



Contextual Approach-Based E-Module Assessment to Improve Students' Critical Thinking Ability and Skills

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Abstract: The research objective of this article is to provide an overview of assessment in the form of improving students' critical thinking abilities and skills through a quality science learning contextual approach. This article discusses several formulations of the problem: E-Modules based on a practical contextual approach to improve students' critical thinking skills, E-Modules based on an efficient contextual approach to improving students' critical thinking skills, and the effect of using E-Modules in the Middle School Science learning process. The form of the research used was the RnD model instrument development research (Allesi and Trollip) which involved 35 respondents. This research involved 35 respondents from several students, teachers, and lecturers. Data is collected in Google form. After that, the data was processed and analyzed using SPSS 0.16. The study results show that the E-Module media is effective and efficient for use in the teaching and learning process and influences the learning process for junior high school students. This study shows that e-module teaching media can be preserved and used in teaching and learning. This article shows that e-module media can be used in the teaching-learning process. It is hoped that the existence of teaching media assessment instruments in the form of e-modules that are memorable in innovative and efficient teaching and learning processes.

Abstrak: Tujuan penelitian artikel ini adalah untuk memberikan gambaran tentang penilaian berupa peningkatan kemampuan dan keterampilan berpikir kritis siswa melalui pendekatan kontekstual pembelajaran IPA yang berkualitas. Artikel ini membahas beberapa rumusan masalah yaitu diantaranya, E-Modul berbasis pendekatan kontekstual efektif untuk meningkatkan kemampuan berpikir kritis siswa, E-Modul berbasis pendekatan kontekstual efisien untuk meningkatkan kemampuan berpikir kritis siswa, serta pengaruh penggunaan E-Modul pada proses pembelajaran IPA SMP. Bentuk penelitian yang digunakan adalah penelitian pengembangan instrumen model RnD (Allesi and Trollip) yang melibatkan 35 orang responden. Penelitian ini melibatkan 35 orang responden yang terdiri dari beberapa orang mahasiswa, guru dan dosen. Data dikumpulkan ke dalam google form. Setelah itu data diolah dan dianalisis menggunakan SPSS 0.16. Hasil dari penelitian menunjukkan bahwa media E-Modul efektif dan efisien untuk digunakan dalam proses belajar mengajar serta berpengaruh terhadap proses pembelajaran siswa SMP. Studi ini menunjukkan bahwa media ajar e-modul dapat dilestarikan dan digunakan dalam proses belajar mengajar. Artikel ini menunjukkan bahwa media e-modul dapat digunakan dalam proses belajar-mengajar. Diharapkan dengan adanya instrumen penilaian media ajar berupa e-modul yang berkesan dalam proses belajar mengajar yang inovatif dan efisien.

A. Introduction

The media has a crucial role in the learning process because it can facilitate the delivery of teaching materials that are difficult to understand through the help of the media as an intermediary. The mass media can display information the teacher cannot explain through certain words or phrases. The use of media in the learning process in the classroom makes learning more flexible, attracts students' attention, and clarifies messages to improve learning outcomes.

Learning media is a learning aid, a tool, or a method that can be applied in teaching and learning (Klisc et al., 2017). Learning media functions to assist educators in explaining learning material (Parikh & Chen, 2009) so that the teaching and learning process can run effectively. It can achieve the desired educational goals (Wahab et al., 2022). To create a successful education, the learning process must also be successful (Salsinha et al., 2022).

Student learning outcomes at school are often indicated by student learning problems, namely, in understanding the material (Mapeala & Siew, 2015). This can be caused by student learning factors that are less effective (Basir et al., 2022). As a result, students need help understanding the material the teacher presents (Reynders et al., 2020). In this case, the role of the teacher as a bearer of knowledge is vast to choose and carry out appropriate and efficient learning for students (Ryen, 2020). One way to be done is to develop exciting learning media to increase students' interest in learning (Spector & Ma, 2019) so that learning does not feel dull. The material presented can be understood by students (Saputra, 2020).

A good learning process can occur with support from quality learning resources or teaching materials. Technological developments at this time can produce various changes, especially in student learning media. Electronic module-based teaching materials are needed to generate process learning with good quality, interactive, and engaging (e-modules). In the current era of globalization, technological developments significantly affect the growth and development of education (Trinova et al., 2022). Therefore, as educators, we must be able to utilize technology in developing learning media (Afidah et al., 2022) so that learning can run smoothly and achieve the desired goals (Chang et al., 2020).

