

Development of Character Education-Based Modules on Environmental Pollution Material to Improve Environmental Care Attitudes

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Abstract

Character is defined as an individual driving engine to carry out an action, respond and respond to something. So that the most important thing instilled by a human being from an early age is character values through character education at school age. This study aims to develop a character education-based environmental pollution module. The research method used is 4D (Define, Design, Development, Dissamination). This research was conducted on class X students of MAN Asahan. The results showed that the assessment of the validation test of the material obtained was 88% (Valid), the assessment of the validation test of learning media experts was 89% (Valid), the assessment of character education experts was 80% (Valid), the response assessment by biology teachers was 95% (Very Practical), the average student response rating is 90% (Very Practical). Based on that it was concluded that the character education-based environmental pollution module that was developed was valid, practical and effective.

Keywords: *Development, Character Education, Modules*



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INTRODUCTION

The environment is all external factors that influence an organism; These factors can be living organisms (biotic factors) or non-living variables (abiotic factors) (Pakpahan, 2018). Law of the Republic of Indonesia Number 32 of 1997 concerning Environmental Managers in Article-1, explains that the environment is a spatial unit with all objects, power, conditions and living things including humans and their behavior that affect the continuity and welfare of other living things. However, the condition of environmental pollution is starting to become a natural phenomenon that can threaten the survival of humans and other living things because of human indifference to the natural surrounding (Suprpto, 2017).

Data from (Statistik, 2018) shows that Indonesia's environmental indifference shows an index number of 0.51, which means that environmental awareness or awareness about the environment is still a very low number. The existence of this environmental problem requires a strategic effort to grow and increase environmental awareness and build an attitude of caring for the environment. The existence of this environmental problem requires a strategic effort to grow and increase environmental awareness and build an attitude of caring for the environment (Yunansyah dan Herlambang, 2017). The attitude of caring for the environment is one of the indicators included in character education where the attitude of attitudes and actions that prevent environmental damage are interpreted as caring attitudes for the environment and can repair environmental damage (Pakpahan, 2018).

Based on observations made at MAN 1 Asahan, it is known that in order to increase students' environmental awareness, the school has provided facilities in the form of trash cans according to their type, planting trees, and minimizing plastic waste by advising the canteen to use paper wrap for food. But unfortunately there is still a lot of waste that is not according to its type, there is still a lot of plastic waste found strewn about in the canteen and some plants at school and in classes are found dry and unkempt, so this is one of the reasons why it is necessary to increase the environmental awareness of participants. educated MAN 1 Asahan. In observation it was also found that the MAN 1 Asahan students were less responsible in carrying out their obligations such as not performing midday prayers on time, being late during school hours, and speaking during ceremonies so that these things became the reasons why it was important to implement character education.

Character is defined as an individual driving engine to take action, behave and respond to something, while character education can be interpreted as an education system by instilling values that are in accordance with national culture with components of knowledge (cognitive), feelings (Affection Felling), and good actions towards God Almighty, for oneself, the community and the nation (Harahap, 2019). So that the most important thing instilled by a human being from an early age is character values through character education at school age (Ernawati, 2017). Character values in middle-level biology subjects consist of: 1) Health Care, 2) Religious, 3) Independent, 4) Tolerance 5) Friendly/communicative, 6) Social Care, 7) Responsibility, 8) Environmental Care (Istiqomah, 2019). Character education can be implemented by educators by developing learning through teaching materials which are one of the most important things in the learning process (Devitri, 2021). Because the quality of an education can essentially be seen through the learning process (Tanjung, 2022).

Based on the results of interviews with teachers in biology class X MAN 1 Asahan that teaching materials in schools, especially biology subjects, are still limited to using textbooks and schools do not use teaching materials that can be studied independently and integrated into character education so that students are not able to implicate what is learned to their surroundings, especially regarding the problem of caring attitude towards the environment in their school. So that this problem encourages the development of character education-based modules because one of the advantages of the module is to help students learn independently so that students can personalize character values independently in the learning process (Devitri, 2021). Much research has been done on

character education-based modules. However, the development of character education-based modules carried out by [Riwanti \(2019\)](#) and [Kibtiah \(2020\)](#) is intended for elementary school students. [Devitri \(2021\)](#) has developed a character education-based module on the reproductive system material. This opened up researchers to develop character education-based modules in class X high school biology lessons and to choose environmental pollution material to solve students' problems or difficulties in independent learning and to be able to implicate character values in their lives.

