Development of Environmental Education Teaching Materials Based on Class VII Middle School Entrepreneurship

Megawati
Universitas Jambi, Jambi, Indonesia
Corresponding author email: megawatimega1245@gmail.com

Abstract
This research aims to develop entrepreneurship-based teaching materials in environmental education for class VII junior high school students. The development approach follows the ASSURE model, which includes potential and competency analysis, setting learning objectives, selecting methods, media and materials, student participation, as well as evaluation and improvement. After development, the teaching materials were tested on class VII junior high school students in Jambi City. Validation results by design and materials experts show product conformity with the writing procedures and curriculum used. Student responses to teaching materials show enthusiasm and improvement in environmental learning. Formative and summative evaluations are also carried out to measure the effectiveness and attractiveness of teaching materials. Comments and suggestions from experts and peers are used to make revisions to the product. The novelty of this research lies in the development of entrepreneurship-based teaching materials in environmental education for junior high school students, which can increase interest and effectiveness of learning. The implication is that the adoption of this teaching material can improve the quality of environmental learning in schools.

Keywords: Development; Entrepreneurship; Environmental education; Teaching Materials

INTRODUCTION
Education is an important foundation in forming individuals and advancing society as a whole. In this modern era, environmental challenges such as climate change, pollution and environmental damage are becoming increasingly real (Ariyana et al., 2018; Clivaz & Miyakawa, 2020; Mutlu, 2020). Therefore, it is important to prepare the younger generation with a solid understanding of environmental issues and the skills necessary to overcome these challenges. Environmental education emerged as a response to this need, providing students with the opportunity to understand the relationship between humans and the environment and develop environmentally responsible attitudes and behavior (Izadi et al., 2022; Mulenga & Marbán, 2020).

At the junior high school level, environmental education is integrated as a local content subject (Ernawati et al., 2022; Marshel & Ratnawulan, 2020; Suzani, 2022). However, in practice, the implementation of environmental education is often faced with various obstacles. One of them is the lack of opportunities for students to be directly involved in the learning process which allows them to
get to know the environment in a real way. Learning that is too theoretical and not concrete enough can reduce the attractiveness and effectiveness of environmental education learning (Martín-Gutiérrez et al., 2017; Nahar, 2023; Ramadhanti et al., 2022).

Apart from that, the lack of relevant and creative learning resources is also an obstacle in teaching environmental education. The use of the field as a learning resource is often limited by time and resource constraints. As an alternative, the use of teaching materials specifically designed by teachers can be an effective solution to overcome this obstacle. Well-designed teaching materials not only provide relevant information, but also integrate environmental concepts into a context that is easier for students to understand.

Apart from obstacles in teaching, environmental education learning is also faced with challenges in developing student competencies. Apart from the cognitive aspect, environmental education learning also aims to develop attitudes and values that are responsible for the environment. Therefore, a holistic and diverse learning approach is needed that is able to explore students' potential as a whole. State junior high school 4 in Jambi City is an example of a school that prioritizes the successful implementation of environmental education. The various awards won by the school show their commitment to integrating environmental education into the curriculum and school life (Ariyana et al., 2018; Ramli et al., 2022). However, the challenges faced in learning environmental education still need to be overcome so that the learning objectives can be achieved optimally.

This research is in line with research conducted by Hidayat & Syahid (2019), which discusses that entrepreneurship-based environmental education provides a unique opportunity for students to understand the relationship between environmental conservation and economic aspects. With a focus on developing entrepreneurial skills, students are not only taught about the importance of preserving ecosystems, but are also empowered to create sustainable solutions independently. This not only creates individuals who care about the environment, but also entrepreneurs who are able to design and run businesses by paying attention to their impact on the environment. Thus, this approach has the potential to create a generation that is socially and economically responsible in maintaining the sustainability of our planet.

Entrepreneurship-based environmental education offers holistic solutions to increasingly pressing environmental challenges. Through this approach, students not only gain a solid understanding of environmental issues, but are also equipped with entrepreneurial skills that enable them to become agents of positive change in society. By combining knowledge of the environment and entrepreneurship, students can identify sustainable business opportunities, create innovations to solve environmental problems, and promote sustainable lifestyles. Thus, entrepreneurship-based environmental education is not only relevant for students' future, but also urgent to maintain the environmental sustainability of our planet. Therefore, research on the development of teaching materials for environmental education is relevant and important to carry out. By developing innovative and high-quality teaching materials, it is hoped that environmental education learning can become more interesting, effective, and capable of forming environmentally responsible attitudes and behavior in students at the junior high school level.