One of the learning media that utilizes technology is the e-module (electronic module) (Wale & Bishaw, 2020). E-module is a form of learning media presented systematically and in an electronic format to achieve learning objectives (Prasetyo et al., 2022). Unlike the usually printed modules, e-modules or electronic modules contain animations (Sudarsono, 2022), videos, and other navigation that make learning media more interactive (Nygren et al., 2019). According to Maha, an e-module is a teaching material designed in a structured manner based on the curriculum and packaged using electronic devices such as computers or Android (Janks, 2013). E-module learning media has its advantages, namely, activities learning can be done independently because of the help of the process learning by using a smartphone. Students can study the material presented by the e-module and can be used without the online internet. The drawback of this media is that modifying the media requires careful planning and much time long enough.

Seeing the importance of using an e-module based on a contextual approach as teaching material for students (Prati et al., 2011), an appropriate assessment instrument is needed to evaluate and provide improvements to increase the use of e-module-based approaches. Therefore, the research aims to use learning media as e-modules (electronic modules) in teaching and learning (Nygren et al., 2019). The existence of this learning media assessment instrument can produce learning media in the form of e-modules (Sato, 2022) that are memorable in innovative and efficient teaching and learning (Ritonga et al., 2022).

B. Method

The type of research used was the RnD model instrument development research (Allesi and Trollip) which involved 35 respondents. This study involved 35 samples of several students, teachers, and lecturers. The data collection technique is to collect data in the Google form. After that, the data was processed and analyzed using SPSS 0.16.

This study aims to produce learning media as e-modules using the Alessi & Trollip development model design. The procedure (steps) of the research are as follows:

Planning

At this stage, planning is carried out, and good planning will provide clear direction for the next development stage (Gómez & Suárez, 2020). In planning the use of e-modules, it can help students learn (Qodria et al., 2022). Help her because e-modules can support students in learning (Mohammadi et al., 2022) whose knowledge can be understood and applied to the environment (Herliani, 2016).

Design

At this stage, design can combine content, instructional perspectives, and interactivity (Sunismi & Setiawan, 2022). Before experimenting, an e-module is made according to the needs (Rahayu et al., 2013), which is certainly not arbitrary and requires time. Some aspects must be considered (Rijal, 2022) so that an e-module is formed that genuinely fits and by needs (Barta et al., 2022). In this design stage, product design, preparation, tools, and materials needed in the process of making e-modules based on a contextual approach (Danianty & Sari, 2022), development and application of e-modules based on a contextual approach to students at SMP/MTS (Pertwi et al., 2018).

Development

At this stage, development is carried out, turning a design concept into a product (Yanti & Riady, 2019). Here the researcher has made the e-module, and the researcher conducted a test with three experts to validate the material (Rifqi, 2021). E-modules later entered the improvement stage regarding e-modules, materials, and design (Amri & Rochmah, 2021). Improvements were made based on expert advice/experts who validated (Spector & Ma, 2019). In the final stage, the field test was carried out (Seranica et al., 2018). This trial was applied to students at SMP/MTS. They were directed to first understand the concept of the subject matter. After that, they were directed to answer problem-based

questions (Álvarez-Huerta et al., 2022). With problems like that, students are expected to be able to think critically, and expectations are achieved (Auerbach & Andrews, 2018). Students can work on and understand what they have learned because it is hoped that students will not only be able to answer (Astuti et al., 2018), but the development of e-modules based on this contextual approach can improve and develop students' critical thinking skills and skills (Nadzif et al., 2022).

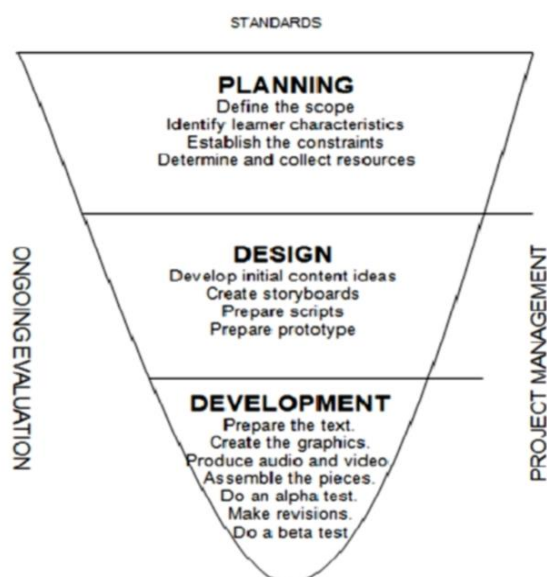


Figure 1. Research Stage

C. Result and Discussion

Result

This sub-chapter will present the results of the research assessment. In this study, the assessment was carried out through the Google form. In assessing visual media, it is adjusted to the instruments and materials that have been selected by estimating those related to models and methods that aim to fulfill the objectives and goals of their development. This e-module media assessment involved 35 respondents, 15 teachers, and 20 students and students.

