Discovery-learning-based Module Development Enriched with Sambas Folklore on the Sub Material Classification of Living Things

ABSTRACT

This study aims to develop a module as teaching materials on the Sub Material Living Things Classification of living things sub-material with a discovery learning approach combined with folklore and determine students' responses to these teaching materials. This study uses the first three stages of the Thiagarajan 4D model development method: define, design, develop, and disseminate. The research instruments used were validation sheets and questionnaires. The sample in this study was class X high school students consisting of 15 people. The five product validators consisted of two lecturers from the Biology Study Program, Faculty of Mathematics and Natural Sciences, Tanjungpura University, three biology teachers from 2 high schools in Pontianak City, and one from Sambas Regency. The module validation sheet consists of 4 aspects, namely content, language, presentation, and graphics consisting of 20 indicators. The student response questionnaire consists of three aspects, namely cognitive, affective, and conative aspects, comprising 26 statements. The response questionnaire validators consisted of 2 lecturers from the Biology Education Study Program, FKIP, University of Tanjungpura. Developing a module based on discovery learning sub-material classification of living things is declared feasible because it obtains a validity value of CVR = 1, meaning that the module is valid in content. Modules declared feasible are tested on a limited basis and obtain an average result of 81.9% in the very strong category. Further research is needed to test modules in larger classes.

ARTICLE INFO

INTRODUCTION

In the 2013 Curriculum, it has been determined the use of a scientific approach in implementing the learning process in the classroom. The scientific approach focuses on students understanding a concept and various materials with a scientific approach, laws, or principles through observing, formulating problems, submitting or formulating hypotheses, collecting data with various techniques, analyzing data, and concluding (Fadhilaturrahmi, 2017). Next, in Permendikbud No.22 of 2016, it is stated that to strengthen the scientific approach, it is necessary to apply inquiry/discovery learning. Teaching materials are needed to support the application of a scientific approach and research-based learning models. Teaching materials are essential to the learning process. Therefore, it is necessary to develop teaching materials so that learning in class is more exciting and enjoyable (Maslahah & Rofiah, 2019). In learning, teaching materials can be a means of good interaction between teachers and students, following the demands of the curriculum and syllabus (Agung & Wahyuni, 2013).

The demands of the curriculum and syllabus are not necessarily achieved at school. Findings based on the results of an interview on March 2, 2020, with a biology teacher at SMAN 5 Pontianak City obtained information that the teacher knows the discovery learning model but has never used it. The teaching method usually done by teachers in schools is generally still in the form of discussion and question-and-answer methods using textbooks and student worksheets (LKPD) as teaching materials sold at bookstores. At several meetings, the more creative teacher also summarized the material on folio paper; however, it was not distributed to students but as a guide during teaching.

Teaching materials have an important role not only for students but also for teachers. Developing various learning resources into good teaching material products according to the syllabus and curriculum still needs to be done. For example, regarding the basic competence (KD) in the Sub-material Classification of Living Things for class X SMA/MA, it is hoped that students will be able to analyze data of an observation table about various levels of biodiversity (genes, species, and ecosystems) in Indonesia and present the results of identification of proposed efforts to conserve Indonesia's biodiversity based on the results of analysis of data on threats to the preservation of various diversity of animals and plants unique to Indonesia which are communicated in various forms of information media. These two competencies direct forms of learning activities such as collecting data, observing, analyzing, identifying, and presenting or communicating. Meanwhile, in one of the textbooks, for example, in Sulistyani et al. (2013), the learning activities listed for the Sub Material of Classification of Living Things are more about classifying and making dichotomous keys or simple determination keys and presenting them. This indicates that the learning activities listed in the example textbook have not accommodated all the demands of KD.

