

Student Response to the Implementation of E-Module-Assisted Cybergogy in Junior High School Students

Novitasari Ramadhani^{1*}, Hasan Subekti²

Science Education Department, Faculty of Mathematics and Natural Sciences, State University of Surabaya, Surabaya, Indonesia

*e-mail: novitasariramadhani.21026@mhs.unesa.ac.id

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Abstract: The low involvement of students in learning is still a challenge, one of which is influenced by the lecture method, which is still dominant in the teaching and learning process. The application of technology-based learning, such as e-module-assisted cybergogy, is expected to increase students' positive responses. This study aims to analyze students' responses to the application of e-module-assisted cybergogy in science learning. This study uses a quasi-experimental method with a one-shot case study design involving 32-grade VIII-D SMPN 1 Bagor students. Data was collected through student response questionnaires and analyzed using descriptive statistics. The results showed that implementing e-module-assisted cybergogy resulted in very positive student responses, with an average response score of 99.1%. In conclusion, this approach can increase student engagement in science learning. This research implies that educators can adopt e-module-assisted cybergogy to create more interactive and innovative learning.

Keywords: Cybergogy; E-Module; Student Response.

Introduction

Information technology's development during the Industrial Revolution 4.0 and Society 5.0 era brought changes in various fields, including education. Conventional learning models are beginning to adapt to digital technology, allowing students to access various learning resources flexibly. One approach that supports technology-based learning is cybergogy. According to [1], cybergogy is a framework designed to create an interactive online learning experience without space and time limitations. This approach integrates information technology to support students' cognitive, emotional, and social development in digital learning [2].

The incessant application of digital technology has increased internet access easily among students. However, many students are more interested in using digital technology to access social media, online games, online shopping, and music entertainment than reading educational information. This contributes to low interest in reading and literacy, ultimately impacting learning [3]. The 2022 Program for International Student Assessment (PISA) survey results show that Indonesia is ranked 69 out of 81 countries with a reading score of 369 [4]. Indonesia's reading score has decreased from 371 in 2018 to 359 in 2022 [5]. Students themselves show mixed responses to this condition. Some find it difficult to understand complex reading texts, while others prefer information in visual or audiovisual form because it is considered more interesting and easy to understand. Therefore, innovations in digital-based learning need to be directed to accommodate student preferences while still fostering reading habits and improving students' digital literacy.

Based on the results of interviews with science subject teachers at SMP Negeri 1 Bagor, the learning method applied is still dominated by lectures, with the main teaching materials in the form of package books and printed modules provided by MGMP Science Nganjuk Regency. Although Internet and online articles are also used, printed teaching materials have limitations, especially in presenting abstract concepts and dynamic processes, such as molecular movements or ecosystem changes. In this regard, printed teaching materials have shortcomings [6], namely, being unable to describe movements and materials shown to be linear [7]. According to [8], printed teaching materials tend to be linear and lack support interactivity in science learning, so they can affect students' understanding of complex materials. In addition, some students are less interested in printed teaching materials because of their monotonous and less interactive nature. This aligns with research [9], which shows that students are more motivated when using technology-based learning media that present interactive visual and animation elements. In addition, teachers apply digital technology-based teaching materials to integrate digital literacy skills into learning [10]. Therefore, innovation is needed in developing teaching materials, including digital-based e-modules that can integrate digital literacy skills into science learning. SMP Negeri 1 Bagor has not implemented e-modules in learning, so its development is a strategic opportunity to increase learning effectiveness.

E-modules are electronic teaching materials that facilitate digital learning by providing online study guides, video links, quizzes, and material articles [11]. Several studies have shown that e-modules effectively improve digital literacy and student learning outcomes. For example, research by [3] shows that using e-modules results in a learning success rate of 100% with a positive response of

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91.22%. In addition, another study reported that Android-based learning modules improved students' digital literacy with an N-gain score of 0.45 (moderate category) and a very positive student response of 97% [7]. Another study by [12] found that using e-modules improved students' comprehension, with an average post-test score of 85 in the experimental class compared to 69 in the control class. Based on these findings, e-modules have the potential to be a solution in increasing student engagement and digital literacy, especially in technology-based learning such as cybergogy.

