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Development of Reading, Questioning, and Answering (RQA)-Based Modules in Biology

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Abstract

The model of 21st century learning applies creativity, critical thinking, cooperation, problem solving, communication, community and character skills. Learning media is a supporting tool in the teaching and learning process, learning media is designed to attract or stimulate student interest and make it easier for students to understand the material. One solution that can be implemented is to develop a learning module based on Reading, Questioning, and Answering (RQA). Based on this, this research aims to find out how valid and practical the RQA-based module is. This research method is Research and Development model used is ADDIE. The research results show that the RQA-based module learning media is suitable for use. It can be concluded that learning media is used effectively and efficiently in the learning process.

Keywords: critical thinking; learning media; module; RQA

INTRODUCTION

The model of 21st century learning applies creativity, critical thinking, cooperation, problem solving, skills, communication, community and character skills. This is done to be ready to face the industrial revolution 4.0. Comprehensive educational transformation is carried out by educational units to be able to provide good services so that they can develop the potential of students so that it will improve human civilization (Aldriani *et al.*, 2021;Abidin *et al.*, 2022; Farid *et al.*, 2023). In 21st century learning, the learning process is student-centered so that students are active in developing their interests and potential. In 21st century practice, education must be able to master various skills that can make students become individuals who have skills in critical thinking, collaboration, communication, creativity and innovation (Aldriani *et al.*, 2021; Samudera & Hadi, 2022; Wahyuni *et al.*, 2022). To support students actively playing a role in 21st century learning, a tool is needed that is able to help students master the various skills that must be achieved. One solution that can develop students' skills is learning media.

Learning media is a supporting tool in the teaching and learning process, learning media is designed to attract or stimulate student interest and make it easier for students to understand the material (Setyosari, 2017; Eliana *et al.*, 2022; Gultom *et al.*, 2022) . Modules are one of the learning media that can be used in the learning process, modules are teaching materials that are arranged systematically in language that is easily understood by students so that students are required to learn independently and be able to solve problems by generating new ideas (Sari *et al.*, 2016; Rahayu *et al.*, 2017; Ami *et al.*, 2021).

One solution that can be implemented is to develop a learning module based on Reading, Questioning, and Answering (RQA). This RQA learning module can encourage students to read, understand the material and find important parts of the material. The RQA module requires students to be able to create questions and answer them so that they are expected to be able to optimize the empowerment of students' creative thinking abilities and train students' abilities in cooperation and collaboration between students (Afrila & Yarmayani, 2018; Ami *et al*., 2021; Samudera & Hadi, 2022). It is also like doing the experiment (Istiana *et al.*, 2019; Pertiwi & Saputri, 2020; Saputri & Pertiwi, 2021), the students read the procedure, questioning the problem, and answering it after finishing the experiment.

Based on the results of observations by distributing questionnaires and interviews with teachers and students in several high schools in Pekanbaru, the use of teaching materials only in the form of textbooks and worksheets, both of these teaching materials are inadequate for students to learn and tend to be uninteresting. And the difficulty of the material influences students' understanding of the material. Meanwhile, the results of data from the distribution of questionnaires that have been carried out regarding the development of teaching materials in the form of modules obtained results of 78% with an average of 75.174% which is in the sufficient category. The results of the needs analysis show that students need learning media that is interesting and able to increase their interest in reading to help them learn viral material which is considered difficult. Based on the results of the needs analysis, a learning module based on Reading, Questioning and Answering (RQA) virus material was developed. Based on this, this research aims to find out how valid and practical the RQA-based module is.

METHOD

The research was conducted at three high school schools in Pekanbaru. The population in this study were students from one of the high schools in Pekanbaru. This research method is Research and Development. The research model used is ADDIE (Analyze, Design, Development, Implementation, Evaluation). This is because this model is simpler, structured, and provides opportunities for evaluation and revision, making it easier to learn and develop (Nurfitri *et al.*, 2022). This research and development method is a research method used to produce a product and test the effectiveness of the product. The analysis stage was carried out to determine students' needs in using the module as a learning medium. To determine the needs of students, a student response questionnaire instrument was used.