The suitability of the presentation with the syllabus and curriculum needs to be done by developing excellent and appropriate teaching materials. Modules are printed teaching materials designed to be studied independently because they are equipped with instructions so students can carry out learning activities without a teacher. Module development is also beneficial for teachers and students because it can be used as a guide for both. Several module development studies on the Sub Material Classification of Living Things were carried out with digital packaging (Buku et al., 2022; Wijaya, et al., 2021) and the application of certain learning models such as guided inquiry with crossword media (Sucita, 2021) and SQ3R (Prameswari, 2021). Module presentations that are interesting and increase students' affective, psychomotor, cognitive, and conative values must also be considered, for example, by including enrichment in the form of local wisdom about the diversity of animals found in folklore.

Referring to the basic competencies in the Sub Material Classification of Living Things, the discovery learning model fits the demands of the recommended activities of analyzing and presenting the results of observations and identifying biodiversity in Indonesia. Implementing discovery learning strategies can be strengthened in learning tools such as modules based on or created with discovery learning syntax. Elements of folklore itself can be packaged in the stimulation, data processing, verification, and presentation sections. For example, students are stimulated by reading about a summary of folklore, then proceeding with processing data on kinds of animals found in the folklore. Next, students verify and present the animal species found. Including the contents of

folklore in the module is expected to attract interest in learning and explore students' knowledge. In addition to containing educational value, folklore also contains moral values that can be learned.

Student responses to the module must also be studied at the development stage, especially in the cognitive, affective, and conative aspects. Cognitive responses relate to one's thoughts or perceptions about attitude objects which can be verbally identified from expressions of beliefs about something, both negative and positive. Affective responses indicate one's attitude that can be inferred from one's evaluation or feelings of the object of one's attitude. Next, conative responses relate to behavior, actions, desires, and actions related to the attitude object (Amir, 2015). Student responses can be obtained through a questionnaire to describe their responses about the discovery learning-based module, which is enriched with folklore. The response will arise if the five senses observe an object as an object catcher. Someone is said to respond positively to something if the object is attractive. Vice versa, someone will respond negatively if the object is unattractive (Yuwono, 2009).

Based on the above studies, this research aims to develop module teaching materials on the Sub Material Classification of Living Things and determine students' responses to these teaching materials. In this study, the folktale, "Treasures of Mount Selindung" originates from Sambas Regency, West Kalimantan. The folklore is selected based on the content of teaching materials, such as the kinds of animals in folklore and positive moral values to be learned by students.

METHOD

This development research uses the 4D model learning tools (define, design, develop, disseminate) according to Thiagarajan (1974). In this study, the development research was only carried out in the first three stages: define, design, and develop. This research was conducted in October 2021-May 2022.

Stage one is defining, which begins with analyzing the development needs through observation and interviews with biology teachers to discover the fundamental problems faced in learning the Sub Material Classification of Living Things for class X IPA. Next is analyzing the content material following the basic competencies and learning objectives set while overcoming the problems revealed in observations and interviews. Stage two is planning (design). Designing the module begins with creating a storyboard. The components in the module modify those of Prastowo (2014) with the addition of discovery learning steps, prefaces, table of contents, core competencies (KI), competency achievement indicators (IPK), and bibliography.

Developing the modules as teaching materials with a discovery learning approach combined with folklore is carried out in the development stage. The designed module was developed in the Microsoft Office Word 2016 program for both the content and cover sections. The module is made in the book form of 44 pages with A4 80 gsm paper size. The cover is printed using glossy paper. After obtaining the initial product, it is reviewed again to check the suitability of all components with the initial design. Next, an assessment by experts (validation) is carried out to determine the feasibility of the module using several indicators. In the early stages, instrument validation was carried out by two validators and continued with product validation by five validators. Expert validation was carried out by 2 lecturers from Biology Study Program of the Faculty of Mathematics and Natural Science University of Tanjungpura and 3 biology teachers from 2 high schools in Pontianak City and 1 high

school in Sambas Regency. Validation includes aspects of feasibility of content, language, presentation, and graphics with 20 indicators. In addition to the 20 indicators, the guiding assessment is also complemented by including suggestions or input for improvement from the validators. The validation results were analyzed by calculating the Content Validity Ratio (CVR) and Content Validity Index (CVI) values according to Lawshe (1975) which were described again by Gilbert & Prion (2016) using the following equations:

$$CVR = \frac{Ne - \frac{N}{2}}{\frac{N}{2}} \qquad (1)$$

Description:

N = the number of experts who agree and strongly agree or give a score of 3 or 4

N = number of members of the validator or team of experts

$$CVI = \frac{CVR}{\sum n} \qquad (2)$$

Description:

n = number of items in all aspects

The module is declared valid in terms of content if the final calculation of CVR and CVI meets the minimum threshold value of 0.99 for 5 validators.