The difference between this study and the previous research is that there are a few studies with e-modules on mixed separation materials, so mixed separation materials are used in this study. In addition, this study focuses on applying cybergogy with the help of e-modules. However, the effectiveness of implementing *e-module-assisted* cybergogy still needs to be explored further, especially in understanding how students respond to this method.

This study aims to analyze students' responses to the application of e-module-assisted cybergogy in learning in junior high school. The results of this study are expected to provide insight into the effectiveness of this method in increasing student engagement and understanding, as well as provide recommendations for the development of technology-based learning in the future.

Research Methods

The approach in this study is a quasi-quantitative approach with an experimental design Pre-experimental design with the shape of a One-shot Case Study Design. to find out the student's response after the treatment [13]. This research is determined based on the purpose of the research, which is to analyze students' responses to the application of cybergogy assisted by e-modules for junior high school students.

Table 1. Research Design One-shot case study design

Treatment	Posttest
X	O

Sources: [14]

Information:

X = Learning with the application of cybergogy assisted by e-modules

O = Posttest score

The e-module that has been developed is piloted on 32 students in grades VIII-D SMP Negeri 1 Bagor for the 2024/2025 school year with a cluster random sampling technique. Cluster random sampling is a regional sampling technique to determine a sample if the object subject or data source being studied is very broad [15]. A response questionnaire was carried out on the 32 students after implementing cybergogy assisted by e-modules. This research was conducted at SMP Negeri 1 Bagor, Banarankulon Village, Bagor District, Nganjuk Regency.

This study uses validated student response questionnaires and teaching tools in the form of teaching modules and validated e-modules. Data on student responses was collected through a response questionnaire after being treated for two meetings in October 2024. Students are given questions and clear instructions on how to answer questions

in the form of statements after implementing cybergogy assisted by e-modules.

The data analysis technique used in this study is a quantitative descriptive technique. The results of the response answers were analyzed in a quantitative descriptive manner, which was classified according to the category of the Guttman scale score, namely, a "Yes" score of 1 and choosing "No" if it got a score of 0. The data analysis in this study uses the score percentage equation expressed in the following equation [14]:

$$\% \text{skor} = \frac{\text{skor dari responden}}{\text{skor maksimal}} \times 100\%$$

The results of student responses obtained and described with response score criteria are presented in the following table [16]:

Table 2. Response Score Criteria

Response Percentage (%)	Categories Response
0-20	Very unpositive
21-40	Less Positive
41-60	Quite Positive
61-80	Positive
81-100	Very Positive

Results and Discussion

The student response questionnaire is in the form of student opinions after participating in learning with the application of cybergogy assisted by e-modules. The results of the student's responses are presented in Figure 1.

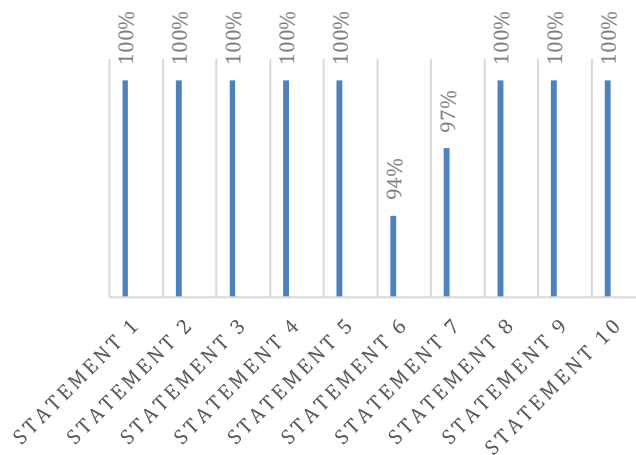


Figure 1. Percentage Diagram of Student Response Questionnaire

Based on Figure 1. The results of the Student Response to the implementation of Cybergogy assisted by E-Module stated that the percentage of students who answered "Yes" was 94% in statement number 6. In contrast, in statement number 7, the percentage of student answers was 97%, and in other statements, the number was 100%. The students who answered the questionnaire responded to 32 people. Some students answered that they felt bored and less independent. However, this number was still very small compared to the overall answers of students who stated that cybergogy learning assisted by e-modules was very effective in learning.

