



Development of Teaching Materials on Movement Plant Based Interactive E-Module Learning Results of Class VIII Students at Smp Negeri 1 Bitung

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Abstract: This development research aims to: (1) produce teaching materials based on interactive e-modules on the learning outcomes of class VIII students at SMP Negeri 1 Bitung, (2) producing interactive e-module based teaching materials that are appropriate for the learning outcomes of class VIII students at SMP Negeri 1 Bitung, and (3) producing teaching materials based on An interactive e-module that is effective on the learning outcomes of class VIII students on the learning outcomes of students at SMP Negeri 1 Bitung. This development research refers to the development design steps developed by Allesi & Trollip. The development design is grouped into three development procedures, which include: (a) planning stage, (b) design stage, and (c) development stage. Product trials consist of tests

alpha which was carried out by two material experts and two media experts, as well as beta testing which was carried out in 2 stages, namely beta test 1 (small group trial) on 6 class IX students and beta test 2 (large group trial) on 60 class VIII students Bitung 1 Public Middle School. Data collection uses interview guidelines, observation, questionnaires for material experts, questionnaires for media experts, student response questionnaires. This research (1) produces interactive teaching materials in digital form which are packaged using a Compact Disk (CD) and equipped with an instruction book that can be used by students as a learning resource to support science learning, (2) the resulting product is considered very suitable for improving student learning outcomes based on the assessment of material experts, media experts and test subjects, and (3) the resulting product is effective in improving

The learning outcomes of class VIII students at SMP Negeri 1 Bitung are proven by the average pretest score of 42.16, increasing to the posttest of 83.5 with a gain score of 0.71.

Keywords: Interactive e-module based teaching materials, student learning outcomes, class VIII junior high school students

INTRODUCTION

Education is a means of forming human personality in obtaining knowledge and skills from teachers to students to achieve predetermined goals. Current advances in technology can influence the field of education. Education in the current technological era requires teachers to be able to operate computers/laptops and innovate in order to provide a new atmosphere in the learning environment. Through Government Regulation Number 19 of 2005 article 19 paragraph 1, in learning it is hoped that educators can use methods and media that are able to actively involve

students and create a fun, interesting and interactive atmosphere that is adapted to the student's stage of thinking development, characteristics and learning conditions. This condition is also very necessary in science learning in junior high school. Science is one of the subjects studied from elementary school to university level.

The objectives of science learning are as follows. (1) understand the natural surroundings; (2) have the skills to gain knowledge in the form of 1 scientific process/method skill; (3) have a scientific attitude in getting to know the natural surroundings and solving the problems they face. Based on this opinion, one of the abilities that students must master in learning science is understanding the natural surroundings on the topic, namely the movement of plants. According to Sudjana & Rivai (2002) the use of learning media can stimulate students' thinking processes from concrete thinking to abstract thinking. The use of media in the learning process can attract students' attention and help them learn so that they will better understand what they are learning, and learning will become more meaningful. However, the implementation of science learning that occurs in class VIII of SMP Negeri 1 Bitung has never used computer media. Science learning in class still uses lecture, question and answer and assignment methods where the learning process tends to convey theory, provide examples and provide practice questions. Using this learning method, the teacher plays a dominant role and students are not fully involved in learning. Students are rarely given the opportunity to discover for themselves the natural problems around them that will be studied. This results in low motivation in learning, students are passive, bored, and find it difficult to understand lessons.

Interactive learning modules are a type of learning media combining material text with other supporting media such as there are images, animations, videos, and make navigation easy. The interactive learning module that will be developed in this research is packaged in digital form. These media characteristics can help students improve learning outcomes, especially regarding movement in plants. The use of digital-based interactive learning modules is not widely used by teachers. The use of teaching materials in the form of interactive learning modules that can be read on computers or laptops is an alternative in science learning, especially material that requires visualization. This interactive teaching material is packaged in digital form, so that this teaching material is more practical and has learning content that makes it easier for students to learn compared to other teaching materials (printed modules, worksheets and books). This content is in the form of text, images, animation and video combined in one file. This interactive teaching material is complete, practical, and makes it easy for students to study the material anywhere and at any time to make it easier for students to understand the material on movement in plants.