Next, an assessment was carried out by experts to determine the feasibility of the questionnaire before being distributed to students. In the early stages, the questionnaire instrument was validated by two validators from the Biology Study Program, Faculty of Teacher Training and Education University of Tanjungpura. The next stage is the questionnaire distributed to 15 students from the same school. The questionnaire was built in two forms of statements, positive and negative statements. The questionnaire determines students' cognitive, affective, and conative responses to the module. The response questionnaire consisted of 26 statements, with 16 positive statements and ten negative statements. In addition to the 26 statements, the questionnaire assessment was equipped with students' suggestions or input regarding the module. Response test results were analyzed using a Likert scale outlined in the statement items. Riduwan (2016) states, "The Likert scale measures the attitudes, opinions, and perceptions of a person or group of events or social symptoms." The formula used is as follows:

$$\text{Interval} = \frac{\text{Statement item score}}{\text{The highest score of the statement item}} \times 100\%$$

and score interpretation follows Riduwan (2016) as listed in the following table:

Table 1. Score Interpretation scale by Riduwan (2016)

Interval	Criteria
0% - 20%	Very weak
20,01% - 40%	Weak
40,01% - 60%	Moderate
60,01% - 80%	Strong
80,01% - 100%	Very strong

(Riduwan 2016)

RESULTS AND DISCUSSION

Module development was successfully carried out with three stages of the 4D model by Thiagarajan (1974). Stage 1 Define was proceeded by interviewing the biology teacher at SMAN 5

Pontianak on February 28, 2020. We obtained information that the teacher knows the discovery learning model but has never used it. The teaching method that is usually used by teachers at SMAN 5 Pontianak is a method of discussion and question and answer using textbook and student worksheets as teaching materials and a summary of the classification of living things in folio paper made by the teacher but not distributed to students. Teaching materials used in schools have several differences from modules, namely modules provide feedback for students so that students can find out their deficiencies and immediately make improvements while teaching materials in schools do not provide feedback. Next, the module provides a glossary to increase students' knowledge of terms that are not understood while teaching materials at school are not available. Then the module is flexible because the module material can be studied by students in different ways and at different speeds while teaching materials at school are the opposite (Lasmiyati & Harta, 2014). Learning using modules has never been done, especially modules based on discovery learning, including the Sub Material Classification of Living Things. Apart from being a teaching material for learning activities, the discovery learning-based module, a Sub Material Classification of Living Things, can also be used to solve students' problems with difficulty classifying living things. This module can be used as a solution to train students to get used to scientific language and to generate students' motivation in learning. According to Hamdani (2011), one of the principles of module preparation is that it must be able to motivate to be a determinant of learning success. Motivation in learning is important because high motivation in students will produce optimal activities to achieve the desired goals (Widiasworo, 2015).

This discovery learning-based module consists of 44 pages with four chapters. Chapter One is an introduction consisting of a background, a brief description, core competencies (KI), basic competencies (KD), and competency achievement indicators (IPK). Chapter Two includes learning activities consisting of learning objectives, instructions for implementing learning, learning stages for classifying living things with discovery learning models, summaries, and formative tests. Formative tests are given as feedback for students, teachers, and programs to assess the implementation of a program unit (Magdalena, Rachmadani, & Aulia, 2020). Then, Chapter Three is comprised of evaluation which consists of evaluation objectives, evaluation material, and evaluation questions. According to Sulistyani et al., (2013), assessing the ability to understand the material can be done by working on evaluation questions. In addition, with evaluation questions, it can be seen the level of difficulty and ease of learning material given to students (Hamdani, 2011). Next, Chapter Four is a conclusion consisting of follow-up actions and expectations. Then, at the end, there are answer keys, a bibliography, and a glossary. The glossary contains explanations of concepts relevant to a particular field of knowledge or activity and can help to find the meaning of difficult words/terms (Susanti, 2016).