Based on Table 2. shows that the response of students answered "Yes" on number 6 as much as 94% with a very positive category, while responding "Yes" on number 7, as many as 97% with a very positive category and the other

number answered "Yes" with a percentage of 100% with a very positive category. Thus, an average response percentage of 99.1% was obtained in the very positive category.

Table 2. Results of Student Responses to the Implementation of Cybergogy Assisted by E-Modules

No.	Statement	Number of Answers		Percentage of "Yes" Answers (%)	Response Category
		Yes	No		
1.	Learning using digital technology media assisted by e-modules can create a fun learning environment.	32	0	100	Very positive
2.	Learning using digital technology media assisted by e-modules makes it easier for me to understand mixed separation material.	32	0	100	Very positive
3.	I feel that learning using digital technology media assisted by this e-module can train digital literacy.	32	0	100	Very positive
4.	I feel that learning science mixed separation material using digital technology media assisted by e-modules makes the material easy to access.	32	0	100	Very positive
5.	Learning to use digital technology media assisted by e-modules makes it easier for me to solve problems with mixed separation material.	32	0	100	Very positive
6.	Learning using digital technology media with e-module media can increase my independence in completing tasks.	30	2	94	Very positive
7.	Learning using digital technology media assisted by e-modules can eliminate boredom.	31	1	97	Very positive
8.	I feel more skilled in learning science using digital technology media assisted by e-modules.	32	0	100	Very positive
9.	I feel that the mixed separation material is easy to learn using digital technology media assisted by e-modules.	32	0	100	Very positive
10.	Learning using digital technology media assisted by e-modules makes it easier for me to learn mixed separation material.	32	0	100	Very positive
Average				99.1 %	Very positive

The student response questionnaire was used as a supporting instrument in this study to evaluate the implementation of e-module-assisted cybergogy in training students' digital literacy. The results of the questionnaire recapitulation showed that most students gave positive responses, with an average "Yes" answer percentage of 99.1%. Specifically, 94% of students gave a "Yes" answer to the 6th statement, 97% to the 7th statement, and 100% to the other statement. This data indicates that cybergogy-based learning with e-modules received excellent acceptance from students.

These results align with previous research that shows that e-modules effectively improve students' digital literacy. A study by [3] reported that using e-modules increased digital literacy with a positive response of 91.22%. In addition, research by [7] found that using Android-based mobile learning modules improved students' digital literacy, with a positive response rate of 97%. Thus, the findings of this study further strengthen that the integration of

technology in learning, especially through cybergogy assisted by e-modules, has a positive impact on improving students' digital literacy.

From the perspective of learning theory, the results of this study are also in line with the theory of constructivism proposed by J. Piaget. In this theory, students passively receive information and actively build their understanding. Implementing cybergogy with e-modules allows students to be more independent in exploring learning materials, ultimately strengthening students' digital literacy skills [17-19].

Although the study's results showed a very positive response, its implementation had several obstacles. One of the main obstacles is that some students do not bring mobile phones into the classroom, which hinders their access to e-modules. In a situation like this, researchers must be able to make strategic decisions to overcome obstacles that arise in the field [20]. In this study, the solution is to provide backup devices so all students can still participate in learning. Future

research can focus on strategies to increase student access to technology so that digital-based learning can be implemented more optimally.

Conclusion

This study aims to analyze students' responses to the application of e-module-assisted cybergogy in junior high school students. The findings showed that the results of the student response questionnaire answered the average percentage of student answers of 99.1% with a very positive category, highlighting that student responses affected the effectiveness of implementing e-module-assisted cybergogy. In particular, e-module-assisted cybergogy in implementing learning provides innovation by utilizing digital technology. Although this study provides valuable insights into students' responses to implementing e-module-assisted cybergogy in junior high school students, limitations such as students who do not carry their mobile phones must also be noted. Future research should focus on examining future directions or opportunities to build on these studies, which have the potential to improve understanding of students' responses to the implementation of e-module-assisted cybergogy in junior high school students.

Author's Contribution

Novitasari Ramadhani: contributed to the design of research, collection, processing, and analysis of data, as well as writing article manuscripts; Hasan Subekti: provided input in the preparation of methodologies, reviewed research results, and assisted in the final editing of articles.

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