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THE DEVELOPMENT OF FUNGI CONCEPT MODUL USING BASED PROBLEM LEARNING AS A GUIDE FOR TEACHERS AND STUDENTS

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ABSTRACT

A competence to develop the teaching materials especially for module that needs to be owned by teachers, considering that the teaching materials make the learning process more effectively and efficiently. In addition, the teaching materials also have an important role for the teachers and students. In the learning process that is conducted on individual, group as well as classical. This research aims to produce a module concept of fungi that can increase the student learning results. The research procedure consists of: the first step of situation analysis (define), planning step (design), developing step (develop), validation module step, the experiment of product, revision and final result of product. The product development is a module for students and teachers.
The data analysis that is found from the model concept of jamur from the students and the teacher module, the result of validation by educational experts demonstrate the value 80,45% module for teacher and student modules for 84,07%, which includes the criteria it deserves, The validation result indicate the percentage of 72,92%, which includes the criteria it deserves. The summary of the validation result of the module, quantitative data are also obtained from the results of a test conducted on a small scale at 17 students grade 1 SMA Negeri Banda Aceh showed that the developed modules are used with decent percentage of 85,61%. The conclusion that the product is fit for use and can improve student learning outcomes.

Keywords: The development of module, problem based learning, the output of learning.

INTRODUCTION:

The government has attempted a number of ways to in increase the human resources through improving the education quality. The improvement of curriculum is one of the efforts to improve the education quality including the development of some methods. Models, approaches, and learning strategy (Mudyohardjo, 2006) stated that in order to improve the quality of education. The engineering learning methods through the organization strategies, delivery strategies, and management strategies of learning must always be implemented so that learning process can be effective, efficient, and has a high attraction.

The result of interview in SMA Negeri Banda Aceh in particular the students of grade 1 shows that the learning process has been using a lot of learning models, such as *Problem Based Learning*, *Numbered Heads Together*, *Picture and Picture*, *Student Team Achievement Division*, speech and question and answer model. That learning models are less able to make the student understandably about the learning of IPA. Studying IPA is known as the memorizing of theory and operating the arithmetic. Finally, IPA changes to be memorizing and counting, not learning about the phenomenon of nature. Susanto, and Margono (1996) stated that learning biology is not only find or conclude the knowledge of living beings, but also endeavor to cultivate and develop attitudes and actions, The capability to think and to improve the ability of scientific method In order to be capable to make scientific investigation.

The learning process that is based on problem helps the students improve their skills of thinking and the solve the problems, to study the role of the adults and become independent students (Arends, 2008:43). This model is characterized by using the problem of the real life as something that must be learned by the student to exercise and cultivate the important concepts. This learning approach gives priority to the learning process, where the teacher's work should focus their self to help the students in achieving the directing skills. Learning based on the problem is used in a higher level of thinking, in a situation-oriented problem, includes how to learn.

Learning of Biology in SMA Negeri Kota Banda Aceh is also supported by materials of learning. The materials of learning use variously but those all are less interesting to be learned and still content-based. The student activities are trained to build the understanding independently any less because the teacher does not use LKS. The teacher also explained that the existence of the necessary learning materials arranged in a systematic, communicative, and interesting for students. The previous research conducted by (Oktaviasari, 2012) states that the module can increase motivation and understanding of the materials being learned. The same thing was found (Abidah,2011) that module can increase the understanding of the students so as to have an impact on student learning outcomes. According to this explanation, so the research wants to develop the materials of learning in a module. In this case, SMA Negeri Kota Banda Aceh is developing the materials of learning in a module.

The materials that are developed to arrange the model of the nature of Biology because the materials had not been developed a module. The materials are the based materials that must be mastered by students and can improve the students to think critically, using scientific methods to develop a concept. As long as the materials are often given in the theory only without any activities that train the thought of the students' abilities, develop the understanding of materials. This survey aims to produce a module-based concept of misguided social interaction on inukuri of fungi to enhance the outcomes of student learning.

