



E-Module Development Using the Canva Application on Environmental Pollution Concept

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Abstract: This research uses the ADDIE development model to produce an E-Module using the Canva application on environmental pollution concept that is Valid, Practical, and Effective. This research was conducted at SMP Negeri Molibagu involving students in Class VII. The research results show that the results of the validation of the E-Module using the Canva application from media experts achieved a score of 85%, which is included in the valid category and suitable for use in learning. The practicality of the E-Module using the Canva application as shown by the implementation of learning during three meetings with a percentage of 85% with excellent category, and the student responses reached 83% with excellent criteria. The effectiveness of the E-Module using the Canva application is demonstrated by student activity with a percentage of 86% with good criteria. Thus, it is concluded that the E-Module using the Canva application on environmental pollution concept has met the valid, practical, and effective criteria.

Keywords: Canva; E-module; Environmental pollution

Introduction

Education is the foundation that is expected to create balance in a person's and society's progress. Education is used as a source of self-awareness and identity of a person or community, as well as the exchange of information. With education, this nation can be independent and able to compete in the world of science and technology so that it is truly ready to face a brighter future in the life of the nation and state. Every Indonesian citizen has the right to receive education, as explained in the 1945 Constitution Article 31 in paragraph 1 (Newstead et al., 2024; Taylor, 2016; Limpo et al., 2018; Khairunnisa et al., 2023).

Education is the primary key for people who want to be insightful and superior in the era of global competition. The development of education impacts the development of science and technology. This can be seen by the increasing growth of science and technology now, which cannot be separated from the progress of science, which has produced many of the latest discoveries in

science and technology. Therefore, natural science is essential because mastery of science and technology is related to natural science (Brown & Tannock, 2009; Setiawan et al., 2023; Rahmi et al., 2023).

Science is a science that studies phenomena through a series of processes known as the scientific process. Science is defined as a collection of knowledge that is naturally structured. Experts have put forward several definitions of science. Science is a science that seeks answers to what, why, and how questions so that it can provide sufficient space for the growth and development of a scientific attitude, practice solving problems, and its application in real life (Widiadnyana et al., 2014; Khairani & Prodjosantoso, 2024).

Development is planned and carried out in one direction: expanding or improving a quality learning tool to be more effective, efficient, and helpful in its application. The learning process is necessary to develop one of the tools that are very important in achieving national education goals, which aims to cultivate skills and build a dignified national character and civilization

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to enhance the nation's intellectual capacity (Hasbullah, 2009; Yuniarto & Yudha, 2021).

E-module is a part of electronic-based E-learning, implemented using information and communication technology (ICT), especially electronic devices. E-modules can be accessed using a computer, tablet, laptop, or device (Asmiyunda et al., 2018). The benefits of employing electronic modules in the educational process include reducing the use of paper and being able to display animations and learning videos via a computer or laptop so that it can attract students. Current technological advances also allow an E-module to be shown via smartphone, making it easy to access anytime and anywhere. E-modules in the learning process must also be contextual, involving the surrounding environment so students can comprehend the subject matter more readily (Sugiharni, 2018; Yunus et al., 2022).

An e-module is a format for presenting self-directed learning materials systematically organized into distinct units. Presented electronically, each learning activity includes navigational links, fostering interactivity and enriching the student's learning experience (Kemendikbud, 2017). The e-module restructures its content by integrating graphics, animations, and videos. E-modules can enhance students' cognitive skills and comprehension while providing the convenience of studying the material anywhere and anytime due to their portability. Apart from that, the learning process no longer depends on the teacher as the only source of information. We still need to encounter e-modules on environmental pollution concept. So, making This e-module on environmental pollution is structured around problem formulation, problem-solving, and communicating the research findings' benefits. It is designed to enhance the quality of learning. Based on the background above, it is necessary to have an e-module on environmental pollution that can be used as a reference by science teachers and can be used by the outside community (Yevira, 2023; Fitriani, 2019; Pakaya et al., 2023; Fitriani, 2023).

