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Research Article

**DEVELOPING OF BIOLOGY LEARNING BOOK WITH  
LOCAL POTENTIAL OF LIVING THING DIVERSITY TOPIC  
FOR SMP STUDENTS****Elya Nusantari<sup>1\*</sup>, Ainda Lihawa<sup>2</sup>**<sup>1</sup>Lecturer in Biology Education Study Program, Faculty of Mathematics and Natural Sciences, Universitas Negeri Gorontalo, IndonesiaEmail: [elya.nusantari09@yahoo.co.id](mailto:elya.nusantari09@yahoo.co.id)<sup>2</sup>Biology Teacher in Public Junior High School 3, North Gorontalo, IndonesiaEmail: [ainda\\_lihawa@yahoo.com](mailto:ainda_lihawa@yahoo.com)**Abstract:**

*The aim of this research was to develop local potential based biology teaching material on subject matter of living thing diversity for grade VII Junior High Schools. The teaching material used in school was only teaching material from the central education office. Local examples in Gorontalo Province were not available. This resulted in the learners did not recognize the local potential that exists in the area. Application of curriculum requires the utilization of local potential as a learning resource through teaching materials, student worksheets, and media. It was important to develop a learning book by using local examples exist in the environment with which student can learn the concept of biology. The method used was the teaching material development, with a 4-D model. Data collection instruments were the need analysis questionnaire for teachers and the feasibility assessment questionnaire of instructional material draft for experts and validators of biology teacher practitioners, and the student questionnaire. The learning book produced is very feasible to use for learning. The validation includes learning book validation test by material experts, instructional media experts and linguists. From this research resulted the teaching materials on the biodiversity material of living things to add examples of the diversity of animals and plants that are local potential, along with the problems and efforts to overcome them.*

**Keywords:** *development, instructional material, local potential, diversity***Corresponding author:****Elya Nusantari,***Lecturer in Biology Education Study Program,  
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**INTRODUCTION:**

Biodiversity or biological diversity is the variety of all forms of life – the different plants, animals and micro-organisms, the genes they contain and the ecosystems of which they form a part. Biodiversity description is more than simply being a measure of the variety of species in an ecosystem; biodiversity indicates the complexity of the relationships between all of the factors making up an ecosystem. Although the definition of ‘biodiversity’ encompasses genetic diversity through the landscape-level ecosystem diversity, it is species diversity that is most commonly targeted.

Anonim (2014) shows Biodiversity provides a greater chance that an ecosystem will cope with such changes across the world, we all rely on different ecosystems to provide us with resources. Changing one ecosystem into another could create a number of problems, such as depriving us of food and water or increasing the risks of disease. We also have an ethical obligation to consider our impact on those species that share our resources.

UNESCO (2014) [2] shows Biodiversity is an important asset to sustainable development and has been identified as a priority by the UNESCO Member States, among other emerging and recurrent issues. Biodiversity is crucial for all living organisms and ecosystems. In addition, biodiversity is essential for human health and resilience, as well as for social and economic development. Political commitment, community action and many other factors including those influenced by cultural and academic disciplines signal the multiple-perspective value of biodiversity. Biodiversity is a shared resource, uniting people, communities and habitats across vast expanses of space and time. To educate for biodiversity, we must also educate about how it is valued, governed and reserved throughout the world.

Maintaining natural levels of biodiversity in our ecosystems also contributes to the maintenance of ‘healthy’ ecosystems – that is, ecosystems that are maximally productive (carbon fixation), that provide both a store and a supply of clean water, that provide adequate vegetation cover thus preventing erosion and other soil problems like salinity, and that provide habitat for animals.

Biodiversity preservation is the responsibility of all parties, especially the future generation in order to sustain its existence. This can be done, one of them, through formal education in schools as stated in the school curriculum of the middle schools. Biodiversity is studied in grade VII with Basic Competence of *Identifying the Importance of Living Thing Diversity in Ecosystem Conservation Efforts*. Students learn about biodiversity in Indonesia and its surrounding so they growing

rained love of homeland and natural resources therein.

Gorontalo Province is a coastal area, rich in natural resources with the complete marine biota. The coastal area has strategic significance because it is a transition region (interface) between the terrestrial and marine ecosystems, as well as having the very rich potential of natural resources and environmental services [3]. This wealth has a special attraction for the various parties to take advantage of its resources and encourage various agencies to regulate their use. Coastal resources are natural resources, assisted/artificial resources and environmental services contained in coastal areas.