METHODS :

The development of model teaching materials are used in this research is the 4-D model (four D model) from (Trianto 2008). The development of 4-D teaching materials is chosen based on this following consideration:

1. This model is arranged programmatically with a sequence of systematic activities in an attempt to solve the problem of learning that relate to learning sources according to the needs and the students' characteristics.
2. The developing model of teaching materials 4-D discuss about how to develop the teaching materials and not teaching design.

The development of 4-D model which is used here consists of 4 steps, they are *define, design, develop, and disseminate* (Trianto 2008). The procedure of development in this research consists of : the first step of situation analysis (define), planning step , developing step , validation module step, product trials of the development, revision and final product.

The data obtained from the testing of this development of module products in the form of qualitative and quantitative data that can be used to repair or improvement of the product development research. Qualitative data in the form of feedback and suggestions on the improvements gained from the subject of the experiment, while quantitative data obtained from is given to the subject of experiment. Quantitative Data is a number 4, 3,

2, 1, which describes the Likert scale which includes four options with the following alternative (Arikuanto, 2006):

1. The number 4 means good/interesting/proper/easy
2. The number 3 means good enough/ interesting enough/ proper enough / easy enough
3. The number 2 means less good/ less interesting/ less proper/ less easy
4. The number 1 means not good/ not interesting/ not proper/ not easy.

Data acquired now from the test material, education and limited field trials were processed by using the descriptive analysis techniques in the form of a percentage(%). The formula used to calculate the percentage is as follow:

$$\text{Persentage (\%)} = \frac{\Sigma \text{ (the answer choice x the weight each of choice)}}{\text{n x S the highest weights}}$$

Description:
Σ = sum of (the answer choice x the weight each of choice)
n =sum of items
to make a conclusion in order to revise the product then the results of the percentage referred to in the table the following validity level criteria.

Table 1: Criteria for the Level of Valid Product Development

Percentage	Criteria
85,00 – 100,00	Very proper
70,00 – 84,00	proper
55,00 – 69,00	Quite Proper
40,00 – 54,00	Less proper
25,00 – 39,00	Not very proper

Table adapted from Sugiono (1999)

RESULTS:

The result of this research is the result of learning materials in the form of modules. The Jamur concept module in generate a learning materials for individual learning and independent with the allocation time 4 x45 minutes. Model concept of Jamur from the students and the teacher module. The result of validation by educational experts demonstrate the value 80,45% module for teacher and student modules for 84,07%, which includes the criteria it deserves. A summary of the result of the module by experts of education can be seen in tables 2 or 3.

Table 2: summary of the results of validation data module tacher by education

No.	Aspects are rated	Percentage	Keterangan
1.	Cover	81,5%	valid
2.	Preface	70,83%	valid
3.	contains/list of pictures	93,75%	very valid
4.	The guide to use of the modules	75%	valid
5.	Syllabus	78,13%	valid
6.	Learning implementation plans	75%	valid
7.	Answer sheet	83,33%	valid
8.	Answer keys	82,5%	valid
9.	Reference list	81,25%	valid
10.	Others	83,33%	valid
	Total of Average	**80,46%**	**valid**

Table 3: summary of the results of the validation data module students by educational experts.

No.	Aspects are rated	Percentage	Description
1.	Cover	87,5%	very valid
2.	preface	70,83%	valid
3.	Contains /list of pictures	93,75%	very valid
4.	The guide to use of the modules	87,5%	very valid
5.	Material	87,5%	very valid
6.	Student learning activities	87,5%	very valid
7.	Question	87,5%	very valid
8.	pictures	87,5%	very valid
9.	Test of competence	75%	valid
10.	Reference list	87,5%	very valid
11.	Compliance with the level of development of learners	87,5%	very valid
12.	communicative	87,5%	very valid
13.	Dialogist	75%	valid
14.	Compliance with the rules of Indonesia	75%	valid
	Total	**84,07%**	**valid**

The validation result indicate the percentage of 72,92%, which includes the criteria it deserves. The summary of the validation result of the module by material presented in table 4.