METHOD

The method used is Research and Development (R&D). The R&D method is a method that will design new products, test the effectiveness of existing products and also develop and produce new products. The 4D development model consists of 4 main stages, namely: (1) Define, (2) Design, (3) Develop, (4) Disseminate ([Sugiyono, 2019](#))

The Define stage consists of defining the problems that exist during the learning process. The Design phase (design) consists of compiling the media based on the conditions at the defining stage. The Develop stage consists of the validation of material experts and media experts by UINSU Biology Lecturer Tadris as well as the responses of biology teachers and class X MAN Asahan students who are used as input until the final product is valid. The Dissemination Stage consists of implementing the product to students as well as testing the effectiveness of achieving the module's objectives.

Data analysis techniques used include validity analysis, practicality analysis, and effectiveness analysis. Validity analysis uses a validation sheet from a module developed by researchers to test validity. Modules are assessed using a Likert scale: strongly agree, agree, sufficient, disagree, and strongly disagree ([Riduwan, 2016](#)).

Practicality analysis was carried out on data that had been collected through the responses of biology teachers and students. Data from teacher and student responses. The data collected was taken from a limited trial process with a Likert scale of 1-5 ([Irawan et al., 2021](#)).

Effectiveness analysis is carried out to see the achievement of the objectives of the module development carried out. So to find out whether the module is effective or not in increasing the attitude of caring for the environment ([Istiqomah, 2019](#))

RESULTS AND DISCUSSION

Module Development

Before the module is designed, a definition stage is carried out, namely the stage of determining product specifications to be developed ([Azka et al., 2019](#)). The researcher conducted an interview with Mrs. Nur Azani, S.Si. (one of the biology teachers at MAN Asahan) about learning media and materials that already exist in schools. So based on these interviews, researchers developed character education-based learning modules on environmental pollution material.

The design stage contains the initial design of the product in the manufacture of education-based modules on environmental pollution material for class X SMA/MA. At this stage the researcher compiled and collected material about environmental pollution

from various class X biology textbooks at SMA/MA. Researchers also add some material from other sources. The learning tasks in the module are part of the application of character education in learning which contains a stimulus so that students are able to understand environmental pollution material and apply it to everyday life (Ule *et al.*, 2021).

The module design can be seen in the following figure:



Figure 1. Enviromental Pollution Module Design

Analysis Content by Education Validators

The product design of the environmental pollution module based on character education has been validated by three expert validators is yaitu Mr. Adi Hartono, M.Pd., Mrs. Enni Halimatussa'diyah M.Pd., Mrs. Dr. Ira Suryani, M.Sc. The content or content of the module will be assessed by material experts, the design and appearance of the module will be assessed by media experts and the application of character education in

the module will be assessed by character education experts (Lestari *et al.*, 2019). Material experts validate aspects of quality and module objectives and quality of learning in modules, media experts validate aspects of module size, cover aspects, aspects of letter typography, aspects of module design, while character education experts validate the application of the 4 selected characters, namely: religious, tolerant, responsible and care for the environment. After carrying out development with some input from the validator during the revision, the results of the conclusion of the validity of the module were obtained as shown in following table.

Tabel 1. Material Expert Validation

Aspect	Score (%)	Category
Content Quality and Purpose	88%	Valid
Learner Quality		

Tabel 2. Media Expert Validation

Aspect	Score (%)	Category
Module Size		
Cover	89%	Valid
Typography Letters		
Module Design		

Tabel 3. Character Education Expert Validation

Aspect	Score (%)	Category
Application of Character Education	80%	Valid

Based on the table above it is known that the percentage score of material experts is 88% or it can be concluded that the environmental pollution module based on character education is said to be valid. While the percentage score of media experts is 89% which also shows that the environmental pollution module based on character education is said to be valid. In addition, the character education validator also states that the character education-based environmental pollution module is valid with a score percentage of 80%. Suggestions, responses and input from the validator aim as the validity of the module so that the resulting module is valid (Wardianti, 2018). In addition, validation will also provide deficiencies and limitations of the developed module (Zega, 2022).

