(RESEARCH ARTICLE)

The practicality of E-Modules based on Problem-Based Learning (Pbl) on the human respiratory system in class Xi (Senior High School 1 Tilango)

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Abstract

This research aims to describe the practicality of E-Modules based on Problem-Based Learning (PBL) on human respiratory system material. This research includes quantitative descriptive research. The test subjects in this research involved 18 class XI students at Senior High School 1 Tilango for the 2023/2024 academic year. The E-Module used has been declared valid by 3 validators, content validation with a very valid category in the score range of 81-100%, construct validation with a valid category in the score range of 61-80%, teacher validation with a very valid category in the score range of 81-80%. 100%. Furthermore, to measure the practicality of the E-Module, instruments for implementing teacher activities, student activities, and student responses are used. The results of the research show that the implementation of learning is in the very good category in the score range of 81-100%. Student activities in the good category are in the score range of 61-80%, and student responses in the very decent category are in the score range of 81-100%. Thus, the E-Module based on problem-based learning (PBL) on the human respiratory system can be applied in learning at Senior High School 1 Tilango.

Keywords: Practicality; Human Respiratory System; E-Module; Problem-Based Learning

1. Introduction

As time progresses, technology has an important influence on science, where in science students are taught about natural phenomena and facts. With this technology, humans use technology to apply this knowledge, (Maritsa, et al. 2021) educational technology plays a very important role in the educational revolution that is taking place, especially in the 21st-century educational revolution and especially in the fourth revolution which is called education 4.0.

Education is a systematic process of transferring knowledge from one person to another according to standards set by experts (Tranat, 2018). With the transfer of knowledge, it is hoped that it can change behavioral attitudes, maturity of thinking, and maturity of personality in formal education and informal education. The aim of education itself is to develop the potential of students to have noble character, knowledge, creativity, and independence.

Learning in education covers many branches of science. There are sciences such as biology. Biology is considered one of the subjects that is difficult to understand because it uses many scientific terms (scientific names) that are not commonly used in everyday life, complex learning concepts, and material processes that are difficult to explain which are related to the natural life around us.

The learning that is often used in the biology learning process is the conventional learning model, where the teacher only explains verbally how concepts, facts, and processes of biological material are presented to students so that it is

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not explained well. Students just listen and write back what is explained. This makes students inactive during the learning process because the learning process is teacher-centered, whereas in the current curriculum (2013 curriculum) students are asked to be active (student center) in solving problems and drawing conclusions from understanding the material carried out during the learning process.

The teacher's role in the learning process is expected to be able to provide materials or tools to support the learning process that are interesting and interactive. Teaching staff are expected to be able to produce good and interactive learning materials or tools (Purba, et al. 2020).

Based on the results of interview observations with Biology teachers at Senior High School 1 Tilango, it is that so far, they have still used learning resources such as printed books to support students' learning. So far, students have never used electronic learning resources such as E-Modules, except for Classroom, Google Meet, Zoom, and PowerPoint. Apart from that, information was also obtained from students that they have difficulty understanding the material on the human respiratory system such as the mechanism of breathing and apart from that, students also have difficulty understanding the scientific terms contained in the material on the human respiratory system. One of the biological materials that is difficult for students to understand is the human respiratory system material, where this material contains many concepts that students need to understand, including many concepts regarding various functions and working mechanisms that students must master and students must be able to improve these concepts . one with another (Rintonga, 2016).

Based on the problems that have been explained, the existence of the E-Module Based on Problem Based Leaning, researchers hope that this E-Module can be used well by teaching staff and students in the learning process, especially on the human respiratory system material.

2. Methods

The research method used in this research is quantitative descriptive. This research was carried out at Senior High School 1 Tilango, Gorontalo Regency, Gorontalo Province. This research was carried out in September 2023.

