

## **Developing Learning Module Based On Local Wisdom To Improve Environmental Care Attitudes**

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**Abstract:** This research aimed to develop a module of environmental pollution based on local wisdom in Gunungkidul to improve the environmental care attitude of junior high school students. This research was a R&D (Research and Development). The development of this module adapted the steps of R&D research according to Sugiyono (2016), which was namely potential and problems, data collection, product design, design validation, design revision, product testing, product revision, usage trials, mass production. This first year research only covered potential problems, data collection, product design, design validation, and design revision. This module was created by placing indicators of environmental care attitude on each subject. Indicators of environmental care attitude include having awareness and gratitude for the culture; they had that must be maintained and preserved to protect the environment from pollution; they had curiosity, critical, and care about the environment in identifying the impact of environmental pollution; they had curiosity, critical, and care for the environment in identifying the impact of environmental pollution, and they must use our nature wisely and maintaining the balance of the ecosystem in the surrounding environment. The students' environmental care attitude would also develop by placing Gunungkidul's local wisdom in each module subject. The module got a very decent validation value in terms of material, media, and language.

**Keywords:** Module, Environmental Care Attitude, Local Wisdom.

### **1. Introduction**

Environment is the most important place for student learning. Environment which is around students can get new knowledge that is not obtained at school. This new knowledge will always be remembered by students if it is obtained from the environment around them. The surrounding environment will provide contextual learning that makes an impression on students. The environment is one of the main parts of life. Without the environment we will not live. Learning through the environment will teach students to be more concerned about its sustainability.

The environment includes the social environment and the natural environment. The community environment has local wisdom that has been passed down from generation to generation. All generations have inherited local wisdom from their ancestors to always obey and practice this local wisdom. Children in millennial generation are also asked to be able to follow existing local wisdom without knowing what the logical reason is behind it. However, the millennial generation child will not remain silent, he will always try to find out the reasons behind the local activities.

Local wisdom in Gunungkidul is something that has positive values and has a logical message. However, millennial children today have not understood this and are only considered "superstition". To be able to introduce the logical value of a "superstition" to millennial children, it requires the role of school. One of the learning media modules, which is used by the teacher in delivering learning materials, must contain local wisdom. The local wisdom of the community is packaged in a learning media module to be able to convey logical messages and relate to the material studied in school.

The practice of local wisdom in the people of Gunung Kidul Yogyakarta, for example, is the tradition of treating trees and rivers as life worthy of respect (sacred) so that sarong and flower offerings have been carried out from generation to generation since their ancestors. In fact, this practice has had a positive impact on environmental protection both for forests and for rivers, for example preventing people from littering around the trees or rivers for fear of receiving punishments which are often beyond human reasoning. The punishment is often attributed to an astral or invisible figure waiting for the tree, forest or river.

Punishment beyond human reasoning makes humans dare not disturb nature. Humans will not dare to cut trees and open forest land if there are offerings in the form of flowers placed around it. Humans do not dare to approach the tree and even touch it if there is already a white cloth wrapped around the tree trunk. Humans will not dare to

throw trash in the river if there are flower offerings floating in the river or placed around it. All forms of offerings, incense, and white cloth used to cover the body of the tree are Gunungkidul local wisdom which has a logical message.

This local wisdom is an effort to tackle environmental pollution in the Gunungkidul area. This is also supported by previous research, namely according to Murdiati's (2015) research, forest preservation can be maintained because the community has sacred the existence of forests in Gunungkidul. Delivering local wisdom to tackle environmental pollution to students will be effective if it is delivered in an environmental pollution learning module. Based on this phenomenon, this study intends to develop a module of environmental pollution based on local wisdom in order to increase environmental awareness among junior high school students. An attitude of caring for the environment can help students to take pro-environmental actions and if it is developed sustainably, students can improve their attitudes to be able to love the environment and protect the environment from all forms of pollution.

Environmental care is an attitude that is expected to develop in a child from an early age. Children as the nation's next generation must have a high environmental care attitude. Without this attitude, the environment will be destroyed in a matter of years because future generations do not care and only want to exploit natural resources from the environment. A damaged environment will make human generations also become extinct. Therefore, an attitude of caring for the environment really needs to be instilled in students through learning activities. Learning activities that instill a caring attitude towards the environment will help the world to exist and the environment to remain sustainable. Through this research activity, a caring attitude towards the environment is expected to grow and develop through modules that are made by placing indicators of environmental care attitudes in each activity.