**RESEARCH METHODS**

**Research Design**

This research adopts a teaching materials development approach using the ASSURE model, which stands for Analyze learners, State objectives, Select methods, Utilize materials, Require learner participation, and Evaluate and revise. This systematic framework offers a structured pathway for crafting teaching materials tailored to the specific needs and characteristics of the students. By following the sequential steps outlined in the ASSURE model, this research endeavors to guarantee the efficacy of the produced materials in fulfilling the predefined learning objectives (Setiawan et al., 2017). Through meticulous analysis, clear
objective-setting, method selection, appropriate material utilization, active learner engagement, and rigorous evaluation and revision processes, the ultimate goal is to create teaching resources that are not only engaging but also highly effective in facilitating student learning and achievement.

Research Target/Subject

This research was carried out during a certain period at a junior high school chosen as the research location. The research time is determined to suit the school's academic schedule and allows students to be involved in the process of testing and validating the teaching materials developed. The target of this research is class VII junior high school students who are the main target users of the teaching materials developed. Apart from that, design experts and material experts are also research subjects to validate the products being developed. Students were chosen as the main target because the development of teaching materials aims to improve the quality of their learning.

Research Procedures

The instruments used in this research include a questionnaire to collect responses from students and experts regarding the product being developed. Apart from that, observation techniques were also used to obtain data regarding the process of using teaching materials during the trial (Jumainah & Nurhayati, 2020; Mirawati & Sikarni, 2023; Warsihna et al., 2020). A combination of instruments and techniques is used to ensure the data obtained is representative and relevant to the research objectives.

Instruments, and Data Collection Techniques

The instruments used in this research include a questionnaire to collect responses from students and experts regarding the product being developed. Apart from that, observation techniques were also used to obtain data regarding the process of using teaching materials during the trial. A combination of instruments and techniques is used to ensure the data obtained is representative and relevant to the research objectives (Akbaş, 2021; Schallert et al., 2022; Wartono et al., 2018).

From the validation results submitted to learning design experts, according to experts the product is suitable for use because it complies with the procedures for writing teaching materials. From the results of the experts' responses, data was obtained in the form of scores and averages. To determine the assessment of each question and determine the product criteria for very good, good, medium, poor and very poor, each item gets a score based on the product item assessment scale as in the following table:

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Value</th>
<th>Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4.20 – 5.00</td>
<td>Very Interesting</td>
</tr>
<tr>
<td>4</td>
<td>3.40 – 4.19</td>
<td>Interesting</td>
</tr>
<tr>
<td>3</td>
<td>2.60 – 3.39</td>
<td>Quite Interesting</td>
</tr>
<tr>
<td>2</td>
<td>1.80 – 2.59</td>
<td>Less Attractive</td>
</tr>
<tr>
<td>1</td>
<td>0% - 20 %</td>
<td>Very Unattractive</td>
</tr>
</tbody>
</table>

Data analysis techniques

Qualitative data obtained from student and expert responses will be analyzed by grouping input and comments, then analyzed qualitatively to support the product revision process. Meanwhile, quantitative data will be analyzed using percentages and Likert scales to evaluate the level of feasibility.
and effectiveness of the product. It is hoped that this analysis technique can provide a comprehensive understanding of the success of developing teaching materials.

RESULTS AND DISCUSSION

The Learner Analysis Stage begins with potential analysis, namely the process of identifying and evaluating potential that supports the development of teaching materials in environmental education, as well as conducting an analysis of the required competencies. Through the results of observations and interviews with 2 environmental education subject teachers at junior high school 4 in Jambi City, it was revealed that they really need learning resources that can suit the characteristics of students, and books that are equipped with pictures and material that are relevant to the needs of students in the class. Setting Learning Goals involves the process of formulating clear and measurable goals for the learning process. Data for establishing these objectives were obtained from curriculum documents. In setting learning objectives, it is important to ensure that these objectives are adjusted to the competency standards and basic competencies stated in the syllabus, by referring to the ABCD rules, which include aspects: Attitude, Behavior, Condition, and Degree. Thus, learning objectives should not only lead to understanding concepts, but also to developing relevant attitudes, skills and practical knowledge for students (Aghajani & Adloo, 2018; Can & Öztürk, 2019; Muzamir, 2021).