3. Results and discussion

3.1. Implementation of Learning

The results of observations of learning implementation in limited-scale trials were observed by observers with reference to the 21 aspects observed. The results of the analysis of learning implementation at meetings I and II can be seen in the following graph.
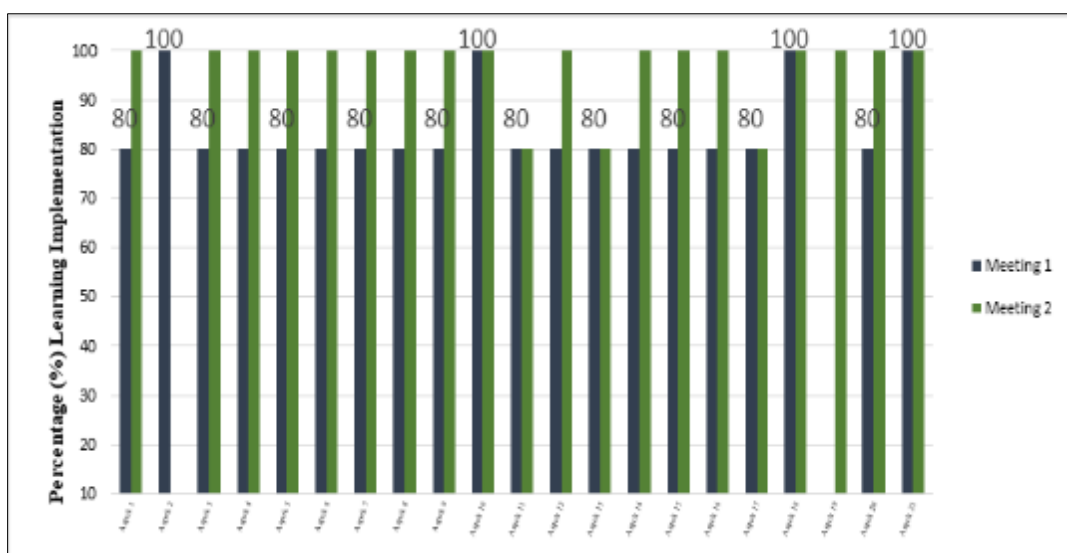

Figure 1 Graph of Percentage of Learning Implementation

The results of the practical analysis based on the implementation of teacher activities were obtained from the results of the observation sheet on the implementation of teacher activities which contained learning steps in accordance with the Learning Plan (RPP) during the learning process which was filled in by the observer, in this case the biology teacher. Observations are made by marking (✓) on each question item that has been carried out. The results of this analysis are in the score range of 81-100% in the very good category. A learning tool can be said to be practical if the teacher's activity in classroom management reaches ≥ 80% (Rohmatullah, 2013). The implementation of learning reached 80%, including very good criteria and is said to be practical, these results were obtained because the learning process met the criteria so that the learning process was very good (Wicaksono & Siswanta, 2021).

3.2. Student Activities

Observations of student activities were carried out to determine the practicality of the E-Module being developed. The percentage of results from observing student activities in 2 meetings can be seen in the following graph.
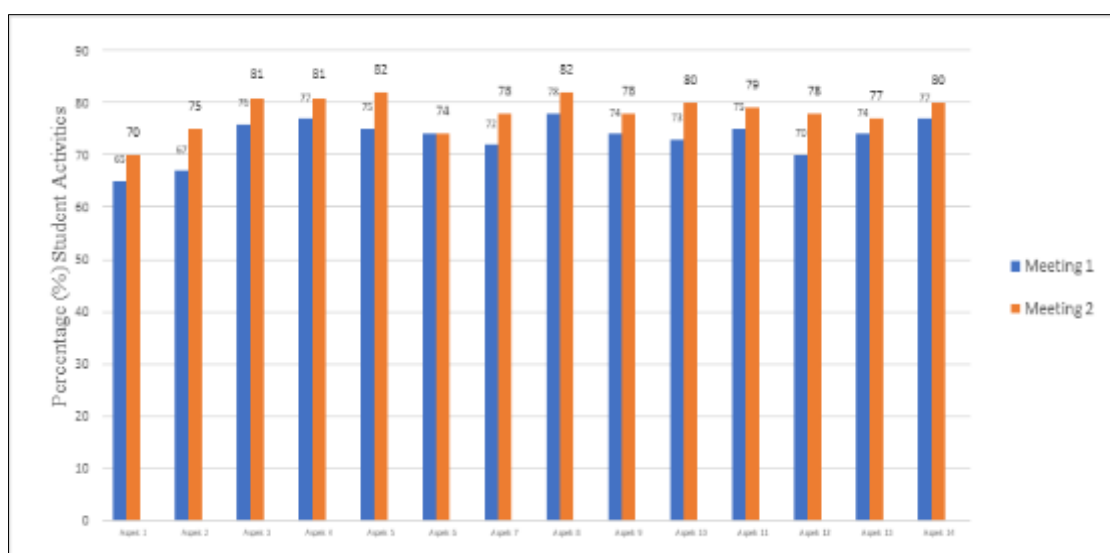