Respon of Teacher and Students

Data on the practicality of using the module was obtained through a response questionnaire from the biology teacher and class X students of MAN Asahan after the module was used in the learning process. Practicality data is shown in tables 4 and 5.

Tabel 4. Biology’s Teacher Respon

Responden	Score	Category
Biology’s Teacher	95%	Very Practical

Based on the biology teacher's response questionnaire, it is known that the module is stated to be very practical to use in learning with a score percentage of 95%. Modules are categorized as very practical because they can be used in the learning process and can be used as independent learning media by students. This is in line with the opinion of (Devitri, 2021) which states that modules help students in independent learning to achieve learning goals. In addition, modules are essentially used by students for learning, so from the main response students will really need in module development. The number of students who become respondents is 33 people who will then fill out a response questionnaire to the developed module as shown in the following graph.

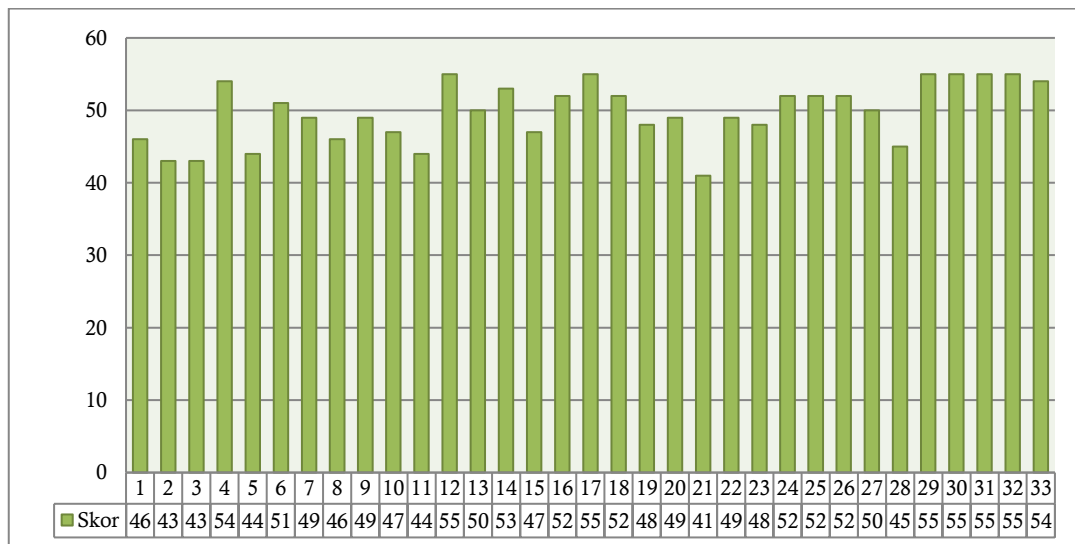


Figure 2. Score of Students Response

After obtaining the response questionnaire scores from the 33 students, they were then calculated by the practicality percentage and the following results were obtained:

Tabel 5. Response score

Total Respondents	Score(%)	Category
33 Students	90%	Very Practical

Based on the results of the practicality questionnaire, it is known that the environmental pollution module based on character education is categorized as very practical because it gets a score of 90% and in research it is found that the module can be used independently by students because there are instructions for use according to the

purpose of the module itself. In addition, the research also found that the module facilitated the learning process because it had a directed goal in accordance with KD.

