

Ecopreneur-Based Biology Learning Module Development For Class XI Students SMA Negeri 11 Kerinci



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ABSTRACT: The purpose of this development research is to produce ecopreneur-based learning modules that are used as teaching materials for students on Biology subjects. This research was motivated by the lack of availability of teaching materials at Sma Negeri 11 Kerinci and the lack of student ability in solving environmental problems and environmental conservation efforts and students had difficulty in analyzing environmental change data. This type of research is Research and Development research. The development model used in this research is the ADDIE model. The ecopreneur-based Biology learning module for class XI students consists of 5 stages including analysis (analyze), design (design), development (develop), implementation (implementation), and assessment (evaluate). Ecopreneur-based Biology learning modules for class XI students are validated by media, material and language experts. Media validation of the developed module obtains a final value (percentage) with a score of 80% with a valid category. Furthermore, the material expert gave a score of 92% with a very valid category and the linguist validation gave a score of 93.3% with a very valid category. The results of the practicality of modules by teachers towards ecopreneur-based Biology learning modules for class XI students obtained an overall average score of 90% with a very practical category. While the results of practicality by students obtained an overall score of 92.8% with a very practical category. The ecopreneur-based Biology learning modules of class XI students reviewed from the learning results scored 79.5% with a very effective category. Thus, ecopreneur-based Biology learning modules for class XI students can be used in Biology learning in High School (SMA) or equivalent.

KEYWORDS: Biology, Ecopreneur, Modules

I. INTRODUCTION

Education is a means of communication, because in the educational process there are communicators, communication and messages. Communication contains the understanding of informing information, thoughts and values with the intention of arousing participation so that the things that are told are in accordance with the target (Rosyada, 2008: 3). One of the subjects in schools that function in informing information, thoughts and values is biology.

Biology is a science related to nature. Biology Learning aims to inform information, thoughts and values that contain facts, concepts, and processes that occur in nature so that students are able to understand the environment. To support students' understanding of biology, a good teaching material is needed so that learning is more effective and efficient and improves learning according to needs.

Based on the results of interviews with Biology teachers at Sma Negeri 11 Kerinci, information was obtained that during the Biology learning process students had difficulty in understanding Biology learning because biology learning teaching materials were limited in the school library, the use of learning modules was small, the learning outcomes of Biology subject students were still low.

The right teaching material used is the learning module. According to Trianto (2009: 98) modules are a set of learning materials / substances that are arranged systematically, reflecting the competencies that students will master in learning activities.

According to Wiyanto and Mustakim (2012: 42) the module is equipped with a variety of complete and detailed instructions so that students can use the modules in teaching themselves. Modules are also a medium for self-study because in it has been equipped with instructions for self-study, teaching modules make students more active self-study without the presence of direct teachers (Chomsin et al., 2008: 43).

Learning using learning modules urgently needs to be applied. Teaching materials in the form of modules help students in self-study because they are equipped with instructions, and teaching materials in the modules can be adjusted to students' needs.

Through biology learning, students are expected to be able to develop competencies, find out and act based on direct experience. One of the interesting natural phenomena for students to learn is about waste. Waste material consists of

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understanding waste, grouping waste based on the type of compound and waste management. Through waste materials, students can get information about the concept of waste, the types of waste and the correct way of waste management, which can later be applied to daily life.

To find out the level of students' understanding of waste, the researcher gave questionnaires to class XI students in the Department of Mathematics and Natural Sciences (MIA) at Sma Negeri 11 Kerinci. Based on the questionnaires distributed obtained by the results of the questionnaire, 70% of students do not understand the impact and environmental changes on waste, 68% of students find it difficult to learn material about the concept of waste. 75% of students also do not know how to process waste properly and correctly. In basic competencies 3.10 students must be able to analyze data on environmental changes, and causes, and the impact of these changes on life.

Then the researchers also made direct observations to the 11 Kerinci State High School school, obtained data that around the school environment, garbage such as food waste, plastic is still widely available around the environment. Around the canteen there are still many garbage, sometimes after eating samaph that the plastic used is not thrown in the trash. This can lead to problems that are school environment, hence the need for proper processing in addressing these problems. Students must be able to solve environmental problems by creating waste recycling product designs and environmental preservation efforts.