E-Modules Based on the explanation above, researchers can conclude that one way to make learning effective is to develop e-modules. So, the author wants to create an e-module using Canva. Canva is an online design tool offering a variety of resources, including presentations, posters, pamphlets, resumes, brochures, graphs, banners, flyers, infographics, certificates, invitation cards, diplomas, business cards, thank you cards, logos, labels, postcards, bookmarks, templates, photo editing, desktop backgrounds, YouTube thumbnails, Twitter posts, Instagram stories, and Facebook covers (Rahma, 2019). Meanwhile, Idawati et al. (2022), states that Canva offers features designed for

educational use, making it a tool that fosters creativity and collaboration across all classes. The only design platform needed in the classroom. Enhances creativity and collaboration skills, making visual learning and communication enjoyable and straightforward. The application of Canva is demonstrated in research by Kana Puspita, titled Development of a Basic Chemistry Practical E-Module Using Canva Design Application. The difference between the author's research and Kana Puspita is that in product development the author will include videos, whereas in Kana Puspita products there are no videos in the product (Nazar et al., 2024).

Based on the needs analysis conducted by interviewing fiqh teachers, it was found that the method most widely used in online fiqh learning was assignments, technology-based media that teachers mainly obtained from the internet, and most students needed help understanding fiqh learning. The teacher stated that the e-module using Canva was interesting to use in learning. The results of the student analysis were that students noted that the e-module using Canva was exciting and that it was necessary to use the e-module using Canva in learning fiqh and eliminate boredom in learning because it was equipped with attractive designs and animated videos. So, teachers and students stated that e-modules using Canva were very interesting and that it was necessary to use e-modules using Canva to learn fiqh material (Enramika et al., 2023; Marwah et al., 2024; Ulliyah et al., 2023).

Leryan et al. (2018), Canva is an online graphic design application. Canva also has various templates or design options from which you can choose. Not only presentations, but Canva also provides designs for posters, banners, profile photos, etc. Canva can help students better understand lessons by presenting text, video, audio, animation, images, and more. The appealing design can capture students' attention, encouraging focus on the lessons (Tanjung & Faiza, 2019). This Canva application is expected to be an alternative for teachers in creating exciting e-modules on Hajj and Umrah provisions. Research conducted by Edi Wibowo entitled Development of E-Module Teaching Materials Using the Kvisoft Flipbook Maker Application. The similarity between the research and the author is carrying out development. The difference between the research and the author is that the author created an e-module using the Canva application. In contrast, Edi Wibowo created an e-module Using the Kvisoft Flipbook Maker application. Comparison of the Canva application, which provides a variety of images, presentations, pamphlets, and posters, whereas, in Kvisoft Flipbook Maker, none are provided (Wumu & Buhungo, 2023; Anam et al., 2023).

Environmental pollution concept is found in class VII SMP/MTS odd semester. The material is in basic skill 3.8, namely Analyzing environmental pollution occurrences and their ecosystem impacts, and basic skill 4.8 involves writing about solutions to pollution problems based on observation findings. The characteristics of environmental pollution concept are that it requires natural objects from the surrounding environment as learning resources. This will allow environmental pollution concept to be accepted and understood easily by students if they can see, feel, or experience it directly for themselves.

Based on the background above, an e-module on environmental pollution that can be used as a reference by science teachers and the outside community is necessary. For this purpose, the author is interested in researching the development of a Canva-based e-module regarding environmental pollution.



Figure 1. Flow chart of research

The steps in this research refer to the development of ADDIE as follows: Stage 1 is Analysis. At this stage, the activity involves defining an ideal learning description that focuses on analyzing the teacher's situation, student characteristics, and concepts encountered. Concepts are taught, and the formulation of specific objectives is ended. This stage aims to define the conditions for facilitating learning through an analysis of the objectives and constraints of the material. Stage 2 is Design or Development Model. This design was carried out to create an E-Module using the Canva application focused on the concept of environmental pollution at SMP Negeri Molibagu, encompassing stages from material preparation to product design. The initial design of the E-Module is the preparation of an initial draft, which includes Learning Objectives, Material in the E-Module, Videos in the E-Module, Evaluation Test, and Bibliography. Experts then validate the learning modules developed to determine the validation of the learning modules designed for suggestions and improvements. The learning modules developed in the previous stage are then applied to students through the learning process carried out in the classroom. To students at the school where the research was carried out.

