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Development of *Gastropoda* diversity atlas on Wohkudu beach, Gunungkidul as a biology learning media for high school students

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Abstract: This study aims to produce biology learning media on biodiversity material, especially animalia sub-material that suits students' needs and to determine the quality of the products produced. The high diversity of gastropods on Wohkudu Beach accompanied by the limited biology learning media related to Gastropoda on animalia material encourages researchers to develop biology learning media, especially Gastropoda. This type of research is research and development using the ADDIE learning development model which goes through three stages, namely analyze, design, development. The first study resulted in the discovery of 40 species from 16 families which were then developed in the form of an Atlas of Gastropoda Diversity on Wohkudu Beach, Gunungkidul, which was validated by material experts, and media experts and limited trials on a biology teacher and 18 class X students of SMA Negeri 1 Banguntapan. Data on the results of the product quality assessment were obtained from sheets in the form of questionnaires. The results of the assessment of material experts are included in the very feasible category with an average percentage of 92.96%, the assessment of media experts is included in the very feasible category with an assessment percentage of 80.21%, the assessment response by biology teachers is included in the very good category with an average percentage of 86.75%, and student responses obtained an average percentage of 90.66% which indicates a very good category. Based on the results of the study, the Atlas of Gastropod Diversity on Wohkudu Beach, Gunungkidul is very feasible to be used as a Biology Learning Media.

Keywords: Atlas, Diversity, Gastropods, Wohkudu, Learning Media.

Introduction

Learning is a deliberate, directed, and purposeful effort so that others gain meaningful experiences. One sign that someone has experienced a learning process is if there is a change in behavior in that person which can be caused by changes in the level of knowledge (cognitive), skills (psychomotor), or attitude (affective). (Arsyad, 2002). The biological learning process is the creation of conducive situations and conditions so that there is interaction between the subject of learning and the object of learning in the form of living things and all aspects of their lives. Through interaction between the subject of learning and the object of learning, it can lead to the development of optimal mental and sensory motor processes in students (Wulansari, 2015). Djohar in Candra Puasati (2008)

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stated that the lack of student learning motivation and low learning outcomes can be influenced by various factors, such as: students' difficulty in understanding concepts, the teacher's way of teaching, and the use of learning media. These various factors, if applied in the biology teaching and learning process in schools, will increase student motivation and learning outcomes.

The results of an interview with one of the biology teachers and several students at SMA Negeri 1 Banguntapan stated that the biology learning process in class X MIPA on the material on the diversity of living things, especially in the sub-material on the classification of living things, has not explored and studied much about the material on animal classification because the learning material objects are difficult to find in the environment around the school so that the teacher only delivers material on plant classification. The learning methods used by teachers in delivering this material are also limited to learning methods with direct instructions, PPT delivery and exploration of the environment around the school which in reality only studies plants. According to Susanti (2003) the limitations of the material in the independent curriculum make some materials unable to be delivered in detail in classroom learning, one of which is the animal material, especially in the gastropoda class. Invertebrate animal material is a fairly dense material and uses a lot of scientific terms, making this material less interesting and quite difficult for students to learn (Alawiyah et al., 2016).

Yudaningsih, (2021) argues that this direct instruction learning method creates one-way communication centered on the teacher, which results in students' knowledge being limited to what the teacher gives. In addition, the absence of learning media that discusses animalia, especially gastropods, means that this animalia material cannot be conveyed optimally. This can certainly lead to a lack of student understanding of animalia materials which can have an impact on student learning outcomes.

Learning media is anything that can be used to convey messages or information in the teaching and learning process so that it can stimulate students' attention and interest in learning. The main function of learning media is as a teaching aid that also influences the climate, conditions, and learning environment that are arranged and created by the teacher. (Sapriyah, 2019). Seeing the needs of students and the function of the media, a learning media is needed that can help students understand biological concepts that are relevant to everyday experiences and life. Atlas is one of the visual graphic learning media that is most often used in the learning process. Atlas as a learning media emphasizes the presentation of images that are arranged systematically and colorfully (Lisdiana, 2021).

Atlas as a learning media also functions to describe learning materials that are difficult to learn with the naked eye. This is in accordance with Lestari's opinion (2017) who explained several advantages of atlases, including including original photos of real and preserved animals supported by complete explanations of animal classification, characteristics, and habitat. Lestari's research results (2017) also showed that the invertebrate atlas learning media that was developed had good characteristics and could improve student learning outcomes. Atlas learning media has advantages according to Wulansari et al. (2015), namely: (1) Helping students understand the material without having to observe directly (2) Increasing student enthusiasm in participating in teaching and learning activities (3) Arousing curiosity about the material presented (4) Able to overcome limited facilities and infrastructure (5) Practical, easy to make, flexible (6) In accordance with learning objectives

From the results of the analysis, several problems were found when communicating animalia classification materials, including the lack of sources and learning media that discuss animalia, which motivated researchers to develop gastropod diversity learning media in the form of an atlas to support recording biology learning in class. With the gastropod diversity atlas learning media, students can observe gastropods without having to come directly to their natural habitat, namely Wohkudu beach, so it is more effective and efficient.