In order to overcome these problems, it is necessary for Biology learning modules that are expected to provide ideas or foster a made attitude, one of which is an ecopreneur-based module. Ecopreneur-based modules can benefit students to solve environmental problems and environmental conservation efforts. According to Murniningtyas (2014: 102) ecopreneur activities are entrepreneurs who care about environmental issues or environmental sustainability. The attitude of ecopreneurs can change the mindset of people to care more about the environment and process it into an entrepreneur (Mcwew, 2013: 264).

The focus of ecopreneurs is on greening and solving problems in society caused by the environment (Ivanko and Kivirist, 2008). Ecopreneurs are businesses that not only care about business profits, but also pay more attention to the underlying green values (Kirkwood and Walton, 2010). Pastakia (1998) explains with ecopreneurs people who show concern for the environment through awareness and consistency in environmental friendliness. With ecopreneur students can improve the ability to think creatively and innovatively by entrepreneurship that cares about environmental issues or environmental sustainability.

II. METHOD

The development model used in this research is the ADDIE model which consists of analysis, design, development, implementation and evaluations. Product trials consist of teachers and students. The instruments used in collecting data in this study are validity test questionnaires, teacher practicality questionnaires, student practicality questionnaires and learning outcome tests.

III. RESULTS AND DISCUSSION

1. Validity

After the module design stage is completed and discussed with the supervisor. Furthermore, the ecopreneur-based Biology learning module is validated by experts and education practitioners in accordance with its field of study consisting of 3 expert validators.

Validation results and improvement suggestions provided by validators are used to revise modules. Based on these suggestions the module was revised and re-discussed with the validator. From the results of the discussion, the validator agreed that the ecopreneur-based Biology learning module could be tested on students of class XI MIA SMA Negeri 11 Kerinci. Validation results consist of expert validation of media, language and material.

There are 3 (three) aspects observed in media expert validation, namely module validity, module cover design and module content design. Validation results from three aspects can be seen in Table 1.

Table 1. Validation value from media experts

| No. | Aspects | Value (%) |
|------------------------|-------------------------|------------|
| 1. | Validity of graphicness | 80 |
| 2. | Module cover design | 80 |
| 3. | Module fill design | 80 |
| Average of all aspects | | 80 |
| Criterion | | Very Valid |

Based on Table 1, it can be known that there is 80% validation of the validity of the graph, the cover design of the module is 80% and the design of the contents of the module is 80%. The average of all aspects is 80% with valid categories.

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There are 5 (five) aspects observed in linguist validation, namely straightforward, communicative, dialogical and interactive, conformity with the development of learners and conformity to language rules. Validation results from five aspects can be seen in table 2 below.

Table 2. Validation value from linguists

| No. | Aspects | Value (%) |
|------------------------|---|------------|
| 1. | Businesslike | 93,3 |
| 2. | Communicative | 100 |
| 3. | Dialogical and Interactive | 100 |
| 4. | Conformity with the development of learners | 80 |
| 5. | Conformity with the rules of language | 100 |
| Average of all aspects | | 93,3 |
| Criterion | | Very Valid |

Based on Table 2, it can be known that the validation of straightforward aspects is 93.3%, communicative 100%, dialogical and Interactive 100%, conformity with the development of learners 80%, and Conformity with the 100% language rule. The average of all aspects is 93.3% with a very valid category.

There are 3 (three) aspects observed in material expert validation, namely the validity of content, the validity of presentation and ecopreneur. Validation results from three aspects can be seen in Table 3.

Table 3. Validation value from material expert

| No. | Aspects | Value (%) |
|------------------------|--------------------------|------------|
| 1. | Validity of content | 93,3 |
| 2. | Validity of presentation | 91,4 |
| 3. | <i>Ecopreneur</i> | 90 |
| Average of all aspects | | 92 |
| Criterion | | Very Valid |

Based on Table 3, it can be known the validation value of material experts consisting of the validity of the contents of 93.3%, the validity of the presentation of 91.4% and the ecopreneur of 90%. The average of all aspects is 92% with very valid categories.

