Development of E-Based Learning Modules *Problem Based Learning* (PBL) in improving students' critical thinking abilities

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Abstract

This research aims to determine the feasibility of problem-based learning (PBL) e-Modules in improving students' critical thinking skills. The research carried out is a type of R&D (Research and Development) research that follows the 4D development model. This research was carried out at the Al-Ikhlas Taliwang Islamic Boarding School for class XI students. This research will last for three months, starting from December to February 2023/2024. Determination of the sample in this research was carried out using purposive sampling technique. The number of samples in this study was 26 students from class XI. Data collection techniques in this research are observation, interviews, documentation and questionnaires. The research instrument consists of a material expert validity test questionnaire, a media expert validity test questionnaire, and an e-module readability test questionnaire by students. The data analysis technique uses the average percentage score formula from the validation results of material experts and media experts, and the results of e-module readability tests by students. From the results of the material expert validation, a score of 3.3 was obtained from validator 1 and 3.6 from validator 2, an average score of 3.45 with good criteria. Then the media expert validation results obtained a score of 3.5 from validator 1 and 3.4 from validator 2 with an average score of 3.45 with good criteria. Based on the results of the e-module readability test assessment by students, it shows that the results of the class . So it can be said that the e-module that is being developed is practical for use in learning.

Keywords : Development, E-module, PBL, Critical thinking

INTRODUCTION

21st century education emphasizes the need for special competencies to face the dynamics of environmental change and complexity (Ethics Y W *et al*., 2016). One of the competencies that is the main focus is the ability to think critically, which includes the skills to analyze, evaluate and create (Rahardhian, 2022). Today's students often experience limitations in their ability to analyze, the first step in developing critical thinking (Trimahesri & Hardini, 2019). Several factors can be identified as causes of this weak ability to analyze, evaluate and create (Ananda & Wandini, 2022). One of them is the use of inadequate learning modules to develop these skills (Padwa & Erdi, 2021). The Problem Based Learning (PBL) model is a teaching approach that actively involves students, enabling them to hone their critical thinking skills by evaluating and analyzing various problems (Nurqolbiah *et al*., 2016). So, it can be concluded that the learning model *problem-based learning* is a learning model that can provide opportunities for students to develop critical thinking skills actively (I. T. Kusumawati *et al*., 2022). appropriate to help the learning process. E-module is an instrument or learning media that contains lesson content, teaching techniques, limitations and assessment techniques that are planned in a structured and interesting way to achieve the desired skills according to the level of difficulty digitally (Nia *et al*., 2022). Based on the results of observations carried out at the Al-ikhlas Taliwang Islamic boarding school, there are obstacles in the learning process, namely the lack of students who are willing to express opinions or ask questions to the teacher even though there is material they do not yet understand, so that interactions between teachers and students are not established properly. optimal which results in students' critical thinking abilities being less than satisfactory. This is reinforced by the results of structured interviews with science teachers that in science subjects there are several students who do not dare to express opinions. Therefore, researchers want to conduct research with the title "Development of Learning-Based E-modules." *Problem Based Learning* in Improving the Critical Thinking Ability of Pondok Al-ikhlas Taliwang Students.

RESULTS AND DISCUSSION

This research uses a 4D development model, namely *Define, Design, Develop, Disseminate.*

The e-module development in this research uses the 4-D development model. The

development stages consist of: (1) define, (2) design, (3) develop. At the defined stage, researchers carried out beginning-to-end analysis, student analysis, material analysis, task analysis, and learning objective analysis. At the design stage, researchers carried out media selection, format selection, and initial design of the e-module being developed. At the development stage, validation tests, practicality tests and trials of the e-module being developed are carried out to see its level of effectiveness.

It is known that the e-module developed meets valid criteria both in terms of material and media, this means that the e-module meets the appropriateness aspects of content, language, presentation and characteristics of the problem based learning approach used to base the e-module. In relation to language, the validity of problem-based learning-based e-modules shows that they are compatible with the level of development required by students whose critical thinking skills are not yet optimal. The learning process that can improve students' critical thinking skills is student-centered learning and takes place in a social context.

Apart from that, the e-module meets practical criteria in terms of interest. It is known that students are more enthusiastic and happy to study reproductive system material using the e-module provided, students' curiosity and questions increase when using the e-module provided and participants Students feel helped when studying reproductive system material when using the e-module provided.

Next, the e-module is viewed in terms of practicality. Practicality data is obtained from assessments using student response questionnaires. The average score from the content suitability assessment is 3.35, which means getting "good" criteria. The average score given by these experts shows that the e-module being developed is valid for use.