Harta et al. (2014) stated that the module is one of the teaching materials written with the aim that students can learn independently without or with teacher guidance. Some of the advantages of the module, according to Evitasari (2019), are as follows: 1) students can achieve learning goals well in a time that is appropriate to their respective speed and abilities; 2) the evaluation items in the module are used as a measure of the success of students in achieving goals; 3) modules can be worked

on and used in various situations and places. Some views of the development results of the discovery learning-based module can be seen in the description below.
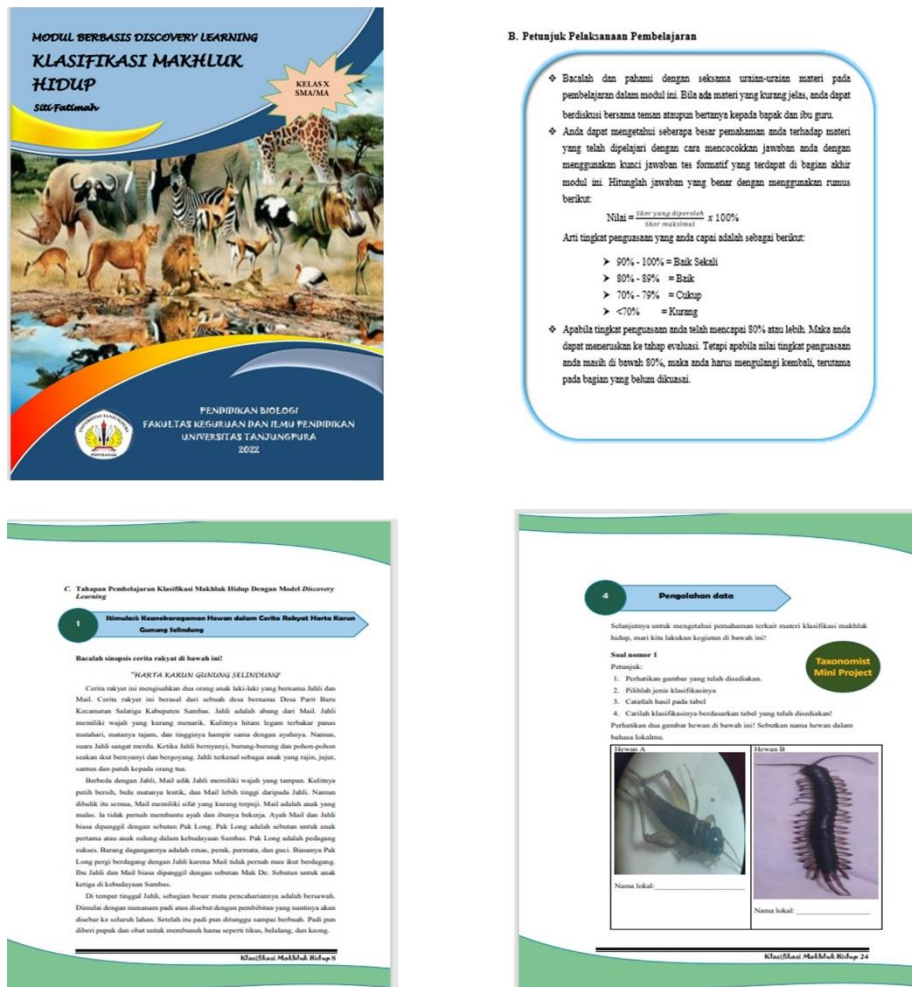

Figure 1. Visualization of some parts of the discovery learning-based module; cover (top left), preface (top right), discovery learning stages (bottom left and right)