This research was conducted at 2 of junior high schools in Gunungkidul, namely MTs YAPPI Mulusan and MTs Muhammadiyah Monggol. The school is a school that is proposed to be an Adiwiyata school. Adiwiyata is a program to make school to be health, clean, and green school. Adiwiyata give the appreciation to the best school that can complete the task of Adiwiyata school. By implementing this module that will be made, the school will be assisted in assessing Adiwiyata schools. Students will also be formed an environmental care attitude to tackle pollution. All of these things can improve the image of Adiwiyata school. Thus, it is necessary to develop an integrated science learning module with environmental pollution material based on the local wisdom of the people of Gunungkidul Yogyakarta to be able to develop a caring attitude towards junior high school students in Gunungkidul.

## **2. Methods**

The research method used for research on the development of the Gunungkidul Local Wisdom-based Environmental Pollution module to improve environmental care is adapting R&D research steps according to Sugiyono (2016), namely potential and problems, data collection, product design, design validation, design revision, product testing, product revisions, trial use, mass production. However, this first year research only covers potential problems, data collection, product design, design validation, and design revision. For the second year of research, only do product trials, product revisions, use trials, and even mass production

### **Place and time of research**

Place of research: Junior high school in Gunungkidul area. The school includes schools that are used as Adiwiyata candidates in the Gunungkidul area which include MTs YAPPI Mulusan and MTs Muhammadiyah Monggol.

Time of study: May 2020 - May 2021

### **Population and Sample Research**

The population in this study were all junior high schools in Gunungkidul which were used as candidates for Adiwiyata schools. The sample in this study were 2 schools which were used as candidates for the Adiwiyata school in Gunungkidul which were taken by random sampling. The research sample was MTs YAPPI Mulusan and MTs Muhammadiyah Monggol.

### **Research Instruments**

The instrument in this study was a questionnaire on the feasibility of language, the feasibility of the material, and the feasibility of the media which were arranged on a Likert scale.

### **Data analysis**

According to Arikunto (2010), quantitative data in the form of calculated numbers can be processed by adding up, compared to the expected amount and the percentage obtained.

The data that has been obtained is then calculated by the formula (Arikunto, 2010) as follows:

$$P = \frac{f}{n} \times 100\%$$

Keterangan :

P = Persentase

f = The number of scores obtained

n = Total maximum score

The result of the percentage score will be converted based on the following criteria:

Table 1. Eligibility criteria for student worksheet  
Score (%) Criteria

Score (%)	Criteria	
61 - 100%	Very feasible	VF
41 - 60%	Eligible	E
21 - 40%	Fairly feasible	FF
0- 20%	Not feasible	NF

Source: Arikunto, 2010

The feasibility score of the module worksheets is assessed on the highest scale very feasible and the lowest scale not feasible.

### Research Steps

The research steps to be carried out are described as follows:

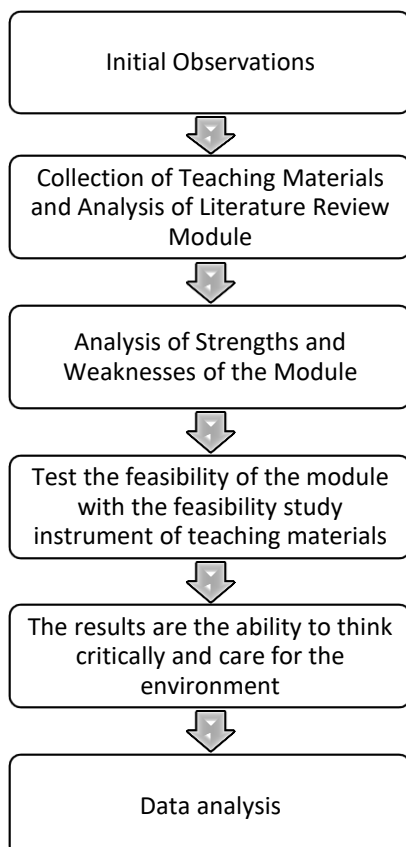


Figure 1. Research steps  
Source: private documentation

### 3. Results and discussion

The results of this study are the results of research and development (R&D) with steps starting from finding potential and problems, collecting data, designing products, validating designs, to design revisions. The results of development research are focused on the results of the validator's assessment and the input of the validator and module users. Validators are carried out by material experts, media experts, and language experts.