Stage 3 is Development, this stage aims to produce a draft E-Module Using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu, which has been revised based on experts and trial data. In Stage 4 of implementation, researchers conducted the teaching and learning process at SMP Negeri Molibagu using E-modules and the Canva

Method

This research is development research that focuses on E-Module Development using the Canva Application on environmental pollution concept at junior high school in SMP Negeri Molibagu. This research will use the Problem-Based Learning (PBL) method. The steps in this research refer to the development of the ADDIE model in Figure 1. The ADDIE model was chosen for this research because it is a product-oriented learning design model. The ADDIE model can be used to develop various products, such as E-Modules, learning methods, learning products, such as E-Modules, learning methods, learning strategies, and learning models (Chaeruman, 2008).

application to explore the concept of environmental pollution. The trial was carried out with limited trials on class VII students at SMP Negeri Molibagu. The trial was carried out to determine the quality of the product, in this case, the E-Module Using the Canva Application on Environmental Pollution concept that will be developed and student responses regarding the E-Module Using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu. Stage 5 is Evaluation and Refinement. Evaluation is carried out to see the quality of the E-Module, which includes the Validity, Practicality, and Effectiveness of the E-Module that has been developed. Quality e-modules are valid products based on validation analysis, practical based on learning implementation, and effective based on student activities.

Quality learning modules are learning valid modules based on validation analysis, practical based on the implementation of learning and student responses, and valuable based on student activities. According to Sugiyono (2019), Data collection techniques are crucial in research as they aim to obtain valid data. Understanding these techniques ensures that researchers gather data that meets established standards.

Validity

The validity of the E-Module created using the Canva application on the environmental pollution concept at SMP Negeri Molibagu was confirmed through expert validation using a validation sheet. This sheet also serves as a guide for revising the E-Module to

enhance the prepared media. The validation sheet created is then given to the validator to validate the e-module and assessment instrument. This validation sheet includes various assessment parameters such as structure, content, language, readability, and presentation, specifically tailored for the E-Module validation.

Practicality

In this research, the practicality of implementing the E-Module on Environmental Pollution using the Canva application at SMP Negeri Molibagu was assessed based on the implementation process and student feedback.

Learning Implementation Observation Sheet

The observation sheet utilized is designed to monitor the implementation of learning activities, specifically to evaluate the usability of the E-Module on Environmental Pollution using the Canva application at SMP Negeri Molibagu, as developed in this study.

Student Response Sheet

The student response questionnaire sheet collects information about student responses to learning activities used in the E-Module Using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu. The student response questionnaire concerns two aspects, namely, student interest and student motivation. Alternative responses are strongly disagree, disagree, agree, and strongly agree.

Effectiveness

The effectiveness of the E-Module Using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu in this research was obtained through observing student activities. Student activity observation sheets were used during the learning process during three meetings to observe student activities.

Data Analysis Techniques

Analyzing data on E-Modules development using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu, namely data analysis of Validity, Practicality, and Effectiveness. The analysis used in this research is described as follows.

Validity Analysis

The validator expert wrote his assessment of the E-Module Using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu on the validation sheet. Two validators carry out this validation, and the two validators will obtain a conclusion from the results of the review. According to

Arikunto (2010), the e-module data validation analysis in this research uses the following equation (1).

$$x = \frac{\sum x}{n} \tag{1}$$

For x , the Average value represents the mean, $\sum x$ denotes the cumulative sum of validator responses, and n indicates the number of validators.

Table 1. The Average Analysis Validation Criteria

Average	Validation criteria
3.76 - 4.00	Very valid
3.01 - 3.75	Valid
2.26 - 3.00	Quite valid
1.50 - 2.25	Less valid

E-modules in science learning regarding vibrations, waves, and sound can be used if they meet valid or very valid criteria based on expert assessment.