METHOD

The type of research that will be used is R & D research (Research & Development), namely research oriented towards researching, designing, producing, testing, and validating the products produced (Sugiyono, 2015: 30). Development is a process of creating products or providing new innovations to previously created products that can be designed, developed, utilized and evaluated according to students' needs. What will be developed in this research is interactive teaching materials to improve student learning outcomes. The development model used in this research is a model developed by M. Alessi and Stanley R. Trollip, which consists of planning, design and development stages. Alessi and Trollip's (2001) development model has three stages, namely planning, design, and development. These three stages have components at each stage. These components are standards, continuous evaluation and project management. This development model can be a reference in producing effective products because the stages are quite simple and at each stage there

are components that are explained in detail or in detail. The Allesi and Trollip development model is very suitable for developing an interactive learning module because this development model explains multimedia components such as text, images, animation and video.

DISCUSSION

The developer had a discussion with the eye teacher class VIII science lessons for breadth of material aspects, regarding determining learning goals, indicators of goal achievement, example questions, practice questions, and evaluation questions and so on. Some of the activities carried out include developing ideas, analyzing concepts and tasks, create an initial program description, and create a flowchart and storyboards. The process in this development stage includes developing content contained in interactive teaching materials consisting of text, images, animations, practice questions and videos so that they are easy to read on a computer/laptop or in digital form. The components of interactive teaching materials are the same as module components in general, consisting of: cover page, module identity, foreword, table of contents, glossary, target user, description, final learning objectives, learning instructions for interactive teaching materials, concept map, criteria for interactive teaching materials, learning activities, competency tests, and answer keys.

The process of developing interactive teaching e-module products is in accordance with Allesi & Trollip (2001) model development steps through three stages, namely planning, design and development. The final product produced is an interactive teaching material application in .format using a link that can be read on a computer/laptop screen with the Windows operating system.

The interactive teaching e-module product was developed based on needs analysis at SMP Negeri 1 Bitung Needs analysis was obtained from the results of initial observations and interviews with teachers and students. The information obtained during initial observations was classroom learning using printed teaching materials such as worksheets or books. The teaching materials used have minimal explanations because they only contain a summary of the material, a collection of formulas, practice questions, are not interesting and are not interactive. Based on interviews with teachers, students had difficulty understanding material that was abstract and required visualization, such as the material on movement in plants. This difficulty was caused by students' lack of understanding of concepts. Solving problems in plant movement requires visualization, so that students can re-communicate a concept they have learned.

The results of interviews with students showed that students needed teaching materials that required interesting images and animation. Therefore, it is hoped that interactive teaching e-module products can be an alternative that can make it easier for students to understand the concepts presented. To make it easier to visualize the material, interactive student teaching materials are packaged in digital form. The goal is that students can control both navigation and the material themselves. Students can freely move between pages, watch, pause, and replay animated and video content (Nugent, Kohmetsher, Deana, Guretzky, Murphy, & Lee, 2016). The interactive teaching material products developed were alpha tested by material experts and media experts

master his field. Based on the results of the material expert assessment, an average score of 3.28 was obtained in the very appropriate category, so that the material presented in the interactive teaching material product was declared suitable for use with revisions according to the suggestions given. Next, the product validation process by media experts. The results of the product assessment obtained an average score of 3.40 with a very feasible category, so that the interactive teaching material product was declared suitable for use in accordance with the revision suggested by media

experts. Beta testing is carried out after the product is deemed feasible by experts. The beta test was divided into two stages, namely beta test 1 (small group trial) involving 6 students. From the results of the beta 1 test response assessment, a mean score of 3.22 was obtained, which qualitatively falls into the "very feasible" category. The next trial is beta test 2 (large group trial). Beta test 2 (large group trial) tested on 60 class VIII students of SMP Negeri 1 Bitung. Average product trial score obtained by beta test 2 with the average score 103 overall was 3.19 with a very decent category. The average score shows students' responses to the use of interactive teaching material products in learning.

The feasibility of interactive teaching material products can be achieved because meet the product assessment criteria for interactive teaching materials consisting of accuracy of material, learner control, material in accordance with the curriculum, up to date material, uses clear discussion, can raise student motivation, students can participate in it, provides instructions for use (Heinich, 1996: 47). Apart from that, interactive teaching material products apply multimedia criteria according to Alessi & Trollip (2001), namely breadth of material, sequence of material, clarity of language used, suitability of material to learning objectives, presence of learning instructions, conclusions/summaries, navigation and interface and a bibliography. Furthermore, the criteria for assessing interactive teaching materials are based on Romiszowski (1986: 406-407), namely that the material is validated by material experts, supported by appropriate media, examples and practice questions in accordance with learning objectives, and the level of difficulty of the questions is adjusted to students' abilities. Apart from being based on these assessment criteria, interactive teaching material products also apply module characteristics, namely 1) self-instruction, 2) self contained, 3) stand alone, 4) adaptive, 5) user friendly, and Mayer's (2009) 7 multimedia design principles for presentation. material in the form of animation and video. These principles are the principle of multimedia, the principle of closeness in time, the principle of coherence, modality principle, redundancy principle, and individual differences principle.