After determining the goals that students must achieve after learning, the next step is to choose methods, media and materials. This step begins with drafting teaching materials that refer to the curriculum and syllabus used at junior high school 4 in Jambi City. The product that will be developed is designed for one semester of learning and is intended for second semester seventh grade junior high school students. The next step is to prepare a map of teaching materials. In making a map of teaching materials it is adjusted to the Competency Standards and Basic Competencies that have been formulated then consult with design experts and material experts.

The validation results are in the form of comments and suggestions aimed at correcting errors in the teaching materials both in terms of design and material. Then the comments and suggestions given are studied in order to revise the product. After the product has been revised by the developer according to comments and suggestions, the product is returned for validation again until the expert team declares that the product in the form of teaching materials to be developed is considered suitable or valid to be tested on users. After being declared suitable or valid, the teaching materials are assessed by peers, after receiving good responses from peers, the teaching materials are ready to be tested.

The fifth step of the ASSURE model is the involvement of students to actively respond. The response in question is feedback that can measure how far students are able to process the material being taught. Therefore, this model suggests the existence of various strategies and methods combined in learning activities such as; simulation, problem analysis, as an effort to get that response. To find out the response from users, namely class VII junior high school students. then at this stage a trial phase is held. Implementation is carried out within a limited period of time, namely only by carrying out trials. The trial was carried out in 3 stages, namely individual trials, small group trials, and large group trials (Asmi et al., 2018; Elsharkawy et al., 2021; Harahap, 2020). When the implementation is carried out, students are asked to fill out a questionnaire containing several questions about the teaching materials. The question is intended to find out the extent of the attractiveness, effectiveness and benefits of the product that has been made.

At this evaluation stage, a broad evaluation is carried out, namely an evaluation of the entire product being made. Evaluation here is carried out in Formative Evaluation and Summative Evaluation. Formative evaluation is carried out when the product is validated by technology learning design expert. Summative evaluation is carried out when the product is tested. The trial was carried out on students of SMP.N 4 Jambi City class VII. In the form of a post test which consists of an individual post test, small group post test, large group post test. This evaluation is carried out to assess whether the product that has
been created is interesting, effective and useful for students. To find out, individual trials, small group trials and large group trials are carried out.

The product produced in this research is the development of entrepreneurship-based environmental education teaching materials for class VII junior high school students, developed based on needs analysis. Before developing a product, the first step that the developer must take is to analyze needs which will later be useful as a basis for determining the product to be produced, in this case environmental education teaching materials. The steps in making teaching materials are as follows (1) Analyzing the needs for teaching materials; (2) Compile a map of teaching materials; (3) Understand the structure of teaching materials.

The interest of learning using entrepreneurship-based environmental education teaching materials for class VII junior high school students can be seen from the results of questionnaires with colleagues and also student responses during the trial. Students are enthusiastic about the teaching materials provided. The students responded very well and were enthusiastic about studying environmental education for class VII junior high school, because so far the teaching materials have not been attractive in terms of appearance and material.

Learning effectiveness can be seen from increased learning outcomes. To measure the increase in learning outcomes, it can be done using minimum completeness criteria on the pre-test and post-test results. The effectiveness of teaching materials can be seen in their use to help students learn. Learning is said to be effective if less time is used, while more learning objectives can be achieved. This is in accordance with Chien (2017) said that the level of effectiveness of learning development is measured through the achievement of learning objectives.

The statement for the teaching material components according to the design expert was commented as incomplete, then the developer revised it by improving the completeness of the teaching material components, this is in accordance with Baehaqi & Murdiono (2020), said that teaching materials are all forms of materials used to help teachers or instructors in carrying out learning activities in class.