The addition of complementary components, namely competency achievement indicators, and table of contents is intended to make it easier for users to use this module. Competency achievement indicators serve as a measure of material mastery that is expected to be achieved in learning objectives. According to Dewi (2015) that carefully formulated indicators can provide an overview of effective learning activities for achieving competence. The table of contents is useful to make it easier for students to find the desired page so that time can be effective (Prastowo, 2014). Then the addition of discovery learning stages to make it easier for users to learn modules independently and more actively. Discovery learning is a learning process in which students are presented with incomplete material and requires students to discover a learning concept for themselves (Maharani & Hardini, 2017). Teachers do not immediately draw conclusions but provide opportunities for students to investigate, search for, and solve problems so that they can add to their learning experiences (Abdjul, 2022). Discovery learning activities are focused on students and teachers only as facilitators (Junaedi, 2020). Discovery learning syntax consists of stimulation, problem identification, data collection, data processing, and proof (Toharudin, 2011).

The cover is shown in dark blue mixed with light blue with a little added yellow with pictures of various animals in the middle to make students more interested and excited when they see the module for the first time. In addition, the module cover is also equipped with an identity and university logo for originality. Another interesting part of this module is that there is a folk story in the stimulation section. Besides being asked to look for the kinds of animals contained in it; students can also take positive values from the story. Next, in data collection, pictures of scientific figures and pictures of animal and plant examples are presented. Furthermore, in data processing, there is a taxonomist mini project which contains pictures, tables of characteristics of animal classes, orders, families, and genera that students can observe so that the classification activities can be known. In addition, there are exercises to make students better understand how to use the determination key.

As revealed in one of the questions in the interview with the teacher, the problem faced by students at school is the difficulty in classifying living things independently so that at the data processing learning stage a taxonomist mini project is made in which there are pictures of animals and tables presenting the characteristics of many orders, families, and genera so students can find their own classification by matching the pictures with the tables provided. Furthermore, to train students to be familiar with scientific language, exercises are made in which scientific language is distinguished by only one to two letters.

Table 2. The validation results of the module as teaching materials developed in this study by 5 validators.

No	Validity Aspects	Indicators	CVR
1	Content	The suitability of the module with KD, competency achievement indicators (IPK), and learning objectives	1
		The suitability of the module with the concept of learning material	1
		Compatibility of the module with the components of the module manufacture	1
		The suitability of the module with the syntax of the discovery learning model	1
		The usefulness of additional information on folklore to add insight and knowledge to students	1
		The suitability of the module with positive values, morality, and social attitudes	1
		Conformity of evaluation questions with learning objectives	1
2	Language	The readability of the module is based on the selection of vocabulary according to the educational level of the students	1
		Clarity of information on the module	1
		Conformity of words and sentences contained in the module with good and correct Indonesian language rules according to PUEBI	1
		The use of language in the module is effective, efficient, concise, clear, and concise	1
		The use of a combination of language and images motivates students to study the module	1
3	Presentation	Compatibility of supporting images with learning materials	1
		Complete information on the module	1
		Clarity and usability of the presentation of the glossary	1
		The sequence of steps in the module makes learning easier	1
4	Graphics	Interesting pictures or graphics	1
		The attractiveness of the cover and the design of the module content	1
		The use of letters that are attractive and easy to read	1
		The accuracy of the layout	1
		CVI	1

The validation results of the discovery learning-based module can be seen in Table 1. All assessment criteria get a value of CVR = 1 or meet the minimum validity value for 5 validators (0.99)

so that it can be declared feasible in terms of content. The validity of the four aspects of the assessment (content, language, presentation, and graphics) consisting of 20 indicators can be stated that they are in accordance with the development objectives described in the assessment criteria.

