The Development Of Textbook Ecology Based On Local Wisdom To Improve Scientific Attitude Of Graduate Students

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Abstract: This research is development research which consists of two stages, namely the development stage and the implementation phase. The purpose of this study is to develop and see the effectiveness of textbook ecology based on local wisdom towards scientific attitude of graduate students. The development stage refers to 4-D model, that is defined, design, develop, and disseminate. The validation results indicate that the developed textbook ecology based on local wisdom is valid by the validator or has a good category in all aspects (material, language, and presentation), so it can be applied in learning process. The results of the graduate student response analysis showed that most graduate students give a positive response to the developed ecology textbook based on local, which amounted to 73.67%, and after the implementation of the ecology textbook based on local wisdom to improve the attitude of the developed, it was found that it can increase curiosity (61.80%), and caring attitude of graduate students on life and the environment (70.25%), but low on open-mindedness or flexibility (46.78%), and critical reflective (43.27%). Because the existing ecology textbooks are not yet integrated with local wisdom, so the results of this research will be recommended as an ecology study guide book that is integrated with local wisdom and scientific attitudes to the graduate students in IKIP Mataram.

Keywords: textbook ecology, local wisdom, scientific attitude, graduate students.

1. INTRODUCTION

The curriculum is software in education, and now all countries, including Indonesia, are reforming or changing the curriculum. This can be asked why the curriculum needs to be reformed. To answer this question can be approached by the factors that influence it, namely the development of the era, this can be answered the question of the reason for the reform of the curriculum, which is none other than to prepare human resources (HR) nation to be able to adapt to the demands of the era. Higher education as one of the education sector that very important role in supporting the progress of a nation or a region by producing HR quality, and about the quality of that HR, described in detail in the curriculum of higher education that refers to the Indonesian National Qualification Framework (INQF), that is human resources who have the ability or critical thinking skills, creative thinking, have good communication skills, and have the ability/skills to solve problems. In the INQF, not only discuss the quality of human resources, but also the effort to make it happens through a good learning process, that is holistic learning and integrative without having to eliminate the characteristics of a region, emphasizes student-centered learning, that is learning that emphasizes on the learning skills that students need to be able to adapt to the times, as set forth in the INQF above.

The establishment or achievement of the quality of HR is strongly supported by the scientific attitude (SA) of the students. This is supported by (Lacap, 2015) stating that scientific attitude has an important role in learning because it is a factor that can determine learning outcomes Mahapoonyanont, 2010). SA is a method of thinking clearly (Candrasekaran, 2014), and not receiving any information without support clear, and SA as a tool that can be used to solve problems (Kaur, 2013). Further (Kaur, 2013) explains that the scientific attitude itself is a comprehensive mindset as set forth in the Regulation of the Minister of Education and Culture Year 2014, which includes open thinking (opened mindedness), curiosity, making decisions based on fact or data (judgment based on verified facts), collect and verify data, then construct conclusions. Local wisdom as a unique part of each region has several terms, including local knowledge, traditional knowledge, and indigenous knowledge. Local knowledge or local wisdom is a collection of knowledge gained through a series of activities performed by a person or group of people in a region, such as observing, predicting, analyzing, to make a conclusion. Local wisdom is a human endeavor to use morals and cognitions to act and behave on issues or phenomena in a certain sphere (Khusniati, at.al., 2017), and (Suryandi & Kusnendi, 2016) states that local wisdom is a form of perspective, attitude, and ability. All that is stated by [6], in this case, can be understood that perspective refers to how a person or group of people views, studying nature, and the last is formed attitude and ability as the result of process to study nature, so based on this matter, what is meant by learning which is holistic and integrated, emphasizing the importance of integrating local wisdom in learning. Taking into account the reform of the curriculum of higher education that refers to the INQF, and emphasizes holistic and integrative learning, as well as the importance of teaching or facilitated critical thinking skills, creative thinking, communication skills and problem-solving skills to students, and in the effort to make it happens there are some noticed among others, first; learning not only focuses on critical thinking skills, creative thinking, communication skills, and problem-solving skills but also emphasizes the formation and development of SA, because...
SA cannot be separated from thinking processes, problem-solving processes, as stated by (Candrasekaran, 2014) namely that scientific attitude is a method of thinking clearly. SA consist of several components, that is open-mindedness, the desire to acquire accurate knowledge, using procedures to acquire knowledge and solve problems (Gokul & Malliga, 2015). Second; the efforts were undertaken to support the mission of reforming the curriculum of higher education through research, one of which is the development of textbook research because textbook is a very important part in the learning process. John states that the textbook is a source of information used by lecturers to teach. The existence of textbooks is not only used by lecturers to teach but also used by students as a source of information, a source of knowledge to learn the knowledge contained in the textbook independently [8]. In an effort to integrate local wisdom in learning, as well as efforts to shape and develop students' scientific attitudes, it is certainly necessary that the textbook be appropriate for that purpose. The textbook developed in the study is an ecology textbook based on local wisdom to develop students’ scientific attitude. This research is strengthened by the results of empirical studies on ecological textbook, and students’ scientific attitudes. Based on preliminary study conducted, it was found that the ecological textbook that exists as lecture books were not yet integrated with local wisdom, and students’ scientific attitude profile shows that the scientific attitude of Biology Education Studies students is low (Huanepi & Firdaus, 2017). Paying attention to the vision and mission of educational curriculum reform and its demands, and aspects of local wisdom, the need for scientific attitudes to be learned and the importance of the existence of textbook as a source of learning to facilitated scientific attitude, it is very necessary to conduct research on the development of ecology textbook based on local wisdom to improve scientific attitude. The results of this research will be recommended as an ecology study guide book that is integrated with local wisdom and scientific attitudes to the graduate students in IKIP Mataram.