Furthermore, according to Dahuri (2003), the potentials of coastal resources are generally divided into four groups: (1) resources that can be recovered (*renewable resources*); (2) resources cannot be recovered (*non-renewable resources*); (3) marine energy; and (4) services to the marine environment (*environmental services*). Resources that can be recovered consist of various types of fish, shrimp, seaweed, seagrass beds, mangroves, coral reefs, including coastal aquaculture and mariculture (*marine culture*). Availability of coastal land is a potential that can be developed for fishing activities. Similarly, the territorial waters of the coast can be developed for a variety of farming activities, especially marine aquaculture. Resources that cannot be recovered include minerals, minerals / quarrying, oil and gas. Energy resources consist of OTEC (*Ocean Thermal Energy Conservation*), tides, waves and so on. While those that are included as the services of the marine environment are tourism and marine transportation.

However, most teachers use learning books which are nationally circulated and published by national publishers. These learning books have become obligatory reference both for students and teachers. The weakness of the learning books is that they only provide information to meet the demands of the national curriculum standards. The learning books are not enriched with any local issues or phenomena in the surrounding areas. Frequently, teachers just reread the material in the learning books; as a result, the materials presented lack of contextual examples, the learning activities which use student worksheets were not in line with the conditions of the students, the teachers, and the school environment. Therefore, it is important to extract and insert local learning resources into learning books that are relevant with the conditions of the region so as to support the learning needs of students. Consequently, learning books which present contextual examples and match the characteristics of the area or the local potential of the area should be developed.

Locally available natural wealth in Gorontalo area can be used as learning resources for students in the schools. In accordance with the didactic triangle of Kansanen in Suryadi (2010) [4] which states that the learning process is a positive interaction between students, teachers and learning books. Learning books are prepared by considering the content of the materials and paying attention to the characteristics of the students. Among them is considering the level of student thinking, whether the student is able to understand the contents of the learning book. The learning book writers should be able to be a didactic bridge between students with a learning book being read. So it is necessary to develop a good learning book in order to deliver the message according to the learning needs of students.

The learning books were adjusted according to the level or students' thinking skills. Students at the secondary school level with the age ranging between 12-15 years are at the level of concrete thinking skills. Learning books should be made in accordance with the level of concrete thinking in which they ought to give concrete or contextual examples within surrounding environment.

The learning book that is prepared in accordance with the indicators of learning in the curriculum. The resulting learning book refers to 3 indicators of learning. Basic Competencies to be achieved is to identify the Importance of the Diversity of Living Beings in Ecosystem Conservation Efforts. Indicators of learning there 5. Learning book developed to achieve 2 Learning Indicators that describe living things contained in marine ecosystems based on classification system and explain the conservation efforts of living things.

The development of the three learning indicators (indicators 3, 4, and 5) aims to add information on the diversity of animals and plants of marine ecosystems that are local potentials of the Gorontalo region. The second indicator aims to add an endangered living creature in Gorontalo so that students know the condition of rare animals and plants. The third indicator aims to conserve living things in Gorontalo.

Based on the description above, this study is entitled: "Biology Learning book Development Based on Local Potential of Living Thing Diversity Topic for Grade VII Students of SMP/MTs". The research problem is: How is the validity of the learning book on biological material which is local potential based on subject matter of diversity of living things for grade VII students of SMP/MTS? The purpose of this study is to produce valid local potential based biology learning book on subject matter of biodiversity of living things for glass VII students of SMP/MTS.

#### **METHOD:**

This research is the development research with a modified 4-D of the development model of Thiagrajan (1974) in Borg (1989) [5]. The authors developed a learning book to enrich the content material according to the curriculum by increasing the number of phenomena and examples existing in the environment according to the local potential of Gorontalo which is a coastal area.

The research was conducted at SMP Negeri 9 Gorontalo. The development was carried out from July 2014 to December 2014. The learning book was field tried out on 15 students at SMP Negeri 9 Gorontalo and subsequently was tried out in one class consisting of 28 students.

The test sample 1 was 15 students. Test samples 2 was 1 class with 28 students. The sample selection was based on the location of the school, namely SMP Negeri 9 Gorontalo. SMP Negeri 9 Gorontalo was located in the Port of Leato Gorontalo City. The residence of students of SMP Negeri 9 Gorontalo is near the marine ecosystem.