Figure 2 Student Activity Percentage Graph

Student activity is an important factor in the implementation of learning. Student activities in learning activities are observed using student activity observations (Kurniawati, 2021). This student observation aims to observe student activities during the learning process (Putri & Lestari, 2017). At the first and second meetings the scores were in the range of 61-80% which was included in the good category.

3.3. Student Response

The practicality of the E-Module being developed is not only seen from student activities and implementation of learning, but also seen from student responses regarding the E-Module that has been developed. The following is a graph analyzing student responses.

Student response questionnaires are given to students at the end of the learning meeting when students have finished using the E-Module . This questionnaire is used as a response and suggestion to determine the level of practicality of the E-Module that has been developed. Students' responses to the E-Module based on Problem Based Learning on human respiratory system material were in the score range of 81-100%, including in the very feasible category. The questionnaire interpretation criteria for student responses are very good at an average of 81%-100% (Riduwan, 2018). Based on the results of the criteria obtained from student responses, it shows that the E-Module based on Problem Based Learning is at a very good level of practicality. Students' responses to products used in learning are said to be effective if at least 75% of students give positive responses to products used in the learning process (Kadir, 2018). The E-Module that was developed was well received by students, in the learning process of students using the E-Module that was developed, students looked enthusiastic when learning to use the E-Module that was developed because in the E-Module there is a video regarding the material discussed in it. E-Module that students can see at the end of the material.
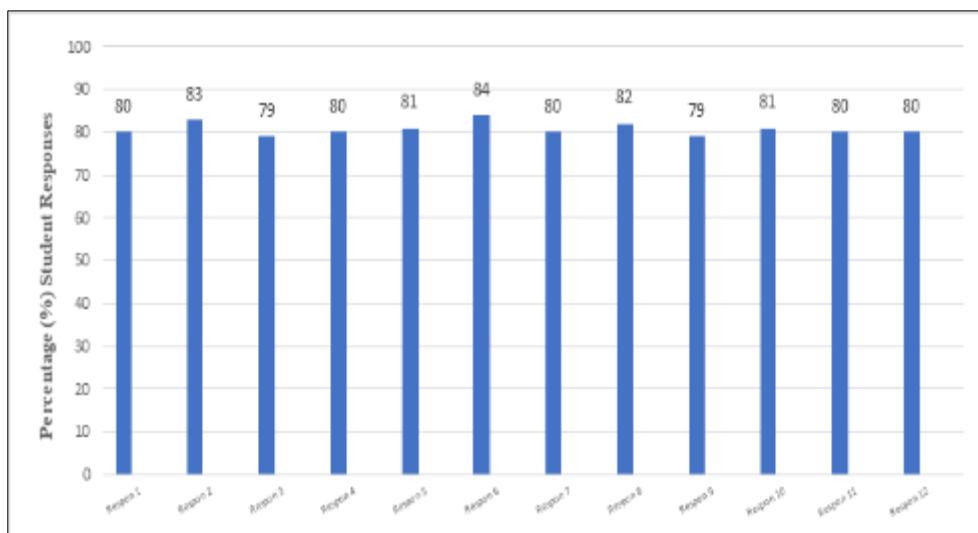
Figure 3 Student Response Graph

4. Conclusion

Based on the results of the research and discussion, it can be concluded that the E-Module based on Problem-Based Learning on human respiratory system material can be said to be practical and can be used in the biology learning process, especially on human respiratory system material.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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