The design stage is carried out to determine the use of learning media, determine the learning indicators to be achieved, and determine the level of student mastery after using learning media. Next is the development stage, at this stage designing an attractive initial format and layout to make it easier for students to understand the material in the RQA-based module. The results of this initial design stage are RQA-based module designs. Implementation Stage, at this stage the design that has been created is developed so that it becomes an RQA-based module that can be used by students. Finally, the evaluation stage, at this stage students are given a questionnaire to find out student responses regarding the RQA-based module that has been used. The results of the questionnaire serve to determine the effectiveness and practicality of the RQA-based module learning media which has been developed by distributing student response questionnaires to the learning media. The student response questionnaire was used to determine the level of suitability of the RQA-based module learning media. Data obtained from the results of the questionnaire used an assessment questionnaire with a Likert scale.

RESULT AND DISCUSSION

Based on the results of the initial analysis regarding student needs for RQA-based modules, the overall average was 75.17% and the teacher needs analysis was 85.71%. So that RQA-based module learning media was developed. Feasibility of the results of development research that develops an RQA-based module product as a learning medium using the ADDIE model. The aim of developing this learning media is to increase students' knowledge, independence, creativity and problem solving in learning. To find out the effectiveness of the RQA-based module learning media, it can be seen through student

questionnaires after using the learning media developed. The results of the student response questionnaire can be seen in table 1.

Table 1. Result of student response questionnaires

No.	Aspect	Validity Score	Criteria
1.	Appearance	86,6%	Very Valid
2.	Language	87,9%	Very Valid
3.	Material	86,6%	Very Valid
	Average	87,03%	Very Valid

Based on analysis of RQA-based learning media data, the material aspect received a score of 85.6%, the language aspect received a score of 87.9%, and the material aspect received a score of 86.6%. So the score obtained has an average of 87.03%. If the learning media gets a score of 80-100% then it is included in the very appropriate category and does not need revision (Sugiyono, 2005). The research results show that the RQA-based module learning media is suitable for use. This cannot be separated from media development steps that are adapted to the development and needs of students and teachers. Learning media is needed by students so that the learning process is more conducive, so that good social interaction occurs (Andel *et al.*, 2020; Fitra & Maksum, 2021; Supriadi *et al.*, 2021).

The effectiveness of RQA-based module learning media makes it easier for students to understand the material thereby increasing students' interest and learning outcomes in learning. This happens because the attractive appearance of the module, attractive media both in terms of material and ease of use will make students more interested in using it and students will be interested in studying the material contained in it. Also, well-designed visuals will increase understanding and help students select, organize and integrate important information (Indriastoro & Rofiq, 2014; McCrudden & Rapp, 2017; Tafonao, 2018). The use of RQA-based module learning media in learning also makes it possible to improve students' critical thinking skills (Meliyati, 2015; Muhammad, 2016; Supriyono, 2018). Apart from that, interesting media will directly impact student motivation in the learning process. High learning motivation will produce high learning outcomes too. Student learning motivation has an influence on improving student learning outcomes (Uliyandari & Lubis, 2020; Yunus & Fransisca, 2020; Magdalena *et al.*, 2021). Based on this, RQA-based module learning media is very necessary during the learning process, because it will increase independence, think critically, and be able to solve problems on your own. So it can be said that RQA-based module learning media is effective and efficient for use as learning media in schools on virus material.

CONCLUSION

Based on the research results, it can be concluded that RQA-based module learning media is needed in the learning process. The RQA-based module learning media is suitable for use with an average score of 87.03%. This RQA learning module can encourage students to read, understand the material and find important parts of the material. The RQA module requires students to be able to create questions and answer them so that they are expected to be able to optimize the empowerment of students' creative thinking abilities and train students' abilities in cooperation and collaboration between students. So that this learning media is used effectively and efficiently in the learning process. This research is useful for the nation, especially teachers, because it can increase teachers' insight and motivation to improve students' skills.

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