The initial step of development research is to find potentials and problems. The discovery of potential is carried out in several stages according to Sugiyono (2015), namely

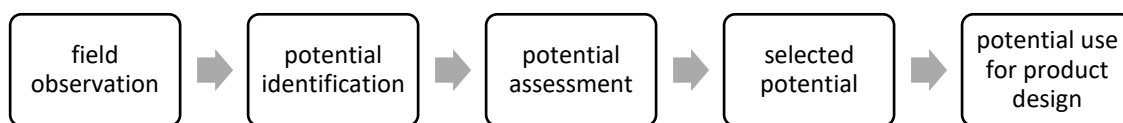


Figure 2. Steps of potential discovery  
Source: Sugiyono (2015)

Observations were made in Gunungkidul district when there were traditional ceremonies of rasulan and babad dalan in the villages of Giring and Sodo. When researchers looked at a series of traditional ceremonies and local wisdom activities in Gunungkidul, the researcher found a potential that there was a need for the preservation of cultural activities and students in schools needed to find out about it by pouring into learning activities. Local kerifan and traditional activities in Gunungkidul will be conveyed to students by pouring it into the learning module. The potential for cultural preservation is selected and will be included in the learning through the module. Then the researchers looked for Basic Competencies in the 2013 Junior High School Curriculum that were compatible with the culture in the Biology subject. Researchers then found the material in KD Environmental pollution. This local wisdom is an effort to tackle environmental pollution in the Gunungkidul area. The delivery of local wisdom to tackle environmental pollution to students will be effective if it is delivered in an environmental pollution learning module. Based on this phenomenon, this study intends to develop a module of environmental pollution based on local wisdom in order to increase environmental awareness among junior high school students. According to Wahyuningtyas (2019) that the implementation of local wisdom in the surrounding environment in learning in schools will be able to improve higher-order thinking skills. Higher order thinking skills are related to students' perceptions of being able to care about nature. Students with good high-level thinking skills will be able to understand the importance of the natural surroundings, so that a caring attitude towards their environment will emerge.

An environmental care attitude which is based on good local wisdom knowledge can help students to take pro-environmental actions and if it is developed sustainably, students can increase students' environmental care attitudes towards their surroundings. The selected potentials are local wisdom, cultural customs, traditions, and environmental care that will be used as potentials for module design.

This research was conducted at 2 Junior High School in Gunungkidul, namely MTs YAPPI Mulusan and MTs Muhammadiyah Monggol. The school is a school that is proposed to be an Adiwiyata school. By implementing this module that will be made, the school will be assisted in assessing Adiwiyata schools. Students will also be formed an environmental care attitude to tackle pollution. All of these things can improve the image of Adiwiyata school. Thus, it is necessary to develop an integrated science learning module with environmental pollution material based on the local wisdom of the people of Gunung Kidul Yogyakarta to be able to develop a caring attitude towards the environment in junior high school students in Gunungkidul.

The second step of this research is to collect data. The data collected in the form of photos of local wisdom in Gunungkidul that support the design of the module, interviews with local village customary leaders who

understand local wisdom in Gunungkidul, then interviews with teachers and school principals regarding what kinds of activities students would easily do in a module to get to know local local wisdom and develop an environmental care attitude.

These data will be used to be able to design learning activities in the module by emphasizing indicators of environmental care attitudes in each activity. Local wisdom in Gunungkidul is something that has positive values and has a logical message. However, millennial children today have not understood this and are only considered "superstition". To be able to introduce the logical value of a "superstition" to millennial children, it requires the role of school. One of the learning media modules, which is used by the teacher in delivering learning materials, must contain local wisdom. The local wisdom of the community is packaged in a learning media module to be able to convey logical messages and relate to the material studied in school.

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The third step of this development research is product design. Product design is done based on the potential and problems that are obtained. From the potentials and problems, data will be collected to carry out product design. The product design in this module is to put every indicator of environmental care. According to Dewi (2015: 191-195), environmental care attitude indicators used in this research include having awareness and gratitude for the culture that is owned must be maintained and preserved to protect the environment from pollution, have curiosity, are critical, and care for the environment. in identifying the impact of environmental pollution, being curious, critical, and caring for the environment in identifying the impact of environmental pollution, as well as using our nature wisely and maintaining the balance of the ecosystem in the surrounding environment. This indicator is contained in every activity in the environmental pollution module. It is hoped that with this indicator, the module can develop and improve students' environmental care attitudes. The explanation per indicator outlined in each activity in the module is as follows

1. Having awareness and gratitude for the culture they have must be maintained and preserved to protect the environment from pollution

In this indicator, each activity in the first step module is that students are directed to know what culture is around them. After students know all the cultures and traditions around them, they are asked to name what is done in that custom, culture, or tradition. By knowing every step of their customs, culture, and traditions they are directed to be able to have awareness and gratitude for the culture they have done every year. The culture they do is not a bad act, but it is an ancestral heritage that has unique values and good intentions that we should preserve.