Presentation aspects in this e-module include the selection of design sizes and colors text, font, text color, background, and image, as well as presenting sample questions, practice questions, answer keys, and summary. Inside the presentation, this e-module uses an attractive display with the suitability between text colors, fonts, and backgrounds that consider aesthetic and functional aspects to give convenience for internal students to use it as a learning resource. A letter (font) has a characteristic function and meaning, so proper use is essential to convey meaning and minimize misunderstanding. Color combinations and the background used are designed to be convenient and easy to read to produce an attractive appearance that can influence students' reading interest. Presentation of other complementary elements, such as examples of questions that facilitate students in learning

and practice questions that are accompanied with answer keys so that students can practice the extent of their understanding of bonding covalent. The summary contains a summary of the material, which can be read to strengthen other concepts learned.

The following is about the assessment and display of visual media development on Google forms that have been carried out:

Table 1. Information Provided by E-Module Media or Electronic Modules is Straightforward to Understand

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	18	51.4	51.4	51.4
	Agree	13	37.1	37.1	88.6
	Simply Agree	4	11.4	11.4	100.0
	Total	35	100.0	100.0	-

Table 1 shows the total number of e-module media development assessments by most respondents who strongly agreed that the information items provided by e-module media or electronic modules were straightforward to understand, namely 51.4%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to excellent categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from the language and presentation of information material provided by e-module media or electronic modules is very easy to understand. Therefore this media is allowed to be developed and applied in learning.

Table 2. Easy to Find the Information I Need

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	12	34.3	34.3	34.3
	Agree	18	51.4	51.4	85.7
	Simply Agree	5	14.3	14.3	100.0
	Total	35	100.0	100.0	-

Table 2 shows that the total number of e-module media development assessments by the respondents who mostly agreed on the accessible item to find the information I needed was 51.4%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to excellent categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, I construct validity from language and presentation of easy-to-find information I need. Therefore this media is allowed to be developed and applied in learning.

Table 3. I Can Effectively Complete My Assignments Using E-Module Media based on A Contextual Approach

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	11	31.4	31.4	31.4
	Agree	17	48.6	48.6	80.0
	Simply Agree	7	20.0	20.0	100.0
	Total	35	100.0	100.0	-

Table 3 shows that the total number of e-module media development assessments by respondents who mostly agreed on the item I can complete my task effectively when using e-module media based on a contextual approach is 48.6%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very good categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from language and presentation can effectively complete my assignments using e-module media based on a contextual approach. Therefore this media is allowed to be developed and applied in learning.

Table 4. The Text or Writing on This E-Module is Very Easy to Read

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	8	22.9	22.9	22.9
	Agree	21	60.0	60.0	82.9
	Simply Agree	6	17.1	17.1	100.0
	Total	35	100.0	100.0	-

Table 4 shows that the total number of e-module media development assessments by respondents who mostly agreed with the text or writing items in this e-module was very easy to read, namely 60%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very good categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying

instrument development. In this study, construct validity from the language and presentation of the text or writing on this e-module is very easy to read. Therefore this media is allowed to be developed and applied in learning.

Table 5. I Can Easily Understand the Explanations that have been Designed on E-Module Media (Electronic Modules)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	8	22.9	22.9	22.9
	Agree	2	57.1	57.1	80.0
	Simply Agree	7	20.0	20.0	100.0
	Total	35	100.0	100.0	-

Table 5 shows that the total number of e-module media development assessments by respondents who mostly agreed on the item I easily understand the explanations designed on the e-module media (electronic module) is equal to 57.1%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very good categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from the language and presentation can easily understand the explanations designed on e-module media (electronic modules). Therefore this media is allowed to be developed and applied in learning.

Table 6. This E-Module Media (Electronic Module) has Exciting Presentation of Material and Images

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	12	34.3	34.3	34.3
	Agree	17	48.6	48.6	82.9
	Simply Agree	6	17.1	17.1	100.0
	Total	35	100.0	100.0	-

Table 6 shows that the total number of e-module media development assessments by respondents who mostly agreed on the e-module media item (electronic module) has an exciting presentation of material and images, namely 48.6%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very valid categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from the language and presentation of this e-module media (electronic module) has an exciting presentation of material and images. Therefore this media is allowed to be developed and applied in learning.