Module Effectiveness in Improving Environmental Care Attitudes

The effectiveness test of the character education-based environmental pollution module was carried out by giving a questionnaire before and after using the module to 33 students. This effectiveness test was carried out to test the use of the module to increase students' environmental care attitude. In this effectiveness test, 8 indicators were used including: attitude towards humans, attitude towards the earth, attitude towards flora and fauna, attitude towards water, attitude towards air, attitude towards land, attitude towards energy, attitude towards waste (Munandar, 2016). Questionnaire scores before and after by students can be seen in graph 2.

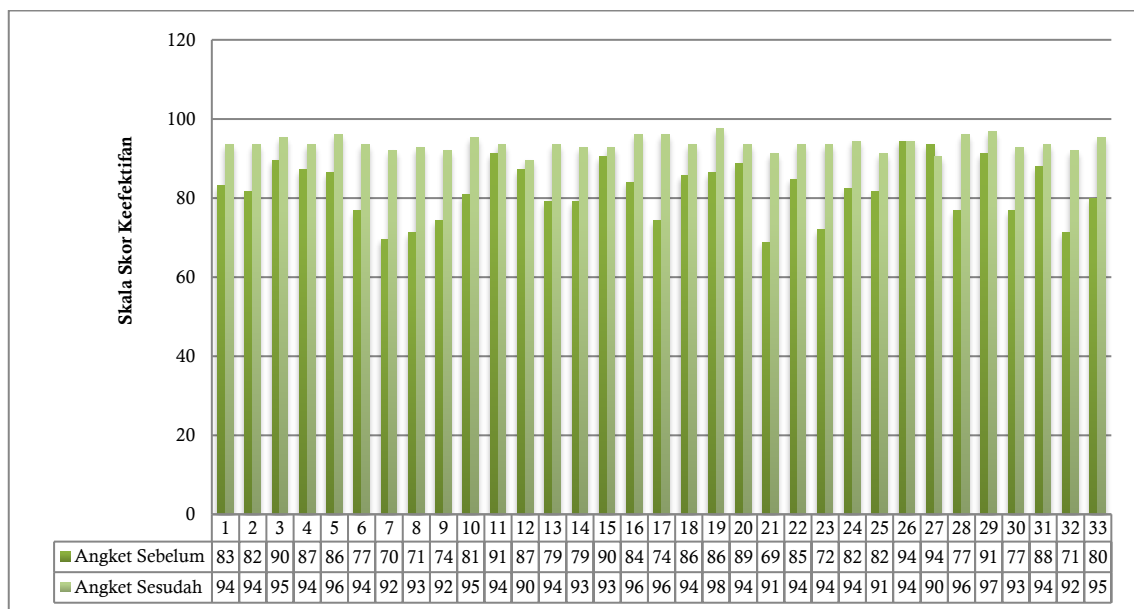


Figure 3. Students Effectiveness Scores

Next, the data in graph 2 is analyzed so that changes are obtained as shown in Table 6 as follows,

Tabel 6. Students Effectiveness Result

Assesment Enviromental Care Attitude		
Care Attitude	Average	Category
Pre-Test	79,21	Good
Post-Test	94,96	Very Good

In the questionnaire before using the module, the average questionnaire score was 79.21 in the good category and in the questionnaire after using the module, the average questionnaire score was 94.96 in the very good category. This illustrates that the module can be said to be effective in increasing the environmental care attitude of students. So these results are in line with that modules that use aspects of character education will have

a good impact on the learning process (Hidayah, 2015). Character education is the most important thing for the formation of good character. It is impossible to form good character if the learning process only emphasizes intellectual activities. Integrating character education in every subject is very important for students to face every problem in their life (Kibtiah, 2020)

The attitude of caring for the environment is defined as a reaction to the surrounding environment by not destroying the environment and caring for the surrounding environment. So the development of character education-based modules that have been tested for their effectiveness can improve students' environmental care attitude. It can be seen that the impact of using this character education-based module raises awareness and responsibility of students towards the surrounding environment. Students who initially do not realize that the little things they don't do can contribute to a large part of the damage to the environment and surrounding ecosystems, but after using the module they can realize, apply and find solutions to the environmental problems they find.

CONCLUSION

Based on research on the development of character education-based modules, it was concluded that the modules were valid, practical and effective in increasing students' environmental care attitudes.

