author is interested in giving the solution for the issues by developing the supporting book that is the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E.

2. Analysis of Teaching

According to Darmojo and Kaligis in Yunus (2015: 177), good teaching materials or worksheet must fulfill the requirement such as the didactive, construction and technical requirement. Based on the result of the analysis of Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E has fulfill the three requirement, yet on the technical requirement, the teaching material has not fulfill the third point that is related to the look of the learning material that is seen less attractive.

3. The Analaysis of Learner and Context

Students of grade V have high enthusiasm and curiosity. So that the writer stimulated the character of the student by giving chance for the students to work independently as well as in group or even small group discussion. The individual or independent activity develop the confidence of the students upon their own skill. Meanwhile, the group activity and discussion makes the students to be more active in cooperation.

4. Writing the purpose of demonstration

The purpose is formulated in fulfilling the requirement of ABCD (Audience, Behavior, Condition and Degree). The teaching purpose are, a) students can identify various form of dance formation correctly and confidently, b) the students can explain the definition of dance formation correctly and confidently, c) students are able to demonstrate the dancing formation of creative traditional dance correctly and responsibly, d) students are able to explain the clean water availability accurately and responsibly, e) the students are able to create a poster about the implication of water cycle for life correctly and
confidently, f) students are able to identify types of business that is processed by oneself correctly and responsibly, g) students are able to identify the diversity type of business in their surrounding correctly and responsibly, h) students are able to present the result of type of business correctly and responsibly, i) students are able to identify the uniqueness of tradition in the social diversity of Indonesian society correctly and responsibly and j) students are able to identify events in reading correctly and responsibly.

5. Developing the scoring instrument.
   The scoring instrument in this research are the questions that mentioned in the product developed by the writer, that is Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment”.

   The development of teaching strategy is needed in helping to achieve the accomplishment of the goal of teaching through the product development used. The teaching strategy used by the researcher is the local wisdom based approach.

7. The Development and the selection of Teaching Material
   The product developed by the researcher is supplementary book for teaching that is Ethno-science Teaching Material in the Learning Cycle 5E Model with Local Wisdom based under the theme of “our bestfriend: the environment”.

8. Conducting the formative evaluation
   a. Expert Validation
      1) Media Expert
         Based on the validation from the media expert, the Ethno-science Teaching Material of the Learning Cycle 5E Model with Local Wisdom based under the theme of “our bestfriend: the environment” is categorized as “Good” with the percentage of 76.85%.

2) Language Expert
   The language validation result from the validator can be observed in the calculation below:

   Table 2. Percentage of score from the language expert
<table>
<thead>
<tr>
<th>Range</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.8 – 56</td>
<td>81.78 – 100</td>
<td>Very Good</td>
</tr>
<tr>
<td>35.2 – 45.7</td>
<td>62.86 – 81.61</td>
<td>Good</td>
</tr>
<tr>
<td>24.6 – 35.1</td>
<td>43.93 – 62.68</td>
<td>Adequate</td>
</tr>
<tr>
<td>14 – 24.5</td>
<td>25 – 43.75</td>
<td>Lacking</td>
</tr>
</tbody>
</table>

   Based on the result from the language expert, the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” is categorized as “Good” with the percentage of 71.43%.

3) Content Expert
   Here is the calculation of the validation score from the content expert.

   Table 3. Percentage of score from the content expert
<table>
<thead>
<tr>
<th>Range</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>68 – 83</td>
<td>85 – 100</td>
<td>Very Good</td>
</tr>
<tr>
<td>52 – 67</td>
<td>65 – 83.75</td>
<td>Good</td>
</tr>
<tr>
<td>36 – 51</td>
<td>45 – 63.75</td>
<td>Adequate</td>
</tr>
<tr>
<td>20 – 35</td>
<td>25 – 43.75</td>
<td>Lacking</td>
</tr>
</tbody>
</table>

   The Result from the content expert on the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” is categorized as “Very Good”. The percentage score from the content expert is 91.25%.

   Based on the scoring of the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” for the grade V students of SD Negeri 58 of Lubuklinggau City that is gained from the media, language and content expert can be seen as a whole in the following:
Table 4. Recapitulation of Percentage Score from the Experts

<table>
<thead>
<tr>
<th>Range</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>198.28 – 244</td>
<td>81.26 – 100</td>
<td>Very Good</td>
</tr>
<tr>
<td>152.52 –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>198.27</td>
<td>62.51 – 81.25</td>
<td>Good</td>
</tr>
<tr>
<td>106.76 –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>152.51</td>
<td>43.75 – 62.50</td>
<td>Adequate</td>
</tr>
<tr>
<td>61 – 106.75</td>
<td>25 – 43.75</td>
<td>Lacking</td>
</tr>
</tbody>
</table>

The overall scoring of the components is categorized as “Very Good” with the percentage of 80.33%.

b. One to One Testing (Individual)

The result from the one to one testing on the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” for grade V of SD Negeri 58 of Lubuklinggau City is done on four indicators that are ease of access, language, attractiveness, and content. Based on the result of one to one testing done to three students, two of them stated that Teaching Material is adequately good meanwhile one of the students mentioned that there is a suggestion. Thus, through the one to one testing here, the Teaching Material must be revised to then later being tested on a small group. The percentage of the scoring from the questionnaire on the one to one testing can be observed in the table below:

Table 5. Percentage of the Scoring from the Students

<table>
<thead>
<tr>
<th>Range</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.78 – 44</td>
<td>81.32 – 100</td>
<td>Very Good</td>
</tr>
<tr>
<td>27.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.77</td>
<td>62.54 – 81.29</td>
<td>Good</td>
</tr>
<tr>
<td>19.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.51</td>
<td>43.77 – 62.50</td>
<td>Adequate</td>
</tr>
<tr>
<td>11 – 19.25</td>
<td>25 – 43.75</td>
<td>Lacking</td>
</tr>
</tbody>
</table>

Based on the percentage, the scoring result from the questionnaire on the one to one testing in the following:

Table 6. Result of Questionnaire for the One to One testing

Table 7. Percentage of the One to One Testing

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>35.75 – 44</td>
<td>81.25 – 100</td>
</tr>
<tr>
<td>Good</td>
<td>27.5 – 35</td>
<td>62.5 – 79.54</td>
</tr>
<tr>
<td>Adequate</td>
<td>24.75 – 27</td>
<td>56.25 – 61.36</td>
</tr>
<tr>
<td>Lacking</td>
<td>11 – 24</td>
<td>25 – 54.55</td>
</tr>
</tbody>
</table>

The scale that describes the minimum score, the quartile score 1, median, and the quartile score 3 as well as the maximum score is as follow:

<table>
<thead>
<tr>
<th>No</th>
<th>Studen t's Code</th>
<th>Number of Statement</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S1</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>2</td>
<td>S2</td>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>3</td>
<td>S3</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>97</td>
</tr>
</tbody>
</table>

Table 8. Result of questionnaire for Small Group Evaluation

Based on the questionnaire scoring gained from conducting the one to one testing on the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” in grade V of SD Negeri 58 of Lubuklinggau City is categorized as “Good” with the percentage of 73.48%.

c. Small Group Evaluation

Small group evaluation is conducted on 2 May 2020. The small group evaluation is conducted to six students of grade V, by gathering the students in one group.

The scoring result of the questionnaire on the small group evaluation can be observed in the table below:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>35.75 – 44</td>
</tr>
<tr>
<td>Good</td>
<td>27.5 – 35</td>
</tr>
<tr>
<td>Adequate</td>
<td>24.75 – 27</td>
</tr>
<tr>
<td>Lacking</td>
<td>11 – 24</td>
</tr>
</tbody>
</table>

Based on the questionnaire scoring gained from conducting the one to one testing on the Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” in grade V of SD Negeri 58 of Lubuklinggau City is categorized as “Good” with the percentage of 73.48%.

The overall scoring of the components is categorized as “Very Good” with the percentage of 80.33%.
The scale that describes the minimum score, quartile score 1, median, and quartile score 3 as well as the maximum score is as follow:

![Score Scale](image)

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>35.75 – 44</td>
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</tr>
<tr>
<td>Good</td>
<td>27.5 – 35</td>
<td>62.5 – 79.54</td>
</tr>
<tr>
<td>Adequate</td>
<td>24.75 – 27</td>
<td>56.25 – 61.36</td>
</tr>
<tr>
<td>Lacking</td>
<td>11 – 24</td>
<td>25 – 54.55</td>
</tr>
</tbody>
</table>

Percentage = \( \frac{\text{average score}}{\text{maximum score}} \times 100 \) = \( \frac{28.17}{44} \times 100 \) = 63.97%

The percentage gained is 87.75% with the category of “very good”. Local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” for the grade V students of SD Negeri 58 of Lubuklinggau City is announced to be practical.
materials from the perspective of three validators. The validators are experts in their field, the three validators are experts in design, language and content. based on the validation result that is done through questionnaire on the local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” for grade V of SD Negeri 58 of Lubuklinggau City, the experet of media gave the score of 76.85% with the category of “good”. The expert of language gave the score of 71.43% with the category of “good”. Meanwhile, the expert of content gave the score of 91.25% with the category of “very good”. Through those scores, it is known that the local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” is valid and ready for further experiment.

The first experiment is done on the one to one testing. This testing is done to the three students of grade V with the different skill. Through the one to one testing, the researcher gained the overall score of 73.48% with the category of “good”. Then the researcher conduct some product revision beforehand prior to conduct a small group experiment. Small group testing gained the overall score of 86.75% with the category of “very good”. Through the one to one testing and the small group testing here, it is discovered that the local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” for the students grade V of SD Negeri 58 of Lubuklinggau is announced to be practical for use.

CONCLUSION

Based on the result of research and the discussion, several conclusions can be drawn as follow:

1. The teaching material is designed with the attractive picture and full color so that it stimulate the motivation and the attractiveness of the students in following the teaching and learning activity.

2. local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” for the students of elementary school is designed using two types of fonts that are Cooper Black, Curlz MT and Times New Roman. The Teaching Material is printed similar to a book in general, using A4 paper of 80 gram. The Teaching Material is also decorated with pictures that is according to the material and the theme of “our bestfriend: the environment”. The selection of colors with a good resolution, bright and cool color motivates the students to participate in the teaching and learning excitedly.

3. Based on the validation result, it is known that the Teaching Material is categorized as very good with the percentage of 80.33%, so that the local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” is categorized as valid.

4. in the one to one testing, the researcher gained the overall score of 73.48% with the category of “good” and the small group testing gained the overall score of 86.75% with the category of “very good”. Therefore, local wisdom based teaching materials of Ethno-science in Learning Cycle 5E under the theme of “our bestfriend: the environment” is announced as practical for use in the grade V of Elementary School.

REFERENCES