The instruments used in this research were the questionnaires of need analysis, the validation sheets for learning book validators of learning experts, linguists, material experts and practitioners of biology teachers and the student questionnaires about the learning book.

The development consisted of three stages, namely the definition stage (define), the designing stage (design), and the development stage (develop). The dissemination stage was not carried out. The development stages are as follows: define stage (the definition) was done to analyze the curriculum, materials, students, and to formulate learning objectives. Data analysis was done qualitatively and quantitatively. The qualitative data analysis was performed on the stage of design and development. In the define stage, the qualitative analysis was conducted to analyze the condition of the curriculum, the students, the material, and the formulation of learning objectives. Then, the validation results were used at the design stage, in which the design and the production of learning books were carried out. The quantitative data analysis was used to establish the validity of the learning book by the validator and the practitioners of biology teachers. The quantitative assessment was done by using the formula of validity adopted from Wijastuti (2013).

#### **RESULT AND DISCUSSION:**

##### **Result**

##### **The Define Stage**

The results of the needs analysis included the analyses of the curriculum, the students, the

learning resources and the needs of the teachers. The analysis of the material should be the basic consideration in the development of teaching materials. The material analysis was done on the learning books that were usually used in the regular learning, which was intended to see the content, especially the material that will be put into the teaching materials. In the analysis of the material, how the material was presented in learning books was studied in order to see whether or not it was in accordance with the Standards of Competence and Basic Competence. Based on the interviews with the teachers of biology, it was revealed that the material content of diversity of living things in the learning books was presented too broadly, hence the explanation of material was general and less detailed, and did not use examples that existed in the surrounding area. For example, the learning indicator was 'to describe the living things that are in the ocean ecosystem based on classification system', and the other learning indicator was 'to give examples of living things that are scarce and their preservation'. Ideally, these indicators can be achieved by presenting various examples of marine ecosystems according to the local potential and examples of scarce animals in some areas and how to preserve them, thus it can train students' ability in solving local problems.

The results of the analysis of the students of SMP N 9 Gorontalo showed that they were mostly at the level of thinking skills which was still low compared to the students of the other schools located in the city of Gorontalo, and some students' learning motivation was low. The students got bored in biology learning process but they had quite good interest in reading the learning book although it was not supported by the completeness of the learning books to enrich their knowledge. The learning that was done so far did not link the local phenomena because the learning was done in one direction, and the practicum on this topic did not exist. Therefore, the spirit of learning of the students decreased especially in the last learning hours.

The learning resources available were limited; only the learning books from the school libraries that were published by national publishers. The results of the material analysis indicated that the concept

of diversity of living things described in learning books was only in general and the explanation was not accompanied by interesting pictures. The pictures shown were not enriched with contextual examples. The students did not understand the examples in the learning book because they did not recognize them and they had never seen the objects directly. Consequently, the learning became meaningless. SMP Negeri 9 Gorontalo did not have internet facility either to support learning.

Based on the interviews with the biology teachers it was revealed that the material of the diversity of living things in the learning books was still general. The learning books were supposed to be enriched with the presentation of the diversity of living things existing in Gorontalo.

Based on the interviews with teachers, so far the teacher had never made a learning book of their own using pictures of objects recognized by the students. The teachers had not yet had the experience to make a learning book and only used existing learning books. The teachers expected to have learning books that utilized local potential of Gorontalo area so as to facilitate students in learning biology. In addition, the learning and teaching process was still teacher-centered.

#### **The Design Stage**

The plan of the learning book was in accordance with the learning book design steps by Sungkono (2003) [6]. The design (the plan) stage of the process of preparing the learning book was done by referring to the appropriate competencies in the curriculum, developing materials and using the results of previous research on local plant and animal diversity in Gorontalo. In addition, the material content was developed using data from previous studies of the diversity of living things both animals and plants in Gorontalo as the local potential material.

#### **The Development Stage**

The development stage consisted of the learning book design validation by the material expert lecturers, learning experts and practitioners of biology teachers. Afterward, the learning book was tried out in a small group of 15 students. The results of the expert and the practitioner validations are presented in the following table.