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REFERENCES

- Azka, Rina Dwi, Albab. (2019). Pengembangan Modul Pembelajaran. *Imajiner: Jurnal Matematika dan Pendidikan Matematika*, 224-236. <https://doi.org/10.26877/imajiner.v1i5.4473>
- Devitri, S. d. (2021). Pengembangan Modul Biologi Materi Sistem Reproduksi Berbasis Pendidikan Karakter pada Maa Pandemi Covid-19. *Jurnal Edu-Bi*, 4(1), 22-26.
- Ernawati. (2017). Menumbuhkan Nilai Karakter Anak SD Melalui Dongen (Fable) Dalam Pembelajaran Bahasa Indonesia. *Jurnal Terampil dan Pembelajaran Dasar*, 4(2), 78-84.

- Harahap, A. P. (2019). Character Building Pendidikan Karakter. *Al-Irsyad: Jurnal Pendidikan Konseling*, 5(6), 1-11.
- Hidayah, N. (2015). Penanaman Nilai-Nilai Karakter dalam Pembelajaran Bahasa Indonesia si SD. *Jurnal Terampil Pendidikan dan Pembelajaran*, 7(2), 112-120 .
- Irawan, Ardy, Rahman Hakim. (2021). Kepraktisan Media Pembelajaran Komik Matematika pada Materi Himpunan Kelas VII SMP/Mts. *Pythagoras : Jurnal Program Studi Pendidikan Matematika*, 5(2), 91-100.
- Ismiatul Kibtiah, F. H. (2020). Pengembangan Modul Pembelajaran Tematik Kelas 4 Berbasis Pendidikan Karakter Bernuansa Kontekstual. *Ibtida'i: Jurnal Kependidikan Dasa*, 6(1), 105–118.
- Istiqomah. (2019). Sikap Peduli Lingkungan Peserta Didik di MAN-1 Pekanbaru Sebagai Sekolah Adiwiyata . *Jurnal Dinamika Lingkungan*, 5(1), 95-103.
- Munandar, Y. d. (2016). Pengembangan Instrumen Nilai Sikap terhadap Lingkungan. *Biologi, Sains dan Pembelajarannya*, 4(2), 292-301.
- Pakpahan, E. H. (2018). *Pendidikan Lingkungan Hidup*. Medan: CV. Widya Puspita. 89 halaman
- Riduwan. (2016). *Dasar-Dasar Statiska*. Bandung: Alfabeta. 110 halaman.
- Statistik, B. P. (2018). *Laporan Indeks Perilaku Ketidakpedulian Lingkungan Hidup Indonesia*. Jakarta: BPS-RI.
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta. 288 halaman
- Suprpto. (2017). *Buku Ajar Hukum Perlindungan Hidup*. Surabaya: Airlangga University Press. 132 halaman
- Tanjung, I. F. (2018). *Biologi Umum*. Medan: CV. Widya Puspita. 140 halaman
- Tanjung, I. F. (2022). *Penelitian Tindakan Kelas*. Medan : Prodi Tadris Biologi UINSU Medan. 88 halaman
- Ule, Bare, Bunga. (2021). Pengembangan Modul Pembelajaran Biologi Berbasis Jelajah Alam Materi Ekosistem SMA Kelas X. *Diklabio : Jurnal Pendidikan dan Pembelajaran Biologi*, 147-156.
- Wardianti, Y. &. (2018). Validitas Modul Biologi Berbasis Kearifan Lokal. *Bioedusains : Jurnal Pendidikan Biologi dan Sains*, 136-142.
- Yunansyah dan Herlambang, Y. T. (2017). Pendidikan berbasis ekopedagogik dalam menumbuhkan kesadaran ekologis dan mengembangkan karakter siswa sekolah dasar. *Edu Humaniora*, 9(1), 108-121.

Zega, I. D. (2022). Pengembangan Media Pembelajaran Multimedia Interaktif Berbasis Website Pada Materi Keanekaragaman Hayati. *Educativo: Jurnal Pendidikan*, 7(1), 430-439.

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