

STUDENT'S RESPONSE TOWARD DEVELOPMENT OF E-MODULE IN PHYSICS MATERIAL ON RESPIRATORY SYSTEM

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Abstract: The aim is to determine the student's response to the Physics E-module material on the respiratory system. The type of research used is Research and Development (R&D). The number of samples was 31 students of class VIII Junior High School 1 Mantewe using the purposive sampling method. The data collection instrument was a student response questionnaire with aspects of perception, belief, and participation. The average results of each study were 3.6, 3.5, and 3.5. The overall average is 3.5, with a very good category. The results showed that all electronic modules were suitable for academic users, as evidenced by students' positive responses to the developed E-modules.

Keywords: *E-modules, Respiratory System, Physics material, Students' Response*

INTRODUCTION

A process of transformation or change in human development to become more qualified so that it can meet personal, community, and state needs are called education. Every effort must be made so that education can continue developing with the times' flow. The establishment of efforts is carried out with all parties' support. Be it the government, schools, communities, and the students themselves. The development of education must also pay attention to the times. The goal is that education becomes the main gateway to introducing changes in society.

Technology is the key to survival now. Based on the data from e-Marketers in New York, smartphone in Indonesia achieved 55.4 in 2015 to be ranked third in the Asia Pacific and is expected to increase to 65.2 million and 74.9 million in 2017 [1]. Technology in education facilitates learning to develop user working by using, making, and caring for the process. Learning Process can be held during a pandemic by distance learning [2]. Distance learning has some problems with the facility, internet network, motivation learning, and support from the parents [3]. It will make learning activities can't be maximal and hamper understanding of students' concepts of a material. In this condition, the activities of the teacher were collecting the assignment.

Learning activities that cannot take place optimally require innovations that facilitate independent learning for students. Learning has two objectives, namely retention, and transfer. Retention only focuses on the results of remembering, while transfer focuses on the purpose of knowledge transfer. Knowledge transfer produces meaningful learning and can help students have higher-order thinking skills [4]. The ability of students to reach

the transfer stage must be supported by teachers who manage learning by choosing suitable teaching materials.

Teaching materials are materials used by teachers to assist the process of teaching and learning activities. Some forms of teaching materials include visual teaching materials. Visual teaching materials can be handbooks, books, modules, LKPD, student books, brochures, leaflets, etc. [5]. With the development of technology, one of the teaching materials that can be made electronically is a module. E-module is a form of presenting self-learning material that is systematically arranged and whose application uses technology and the internet in learning. Video, audio, and animation add to the learning experience [6]. The e-module that was compiled was the government's effort to answer the problem to provide students with a meaningful learning experience during the pandemic. So, this study aims to determine students' response to developing the E-module of physics material in the respiratory system.

RESEARCH METHOD

This research is a type of Research and Development (R&D) using a 4D model. The development model contains procedures from define, design, develop, and disseminate. The first stage, define, starts from making observations related to needs analysis for both students and teachers. The second design stage is carried out by making a Draft I product, namely an e-module containing Physics material in the respiratory system. The third stage, development, is to conduct product feasibility tests by experts and readability tests by conducting limited trials. In the third stage, a revision of Draft II was obtained from the results of expert input and a little cpba test. The fourth stage

of dissemination is the dissemination of the product. Dissemination is done by conducting field tests.

The study aimed to analyze students' response to the e-module of Physics material in the respiratory system. The data collection technique was carried out with a student response questionnaire. The questionnaire contains ten statements, each containing five negatives and five positive statements. The Likert scale was used in the preparation of the questionnaire with the answer choices TS (Disagree), KS (Disagree), S (Agree), and SS (Strongly Agree). Data collection was carried out in April 2021 at Public Junior High School 1 Mantewe. The sample used is class VIII students, totaling 31 people. Students are asked to use e-modules during teaching and learning activities. Then after completion, students are asked to fill out a response questionnaire honestly, according to the situation they are experiencing.