According to the expert, the organization of teaching materials is not in accordance with the Basic Competencies and the presentation is not coherent, after paying attention to the comments from the experts the developer revised it by improving the arrangement of the material to be adjusted to the basic Basic Competencies of the Syllabus. Revisions are carried out by paying attention to the principles in developing learning materials as stated (1) the principle of relevance, learning materials should be relevant to achieving competency standards and basic competencies. (2) the principle of consistency, if there are 4 types of basic competencies mastered by students, then the material that must be developed must also include 4 types. (3) the principle of sufficiency, meaning that the material taught should be sufficient to help students master the basic competencies being taught. Material should not be too little or too much. The statement for learning objectives was commented by experts as not being in accordance with the criteria for writing learning objectives. then the developer makes revisions by following the criteria for writing learning objectives as that the learning objective is to determine what students can do after participating in learning activities (Hyland, 2019; Suprobo & Santosa, 2017; Yulianda et al., 2019). The formulation of general learning objectives must be clear and measurable, in the form of behavior.

From the opinion above, it is clear that the aim is not just to provide direction in learning, but also to provide content regarding the expected learning outcomes, both regarding cognitive, affective and psychomotor aspects. Learning objectives can be categorized into three domains, namely (1) Knowledge. This learning objective is related to a formula to show the knowledge that participants gain from the learning they are taking part in. (2) skills, in this case skills can be intellectual, physical or social. This type of learning objective is a formula to show how participants learn to carry out something that is the learning objective. (3) Attitude, attitude is related to feelings and behavioral tendencies. The learning objectives of this type are a formulation to show the formation of attitudes in learning participants which is the goal of learning.

From the presentation of the results of the content/material expert validation, it can be concluded that the teaching materials developed are in accordance with the environmental education learning syllabus for class VII middle school environmental education learning competency standards. Statements
for illustrations or images commented on by experts are not proportional in size and without explanation. For this comment, the developer revised it by enlarging the image and making it proportional and providing an explanation for each illustration and image. That illustrations play an important role in teaching materials, because they can clarify concepts, messages, thoughts or ideas conveyed in teaching materials. Apart from that, attractive illustrations plus the right layout can make teaching materials interesting to study.

Statements regarding the suitability of the material to the relevance of students and the level of thinking of students according to experts are not yet relevant to the material. Advice from experts is that examples should be adapted to the material and relevant to the students’ surroundings. This refers to the concept of contextual learning put forward that contextual learning is a teaching and learning concept that helps teachers link the material they teach with students' real world situations and encourages students to make connections between the knowledge they have and its application in their lives as family members, citizens and communities.

This shows that in contextual learning, students find meaningful connections between abstract ideas and practical applications in real-world contexts. Subject matter in the curriculum needs to be developed appropriately so that it can optimally help students achieve competency standards and basic competencies. The expert commented on the use of letters, type of letters, punctuation marks and spaces in the title, subtitles and material, with a statement that they were not consistent. The advice given by the expert was to be consistent in typing and use of punctuation marks and spaces. Based on advice from experts, the developer revised the typing and use of punctuation consistently.

Learning approaches that innovatively combine environmental and entrepreneurial concepts offer great potential to increase students' understanding of the complexity of today's environmental challenges and inspire them to develop creative solutions. Students' involvement in this contextual learning not only allows them to link abstract concepts with practical applications in real life, but also provides the opportunity to hone the entrepreneurial skills needed to face environmental problems with a sustainable approach. The implications of this approach are very relevant in facing global environmental challenges, because it can produce a generation that not only cares about the environment but is also able to act as empowered agents of change and innovate in creating sustainable solutions. Thus, this entrepreneurship-based environmental education approach has the potential to create a significant positive impact in promoting environmental sustainability in the future.

CONCLUSION

The importance of environmental education as a local content subject in junior high schools is very relevant to the increasingly real environmental challenges. Even though there are various obstacles in implementing and learning environmental education, such as limited time and resources and a lack of relevant learning resources, the development of innovative and creative teaching materials is an effective solution. By using teaching materials specifically designed by teachers, environmental education learning can become more interesting, concrete and effective in developing environmentally responsible attitudes and behavior in students. Through a holistic and diverse approach, environmental education can prepare young people with the knowledge, skills and attitudes needed to face the complex environmental challenges of the future.

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REFERENCES