Practicality Analysis

The practicality of the e-module includes using it with the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu. This research developed an analysis of the practicality of E-Modules Using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu based on an analysis of student responses and analysis of implementation in learning.

Analysis of Student Responses

Student response data was obtained from a questionnaire that analyzed percentages and qualifications to conclude whether the E-Module Using the Canva Application for Environmental Pollution concept at SMP Negeri Molibagu received a good response from students. The instrument items use a Likert scale from positive to negative, namely: Strongly Agree, Agree, Disagree, and Strongly Disagree. Calculating the percentage of student responses in learning is done using the following equation (2).

$$\% = \frac{\text{Number of student responses}}{\text{Number of student}} \times 100\% \tag{2}$$

Student responses are assessed by matching the average total score given with the criteria in Table 2.

Table 2. Percentage of Interpretation Student Responses

Percentage (%)	Interpretation
86 - 100	Excellent
76 - 85	Good
66 - 75	Enough
56 - 65	Not enough
0 - 55	Very less

E-Module using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu is practical from student responses if 75% of students are in the good and excellent categories.

Analysis of Learning Implementation

Practicality analysis is also based on data analysis resulting from observations of learning implementation. The analysis of learning implementation offers two choices: implemented or not implemented. Equation (3) is utilized to calculate the extent of implementation in the learning process.

$$\%Implementation = \frac{\text{Number of steps implemented}}{\text{Number of steps planned}} \times 100 \quad (3)$$

Evaluation of learning implementation involves determining the average total score based on the criteria outlined in Table 3 (Sukardi, 2013).

Table 3. Learning Implementation Criteria

Percentage (%)	Interpretation
86 - 100	Excellent
76 - 85	Good
66 - 75	Enough
56 - 65	Not enough
0 - 55	Very less

E-Module Using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu is practical from the aspect of learning implementation if 75% of students are in the good and excellent categories.

Effectiveness Analysis

In this analysis of the E-Module, which was developed using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu, activities will be obtained from the results of student observations in learning.

Analysis of Student Activities

In following the learning process during three meetings, the results of observations of student activities were analyzed using the equation (4).

$$\%Activities = \frac{\text{Total score obtained}}{\text{Maximum score}} \times 100\% \quad (4)$$

Observations are conducted during each session to calculate the average percentage of student engagement using equation (5).

$$\%Average = \frac{\% \text{ total meetings}}{\text{Number of meetings}} \times 100\% \quad (5)$$

Student activity assessment is performed by computing the average total score based on the criteria specified in Table 4.

Table 4. Assessment of Student Activities

Percentage (%)	Interpretation
86 - 100	Excellent
76 - 85	Good
66 - 75	Enough
56 - 65	Not enough
0 - 55	Very less

Student activities are practical in learning if 76% of students are in the good and excellent categories.

Result and Discussion

The research results obtained by the author after conducting E-Module research using the Canva Application on Environmental Pollution concept at SMP Negeri Molibagu are described as follows.

E-Module Validation Results Using the Canva Application

Validators validate learning modules by looking at assessment aspects, including quality of content, correctness of concepts, depth of concepts, appropriateness of language, and quality of completeness/supporting materials. According to Anggriani et al. (2024), expert validation or validators aim to obtain expert opinions about devices or products that are made based on certain aspects.

The average validation value is 3.50, which is in the Valid category, with information that can be used with slight revision. The assessment results by these two validators show that the E-Module uses the Canva application, which is well-developed and can be used in learning.

Practical Results of E-Modules Using the Canva Application

The practicality of the developed E-Module is evaluated using two indicators: the implementation of learning according to the planned learning model and a student response questionnaire conducted at the conclusion of the learning activity.

Results of Learning Implementation Data Analysis

Learning was implemented to determine the practicality of the E-Module using the developed Canva Application. When researchers carry out the learning process, observers fill in learning implementation data. Three observers observed learning implementation during three meetings with ten students at SMP Negeri Molibagu. The implementation of the e-module using the Canva application can be seen in the attachment, and the summary is shown in Figure 2.