2. LITERATURE REVIEW

2.1. Local Wisdom
Local wisdom, can be understood as arguments, values, local opinions (full), full of wisdom, good, supported and accessed by community members. (Ibrahim, 2014)(Kerof, 2012) says that local wisdom is all forms of knowledge, beliefs, understanding, or understanding of customs or ethics that demand human behavior in life in the ecological community. (Gobyah, 2003) said that local wisdom is a combination of the sacred values of God's word and existing values. in line with the opinion of (Tarakanita, et al., 2013) local wisdom is a source of knowledge that is organized dynamically, developed and passed on by certain participation that is integrated with their understanding of the surrounding nature and culture (Hasyim and Muda, 2019). Wisdom arises from a long period of development in society as a potential energy system community collected to live together with peace and dynamic. Local wisdom in this study is not limited to local cultural wisdom that provides all about the wisdom that surrounds the values of policy, which can be used as guidelines for shaping the character of scientific style. To be taken as a guideline for character development, scientific attitude, and critical thinking disposition. So local wisdom needs to be integrated into textbooks

2.2. Scientific Attitude
Scientific attitude is an open discussion, discussion about appropriate knowledge and according to the procedure to obtain solutions and answers to existing problems, (Gokul & Malliga, 2015) Scientific attitude is the result of scientific research that has different characteristics of attitude. Another, The formation of a mindset that is supported as a learning achievement is strongly supported by scientific attitudes. This is supported by (Lacap, 2015), stating that the theory has an important role in learning, because it is a factor that can determine learning outcomes (Mukhopadhyay, 2014), is a method of thinking clearly, does not receive information, without the support of proven supporters clear (Candrasekaran, 2014), is a tool that can be used to solve problems (Kaur, 2013). Scientific attitude is a mindset published as stipulated in the Minister of Education and Culture Regulation 2014, which includes open thinking (curiosity), curiosity (curiosity), making decisions related to the content of data or data (assessment based on verified facts), collected and organized data, then compile conclusions

3. METHODS
This research is development research which refers to 4-D model which consists of 4 development stages that are defined, design, develop, and disseminate (Thiagarajan, at.al.,1974). This research produces a product of ecological textbooks based on local wisdom. The framework of a qualified product includes three criteria, namely validity, practicality, and effectiveness (Nieveen, 2007). The research question in this research are: (1) how is the validity of ecology textbook based on local wisdom to develop graduate students scientific attitude based on the content, language and presentation aspect, (2) how is the practicality of ecology textbook based on local wisdom to improve scientific attitude based on local wisdom to improve graduate students responses to textbook of ecology based on local wisdom to improve graduate students scientific attitude, and (3) how the effectiveness of ecological textbook is based on local wisdom to improve scientific attitude observed from graduate students scientific attitude after the implementation of textbook of ecology based on local wisdom. This research consists of two stages, namely the development stage and the implementation stage. At the development stage, a textbook of ecology based on local wisdom to facilitated scientific attitude of graduate students responses to textbook of ecology based on local wisdom to improve graduate students scientific attitude, while the second stage was the implementation stage of the ecology textbook that had been developed. The process of data analysis is done descriptively.

3.1. Validation analysis
Before the textbook of ecology based on local wisdom implementation in learning, validation was first performed. The components or aspect for validation consists of three components, that is feasibility of content, language aspect, and presentation aspect, and the process of validation is done by 4 validators

3.2. Graduate students response analysis
Data about student responses and scientific attitudes of students were obtained using questionnaires and then analyzed descriptively, and responses consist of very good, good, not good, very bad.
3.3. Graduate scientific attitude analysis
Data on scientific attitudes of students is obtained using a questionnaire, which consists of curiosity, Open mind/flexibility, Critical reflection, and Sensitivity to living things and environment, and the data about graduate Students' scientific attitudes were analyzed descriptively.