Table 4: A Summary of the Results of the Validation data Module by Material

No.	Aspects are rated	Percentage	Description
1.	Learning implementation plan KD 1.1	75%	valid
2.	Learning implementation plan KD 1.2	75%	valid
3.	Fungi Material	73,33%	valid
4.	Material Classification of fungi	71,87%	valid
5.	Answer sheet of competency test	70,83%	valid
6.	learning activities 1	72,22%	valid
7.	learning activities 2	72,22%	valid
	Total	**72,92%**	**valid**

Quantitative data are also obtained from the results of a test conducted on a small scale at 17 students grade 1 SMA Negeri Banda Aceh showed that the developed modules are used with decent percentage of 85,61%. Summary data on small scale trial results by students can be seen in Table 5

Table 5: summary of field trial result data

No.	Aspects are rated	Percentage	Description
1.	Cover	90,2%	very valid
2.	Contents/the list of pictures	100%	very valid
3.	Introduction	97,1%	very valid
4.	cyompetence	64,71%	quite valid
5.	Usage instruction of modul	88,24%	very valid
6.	Kind of learning activities in module	83,52%	valid
7.	Bibliography	94,11%%	very valid
8.	Questions for testing of competence	82,34%	valid
9.	Others	76,47%	valid
10.	Pictures	79,41%	valid
	Total	**85,61%**	**very valid**

Qualitative data in the form of comments and suggestion on improvements obtained from the validation and test subject. The qualitative data was used for the revision of product. Revision the module is done on the

introduction, content and cover, part of the cover with the appropriate setting so it does not need to be long. The usage instruction of model has been presented in the form of hart so that students can understand the steps working on module. Usage instructions module has also been coupled with location times so students can finish does not exceed the limitation of time. Observing the table coupled with indicators analyzing the data in the form of a table because the table is difficult to observe the indicator was measured. Chart of the scientific method has given a number and description making it easy to understand. Answer keys and image captions in learning activities have been clarified so that it can be understood. Error writing test and answer keys competencies and a summary has been revised to clarify the description. Modules are developed as a whole meets the component modules. The module contains the outline of learning objectives that are specific and explicit usage instructions module, the sheets of student activities, worksheet and answer keys of worksheet, and the answer key of evaluation sheet. The final result of product in form of modules that have been revised. The details of revision of products will be described in table 6.

Table 6: The details of Product Revision

No.	Part of the module	Before Revision	After Revision
1.	Cover	- Changing the color - Adding the background so that there is no empty part. - The module of student needs to add the name box.	- The color of cover is replaced with the background - The cover has been fixed with the provision of background. - The box of the student's name has been added.
2.	preface	- There are some things that must be considered in writing the preface to make it look appealing and is not complicated - The content of module does not need to be described in the preface.	- The word is not very important must be deleted in the preface
3.	The interactions of module usage	- It would be better look attractive for students if forms are presented in chart. - Impressed as an explanation of the parts of the module - The writing that is less clear if the white color. - Add a description of the allocation of time for each stage of learning.	- Instructions of usage are presented in chart form of presented. - The writing was changed to be more clear so that more clear. - The instructions have been added to the description of the allocation of time for each learning activities.
4.	Syllabus	- Indicators observing and analyzing the table should be made 1 to analyze the results of the experiment - Learning resources are given a page that referred to.	- Indicators to observe and analyse the merge into analyzing the results of experiment - Learning resources have been added to the designated page.
5.	RPP	- The improvement of writing - Making conclusion from the result of learning in core activities.	- The writing has been improved - The conclusion learning result are included in core activities.
6.	content	- The chart should be given a number and title. - The content need to be added because the answer of question there is no in content. - The picture of biomes should be placed closed to the content so that it can directly understand.	- The chart are numbered - The sample of biology object is added - The picture of biomes remains on the original because the description of it is quite clear.
7.	Learning Activities	- The reference of pictures need to be given a page. - The writing of image 12 need to be clarified and the color is black - In case 3 of number 2 answer keys is not finished yet - There should be an assessment rubric any learning activity.	- The reference has been given a page. - The writing of image 12 has been clarified with black color. - The answer key of case 3 of number 2 has been improved. - The RPP has been added the rubric of the module assessment module
8.	Summary	- The writing of the first letter of the kingdom name should be capitalized.	- The writing of kingdom has been improved
9.	Testing of competence	- The wrong answer key should be free - TSP fertilizer is less	- The answer key has been corrected - The writing of fertilizer has been