Validation of modules aims to see the validity of modules ranging from cover design, content design, content validity, presentation, ecopreneur and grammar in the module. Validation is carried out by three validators consisting of expert media, language and material expert validators.

Media expert validation scored 95.3% with a very valid category. Furthermore, the material expert got a score of 92.5% with a very valid category and the validation of the linguist got a score of 89% with a very valid category. With the validation results, the ecopreneur-based Biology learning module can be tested on students of class XI MIA SMA Negeri 11 Kerinci.

The modules developed are in accordance with the graphing, the cover design and the fill design also display the shape, font size, space (space), attractiveness and consistency that is compatible. Modules should also pay attention to module quality elements which include format, attractiveness, shape, font size, space (space) and consistency (Daryanto, 2013:13).

The ecopreneur-based Biology learning module developed is also in accordance with the characteristics of students, where according to Haryanto (2011: 87) explained that in adolescence 12-21, students already have independence, responsibility, intellectual skills and concepts to help students in learning.

According to Richey et al, (2011: 3) module design should meet the components of learning design which include:

- a. Student characteristics
- b. Adjusting the material to the circumstances or needs of students
- c. Learning strategies
- d. Media and how it is used
- e. Designer and design process

Ecopreneur-based Biology learning modules have fulfilled all five components where in the module there are media, learning strategies, materials that are dreamed, matching designs and characteristic arrangements for students.

Based on expert validation of product materials conducted by material experts, it was obtained that the materials in the ecopreneur-based Biology learning modules already met the criteria and in accordance with the needs of students. The criteria and needs of the student in question are materials that are in accordance with the expected learning competencies of class XI.

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The modules developed have associated the content of the material with the curriculum used in biology learning, in the modules also contain activities that students must do so as to cause student interaction with teachers, or with students themselves. The language used in the module is also simple and easy to understand.

Modules also feature assignments that encourage students to display skills in the classroom and outside the classroom. This is in accordance with Tomlinson's opinion (2007: 109) explaining 6 principles in designing learning materials, namely: (1) The material must be clearly related to the curriculum used, (2) the Material must be authentic in terms of text and assignment. (3) The material must stimulate interaction. (4) The material should allow students to focus more on the formal aspects of the language. (5) The material should encourage students to develop skills in learning. (6) Materials should encourage students to develop skills outside the classroom.

2. Practicality

To see the practicality of ecopreneur-based modules, a trial was conducted at SMA Negeri 11 Kerinci. Practicality involves teachers and students.

Judging from the practicality of the modules by the teacher towards the modules developed obtained an overall average score of 90% with a very practical category. While the results of practicality by students obtained an overall score of 92.8% with a very practical category.

The modules developed are very practical, the images displayed in the module are also clear and use simple language that is easy to understand and has a more efficient time. Modules are also presented according to the circumstances or life of the student. According to Suprijono (2009: 80) explained that learning conducted contextually can help students understand the meaning of learning materials with their own life context in the social and cultural environment of society.

The modules presented contain images and examples that are easy for students to understand so that students find it helpful in understanding Biology materials, the module also displays ecopreneurs who can increase creativity and innovation from students by utilizing waste or the student environment so as to produce something of economic value.

Students are interested in using ecopreneur-based Biology learning modules in Biology. The modules presented on the cover of the image, the shape and size are compatible. The content of the module can stimulate student interest because it displays interesting illustrations, the use of letters, slashes and matching colors. This is in line with the opinion of Daryanto (2013: 14) who explains that the learning module must be able to play its function and role in effective learning, namely the attractiveness of the module itself.

3. Module effectiveness

Learning outcomes are abilities that students have after they experience their learning practice. This learning experience is in the form of effective learning activities and can realize diverse learning goals or outcomes. The purpose of the assessment of learning outcomes is to measure how far the success rate of the learning process has been implemented. The learning outcome test is used to determine the effectiveness of the learning process using ecopreneur-based Biology learning modules.