In Figure 2, the average score for the percentage of learning implementation during the three meetings is 85%, with the excellent criteria. The explanation of these criteria can conclude that learning with the E-Module developed is classified as practical. This shows that the learning carried out is in accordance with the teaching module (Bouti et al., 2024; Azizah et al., 2024).

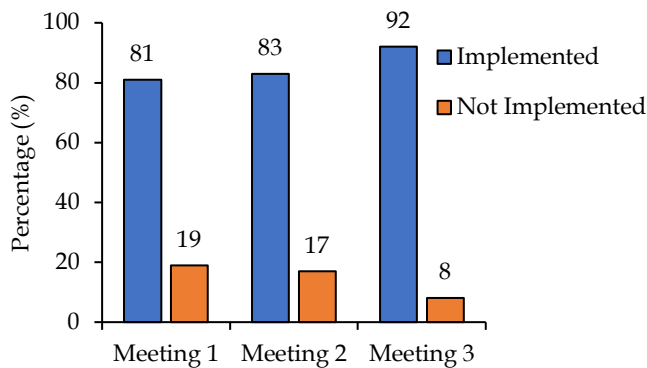


Figure 2. Percentage of learning implementation

Results of Student Response Data Analysis

Student responses in this research are student responses to using E-Modules using the Canva application developed by researchers. Student response data was obtained through a student questionnaire with 18 statement items. Scoring for each statement uses a Likert scale. The total score obtained for the average percentage of student response questionnaires to E-Modules using the Canva application on environmental pollution concept at SMP Negeri Molibagu for the four overall aspects. Namely, student responses with positive statements were 83%. This shows that the average response obtained by students is in the Good criteria (76-85%). Meanwhile, the total response of students with negative statements was 17%.

Effectiveness of E-Modules Using the Canva Application

Student activities were monitored through observation sheets filled out by three observers over three sessions. Student activity data during learning was analyzed to answer the researcher's question about how students' activities were in learning with E-Modules using the Canva application.

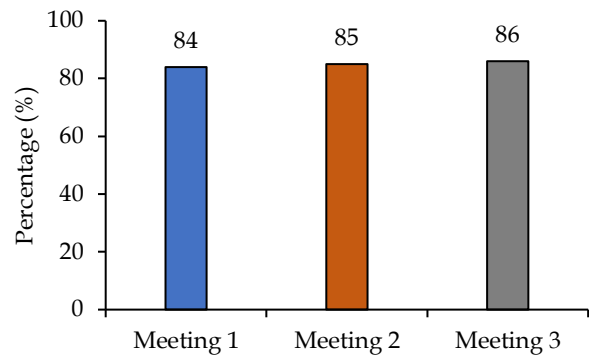


Figure 3. Percentage of Student Activities

Student activities were assessed with 10 students in SMP Negeri Molibagu. The results of student activities at the first, second, and third meetings can be seen in the attachment, and the summary is shown in Figure 3. Based on Figure 3, the percentage data obtained shows that the results of student activities from meeting 1 to meeting 3 are similar. The student activity graph has the highest percentage with a score of 86%, which is included in the excellent criteria for meeting 3. See the attachment for more details regarding the results of processing student activity data (Wahyuni et al., 2022; Lubis et al., 2024; Suputra et al., 2023).

Conclusion

Based on the research findings and discussion, it is concluded that the E-Module on environmental pollution using the Canva application has met quality criteria across three aspects. These include the validity of the developed e-module, which received an average validation score of 3.50, indicating it falls within the valid category based on assessment by two validators. The practicality of the e-module is obtained through learning implementation of 85% with excellent criteria. Meanwhile, the results of the percentage of student responses gave a positive reaction from 83% in the good category. The effectiveness of the learning module through student activity in the percentage of student activity results is 86%, which indicates excellent criteria.

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Author Contributions

Andika Wijaya Putra: Conceptualization, methodology, writing—original draft preparation; Chairunnisah J. Lamangantjo: Validation; Ritin Uloli: Methodology, curation, writing—review and editing, formal analysis.

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Conflicts of Interest

The authors declare no conflict of interest.

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