Table 7. I Can Easily Understand the Language Used in the E-Module Media (Electronic Module)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	9	25.7	25.7	25.7
	Agree	22	62.9	62.9	88.6
	Simply Agree	4	11.4	11.4	100.0
	Total	35	100.0	100.0	-

Table 7 shows that the total number of e-module media development assessments by respondents who mostly agreed on the item I easily understand the language used in the e-module media (electronic module) is 62.9%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very valid categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from language and presentation can easily understand the language used in the e-module media (electronic module). Therefore this media is allowed to be developed and applied in learning.

Table 8. I Can Understand Every Material or Image Used in the E-Module

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	10	28.6	28.6	28.6
	Agree	20	57.1	57.1	85.7
	Simply Agree	5	14.3	14.3	100.0
	Total	35	100.0	100.0	-

Table 8 shows that the total number of e-module media development assessments by respondents who mostly agreed to the item I can understand every material or image used in the e-module is 57.1%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very valid categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from the aspect of can understand every material or image used in the e-module. Therefore this media is allowed to be developed and applied in learning.

Table 9. Media E-Module Based on This Contextual Approach Can Improve Students' Critical Thinking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	12	34.3	34.3	34.3
	Agree	14	40.0	40.0	74.3
	Simply Agree	9	25.7	25.7	100.0
	Total	35	100.0	100.0	-

Table 9 shows that the total number of e-module media development assessments by respondents who mostly agreed on e-module media items based on this contextual approach can increase students' way of thinking critically by 40%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very valid categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from the aspect of media e-module based on this contextual approach can improve students' way of thinking critically. Therefore this media is allowed to be developed and applied in learning.

Table 10. Media E-Module Based on This Contextual Approach Can Improve Students' Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	9	25.7	25.7	25.7
	Agree	21	60.0	60.0	85.7
	Simply Agree	5	14.3	14.3	100.0
	Total	35	100.0	100.0	-

Table 10 shows that the total number of e-module media development assessments by respondents who mostly agreed on e-module media based on this contextual approach can improve student skills by 60%. The developed media is valid if the validator's assessment meets the percentage results > 50%, valid to very valid categories. Therefore, the assessment of e-module media (electronic modules) is valid to be developed and applied to junior high school science learning, especially in the material on the classification of living things.

Construct validation is validity definition or validity understood as how far the impact of the measurement results is capable of reflecting a theoretical construct underlying instrument development. In this study, construct validity from the aspect of media e-module based on this contextual approach can improve students' skills. Therefore this media is allowed to be developed and applied in learning.

Discussion

From the research, it can be concluded that the assessment has been carried out through the Google form by teachers, lecturers, and students. In this assessment, several things need attention and improvement from the e-module media that has been provided. In assessing the development of e-module media through the Google form, it was proved that the respondents agreed. It was feasible that e-module media could be used and used by junior high school students (SMP).

E-module learning media has its advantages, namely activities learning can be done independently because of the help of the process learning by using a smartphone; students will be able to study the material presented by the e-module and can be used without online internet. The drawback of this media is that modifying the media requires careful planning and requires much time, long enough.

Seeing the importance of using an e-module based on a contextual approach as teaching material for students, an appropriate assessment instrument is needed to evaluate and provide improvements to increase the use of e-module-based approaches. Therefore, the research aims to use learning media in the form of e-modules (electronic modules) in the teaching and learning process. This learning media assessment instrument can produce learning media in e-modules that are memorable in innovative and efficient teaching and learning.

D. Conclusion

From the description above, it can be concluded that the assessment has been carried out through the Google form by teachers, lecturers, and students. In this assessment, several things need attention and improvement from the e-module media that has been provided. In assessing the development of e-module media through the Google form, it was proved that the respondents agreed. It was feasible that e-module media could be used and used by junior high school students (SMP).

From this assessment process, each respondent also indicated that several aspects still needed to be improved to perfect the e-module media. Several aspects of the input are given, such as too much explanation and lack of pictures, and the number of questions in the e-module. The development of this e-module media can improve students' critical thinking skills and skills.

The reviewer has included several illustrations that need to be in an e-module learning media. This article shows that teaching media in e-modules may be used in teaching and learning. The existence of an assessment instrument for the development of e-

module media can produce memorable learning media in innovative and efficient teaching.

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