Student response data from the results of filling out the questionnaire will be analyzed using the following formula:

$$x = \frac{\sum score}{MaxScore}$$

Then the results are categorized in table 1:

Table 1. Categorize the students' response

No.	Interval	Categorized
1	$3.25 \leq x < 4.00$	Very Good
2	$2.50 \leq x < 3.25$	Good
3	$1.75 \leq x < 2.50$	Enough
4	$1.00 \leq x < 1.75$	Less

RESULT AND DISCUSSION

The product of this research is an e-module material on Physics in the respiratory system. E-modules are the right choice when learning at school using the distance learning system (PJJ). E-modules are very useful in distance learning because they can

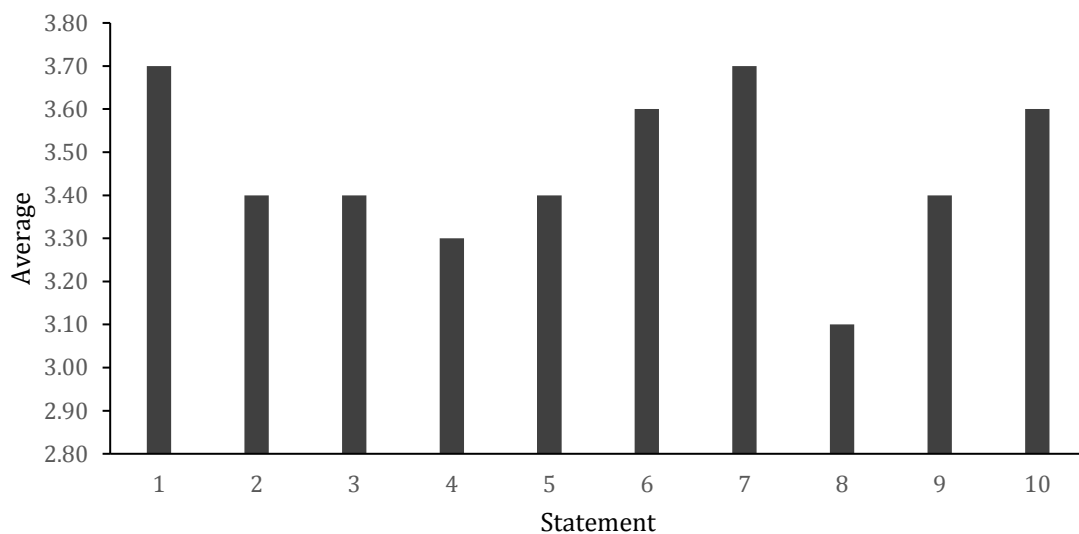
be used as practical learning resources that can be used anytime and anywhere [7, 8]. E-module was developed using *Page Flipbook* that includes cover, procedure, material, and students' worksheet.

The material contained in the E-module is a Physics material in the respiratory system. In this case, there is a relationship between physics and biology. The respiratory system is a material that examines the mechanism of respiration. The vital organs in the respiratory system are the lungs. The lungs work by relying on air pressure to inhale and exhale. The working air pressure is found in the laws of physics.

The relationship between air pressure and the lungs is essential to studying science learning at school. It is intended so that there is a continuous understanding of the concept of the material for students. The 2013 curriculum mandate states that science is integrated learning from physics, chemistry, and biology [9]. The application of integrated science must be applied carefully in schools. So the students can have broad insights.

Learning that takes place based on the 2013 curriculum must be student center. The product facilitates students to learn independently without reducing the essence of learning. In the student activity section, they have to experiment. Experiments show the application of the scientific method in learning from observing, asking, trying, presenting, concluding, and creating. This section is essential to be used as an alternative to studying independently or in groups.

The developed product will go through various stages until it gets a draft II product design for field testing. Products that are suitable for use can be measured through a student's readability test or seen from the student's response to the use of the product. The results of student responses can be seen in the graph below:



Picture 1. The average score of students' response

Figure 1 shows five positive statements and five negative statements. Statements 1-7 and 9-10 show excellent student responses. While statement number 8 shows a response with a good category from students. Students stated that using E-modules during learning was very fun, making them more enthusiastic about learning material about physics in the respiratory system. One of the factors that generate interest is the content in the e-module. The e-module contains pictures and video practicum instructions that make learning easier for students. E-modules or electronic modules can include media in visual, audio-visual, or audio. One is interactive and easy to understand [10-12]. The student can see directly from the videos without understanding the content of write.