2. Have curiosity, criticality, and care for the environment in identifying the impact of environmental pollution

Activities in this indicator students are directed to 2 incidents in the area where they live, namely polluted and uncontaminated conditions. The contaminated condition will invite the child to analyze who caused the contaminated condition. If the condition is polluted, will local wisdom products such as ungrung, fried grasshopper, and tiwul still exist. This activity will lead students to identify environmental pollution that will harm themselves and others.

3. Having curiosity, criticality, and care for the environment in identifying the impact of environmental pollution, as well as using our nature wisely and maintaining the balance of the ecosystem in the surrounding environment.

Students' critical thinking skills are highly demanded on this third indicator, students are asked to be able to assess a tradition against environmental pollution. Is the tradition of, for example, giving offerings in rivers, forests, and around large trees to help the place not to be damaged by people? By identifying these traditions, students will

be able to find the good values behind the traditions, customs, and cultures that exist around society today. The good grades will be processed by students with their critical thinking skills to be a tool to maintain the balance of the natural surroundings. Then students will be able to conclude that local wisdom in the Gunungkidul area will be able to help nature avoid environmental pollution.

In addition to indicators of environmental care, local wisdom and Gunungkidul customs are always used as a reference in carrying out activities in the module. This is intended so that students can connect the customs around them with environmental conservation material in the module. By knowing the relationship between 2 potentials, namely local wisdom carried out as an effort to overcome environmental pollution, it is hoped that students can sharpen their environmental care attitude. For example, the activities in the module are as follows:

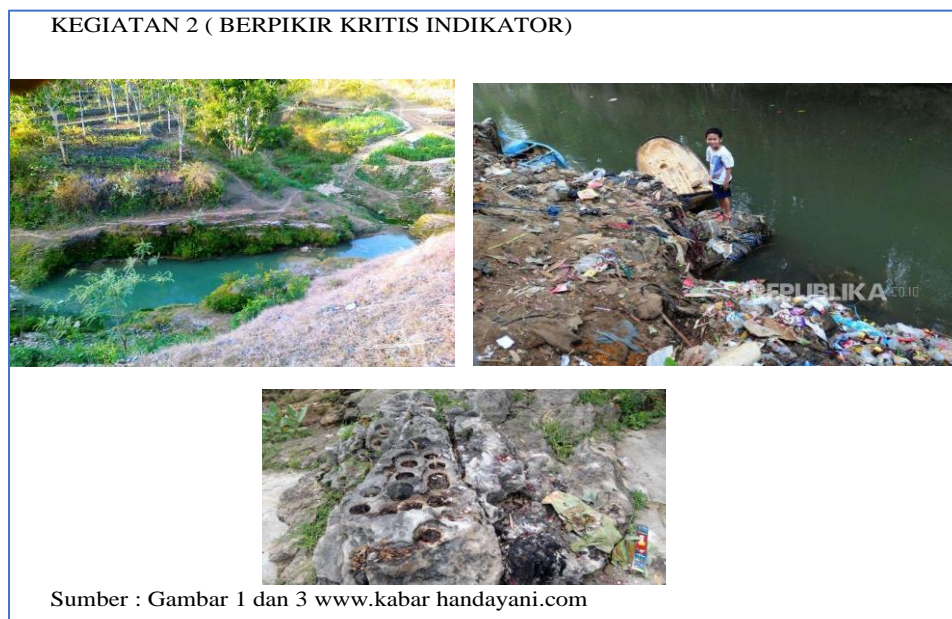


Figure 3.Clean river (left), dirty river (right), and offerings in the river (bottom)  
Source: www.kabarhandayani.com