## a. Validation Results of Material Expert

Table 1: Results of the Improvement Suggestions from Learning Expert Validator

NO	Question indicators	Suggestions for improvement
1.	The suitability of the material to the basic competencies and competency standards	Advice from material validator: It is preferable that the standard and basic competencies are adjusted with the chapter titles and contents of the subject matter in the teaching materials.
2.	The suitability of the material to students' needs	Advice from experts of material: It is adjusted to the needs of students; therefore, the language of teaching materials and the level of difficulty should be considered.
3.	The suitability of material to the learning objectives	Reformulate the material of learning objectives to be achieved, so that the organization is clear.
4.	The completeness of the materials	Marine animals and plants that exist in Gorontalo should be more exposed.
5	The clarity material	In chapter 3, the marine animals and plants in Gorontalo should be multiplied.
6	The sequence of material	Writing scientific name must be consistent, for example there is Chyanophyta writing, there is also Chyanopyceae, the students will be confused.
7	The ease of understanding the material	The material contained in teaching materials should be adjusted to the level of student understanding.
8	The completeness of reference or citation	Reference and citation are good.
9	The conformity with the material title	These items need to be noticed.
10	The completeness of the summary of the material	The summary should be adjusted with the content, it should not be too much/long.
11	The completeness of exercise questions/problems	The questions/ problems are adjusted with the content and to the level of student thinking.

Table 2: Percentage of Product Feasibility Of Learning Book by Material Expert

No	Questions	Average score	Expected Score	Feasibility level
1	The suitability of the material to the basic competencies and competency standards	3.5	4	87.5% (Very Good)
2	The suitability of the material to students' needs	3.5	4	87.5% (Very Good)
3	The suitability of material to the learning objectives	3.5	4	87.5% (Very Good)
4	The completeness of the materials	3.5	4	87.5% (Very Good)
5	The clarity material	3.5	4	87.5% (Very Good)
6	The sequence of material	3	4	75% (Good)
7	The ease of understanding the material	3.5	4	87.5% (Very Good)
8	The completeness of reference or citation	3	4	75% (Good)
9	The conformity with the material title	3.5	4	87.5% (Very Good)
10	The completeness of the summary of the material	3.5	4	87.5% (Very Good)
11	The completeness of exercise questions/problems	3.5	4	87.5% (Very Good)

Percentage of all aspects of material =  $(37.5) / (44) \times 100\% = 85.2\%$  (Very Good)

**b. Validation Results of Media Expert****Table 3: Results of the Improvement Suggestions on Media Validation**

No	Indicators Question	suggestions for improvement
1	The accuracy of the selection of the typeface size	Suggestions for improvement from media experts are: the size of the font should be noticed, the section can be more than 12 pt, while the font size in the caption or tables are minimized to minimum of 11 pt.
2	The clarity of font size	The font size should be adjusted.
3	The clarity of letter shape / typeface	Suggested improvements: the shape and type of the fonts should be the Times New Roman, or do not use too many kinds of typefaces.
4	The clarity of the images that are presented	Suggested improvements: all the images should be revised, use the 'Size' icon to shrink and magnify the image, and the images that are not clear should be replaced.
5	The accuracy of image size	Suggested improvements: the accuracy of the size of the image should be adjusted.
6	The accuracy of image placement	Image placement should be customized to the needs and the display.
7	The accuracy of the space of lines, paragraphs, and characters in a text or sentence	The space, lines and paragraphs must be corrected, there are mistakes in the writing.
8	The attractiveness of the images on the cover	The images on the cover should be more highlighted with images that correspond to marine plants and animals that exist in Gorontalo, and try not to be too crowded.
9	The compliance of the layout of images and the text on the cover	The layout of images and text on the cover should be matched, so it needs to be adjusted.
10	The consistency of words and terms used in sentences	There are still a lot of words and terms that are inconsistent, for example Chyanophyta, it is also written as Chyanophyceae. Which one is true? It will make students confused
11	The consistency of the font size	Font size should be adjusted and consistent
12	The attractiveness of the page views presented	It should be made more attractive.
13	The accuracy of the size of the column / table used	-
14	The precision placement of the column / table on teaching materials	-
15	The orderliness of the chapters / subchapters in material content	It must be reviewed and improved, there are still mistakes.