No.	Part of the module	Before Revision	After Revision
		- The answer of number 3 should be improved - The language is used should be facilitated with the clear instruction of question	improved - The answer key to the explanation has been corrected - The instruction of the question clarified
10.	Bibliography	- Improve the punctuation of colon and capital letter.	- The punctuation a has been improved
11.	Pictures	- The pictures should be more clear	- The pictures are clear

The result of validation by education experts, expert content, and the subject of trials showed that the developed modules are proper to be used. The modules were also developed to improve student learning outcomes. The results achievement and postes at time of experiment showed the increased values of postes.

THE DISCUSSION:

The concept of fungi is basic material that is given to the high school students. These materials explain the work principles of scientific to obtain a biological concept so that such materials should not only be taught in SK and KD are related, but also on the whole matter of biology. The concept of fungus can be taught through the study of *problem based learning.* Learning problem based can improve the competence of thinking and the skills of science process of students so that the learning goals can be achieved. Susanto and Margono (1996) state that learning biology is not just get the information and conclude knowledge of living beings, but also endeavor to cultivate and develop the attitude and the ability to think and to improve the capability of running a scientific method to be able to do the scientific research.

According to the experiment, the students feel confusing to make the module. It can be caused by several factors, among others: student are not accustomed to follow learning with modules, students are not accustomed to apply scientific methods in the learning activities so that the role of teachers is essential to guide and provide direction to the students at the beginning of study. The modules were developed with specific time allocation that can motivate students so that the time of learning can be used effectively. It can motivate students and teachers to use the time well so that the lateness can be minimized.

The strength of module that is produced has been selected through validation stages and experiment of the small scale and revised so that it is proper to be used in learning. The module that is made using the inquiri learning methods so that can exercise the students to build their own concept. The module based on inquire also exercise the students to do the scientific research. The module contain a feedback sheet that can be used to measure the students' abilities in doing the module. The weakness of module that is produced, it is developed based on analysis of the needs in SMA Negeri Banda Aceh so that needs to adjust with the condition of school if wish to use at Senior High School outside of Banda Aceh.

CONCLUSION:

The development of teaching materials is important for teacher to cultivate the quality and efficiency of learning process. The materials that are developed have important role both for the teacher and students. in developing the teaching materials particularly in the module of teacher needs to pay attention to procedure and components of module. These components include a review of the subjects, introduction, learning activities, exercises, summary, formative test, and answer keys of a formative test and follow-up. The utilization of modules the process of learning in a classroom can be performed on a system of individual learning as well as classical. based on the above exposure, it can be conclude that the module was developed to use and can improve the outcomes of student learning. The module is better implemented in all classes of grade 1 so that the test of module more accurately and if has the proper criteria the module can be used in studies on the material of biology. The module can be disseminated not only in SMA Negeri Banda Aceh, but with adaptation to the condition and facilities of the school because module that is developed based on the analysis In SMA Negeri Banda Aceh. The researcher can make further research to test the effectiveness of the learning module. The module which is developed can be used as reference for teachers to develop module in another material. The teachers can develop further by adding the learning activities in the material of scientific method application in order to the students are accustomed to think critically.

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