Development of Liver Function Module to Understand the Students Concept in Biological Lessons

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ABSTRACT

The goal of this study was to develop an excretion system module in Biology subjects to stimulate the understanding of the concepts of high school students. The research method referred to the steps of Research and Development. The research began with analyzing the need of the excretory system material to be used as a learning resource for students. The trial module was limited to 20 high school students in Kepahiang District who had received excretion system material before. The result showed that the ability to understand the concepts of students varied greatly. The ability to understand the concepts of students was mostly in the good category (35%), and sufficient (65%). The ability of students in aspect of understanding an idea, translating relationship that exist in a symbol, illustration, map, diagram, table, graph, had been well developed (translation). The ability to develop and obtain information that was not explicitly listed from the referenced source had been well developed (interpretation), and the ability to predict or give an idea of something based on trends that apper in the data that had not been well developed (extrapolation). In summary, the excretory system learning module was capable of stimulating the ability to understand the concept of students in terms of classical values.

Keywords: Research and Development, modules, excretion system, learning concepts.

INTRODUCTION

The development and progress of a nation is influenced by the quality of education. Education is made as one of the tools that can be utilized to measure the quality of a nation, so that through education there will be people who are devoted, nerilmu, independent and responsible. In the process of education, teaching and learning are two concepts which cannot be separated. Learning shows what someone should do as a subject who receives a lesson (learners), while teaching shows what the teacher must do as a teacher (Uliyandari *et al*., 2019).

The use of varied and innovative teaching materials but still in accordance with the material to be taught is very important for the instructor to make the learning process more effective, efficient, and attractive. There is a tendency of teaching material sources to be emphasized in books. Even though there are still many other sources of teaching materials besides books that can be used (Sutrisno, 2008). Therefore the selection of teaching materials that are varied and innovative but still in accordance with the material to be taught needs to be done carefully. Teaching material that has a high adaptability to the development of science and technology and also the material in it according to competence or subcompetence is known as a module (Fitriyati *et al*., 2015).

The module is a printed teaching material in the form of sheets of paper containing materials, summaries and instructions on the implementation of learning tasks that must be done by students that refer to the basic competencies that must be achieved (Prastowo, 2013). Modules have distinguishing characteristics from other teaching materials. The flexibility of making material in modules is one of the advantages of the module (Handayani, 2014). The use of modules in learning aims to enable students to learn independently or at a minimum from the teacher so that in learning process the teacher's role is only as a facilitator. The module writing aims to clarify and facilitate the presentation of messages so that they are not too verbal, overcome the limitations of time, space, and sense power, for students and educators, can be used appropriately and varied, increase motivation and enthusiasm for students to learn, develop the ability of participants students in interacting directly with the environment and other learning resources, allows students to learn independently according to their abilities and interests and allows students to measure and evaluate their own learning outcomes (Suryosubroto, 1983).

RESEARCH METHODS

The method of development in this research used an Research and Development (R&D). Research subjects were 20 students who had studied the excretory system material before. This research and development site was conducted at Islamic high school (MAN 2) Kepahiang Kepahiang District, from October 2019 to January 2020.

Concept understanding data was collected using a test instrument in the form of a matter of prestest and posttest. The value obtained by students was the percentage of the maximum ideal score that should be achieved if the test was done with 100% results (Purwanto, 2013). The value of understanding students' concepts obtained by the percentage of students' correct answers using the following formula:

$$NP = \frac{R}{SM} x\ 100\%$$

With:
NP : Percentage of value expected
R : Raw scores obtained by students
SM : The ideal maximum score from the test

RESULTS AND DISCUSSION

The results of testing the ability of students to understand the concepts through the excretion system module are presented in Figure 1. The ability to understand the concepts of students as a whole was obtained from the average assessment of student discussion materials. Percentage of concept understanding ability of MAN 2 Kepahiang students after using the development module were 35% good and 65% sufficient. This percentage shows that the results of research-based development results could stimulate students' understanding of concept skills, because in this module presents discussion material compiled with questions that can stimulate students' concept understanding abilities.

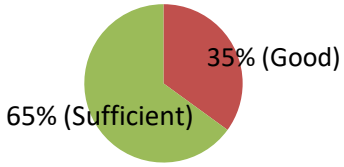

Figure 1. Percentage of students' classical concept understanding abilities

The results of the analysis show that the aspect of understanding the concept provides an explanation to get an average indicator of the understanding of the concept measurement, namely translation, interpretation, and extrapolation. Data on students' concept understanding ability is shown in Table 2. Table 1 shows that the indicator of understanding the concept of the transition to get a mean value of 83 (Good), Interpretation with a value of 76 (Good), and Extrapolation with a value of 66 (Sufficient).

Table 1. Ability of student concepts' understanding

No	Indicator of concept understanding	Value	Category
1.	Translation	83	Good
2.	Interprestation	76	Good
3.	Ekstrapolation	66	Sufficient

Aspects of understanding the concept of translation. Students were able to provide the answers precisely and systematically by explaining the meaning of the human excretion system and the excretion process that occurs in the liver. Students on the translation indicator were able to explain, restate, and complete an idea which expressed in another way from the original statement known previously. Students were considered to be able to understand the concept of translation because according to Bloom, understanding the concept of translation is when students are able to translate a problem given with abstract words into concrete words and the ability to translate relationships contained in symbolic form, including illustrations, maps, tables, diagrams, graphs. In the concept of interpretation, students were quite capable of interpreting questions and rearranging the stages of the urea cycle in a different form, namely by using a flow chart, but students were still unable to determine elaborate in detail. Learners were still lacking in interpreting and explaining a description, just mentioning a few not explaining in detail what happened to the heart of the mouse. According to Bloom (Bloom, 1956), the interpretation that is an explanation or summary of a communication, its contents interpret various social data that is recorded, modified, or arranged in other forms such as graphs, tables and diagrams. On the concept of extrapolation, students could already determine the problems and solutions but still lack information in terms of connecting problems and solutions. Students still have difficulties in concluding and differentiating on a given problem. Students could already explain the table of liver function examination but students still have not described clearly and still cannot relate to the initial concept.

CONCLUSIONS

Based on the results of research on the development of excretory system modules in biology subjects to stimulate the conceptual understanding ability of high school students in Kepahiang District, it could be concluded that the results of the study showed that the

excretion system module was able to stimulate the comprehension ability of students' concepts and added stimulus to train students' conceptual understanding skills in aspects of managing strategies and tactics.

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