**Table 4: Percentage of the Learning Book Product Feasibility by Media Experts**

No	Questions	Average Score	Expected Score	Feasibility Level
1	The accuracy of the selection of the typeface size	3.5	4	87.5 (Very good)
2	The clarity of font size	3.5	4	87.5% (Very good)
3	The clarity of letter shape / typeface	3.5	4	87.5% (Very good)
4	The clarity of the images that are presented	3.5	4	87.5% (Very good)
5	The accuracy of image size	3.5	4	87.5% (Very good)
6	The accuracy of image placement	3	4	75 % (Good)
7	The accuracy of the space of lines, paragraphs, and characters in a text or sentence	3	4	75 % (Good)
8	The attractiveness of the images on the cover	3.5	4	87.5% (Very good)
9	The compliance of the layout of images and the text on the cover	3	4	75% (Good)
10	The consistency of words and terms used in sentences	3.5	4	87,5 % (Very good)
11	The consistency of the font size	3	4	75 % (Good)
12	The attractiveness of the page views presented	3.5	4	87.5% (Very good)
13	The accuracy of the size of the column / table used	3	4	75% (Good)
14	The precision placement of the column / table on teaching materials	3	4	75% (Good)
15	The orderliness of the chapters / subchapters in material content	3.5	4	87.5% (Very good)

Percentage of all aspects of media =  $(49.5) / (60) \times 100\% = 82.5\%$  (Good / Feasible)

### c. Results of Validation of the Language Expert

**Table 5: Results the Improvement Suggestions Validation from The Language Expert**

NO	Indicator questions	Suggestions for improvement
1.	The clarity of language use	Advice from language expert is: to obey the spelling rule.
2.	The accuracy of written language	Advice from language expert is: to adjust the writing to the spelling rule.
3.	The readability of text or correct sentences	Adhere to Indonesian sentence structure rule and correct spelling
4.	The appropriateness of words or terms used	Customize to the other validation results
5	The accuracy of a word or term used	-

**Table 6: Percentage of Product Feasibility Learning books by Language Expert**

No	Questions	Average Score	Expected Score	Feasibility Level
1	The clarity of language use	3.5	4	87.5% (Very good)
2	The accuracy of written language	4	4	100 % ( Very good)
3	The readability of text or correct sentences	3	4	75 % (Good)
4	The appropriateness of words or terms used	3.5	4	87.5% (Very good)
5	The accuracy of a word or term used	3	4	75 % (Good)

Percentage of language aspects =  $(17) / (20) \times 100\% = 85\%$  (Very Good / Very Feasible)

#### d. Results of Validation of Practitioner / Teacher Of Biology

**Table 7: Results ofThe Improvement Suggestions From Biology Teacher**

NO	Indicators Aspect Question	Suggestions for improvement
1.	Aspect A (Quality of Content)	Advice from the biology teacher is: the formulation of learning objectives should refer to the indicator, it should be given attention.
2.	Aspect B (Quality of language)	Advice from the biology teacher is: the sentence structure should be given attention.
3.	Aspect C (Quality of Presentation)	-
4.	Aspect D (Quality of Graphics)	-

**Table 8: Percentage of the Feasibility of the Learning Book Product by Biology Teachers**

No	Aspects of Question	Average Score	Expected Score	Feasibility Level
1	Aspect A (Quality of Content)	21.5	24	89.5 % (Very Good)
2	Aspect B (Quality of language)	20.6	24	85.7 % (Very Good)
3	Aspect C (Quality of Presentation)	9.5	12	79 % (Good)
4	Aspect D (Quality of Graphics)	7	8	87.5 % (Very Good)

Percentage of the overall aspects =  $\frac{62}{72} \times 100\% = 86\%$  (Very Good)

#### e. TheResult of Field Tryout

**Table 9: Questionnaire Instrument Of Students' Responses On The Learning Book Product**

No	Component	Answer/Response	
		Yes	No
<b>A. Criteria for the physical appearance</b>			
1	Is the appearance of the learning book interesting?	100 %	-
2	Does the presentation of the learning book attract students' interest and attention to read?	100 %	-
3	Do the illustrations (pictures and schemes) in the learning book support the comprehension of the material?	100 %	-
4	Can the letters used in the learning book be read by the students?	100 %	-
Continue...			