The e-module also contains indicators of critical thinking skills. This is in accordance with the development objective, namely to improve students' critical thinking skills to solve a problem by expressing various ideas and various kinds of answers.

This is also in line with research conducted by Islahiyah, I., Pujiastuti, H., & Mutaqin, A. (2021) showing that science e-Modules can be used by teachers as an alternative to improve critical thinking skills. Other research also confirms that conducted by Sujanem, R., Suwindra, I. N. P., & Suswandi, I. (2022) shows that learning assisted by e-Modules can improve critical thinking skills. Research conducted by Rosida, F. A., & Nuvitalia, D. (2024) is also in line with the results of this research, namely stating that PBL is a learning model that can help students to improve the development of lifelong learning skills in an open, reflective, mindset. critical, and active learning, as well as facilitating successful problem solving.

CONCLUSION

Based on the explanation in the previous chapter, the following conclusions were obtained:

1. Development of PBL-based e-modules to improve students' critical thinking skills based on validator assessments in the "Good" category so that they are valid and suitable for use, with an average score
2. The results of the PBL-based E-module readability test for students with an average score classified as Good, meaning that the e-module is easy to understand.

SUGGESTION

Science based e-module *Problem-Based Learning* (PBL) to improve critical thinking skills that have been produced are declared valid, practical and effective. So, e-modules can be used for classroom learning. The suggestions for utilizing the new e-module products that have been produced are:

1. PBL-based e-module to improve the critical thinking skills of class

3. For students to be able to make the best use of the e-module provided by the teacher, it is recommended that they use the e-module while still following the teacher's instructions.
4. It is hoped that other researchers can conduct more in-depth research regarding the relationship between critical thinking skills and PBL-based e-modules in stimulating critical thinking skills.

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BIBLIOGRAPHY

Allimah, C. (2023). Penerapan Pembelajaran Berbasis Masalah Untuk Meningkatkan Kemampuan Berpikir Kritis Peserta didik Pada Pelajaran IPS Kelas VIIIA SMP Negeri 9 Kota Mojokerto. *Nuris Journal Of Education And Islamic Studies*, *3*(2), 76–90.

Ananda, E. R., & Wandini, R. R. (2022). Analisis Kemampuan Literasi Matematika Peserta didik Ditinjau Dari Self Efficacy Peserta didik. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(5), 5113–5126.

Arifin, M., Suyitno, H., & Dewi, N. R. (2019). Kemampuan Berpikir Kreatif Matematis Melalui Problem Based Learning Berbantuan Mobile Learning Era Disrupsi. *Prisma, Prosiding Seminar Nasional Matematika*, *2*(1), 376–383.

Arnila, R., Purwaningsih, S., & Nehru, N. (2021). Pengembangan E-Modul Berbasis STEM (Science, Technology, Engineering And Mathematic) Pada Materi Fluida Statis Dan Fluida Dinamis Menggunakan Software Kvisoft Flipbook Maker. *Edumaspul: Jurnal Pendidikan*, *5*(1), 551–556. Https://Doi.Org/10.33487/Edumaspul.V5i1.1216

Asmiyunda, A., Ekaputra, F., & Affan, A. (2023). Developing Learning Tools With Case-Based Learning And Project-Based Learning For Digital Classroom Management Course. *Jurnal Eksakta Pendidikan (Jep)*, *7*(1), 84–93. Https://Doi.Org/10.24036/Jep/Vol7-Iss1/729

Ati, T. P., & Setiawan, Y. (2020). Efektivitas Problem Based Learning-Problem Solving Terhadap Kemampuan Berpikir Kritis Dalam Pembelajaran Matematika Peserta didik Kelas V. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *4*(1), 294–303. Https://Doi.Org/10.31004/Cendekia.V4i1.209

Ayudia, I., Bhoke, W., Oktari, R., Carmelita, M., Salem, V., Khairani, M., Mamontho, F., & Setiawati, M. (2023). *Pengembangan Kurikulum*.

Baroya, E. P. I. H. (2018). Strategi Pembelajaran Abad 21 - Lpmp Jogja. *Jurnal Lembaga Penjaminan Mutu Pendidikan Prov. Diyogyakarta*, *I*(01), 101–115.

Benyamin, B., Qohar, A., & Sulandra, I. M. (2021). Analisis Kemampuan Berpikir Kritis Peserta didik SMA Kelas X Dalam Memecahkan Masalah SPLTV. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(2), 909–922. Https://Doi.Org/10.31004/Cendekia.V5i2.574

Dari, F. W., & Ahmad, S. (2020). Model *Discovery Learning* Sebagai Upaya Meningkatkan Kemampuan Berpikir Kritis Peserta didik SD. *Jurnal Pendidikan Tambusai*, *4*(2), 1469–1479.