The test results of students in the Biology subject experiment class were 79.5% with a very effective category while in the control class got a score of 71.5% with the effective category. In the module is packed with training questions, answer keys along with answer evaluation so as to help students in venting their learning achievements. According to Riyanto (2009), a person can be said to learn if he can do something by means of exercises so that the person concerned becomes changed. In line with the results of Wahyuningsih research (2011) the use of teaching materials in learning can improve student learning outcomes.

CONCLUSIONS

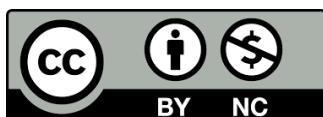
Based on data analysis and discussion, it can be concluded as follows. The ecopreneur-based Biology learning module for class XI students consists of 5 stages including analysis (analyze), design (design), development (develop), implementation (implementation), and assessment (evaluate). . Ecopreneur-based Biology learning modules for class XI students validated by media experts give the final score (percentage) with a score of 80% with a valid category. Furthermore, the material expert gave a score of 92% with a very valid category and the linguist validation gave a score of 93.3% with a very valid category. The results of the practicality of modules by teachers towards ecopreneur-based Biology learning modules for class XI students obtained an overall average score of 90% with a very practical category. While the results of practicality by students obtained an overall score of 92.8% with a very practical category. The ecopreneur-based Biology learning modules of class XI students reviewed from the learning results scored 79.5% with a very effective category.

REFERENCES

- 1) Chomsin S, Widodo, dan Jasmadi. 2008. *Panduan Menyusun Bahan Ajar*. Jakarta: Gramedia.
- 2) Daryanto. 2013. *Menyusun Modul (Bahan Ajar untuk Persiapan Guru dalam mengajar)*. Yogyakarta: Gava Media
- 3) Ivanko and Kivirist. 2008. *ECOpreneuring: putting purpose and the planet before profits*. New Society Publisher

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- 4) Kirkwood and Walton. 2010. What motivates ecopreneurs to start businesses? *International Journal of Entrepreneurial Behaviour & Research*, Vol. 16 No. 3, pp. 204-228
- 5) Mcewen, Thaddeus. 2013. Ecopreneur as a Solution to Environmental Problems. *International Journal of Academic Research in Business and Social Sciences*. 3(5): 264-280.
- 6) Murniningtyas, Endah. 2014. *Prakarsa Strategi Pengembangan Konsep Green Economy*. Jakarta: DEPUTI Sumber Daya Alam dan Lingkungan
- 7) Pastakia, Astad.1998. Grassroots ecopreneurs: change agents for a sustainable society. *Journal of Organizational Change Management*, Vol. 11 No. 2, pp. 157 – 173
- 8) Riyanto, Yatim. 2012. *Paradigma Baru Pembelajaran: Sebagai Referensi Bagi Pendidikan Dalam Implementasi Pembelajaran Yang Efektif Dan Berkualitas*. Jakarta: Kencana.
- 9) Sudijono, Anas. 2005. *Pengantar Statistik Pendidikan*. Jakarta: RajaGrafindo Persada.
- 10) Sudjana, N. 2005. *Penilaian Hasil Proses Belajar Mengajar*. Remaja Rosda Karya: Bandung.
- 11) Suprijono, A. 2009. *Cooperative Learning: Teori dan Aplikasi PAIKEM*. Yogyakarta: Pustaka Belajar.
- 12) Tomlinson, B. 2007. *Developing Material For Language Teaching*. Lonodon: Gromwell Press.
- 13) Trianto. 2009. *Model Pembelajaran Terpadu: Konsep, Strategi dan Implementasinya dalam KTSP*. Jakarta: Bumi Aksara. *urnal of Teacher Education*. 36(1). 36-49.
- 14) Wahyuningsih, A. N. 2011. Pengembangan Media Komik Bergambar Materi Sistem Saraf Untuk Pembelajaran yang Menggunakan Strategi PQ4R. *Jurnal PP*.



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