Gunungkidul local wisdom products in the form of offerings can be connected to clean and polluted rivers. Seeing the offerings placed in the river as a form of local wisdom in Gunungkidul makes residents afraid to pollute the river because if they pollute the river, the creatures given the offerings will get angry and disturb the villagers. This is packaged in activities based on indicators of environmental care. The activity of linking the three photos must contain indicators of having awareness and gratitude for the culture that is owned must be maintained and preserved to protect the environment from pollution; have curiosity, critical, and care about the environment in identifying the impact of environmental pollution; have a curiosity, are critical, and care about the environment in identifying the impact of environmental pollution, as well as using our nature wisely and maintaining the balance of the ecosystem in the surrounding environment. Therefore, a module designed like this is expected to develop a caring attitude towards the environment. The module effectiveness test for developing a caring attitude towards the environment will be carried out in the second year at Junior High School in Gunungkidul.

The module design is also compiled containing several topics, namely

1. Introduction or Environmental Pollution Practices associated with the slogan Gunungkidul Hamemayu Hayuning Buwana as one of the slogans of local wisdom
2. Definition of Environmental Pollution
3. Types of Environmental Pollution include Water Pollution, Soil Pollution, Air Pollution
4. Factors that cause water pollution, soil pollution, air pollution
5. Impact of Water Pollution, Soil Pollution, Air Pollution

The design of this module will be used to support the research objectives, namely to develop a module on environmental pollution based on local wisdom that can develop a critical thinking attitude. It is emphasized that a critical thinking attitude is always carried out in all module activities using indicators of critical thinking in the preparation of each activity in the module. The first module activity is definitely based on having awareness and gratitude for the culture that is owned must be maintained and preserved to protect the environment from pollution, have curiosity, are critical, and care about the environment in identifying the impact of environmental pollution,

have curiosity, are critical, and care for the environment in identifying the impact of environmental pollution, as well as using our nature wisely and maintaining the balance of the ecosystem in the surrounding environment.

The fourth step in this development research after product design is design validation. This design validation contains 2 stages according to Paidi (2011), namely validation and internal review from senior lecturers and colleague lecturers as well as external validation and review from teachers and students involved as module users.

Table 1. Recapitulation of Validation Results from Linguists

Aspect	No.	Category	Percentage	Statement
presentation	1	Module has an attractive design	100 %	VF
	2	The module contains interesting pictures, so that students are interested in learning	100 %	VF
	3	The module provides practicum instruction sheets and practicum results so that students are helped in doing practicum	100 %	VF
	4	Modules use matching writing colors so they are not boring	90%	VF
	5	Module provides space for writing identities and has been arranged in position	89 %	VF
	6	The module provides activities so that students can be active in classes	100 %	VF
	7	Modules have interesting activities	100 %	VF
	8	Module uses activities in the environment as part of the material in the module	100 %	VF
	9	Modules use material that is combined with practicum activities	100 %	VF
	10	Modules have clear writing	100 %	VF
	11	Modul memiliki gambar yang variatif	85 %	VF
	12	Module displays an image size that corresponds to a font size	81%	VF
	13	The module has a font size that corresponds to paper size	80%	VF
	14	The module has an image size that fits paper size	80%	VF
	15	Module has an attractive cover	85%	VF

Table 2. Recapitulation of Validation Results from Material Experts

Aspect	No.	Category	Percentage	Statement
Good and correct Indonesian Language	1	Module uses the rules of Indonesian that are good and correct	85 %	VF
	2	The module presents material, questions of understanding using language that can be understood by	87 %	VF
	3	Module uses Enhanced Spelling (EYD) rules well	85 %	VF
	4	The module uses Enhanced Spelling according to the guidelines it should be so as to help students understand the material	83 %	VF
Terminology	5	Module uses terminology that is in accordance with the concept which is the subject of	87 %	VF
	6	The module uses sentences in accordance with the Environmental Pollution material so that students easily understand the material	87 %	VF
	7	Modules use consistent sentences	100 %	VF
	8	The module presents sentences according to Indonesian grammar that are good and correct in	100 %	VF
Language Conformity	9	Modules use language in accordance with the development of students	85 %	VF
	10	Modules present material in language that is easily understood by students	88 %	VF
	11	The module uses a sentence structure in accordance with the cognitive mastery of students	85 %	VF
	12	Modules use sentences that are easily understood by students	96 %	VF
	13	Modules use communicative language	90 %	VF
	14	Modules use language that is effective and efficient	92 %	VF
	15	Modules using dialogue or interesting words	83 %	VF

Validation and review get results in the form of a percentage value of eligibility and input. Validation and review were carried out in terms of material, language and media.