5	Do the scientific and the local names used in the learning book help students understand the learning book?		-
<b>B. Criteria for the presentation of the concept</b>			
1	Is the relationship between science material and school potential shown in the learning book?	100 %	-
2	Are the materials about biology in the learning book available around you that make you interested in learning more about local potential existing in your neighborhood?	100 %	-
3	Can the learning book motivate you to work together in a group?	100 %	-
4	Can you learn with the learning book only without the help of the teachers?	90%	-
5	Can you do all the tasks and and solve all the problems in the textbok?	90 %	-
6	Can the learning book develop your perception and knowledge about biology based on the characteristics and the potential in your region?	100 %	-
7	Do you have the desire and passion to become a person who cares more about the environment and can preserve the potential in it?	90 %	-
8	Do you prefer to study biology with the availability of local potential based learning book?	100%	-
<b>C. Criteria of the language</b>			
1.	Is the the language used easily understood?	100 %	-
2	Is the language used in the learning book suitable with your age?	100 %	-
3	Are the terms in the learning book, particularly the scientific terms, easily understood?	100 %	-

Based on the tables above, the result of the students' responses indicates that 98% of the students are interested in the learning book. This shows that the students are interested in studying the diversity of living things because the learning book provides local potential data and any problems encountered by the region.

### Discussion

UNESCO (2014) shows that Biodiversity is mainstreamed in an interdisciplinary way across many topics within the curriculum, while also being embedded into biology. The study of biodiversity is also extracurricular offered as an opportunity and in non-formal education (in natural history museums, zoos, aquaria, botanical gardens, parks, etc.) so that teachers and students can appreciate the intrinsic value of biodiversity, are aware of the importance of biodiversity for people and ecosystems, and are aware of the threats it faces, thus allowing them to a make choices and take actions to improve the status of biodiversity. Research of learning bookdevelopment that use local potential is in accordance with the mandate of the curriculum and the National Institution of Education Standards in 2006, which stipulates that the curriculum applied in Indonesia as an effort to improve the quality of education and requires educators (teachers) to harness local potentials to be studied and to write them in learning books. It is stipulated in the Operational Reference of Curriculum Design in Education Unit Level that

each region has potential, needs, challenges, and the diversity in the environment. Therefore, the curriculum must accomodate the diversity to produce graduates that are relevant to the development needs of the region so as to produce graduate students who are not only able to answer the challenges of the times but also capable of meeting the needs of the communities in the region. The problem of this research were how was the learning book of the diversity of creatures based on local potential in junior high school?, how was the validity of the development learning book product?, and how was the feasibility of study book based on the result of field trial?. The purpose of the research was to develop valid and reliable learning book based on the result of material validity test by learning material expert, linguist, educational expert, and science teachers.

The development of learning book in this study has the particularity that it was developed by loading examples of local biological resources in Gorontalo area. The process of developing this learning book wasutilizing the results of previous studies of biodiversity. It is important to inform the research results through the field of education as a vehicle for the transfer of knowledge to students as a generation of the nation who are responsible for the safety of the world's ecosystems through conservation of natural resources. As stated by Bendix *et. al.* (2010) [7] that facilitating the transfer of the compiled knowledge to the public is

to boost awareness at site for the needs and benefits of biodiversity research, to safeguard ecosystem services and human well being, and in turn, to attain acceptance of the local population.

Furthermore, Bendix et. al. (2010) [7] states that the results of the research programs are mostly published in English in scientific journals or books, which make their appreciation by the local people difficult. Thus, it is absolutely necessary to translate the results into layman's language in order to raise awareness and foster the feeling of responsibility of the public for biodiversity and related ecosystem services. In addition, environmental information on a more popular scientific level is necessary for stakeholders and interested people. Such activities are regularly organized jointly. One example is the publication of a booklet by NCI and the research program (Kiss and Bräuning 2008) summarizing and "translating" the scientific results into Spanish language for a wider readership.

The learning books that have been developed in this research has been enriched with the examples of the diversity of living things which is in accordance with the existing local potential in Gorontalo area and with those in Indonesia in general. The developed learning books has the advantages in terms of the specificity of the materials that are presented, the proximity of the material presented which is in accordance with local potential in Gorontalo area, the displaying of interesting pictures, the conveying of words of motivation and the activities of the application of the material to students so that they are more enthusiastic in learning about the surrounding world, as well as the latest information about the diversity of living things that exist in Indonesia. This provides motivation to students in learning, because the learning will be meaningful.

Anwari et. Al (2016) [8] states that local wisdom as the product of local knowledge has been giving a local context in science development. Local wisdom is important to connect scientific theories and local conditions; hence science could be accessed by the common people. Using local wisdom as a model for learning science enables students to build contextual learning, hence learning science becomes more meaningful and becomes more accessible for students in a local community.

This is similar to the results of the study of Susantini and Askiyatin (2011) [9] that the learning media development with the learning cycle model oriented is the learning that refers to the constructivism approach and meaningful learning. This is demonstrated by the responses of students who stated 'yes' by 100%. The developed learning

aids facilitate students in applying the concepts into real life at the stage of using the findings.