4. RESULT AND DISCUSSIONS

The textbook is one of the learning resources that is often used in learning, whether used by lecturers as a teaching guide or used by students as a source of learning independently. Therefore, the quality of textbook must also be maintained. The quality referred to in this case refers to aspects of content, practicality, and language aspects used in a textbook. The content aspect refers to the content or material contained in the textbook. Based on the results of the validation of ecology textbook based on local wisdom as shown in Table 1, the values for the content aspect are 4.0 (very well category). This value indicates that the material contained in the ecology textbook is developed appropriately and adequately, that the material contained is in accordance with ecological scholarship, in accordance with the higher education syllabus, free from misconceptions, and materials contained integrated with local wisdom. This is reinforced by [8] namely that the material contained in the textbook must reflect the knowledge and learning cultures of students, and consistent with the syllabus, or with other statements one of the characteristics of the textbook is in accordance with the curriculum and review materials, and that the material contained in the textbook must be in accordance with the level of cognitive development of graduate students, as well as activities or activities that exist in textbook can help students to improve their thinking skills (Mahmood, 2011). (Andayani & Gilang, 2015) also stated that the material contained in the textbook must be adapted to local culture. The material contained in the textbook must be in accordance with the material studied by the students (Deuri, 2012), while (Cain & Evans.1990) adding that in addition to the appropriate material as well as material contained in the textbook does not match the textbook, or the material contained there misconception, then the textbook is not in accordance with its function as a source of learning or source knowledge. In addition to the content aspects, the language is characteristic of a textbook that must be evaluated. Based on Table 1, it is known that the language aspect value is 3.8 (very well category). This value also indicates that the language used to convey content or material tailored to the subject or the use of textbook, in this case, is the graduate students, is that the language used in conveying the material in a textbook must be controlled, correlated or adapted to the level of condition or user of the book teach, as well as the language used is simple, so it is not confusing (Deuri, 2012)(Koulaidis, 2001). Control or adjustment of language of the delivery of the material aims to mediate the reader, which is not directly faced with the material, but given introduction about a material in a structured manner, then the students interpret the intention of the introduction of each chapter in the textbook (UNESCO, 2010) and (Mahmood, 2011) adding that the use of language is also unbiased (business), i.e. not using racist language, or pay attention to the code of ethics. The other component or aspects that characterize a textbook are components or aspects of the presentation. Based on the validator's assessment of the presentation aspect of 4.0 (very well category, see Table 1). This value indicates that the presentation of the local wisdom-based ecology textbook is concerned about layouts, illustrations, table of contents, and lists glossaries, and bibliography. Image layout and illustration refers to the organization of the preparation of a book and activities to be performed by the reader (Mohammadi, & Abdi, 2014), as well as the size of the book itself, the readable form or type of font style (Mahmood, 2011), and the illustration present in a textbook must reflect the content or concept, and are sorted by number, attractive, using a natural (Deuri, 2012). Table of contents is part of a book that shows the contents or chapters, and/or materials that will be written on a book, so that with the table of contents, students can see thoroughly the contents of a book, and students can use the existing information in the table of contents to find or combine existing material in each chapter in the developed local wisdom-based ecology textbook. (Mahmood & Iqbal, 2009) states that at the end of the section of the book should be listed as a glossary that corresponds to the term contained in the content or material that is addressed in each chapter. To make it easier for students to discover the meaning or meaning of each term in the ecology-based textbook of this local wisdom, the word or term is bold for local terms, and for foreign terms in bold and italic, the literature lists the source or reference used in composing textbook of ecology based on local wisdom, so that in its compilation always pay attention to code of ethics and copyright.

4.1. Quality analysis of the developed ecology textbook
Validation is a process to get an overview or description of the quality of the developed ecology textbook based on local wisdom. The validation process is carried out by 4 validators, and the results of the validation can be seen in Table 1 below.