The modified validation questionnaire from Nurul Hidayah's (2011) questionnaire and the results of the media validation are summarized as very feasible (VF), the results of the validation of the language are very feasible, and the results of the validation of the material are summarized as very feasible. These results are presented in Table 1, Table 2, and Table 3. All module assessment categories are summarized as VF (very feasible).

The fifth step of this development research is design revision. Design revisions are made from the results of validation and reviews by material, media and language experts. The results of internal and external validation will be carried out as a basis for revising the design. The design revision in the environmental pollution module based on local wisdom to develop a caring attitude towards the environment includes a summary of input from internal and external validators and reviewers

Feedback	Follow up
<ol style="list-style-type: none"> <li>1. More adapted to the abilities of children in grade 7</li> <li>2. The material sometimes exceeds the basic competency limits of environmental pollution for grade 7 junior high school students.</li> <li>3. Please provide lesson plans that can be used by the teacher in using the module to make it more focused</li> </ol>	<ol style="list-style-type: none"> <li>1. Make activities simpler so that grade 7 junior high school students can understand them easily</li> <li>2. Make activities simpler so that grade 7 junior high school students can understand them</li> <li>3. Prepared lesson plans to complement the module in guiding teachers to implement the module</li> </ol>



Table 3. Recapitulation of Validation Results from Media Experts

Aspect	No.	Category	Percentage	Statement
Material coverage	1	The depth of the material in the module is in accordance with the development of students	85 %	VF
	2	Completeness of the material in the module according to the development of students	80 %	VF
	3	The accuracy of the material presented in the Module corresponds to everyday life	87 %	VF
	4	The basic concept of the material in the Module is in accordance with the concept of Environmental Pollution	100 %	VF
	5	Modules have material that is easy to understand	85 %	VF
	6	Modules have material that adds to the knowledge of students	100 %	VF
	7	The module contains materials that use local wisdom of Gunungkidul	100 %	VF
	8	Modules have material presented in order of	92 %	VF
	9	Modules have complete material	88 %	VF
suitability of Based Competence dan Main Competence of 2013 Curriculum	10	Relevansi tujuan pembelajaran pada Modul sesuai dengan Based Competence dan Main Competence 2013 Curriculum	85 %	VF
	11	The conformity of the material on the Module with the syllabus	100 %	VF
	12	The conformity of the material in the Module with Based Competence dan Main Competence of 2013 Curriculum	100 %	VF
	13	Consistency of questions and answers in the module according to Based Competence dan Main Competence of 2013 Curriculum	92 %	VF
Meaningfulness	14	The module which uses local wisdom material is meaningful for students	98 %	VF
	15	The material provides motivation for students to do things that are useful	98 %	VF

a. Media :

Follow up	feedback
1. Some of the sentence questions need to be reviewed, in the data analysis section of the activity.  2. Addition of overall conclusions at the end of the module activity.  3. Added instructions for using the module  4. Improved citation of pictures	1. Improved sentence questions in the activity section of the module will be improved to attract students and make it easier for students to understand.  2. The author adds the final conclusion at the end of the module  3. The author makes instructions for using the module on the home page before entering the subject of environmental pollution  4. The author improves the citation of the image

b. Linguistic

Follow up	feedback

<p>1. The language used is sometimes not standardized and contains regional languages</p> <p>2. The use of terms is inconsistent sometimes there is a term 1 meaning written in English sometimes Indonesian</p>	<p>1. Language will change to standard Indonesian and according to EYD</p> <p>2. The terms will be consistent into Indonesian terms</p>
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Revision of the Module Design will be carried out by referring to the follow-up of the input from the validators and reviewers. This module has been categorized as very feasible, so this module can be used as a learning medium to help teachers carry out teaching and learning activities (Nurahmi, 2017). Henceforth, in the second year of research after the module design is revised, limited testing, design revision, large-scale testing, and mass production will be carried out to make the module more feasible and mass produced as a credible teaching material.

#### 4. Conclusion

This research and development has produced a learning tool in the form of an Environmental Pollution module based on local wisdom to improve a very proper environmental care attitude. The feasibility value has an average of 89% in terms of language, in terms of material 93%, and in terms of media 93%. All of these values indicate that the module is very feasible. This module can be applied in learning biology at SMP / MTs to increase environmental awareness.

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