In addition to the validation results, several validators also provided several suggestions as a reference for the development of discovery learning-based modules. Assessment by the validator is very important to provide an assessment of the teaching materials developed so that they are suitable for use as a learning resource (Ektryana et al., 2014). The results of the suggestions from the validator and their revisions can be seen in Table 3. The revisions made included adding reference sources, writing species nomenclature, image clarity, and captions, correcting punctuation errors, correcting typing errors, correcting errors in capitalization, and writing initials and words front. In development activities, suggestions and input from the validator are very useful to improve the suitability of product manufacturing with the results of the needs analysis which are missed from what has been described in the design stage. The selection of the right validator can improve the quality of the product being developed (Ektryana et al., 2014).

Table 3. The validator's suggestion for the improvement of the discovery learning-based module developed in this study.

No	Suggestion	Revision
1	Add a reference source in the image	The reference source has been added to the image
2	The spelling of the species' nomenclature is inaccurate	The writing of the nomenclature of the species has been changed
3	Pictures are not clear and large so misunderstandings can arise	The image has been clarified and enlarged
4	Note the writing of prefixes and prepositions as well as the placement of commas	Prefix and preposition writing and comma placement have been improved
5	The description in the picture needs to be adjusted	The description in the picture has been adjusted

Overall, the module development process was successfully carried out and received a valid assessment from all validators. Improvements according to suggestions and input from the validator have been carried out which are expected to improve product quality. Next, the discovery learning-based module can be tested in small-scale subjects to find out the response from students. The results of the student response questionnaire analysis in a small-scale trial at one of the high schools in Pontianak City can be seen in Table 4.

As presented in Table 4, the indicator with the highest percentage, namely the clarity of pictures/tables in supporting students to understand the contents of the module, received an average score of 91.66%. This is because in each explanation of important figures and material, pictures are presented that can support students' knowledge. Then, the second highest indicator, namely the willingness of students to use modules with the same approach, earned an average score of 85.83%. This shows that the discovery learning-based module combined with folklore is appropriate to be used as a learning resource for students. According to Sitepu (2017), learning through various sources allows students to learn with their own learning styles, increases their curiosity, and communication skills, learn in groups, and compile and present reports of observations systematically. According to Raharja et al. (2018), learning will run more smoothly and satisfactorily if students have high curiosity. In addition, it can be concluded that students want to make another module using the same approach. Annisah et al. (2020) state that folklore is a familiar part of society as well as when folklore

is used as teaching material in schools it is hoped that it will increase students' creativity and interest in learning, as well as have a positive impact on character and moral values learners.

Table 4. Student responses to the small-scale trial of discovery learning-based modules developed in this study.

Aspect	Indicators	Student Response	
		Score Average (%)	Criteria
Cognitive	Ease of understanding the contents of the material contained in the module	74.99	Strong
	Clarity of pictures/tables in supporting students to understand the contents of the module	91.66	Very Strong
	The added value of folklore in the module	83.74	Very Strong
	Clarity of the structure of the discovery learning presentation and the order of the material	75.82	Strong
	Average in the cognitive aspect	79.04	Strong
Affective	Motivation	80.83	Very Strong
	Appropriateness of the appearance of the module	80	Strong
	Curiosity	79.99	Strong
	Attractiveness	81.66	Very Strong
	Average in the affective aspects	80.83	Very Strong
Conative	Willingness to use modules with the same approach	85.83	Very Strong
	Average in conative aspect	85.83	Very Strong
	Average response in all aspects	81.9	Very Strong

The overall module development process was successfully carried out and received a response of 81.9% in the very strong category. With the fulfillment of the validity assessment by experts and the response test of students as users, the module developed in this study meets the requirements to be tested on a larger scale. The results of the development of this module are expected to meet the need for more varied learning resources both in terms of content and learning activities presented. The inclusion of folklore content adds to the attractiveness of the product for students as well as reintroducing local wisdom that exists in each region.

CONCLUSION

The development of a module based on discovery learning in the Sub Material Classification of Living Things was successfully carried out with a CVR value for each criterion and a CVI of 1 which fulfills a minimum score of 0.99 for five validators. This module also gets an average student response in the cognitive, affective, and conative aspects of 81.9%, which means it is in a very strong category.

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