Product effectiveness tests are carried out to determine the effect Products are developed towards understanding the concept. Based on the pretest and posttest results, a score gain value of 0.71 was obtained. The gain score obtained shows that there has been an increase in understanding of concepts in the high category. Interactive teaching material products are considered effective in improving understanding of concepts, because the material presented apart from using text and images, is also equipped with animation and video material that visualizes movement in plants. This is supported by the opinion of Rogness (2011), who states that the use of visualization can help students improve their understanding of concepts. This visual form can be in the form of animation or video (Gambari, Falode, & Adegbenro, 2014). This is also supported by research conducted by Lasmiyati & Harta (2014) that teaching materials in the form of modules can increase understanding of concepts.

CONCLUSION

Based on development goals, research questions, and the results of research and development can conclude that the interactive teaching material product is interactive teaching material in science subjects, especially material on movement in plants for class VIII students at SMP Negeri 1 Bitung which is produced in digital form which is packaged using a Compact Disk (CD) and is equipped with instructions that can be used. used as a learning resource to support science learning. The interactive teaching material products produced are equipped with text, image, animation and video content. In addition, product materials Interactive teaching consists of components in it includes;

cover page, module identity, final destination learning, concept maps, success criteria, content; (a) learning objectives, (b) material description, (c) summary, (d) exercises questions, (e) reference list, (f) answer key/question discussion), and Competence test. Practice questions are presented in each activity learning in the form of multiple choice questions, which aims to measure students' understanding of the material they have studied. The interactive teaching materials developed are considered very feasible used as a learning resource for science learning. Matter The review is based on the results of the alpha test assessment (material expert and media experts) and beta test (student response) as follows: a. The alpha test results assessed by material experts obtained an average score overall from the five aspects it is 3.28 with "Very Decent" category, with details for the average score each preliminary aspect is 3.25 with categories very worthy; The content aspect is 3.33 in the very category worthy; the learning aspect is 3.23 in the very category worthy; the task/exercise aspect is 3.33 in the very category feasible, and the summary aspect is 3.28 with categories very worthy. b. The alpha test results assessed by media experts obtained an average score overall from the three aspects it is 3.40 with "Very Decent" category. With details of each average The score for these three aspects, namely the appearance aspect, is 3.28 with a very feasible category, the usage aspect is equal to 3.50 with a very feasible category, and utilization aspects amounting to 3.33 with a very decent category. c. Beta test results in beta test 1 (small group test) were obtained The overall average of the three aspects is 3.22 with "Very Decent" category. Details of each average score for these three aspects, namely the learning aspect of 3.28 with a very decent category, display aspect of 3.17 with a very worthy category and a programming aspect of 3.25 with a very decent category. Meanwhile, beta test results 2 (large group test) the overall mean score is obtained from the three aspects of 3.11 in the "Very Decent" category. With details of each average score for the three aspects The learning aspect is 3.10 with categories very decent, display aspect of 3.11 with categories very decent, and the programming aspect is 3.13 with very worthy category.

The interactive teaching materials developed are considered effective in improve student learning outcomes seen from the average pretest score amounting to 42.16, an increase in the posttest of 83.5 with a value score gain of 0.71.

SUGGESTION

There are suggestions for making more use of interactive teaching material products effective in the learning process include the following:

1. For Teachers

Teachers can utilize interactive teaching material products follow the following stages:

a. The teacher first explains about the product and Its use is intended to make it easier for students understand the material presented in the teaching materials interactive.

b. When delivering material, start by delivering learning objectives so that students can have an idea material before studying.

c. Use of interactive teaching material products, preferably teachers explain the material or practice questions again is in it.

2. For Students

You can use interactive teaching material products for students follow the following stages:

a. Students learn all the components contained in product begins by studying the table of contents, instructions, competencies, material descriptions, exercises, answer keys, and tests competence. Discuss with teachers and peers if you have difficulty understanding the material or running interactive teaching material products.

b. Students must study the instructions well operate interactive teaching material products, so that easier to use.

c. Both teachers and students, to operate material products Interactive teaching should use a computer/laptop with spec in accordance with the product specifications contained in guidebook.

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