Materials and Methods

Procedures

This study uses a modified ADDIE development model through three stages, namely analysis, design and development. The analysis stage contains the determination of the needs required in the development process, this stage is carried out by interview activities related to problems in the material on animal diversity. The next stage is design, at this stage the design of learning media products (prototypes) is carried out including the initial part consisting of the cover, foreword, table of contents, the core part in the form of material that will be included in the atlas, to the closing part containing the index, glossary and bibliography. Then the development stage (development) which consists of the stage of compiling the material into the designed atlas framework, product consultation, correction and review, validation by experts, revision and limited trials at schools for biology teachers and students of SMA N 1 Banguntapan.

Data analysis

The results obtained are then explained descriptively and tabulated according to the assessment of the feasibility of the Learning Media. The data obtained from the questionnaire is then sought for percentages using the formula: Riduan (2003) in R & Susanti, (2019):

$$Feasibility = \frac{Total\ Scores\ Obtained}{Highest\ Score}\ X\ 100\ \%$$

Interpretation of the experts' validation assessment categories can be seen in Table 1 below.

Table 1. Interpretation of Validation Assessment Categories.

No	Scores	Categories
1.	80% < skor ≤100%	Very feasible
2.	60% < skor ≤ 80%	Feasible
3.	40% < skor ≤ 60%	Fairly feasible
4.	20% < skor ≤ 40%	Not feasible
5	0% < skor ≤ 20%	Very not feasible

Interpretation of the respondents' response assessment categories can be seen in Table 2 below.

Table 2.Interpretation of Questionnaire Results.

No	**Scores**	**Categories**
1.	80% < skor ≤100%	Very Good
2.	60% < skor ≤ 80%	Good
3.	40% < skor ≤ 60%	Enough
4.	20% < skor ≤ 40%	Not Good
5	0% < skor ≤ 20%	Very Bad

Results and Discussion

The stages of development research in the ADDIE development model this time consist of the following stages:

a. *Analysis*

The results of the analysis conducted on students and biology teachers through the observation stage showed that there were problems that occurred during the learning of biodiversity material. The scope of biodiversity material includes animals and plants that should be delivered completely but in fact have not been realized due to lack of learning time and lack of learning media that support the delivery of the material.

b. *Design*

The designs in this atlas are listed in Figure 1 below:

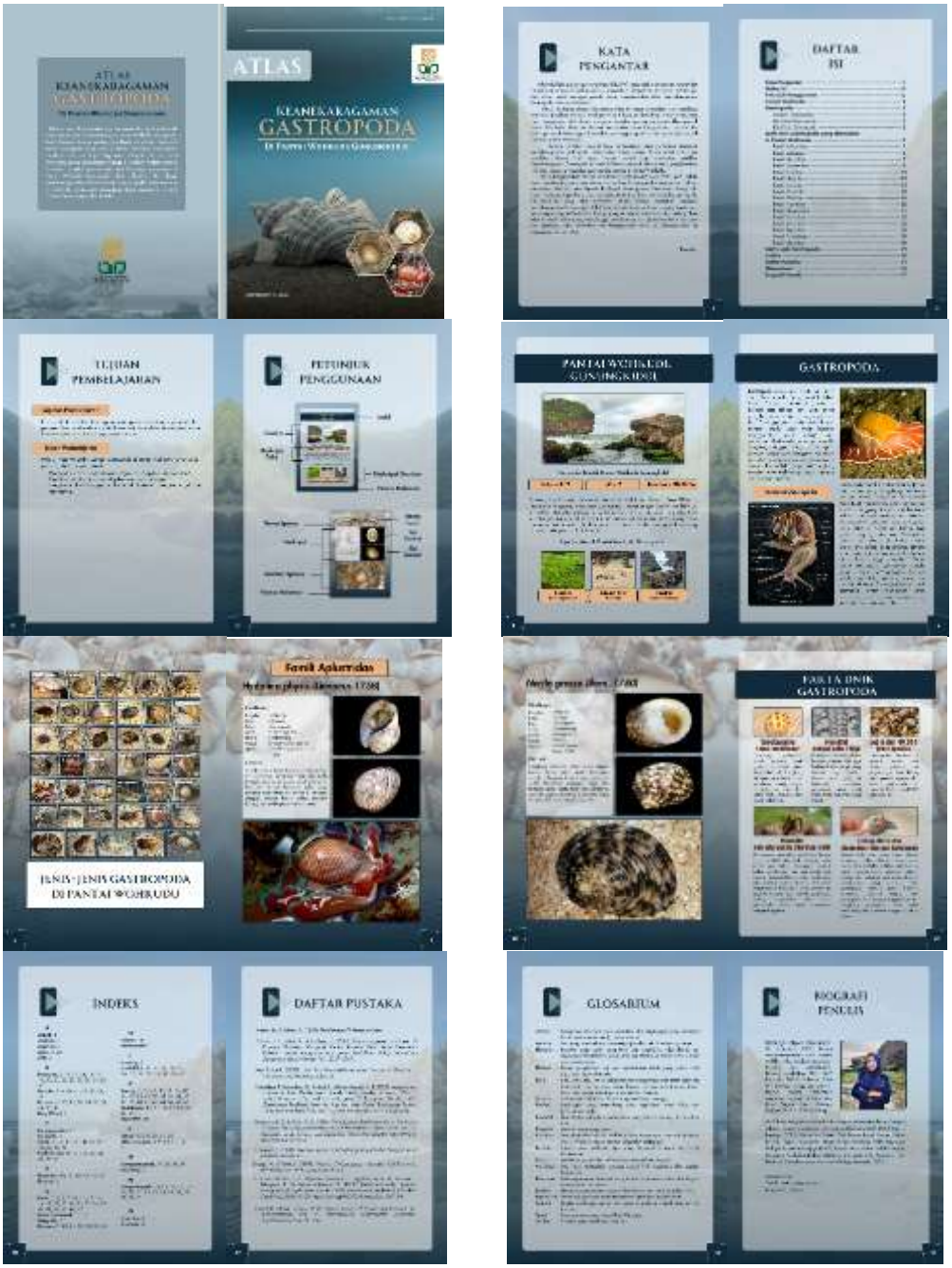

Figure 1.Atlas of Gastropod Diversity Design.

c. *Development*

The product that has been completed through the design, consultation, correction and review stages then the product enters the expert validation stage. This validation test is carried out by a material expert and a media expert who are competent in their fields using a 4-point Likert scale which can be seen in table 3.

Table 3.Expert Validation Test Results.

No	Validator	Percentage	Criteria	Everage	Final Criteria
1	Material Experts	92,96%	Very feasible	86,59 %	Very feasible
2	Media Experts	80,21 %	Very feasible		

The Atlas of Gastropod Diversity on Wohkudu Beach developed by researchers received a very

feasible score from material experts and media experts with a percentage of 92.96% and 80.21%. The average of the two experts showed a very feasible category with a percentage of 86.59%. This percentage is the basis that this product is worthy of entering the next stage, namely product trials in schools. The product trial was conducted on a limited basis at SMA N 1 Banguntapan on 18 grade X students and a biology teacher. The purpose of this limited trial was to determine the response of product users in the field. The results of the limited trial in schools are listed in Table 4.

Table 4. Limited Trial Response Results in Schools.

No	Respondents	Percentage	Criteria	Everage	Final Criteria
1	Biology Teachers	86,75%	Very good	88,70 %	Very Good
2	Students	90,66%	Very good		

The results of the product trial with biology teachers obtained a good response with a percentage of 86.75% (can be seen in table 4) while the results of the product trial with students obtained a very good response with a percentage of 90.66%.

Table 5. Overall Score Results.

No	Assessor	Percentage	Everage	Criteria
1	Material Experts	92.96 %	87,64 %	Very feasible
2	Media Experts	80,21 %		
3	Biology Teachers	86,75 %		
4	Students	90,66 %		

Based on table 5, the average percentage of assessment results is 87.64%. According to Wicaksono (2014), a positive response is obtained if the questionnaire response category shows that more than 50% of statements receive a strong or very strong response, so that the media is said to be suitable for use as a learning medium. A positive response also shows that this atlas learning media was developed to make students understand better, be able to learn independently, be active and have a high interest in the lesson.

Conclusions

The development of "Atlas of Gastropod Diversity in Wohkudu Beach as a Biology Learning Media for High School Students" after being tested for feasibility by material experts is included in the very feasible category with a percentage of 92.96% and media experts are included in the very feasible category with a percentage of 80.21%. Then biology teachers and students gave a very good response with a response percentage of 86.75% and students 90.66%. The assessment given by the validator and respondents had an average value of 87.64% so that "Atlas of Gastropod Diversity in Wohkudu Beach as a Biology Learning Media for High School Students" is very feasible to be used as a biology learning media in schools.

Conflict of Interest: With this the author declare that there is no conflict in the data published in the manuscript interests of any party. If in the future something is found Full responsibility for this matter rests with the author.

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