<table>
<thead>
<tr>
<th>Component/aspect of validation</th>
<th>Average of validation</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility of contents</td>
<td>4.0</td>
<td>Very well</td>
</tr>
<tr>
<td>Language aspect</td>
<td>3.8</td>
<td>Very well</td>
</tr>
<tr>
<td>Presentation aspect</td>
<td>4.0</td>
<td>Very well</td>
</tr>
</tbody>
</table>

4.2. Analysis of graduate student responses to the developed ecological textbook
The product of this research is the ecology textbook based on local wisdom to improve graduate student scientific attitude, and the percentage of graduate student about ecology textbook has developed can be seen in Table 2 below.
The quality of the product can also be judged by the perception or response of the reader [8]. Based on Table 2, the average student’s response to the ecology textbook based on local wisdom is good (73.67%). The response given by the students is suitable with the validation results as shown in Table 1, so that the developed ecology textbook based on local wisdom can be used by students as a source of learning, or in other words that the developed local-based ecology textbook has the practical value as (Nieveen, 2007) states that the practical aspect of a product in terms of the product can be used realistically usable in a designated condition. The practicality of a product is also influenced by cost, and ease of accessing the product (Mahmood, 2011)(Litman & Spielberger, 2003). In practice, this ecology textbook based on local not been published nationally, in the sense that is still limited to students who become respondents or subjects of this study alone.

### 4.3. Analysis of graduate student scientific attitudes

Scientific attitude is an attitude that must be possessed by everyone, including prospective teacher students, with this scientific attitude, prospective teacher students can respond to the surrounding their environmental conditions, new information, and can solve problems well. Table 3 below shows the percentage of graduate students' scientific attitudes after implementing the textbook ecology based on local wisdom.

**TABLE 3.** The percentage of graduate student scientific attitude after implementation of ecology textbook based on local wisdom

<table>
<thead>
<tr>
<th>Graduate students scientific attitude</th>
<th>Percentage (%)</th>
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<tr>
<td>Curiosity</td>
<td>61.80</td>
</tr>
<tr>
<td>Open mind/flexibility</td>
<td>46.78</td>
</tr>
<tr>
<td>Critical reflection</td>
<td>43.27</td>
</tr>
<tr>
<td>Sensitivity to living things and environment</td>
<td>70.25</td>
</tr>
</tbody>
</table>

Therefore, to fulfill the practicality factor in cost and accessibility aspect, hence the next ecology textbook based on local wisdom developed this will be published nationally at a reasonable price. Furthermore, to answer the research question number 3, that is how the effectiveness of ecology textbook based on local wisdom to improve the scientific attitude, observed from the graduate student students scientific attitude after the implementation of ecology textbook based on local wisdom, and based on Table 3, that the students curiosity a new phenomenon or knowledge of 61.8% (high category). These results indicate that students have excellent capital to study natural phenomena and/or to gain knowledge. Izard states that across the lifespan, curiosity serves a broader function of building knowledge, skills, relationships, and expertise (Kashdan, 2019). Silvia states that curiosity has a very fundamental role to motivation, learning, and well-being, and when a person has a high curiosity, he will focus more on an object and spend time searching for information about a phenomenon, information or knowledge, have a higher ability to remember, and keep completing the activities it undertakes before its objectives are achieved (Kashdan, 2019). Nevertheless, the importance of curiosity, but does not always show strong evidence for open attitude and reflective thinking, this can be seen in Figure 3, namely that the percentage of open attitude/flexibility is 46.78% (low category), and reflective thinking (critical reflective) of 43.27% (low category). This result indicates that students have a high sense of wanting to acquire knowledge, and students do not pay attention to or substantiate the evidence in constructing or constructing an explanation, whereas to be able to construct or construct an explanation must give priority to evidence, critical openness and reflection (Haran, Ritov & Mellers, 2013), open-minded willing to change his mind in the face or reliable evidence and the respect another's point of view (Pitafi & Farooq, 2012), and in Table 3 also shows that the students scientific attitude about the sensitivity to living things and environment is 70.25% (high category). This percentage indicates that students have a good/high attitude towards life and the environment. Based on the results or findings obtained during the study, it is suggested that the learning process can not only increase the curiosity of the students, although the curiosity is a very supportive factor in the acquisition of knowledge and skills, but also expected to improve other attitudes, such as an open and critical reflective attitude. These-two attitudes are a very important factor in learning, and also in life in the information and technology age. Therefore, further research can improve both (reflective open and reflective thinking), both as an attitude and as a habit of mind/habit of thinking.

### 5. CONCLUSION

This research is development research because it develops ecology textbooks based on local wisdom to improve graduate students’ scientific attitude. Based on the result of the research, it is found that the developed textbooks are valid, or else the ecology textbook based on local wisdom is developed have good quality in all aspects (content, language, and
s presentation aspects), so that it can be applied in the learning processor can be used as a learning resource by students. Most of the graduate students’ responses positively to ecology textbook based on local wisdom to improve graduate students scientific attitudes, and after the implementation or implementation of local wisdom-based ecology textbooks to improve the attitudes of science developed, it was found that it could increase graduate students’ curiosity and attitudes to life and the environment, but low on open mind or flexibility and critical reflection.

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