

Development of Science Teaching Module Based on Environmentally for Student at MTsN Barru



Nurul Muchlisa¹, Muhammad Arsyad², Helmi³

ABSTRACT: This research on the development of environment-based science teaching modules aims to: 1) to analyze the results of the validity of the content of science teaching module based on environment which meet valid criteria, 2) to analyze practitioners' assessments of environment-based science teaching modules, 3) to analyze the effectiveness of science teaching module based on environment. The test subjects for this research were 23 class VIII students at MTsN Barru. The research method with 4D model. The instruments used in this research were validation sheets, practitioner assessment questionnaires, and test instruments for students' science learning outcomes. The practicality criteria are seen from practitioners' assessments of the teaching modules, and the effectiveness criteria are seen from the average percentage gain score increasing students' science learning outcomes. Based on the results of the analysis, the following conclusions were obtained: (1) the science teaching module based on environment developed based on expert assessment using Aiken's V index analysis was declared valid and suitable for use with minor revisions; (2) the science teaching module based on environment in terms of teacher responses is in the very good category; (3) the effectiveness of the science teaching module based on environment, which was analyzed using N-gain, obtained an average value of 0.56, which is in the medium category with a percentage of 56.46%, which means that there is an increase in students' science learning outcomes so it can be said that The science teaching module based on environment developed is effective and can improve students' science learning outcomes.

KEYWORDS: teaching module, environment based, learning outcomes

INTRODUCTION

Learning is a process of introducing knowledge designed by teachers in order to develop students' potential so that students obtain knowledge effectively and efficiently with optimal results. In science subjects, learning is carried out in accordance with the nature and characteristics of the science. According to Collette and Chiappetta (1994), science is essentially a collection of knowledge (a body of knowledge), away of thinking, and a way of investigating. The success of the learning process cannot be separated from the creativity of educators in implementing the learning process. One of the resources in the learning process is teaching modules. A teaching module is a set of learning concepts that contain various materials used in the teaching and learning process which are arranged in more detail, directed and systematic according to previously determined learning topics. Teaching modules play an important role in organizing the learning process as one of the main, effective and efficient learning resources. In science learning, an environment-based approach stimulates students to learn meaningfully, and fosters students' curiosity. Teaching modules that can bring students closer to their teaching modules based on environment. Utilization of the natural science (natural) environment is carried out to study natural phenomena or symptoms related to natural science concepts and principles and the social environment can be used to study the application (of natural science concepts or principles) which, either directly or indirectly, are utilized by the community in their activities and social interactions (Salam M, et.al, 2016). Learning through the environment can train students to better understand the application of science material, theories and concepts in everyday life. The environment in question is the environment around students, such as the school environment. The school environment can be used to support the learning process used by teachers, such as school gardens, school grounds, and the community at school and in the environment around the school (Najlunir, 2010). This research was conducted at MTsN Barru because it is a school that cares about the environment. MTsN Barru applies environmental aspects in its discussions and integrates environmental material into its learning according to the topic of discussion. Apart from that, the teaching modules used at MTsN Barru are still teaching modules like textbooks which only provide a brief explanation of the material, but are also less interesting. So teaching modules are needed that can become a learning resource by accommodating the needs of students. This is in line with the results of research conducted by Rezqi, Arsyad, and Kaharuddin (2021) which states that environment-based teaching modules show effective results in science learning. Apart from that, the results of research by Dahniar, Arsyad, and Khaeruddin (2018) based on the karst ecosystem stated that the implementation of learning using karst-based learning tools was able to be carried out well by teachers. By using environment-based teaching

Development of Science Teaching Module Based on Environmentally for Student at MTsN Barru

modules, students will be actively involved in learning and gain experience by carrying out activities that allow them to discover principles for themselves. Apart from that, the use of the surrounding environment as a source of learning for students will be one of the supporting factors for increasing learning outcomes and students' creativity in finding learning concepts. For example, the ability to observe, take notes, formulate questions, hypothesize, or conclude results from problems obtained in the surrounding environment.

METHOD

This research was research and development (R&D) with the Thiagarajan 4D development model. The 4D model consists of 4 main stages, namely, defining, designing, developing and disseminating. This study used research subject for class VIII MTs of 23 people. It was held in the Even Semester of the 2022/2023 Academic Year in MTsN Barru located on Gempunge, Kec. Barru, Barru Regency. The instruments used in this research were validation sheets, practitioner assessment questionnaire sheets, and science learning outcome test instruments. Which has been validated by experts and analyzed using the expert agreement index (Aiken's V). The researchers used the data collection techniques in the form of validation, questionnaires and test of learning outcomes. In this research, the test were carried out twice in the implementation phase or product testing. The trial design use is "One Group Pre-test and Post-test Design". The analysis used to determine the level of relevance by three experts used the content validity coefficient (Aiken's V) with the following formula (Azwar, 2012):

$$V = \frac{\sum s}{n (c-1)} \quad (1)$$

Aiken test requirement: after calculating, if $V \geq 0,4$, the the expert agreement index was valid.