The learning book which has been developed as a learning resource has an advantage over the learning books circulated in schools. The learning books available in schools generally overview the material of diversity of living beings in the effort of preserving the ecosystem in Indonesia globally. While the developed learning book contains the diversity of living things according to the local potential marine areas, coastal and inland areas of Gorontalo, so that students can recognize the shape and type as well as the diversity that exists.

It is also consistent with Pratiwi (2010) who states that the local beach area of Krakal Gunung Kidul Yogyakarta is a learning resource that has abundant presence of biota that can potentially help the learning process as well as research by taking into account the environmental supporting capacity. It is clear that it is very important to use of local potential as a learning tool for students. Similarly, Rinie et al (2011) [10] have made use of the natural resource in contextual learning. The study has resulted in a very feasible learning book used for learning the diversity of living things.

Ardan (2016) [11] conducted a study entitled "The Development of Biology Teaching Material Based on the Local Wisdom of Timorese to Improve Students Knowledge and Attitude of Environment In Caring the Persevation of Environment". The results showed that the giving of new examples of plants, animals and ecosystems typical of NTT (East Nusa Tenggara) and the Timor Island, for biology learning books, can arouse students' awareness in preserving the environment lingkungan. Formerly, plants and animals data are only kept by the researcher, even though when they informed through the biology learning book can be beneficial to students and teachers at school.

Through this teaching material, the students are expected to have an attitude of pride towards biodiversity in Gorontalo. The students can realize the result of human activity that does not pay attention to the safety of the ecosystem. As stated by Mutia (2009) [12] found despite the benefits from biodiversity, today's threats to species and ecosystems are the greatest recorded in recent history and virtually all of them are the caused by human mismanagement of biological resources often stimulated by misguided economic policies, pollution and faulty institutions in addition to climate change. To ensure intra and intergenerational equity, it is important to conserve biodiversity. Some of the existing measures include conservation of biodiversity; zoological gardens,

botanical gardens/arboretums, seed banks and national parks and game reserves.

The product of this research was a learning book that can be applied in science learning in junior high school. Its application in learning is accompanied by the selection of appropriate instructional strategies, example inquiry strategies, problem-based learning, and student-centered learning strategies. Teachers can choose a tourism learning strategy because the location of the school is close to the beach. Other learning strategies that can be applied are inquiry and problem-based learning. Student activities in learning need to be guided by student worksheet. It is intended that there is continuity between the learning instrument which include the Learning Implementation Plan, the learning book, the student worksheet, and the authentic assessment.

The result of this study indicate that the learning book development product in accordance with local potential in the area of Gorontalo which is coastal area. This learning book was declared valid and appropriate for using by teachers and students in junior high school.

The result of this research has an important contribution in the field of education. Learning book development product has fulfilled the curriculum mandate that requires the utilization of local potential in learning to train students' sensitivity in solving problems around them. This learning book product can help teachers in preparing the learning process optimally. This development product can be one of the teacher's references to conduct further development research. Research development conducted by teachers can contribute to the progress of education in Gorontalo. Most teachers in Gorontalo have not been able to develop their own learning book.

### CONCLUSION:

This research produces a learning book on the material diversity of living things. This development product has been declared valid and suitable for science learning in junior high school. Based on the result of validity test by the material expert, the learning media expert, and the linguist, the product of this development has been declared valid. The result of the validity test by the material expert is 85.2% with very decent category. Result of validity test by expert of learning media equal to 82,5% with decent category. The result of validity test by linguist is 85% with very feasible category. Result of validity test by biology teacher equal to 86% in very feasible category.

Draft of learning book was also tested on small group and large group of students. Small group trial was conducted to gain input or improvement from

students related to the reading book readability. Furthermore, large group test was conducted to obtain student responses using a questionnaire. Large group test results of 98% with very decent category.

The result of this research indicates that the learning book development product has been in accordance with the local potential of Gorontalo region which is coastal area. This learning book was declared valid and feasible for using by teachers and students in junior high school.

Nevertheless, this development research has a number of limitations. A number of such limitations were in this development research used 4-D model, namely Definition, Design, Development, and Dissemination. This research was conducted only until the stage of Definition-Design and Development. The dissemination stage has not been done because it requires resources, namely time, and great cost. Further research needs to be done until the dissemination stage.

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