The results of a good response include showing difficulties from students. When implementing the E-module with physics material in the respiratory system, some students stated that it was difficult to understand the relationship between physics in the respiratory system even though they were easy to experiment with. Because air pressure cannot be seen, something abstract or formless is challenging to understand for concrete-type students. Students' cognitive development is different; this is cause even though at the age of 13 years, they have entered the conceptual phase, some are still in the concrete operational phase in cognitive abilities. [13].

Based on the results of student responses, the average of the overall responses in table 2:

Table 2. Result of Students' Responses

Aspect	Average	Categorize
Perception	3.6	Excellent
Trust	3.5	Excellent
Participation	3.5	Excellent
Average	3.5	Excellent

Overall results are grouped by aspect, obtaining an average of 3.6 with an excellent category in the element of perception. Statements on the part of perception are contained in points 1, 4, and 7. These results indicate that the perception of the developed product, namely the developed E-module, includes the aspects that students need to learn independently. In the second aspect, the trust obtained an average of 3.5 with an outstanding category. Statements on the perception aspect are found at points 2, 3, 5, 6, and 8. The results of student responses show that students believe that by using the E-module, students are easier to understand Physics material in the respiratory system by reading the material and conducting experiments provided.

The third aspect is participation. In this aspect obtained an average score of 3.5 with a good category. The third aspect is contained in points 9

and 10. The results show that at this point, there is a form of student participation in using e-modules. Students can use it individually or in groups. The response results show that students prefer to do experiments with groups. Learning together makes it easier to solve problems through discussion.

Overall, the average results of the three aspects, perception, trust, and participation, with an excellent category, showed a score of 3.5. The excellent category indicates that the overall response of students to the developed e-module is very good or positive. The positive reaction shows that the e-module can appropriately be used as a learning medium in schools.

Physics material in the respiratory system is one of the materials that require visualization to see how the respiratory system works and how air pressure affects breathing. The developed e-module contains material and experiments that need students to make a simple lung model and practice how the lungs work. Teachers must prepare for enjoyable learning by choosing the proper methods, strategies, media, and teaching materials [14].

The e-module made contains material components and practical steps that students must do. E-module is an alternative learning resource that can be used independently; its use is essential in learning. The advantages of using e-modules are that they can be used outside of school, mainly when education is carried out remotely. E-modules can contain visual and audio media. E-modules are specifically designed for independent learning [15-17].

The aspect of trust in the response questionnaire can be interpreted as students believing that learning to use the developed e-module facilitates students' understanding of the material being taught. The active role of students must appear to be able to explore the concept of material while learning. The use of e-modules must still get supervision from the teacher. The teacher becomes a facilitator who can guide students, control, and provide feedback during learning. Without supervision, the use of e-modules also cannot produce maximum results. The facilitator must have competence in teaching. The competencies in question are the ability to ask students problems, provide motivation, promote learning variations, explain, open & close lessons, manage discussions and manage classes [18].

Based on all the response results, an e-module is getting a positive response. Independent learning can be oriented to maximum student involvement in learning activities at school. Student centers are essential for teachers to support good learning design. E-modules used as teaching materials to make it easier for students to be actively involved in a class can instill scientific concepts such as learning, observing, analyzing, and drawing conclusions.

In addition, it can also increase students' curiosity during learning so they can easily find the basic concepts of the material being taught. Such a science education goal requires students to participate in discussions about science, be skeptical, question claims made by others about scientific issues, and make informed decisions about the environment, their health, and well-being. In addition, students are also expected to master the competence to demonstrate cognitive abilities on the one hand and the other hand, establish values and motivations when they meet, and respond to socio-scientific issues [19-20].

CONCLUSION

Measuring student responses to the module shows that the developed e-module received a positive response. The average answer from the three aspects of perception, trust, and participation is 3.6, 3.5, and 3.5, with an average total response of 3.5, getting the excellent category. The positive reaction stated that the product was suitable for teaching and learning activities. The researcher hopes this research can be used as a reference for further research.

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