The percentage of practitioners' respons to each statement using the criteria according to Table 1 below which is adapted from Riduwan (2018):

Table 1. the Criteria Percentage of Practitioner Assesment Score

<u>Percentage</u> <u>(%)</u>	<u>Criteria</u>
81 – 100	Very Good
61 – 80	Good
41 – 60	Fair
21 – 40	Less
0	–Very
20	Less

The effectiveness of environmentally based science modules can be obtained from increasing students' science learning outcomes by using the N-gain score formula. According to Sundayana (2014), to find out N-gain, the following formula is used:

$$N\ Gain = \frac{X_{posttest} - X_{pretest}}{X_{Max} - X_{pretest}} \quad (2)$$

The gain score results obtained are then grouped based on the criteria as in Table 2 below:

Table 2. Criteria Normalized Gain

<u>Normalized N-Gain Value</u>	<u>Interpretation</u>
$0,70 < g \leq 1,00$	Tinggi
$0,30 < g \leq 0,70$	Sedang
$0,00 < g \leq 0,30$	Rendah
$g = 0,00$	Tidak terjadi peningkatan
$-1,00 \leq g < 0,00$	Terjadi penurunan

The interpretation of the categorization of the effectiveness of the gain score in the form of percent (%) is as in Table 3 below:

Table 3. Effectiveness Interpretation Category

<u>Percentage(%)</u>	<u>Categori</u>
< 40	Tidak Efektif
40 – 55	Cukup Efektif
56 – 75	Efektif
>76	Sangat Efektif

Development of Science Teaching Module Based on Environmentally for Student at MTsN Barru

RESULT AND DISCUSSION

The aspects validity result of the science teaching modules based on environmental by the three experts/experts are aspects of content suitability, presentation, language and graphics. The score obtained from the content validity coefficient analysis test of the expert agreement index using the Aiken's V index analysis is presented in Table 4 below:

Table 4. The Validity Analysis Test of The Environmentally Based Science

Aspect	Teaching Module		
	Total Validity Item Score	V	Category
Content Eligibility	12,89	0,76	Valid
Presentation Eligibility	10,67	0,71	Valid
Language Eligibility	13,00	0,72	Valid
Graphic Eligibility	11,00	0,73	Valid

The validation analysis that has been carried out is shown in Table 4, which states that the environment-based science teaching module is declared feasible/valid to proceed to the trial stage. The results of this analysis are in line with research conducted by Rezqi (2021) which stated that environmental-based teaching modules developed on sound and light wave material were declared valid by experts. The environment-based science teaching module is declared valid and suitable for use in four aspects of assessment, namely in the aspects of appropriateness of content, appropriateness of presentation, appropriateness of language, and appropriateness of graphics. The analysis result of the practitioner's questionnaire sheet on the environmentally-based science teaching module developed to see the practicality of the science teaching module are as follows:

Table 5. Practitioner Assessment Results of The Environmentally Based Science Teaching Module

Aspect	The average score	Percentage	Category
Content Eligibility	3,46	82,13%	Very Good
Presentation Eligibility	3,43	81,50%	Very Good
Language Eligibility	3,41	81,00%	Very Good
Graphic Eligibility	3,48	82,75%	Very Good

The practitioners in this research were science subject teachers at the SMP/MTs level, totaling 19 science teachers. Among them are 4 science teachers from Barru MTsN schools and 15 science teachers from several MTs schools which are members of the MGMP Science MTs group throughout Barru Regency. The practitioner assessment questionnaire consists of 50 statement items related to the environment-based science teaching model that has been developed. As for the results of the analysis of the practitioner assessment questionnaire, it was concluded that 19 practitioners on average gave a very good assessment to the environment-based science teaching module that was developed. The results of this assessment are supported by practitioners' direct responses when assessing the teaching modules being developed. The results of this analysis are in line with research conducted by Suparman (2016) which stated that the development of environment-based physics learning media with heat material was stated to be practical with the supporting devices overall being implemented well. In line with this, research conducted by Afdalia (2020) regarding the development of Sandeq local wisdom-based science learning modules stated that the modules developed could be declared valid and received positive responses from students, as well as very positive responses from teachers. The effectiveness of the environment-based science teaching module, an analysis of the increase in student learning outcomes was carried out using the N-gain score equation. The results of the N-Gain analysis can be seen in Table 6 below:

Table 6. The Result Percentage N-Gain Score of Class VIII MTsN Barru

Normalized N-Gain Value	Interpretation	Frequency	Percentage (%)
$0,70 < g \leq 1,00$	Good	6	26,08
$0,30 < g \leq 0,70$	Currently	10	43,48
$0,00 < g \leq 0,30$	Low	2	8,70

Development of Science Teaching Module Based on Environmentally for Student at MTsN Barru

$g = 0,00$	Still	3	13,04
$-1,00 \leq g < 0,00$	Decrease	2	8,70
Total		23	100
The average gain score overall		0,56	56,46

Based on the analysis results, the average N-gain score of 0.56 is in the medium category with a percentage of 56.46% based on effectiveness interpretation criteria, which means that the environment-based science teaching module is effectively used in learning. This is supported by research conducted by Afdalia, et al (2020) regarding the development of physics science learning modules based on local sandeq wisdom which states that the effectiveness of the learning modules developed is classified as a learning resource that can instill a love of local culture in the surrounding environment. In line with research conducted by Arifuddin, et al (2017) regarding the development of environmentally friendly teaching materials along river banks which stated that learning outcomes as a measure of the effectiveness of the teaching materials developed also provided positive results. This is supported by the results of calculations carried out using the gain score obtained at 0.66 (medium category).

CONCLUSIONS

Based on the results of research and limited trials that have been carried out, the following conclusions are obtained: 1) The results of the development of environment-based science teaching modules are in the valid category so they can be declared as suitable for use. 2) Practitioners' assessment of the environment-based science teaching module developed is in the very good category. This shows that practitioners responded positively to the environment-based science teaching module that was developed. 3) The effectiveness of the environment-based science teaching module is obtained from the increase in student learning outcomes after implementing the environment-based science teaching module which is analyzed using N-Gain in the medium category. This means that there is an increase in learning outcomes for students in class VIII of the new MTsN, and the teaching modules developed can be declared effective for use in the learning process.

ACKNOWLEDGEMENT

Thank you to supervisor who has guided this literature study to completion, and thank you to leadership, teaching staff, and teachers in the field of science at MTsN Barru who have provided opportunities and service facilities while conducting research.

REFERENCES

- 1) Afdalia., Arsyad, M., Arifah, K. 2020. Pengembangan Modul Pembelajaran IPA Berbasis Kearifan Lokal Sandeq pada Sekolah Menengah Pertama. Prosiding Seminar Nasional Fisika PPs UNM. Volume 2. 68-71.
- 2) Arifuddin, M., Salam, A. M., Mawaddah, S. 2017. Pengembangan Bahan Ajar Berwawasan Lingkungan Bantara Sungai Untuk Melatih Kemampuan 5M. Jurnal Sains dan Pendidikan Fisika (JSPF). 13(1). 248-254
- 3) Azwar, S. 2012. Reabilitas dan Validitas. Yogyakarta: Pustaka Belajar.
- 4) Collette, A.T. & Chiappetta, E. L. 1994. Science Instruction in the Middle and Secondary Schools (3rd Edition). New York: Merrill.
- 5) Dahniar, Arsyad, M., Khaeruddin. 2018. Pengembangan Perangkat Pembelajaran IPA Berbasis Ekosistem Karst Untuk Kelas VII SMP Negeri 4 Bantimurung. Seminar Nasional IPA 2018.
- 6) Najulmuir. 2010. Memanfaatkan Lingkungan Sekolah Sebagai Pusat Sumber Belajar.
- 7) Puspita, A. M. I., & Setyaningtyas, D. 2022. Pengembangan Media Pop-Up Book Berbasis Kearifan Lokal Sebagai Penguatan Pendidikan Karakter Gotong Royong. Jurnal Educatio. 8(3). 915-922.
- 8) Rezqi, S., Arsyad, M., Kaharuddin. 2021. Pengembangan Modul ajar Berbasis Lingkungan. Prosiding Seminar Nasional IPA PPs Universitas Negeri Makassar. 2.
- 9) Riduwan. 2018. Skala Pengukuran Variabel Penelitian. Bandung: Alfabeta.
- 10) Salam M., A., Miriam, S., Arifuddin, M., dan Ihsan, I.N. 2016. Pengembangan Modul ajar Berbasis Lingkungan Bantaran Sungai Barito untuk Melatih Keterampilan Proses Sains Siswa. Makalah Prosiding. Seminar Nasional Lahan Basah Tahun 2016. Banjarmasin, 684- 688.
- 11) Sundayana, R. 2014. Statistika Penelitian Pendidikan. Bandung: Alfabeta.
- 12) Suparman, M., Jasruddin., Muris. 2016. Pengembangan Media Pembelajaran Fisika Berbasis Lingkungan dengan Memanfaatkan Komputer Siswa Kelas X SMA Negeri 1 Ulaweng. Jurnal Sains dan Pendidikan Fisika. 12(2). 136-145.



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.