Biology Teaching Materials Based on Character Value

Khairil Hadi¹, Dazrullisa², Binari Manurung³ and Hasruddin⁴

¹Department of Biologi Education, STKIP Bina Bangsa Meulaboh, Meulaboh, Indonesia
²Department of Mathematics Education, STKIP Bina Bangsa Meulaboh, Meulaboh, Indonesia
³Department of Biology, Universitas Negeri Medan, Medan, Indonesia

* herilbio@yahoo.co.id

Abstract. This study aims to determine the validity of integrating character education education in the development of teaching materials. This research uses mixed method research approach with research and development type adapted model which is developed by Borg and Gall. This research was conducted in senior high schools over West Aceh District from January to June 2018. This research begins with observation, material analysis, character value analysis, and character value integration in teaching materials. The instrument of data collection used in this research is validation sheet. Validation done by experts in the field of biology as many as 10 validator with undergraduate qualification 4 teachers, graduate 4 people and doctoral 2 people. The data in this research is the result of the validity of teaching material of development result. Data analysis techniques to determine the level of validity of teaching materials using simple descriptive statistical formula. The results of this study indicate that the results of the development educational materials based on character education are valid with the average score of validation results of 93.75%.

1. Introduction

Character issues have become an important issue lately. Character problems are discussed in seminars, print media, and electronic media. Various alternative solutions proposed one of which is widely proposed to overcome this, at least reducing the problem of bad character through education, namely formal education in school.

School is a place of formal education that can improve the quality of human resources through the stages of the learning process. Success or failure of the learning process in school is determined by the teacher, one of them in the use of teaching materials. Teaching materials are a series of materials used as learning resources. The use of teaching materials in education at the high school level has been widely criticized because most teachers still use conventional teaching materials and the absence of creative effort to develop teaching materials according to the needs of learners and the applicable curriculum so the impact on the quality of education is low.

Good teaching materials are teaching materials that can change the behavior of learners in teaching and learning process both in terms of affective, psychomotor, and cognitive. Therefore, there is a need for learning innovations that are poured into teaching materials. Innovation of learning is poured in the material or textbook can provide better learning outcomes, increasing efficiency and effectiveness of learning to satisfactory results[1]. One such effort is to integrate the values of characters in teaching materials.
In Indonesia, the character values based culture of the nation is composed of religious, honesty, tolerance, discipline, hard work, creative, independent, democratic, curiosity, the spirit of nationalism, love of country, respecting for the achievements, friends / communicative, love of peace, love to read, caring about the environment, social care, and responsibility. Implementation of these characters in biology learning by linking learning materials in accordance with the character that has been determined.

Integrating character education in teaching materials needs to be done to improve the character of the students who are increasingly damaged and support the implementation of Curriculum 2013. Habit and understanding of this behavior is then internalized in character and become a component in the formation of his personality. Implementation of character education in the 2013 curriculum can be done through the process of integration of learning achievement, by synergizing the role of educational institutions, teachers act as competent people and deserve to emulate for students. Schools that address the education of students with serious characters tend to have higher academic achievement [2]. The relationship between the implementation of character education and academic achievement in elementary schools in California, USA concludes that primary schools that carry character education are seriously and well-designed tend to have high academic achievement [3].

Innovation in the development of this teaching material serves to produce new teaching materials with the aim of achieving effective and efficient learning. Development of teaching materials in biology learning developed by utilizing character values will give new nuances in the learning process. Where learners not only have the ability to think, but learners also have good character without leaving the values of Indonesian character. Some advantages in the application of learning by linking science, technology, environment and society will make students better and the attitude of students more concerned about the environment [4].

2. Method

2.1 Approach and Types of Research

The research approach used is a combined research approach, ie research mixed methods with research and development research type by adopting the development model from Borg and Gall.

2.2 Research Procedures

The research steps include: 1) Observation and interviews with biology teachers in some high schools in west Aceh district of Aceh Province which is related to developmental materials. 2) Determination of the material to be developed taking into account the suggestions of teachers who were observed and interviewed. 3) Analysis of the material and compile the material. 4) Analysis of character values. 5) Integrating the value of the characters into the teaching materials on the materials that have been prepared, and 6) Expert validation.

2.3 Research Instruments

Instrument of data collection used in this research, that is validation sheet. Validation done by experts in the field of biology as many as 10 validator with undergraduate qualification as much as 4 teachers, graduate 4 people and doctoral 2 people. Aspects assessed include: (1) the quality of the display, (2) the feasibility of the presentation, (3) the feasibility of the language, and (4) the feasibility of contents.

2.4 Data Analysis and Techniques

The data from this research is the result of the validity and the value of characters that are integrated into the teaching materials. Data analysis techniques to determine the level of validity of instructional materials using descriptive statistical formula. The data obtained from the analysis results are then interpreted in descriptive form as follows:
Table 1. Validity Rate of Development Result Products

| Percentages (%) | Validation Criteria |
|-----------------|---------------------|
| 76-100          | Valid (no revisions needed) |
| 56-75           | Valid enough (no revisions needed) |
| 40-55           | Less Valid (need to be revised) |
| 0-39            | Invalid (need to be revised) |

3. Results and Discussion

Data obtained from the analysis validation results then searched the overall average score using a simple statistical formula to determine the level of validity of teaching material development results.

Table 2. Validity Scores on Character Education in Teaching Materials

| No | Validator | Integration of character values (%) | Appreciation of character values (%) | Average Overall Score (%) | Validation |
|----|-----------|-------------------------------------|-------------------------------------|---------------------------|------------|
| 1  | Validator 1 | 100%                                | 100%                                | 92%                       | Valid      |
| 2  | Validator 2 | 75%                                 | 100%                                | 87,5%                     | Valid      |
| 3  | Validator 3 | 75%                                 | 75%                                 | 87,5%                     | Valid      |
| 4  | Validator 4 | 75%                                 | 100%                                | 87,5%                     | Valid      |
| 5  | Validator 5 | 100%                                | 75%                                 | 87,5%                     | Valid      |
| 6  | Validator 6 | 100%                                | 75%                                 | 87,5%                     | Valid      |
| 7  | Validator 7 | 100%                                | 100%                                | 100%                      | Valid      |
| 8  | Validator 8 | 100%                                | 100%                                | 100%                      | Valid      |
| 9  | Validator 9 | 100%                                | 100%                                | 100%                      | Valid      |
| 10 | Validator 10| 100%                                | 100%                                | 100%                      | Valid      |

Average Overall 93,75% Valid

The data obtained shows that the entire validator stated the results of development of teaching materials in this study is valid. Average score of validation results of 93,75% indicates that teaching materials based on character education are valid.

The overall character values integrated in textbooks can provide a positive character value to learners. The values of the character presented can provide learners’ insight in maintaining biodiversity.

If teachers consistently integrate character education in the subject matter, it is likely to produce good-character students [5]. The values of Indonesian character that are integrated into this teaching materials include (1) Responsibility; (2) Admiring God’s Creation S.W.T; (3) Cooperation, discipline, mutual respect; (4) preserving the environment; (5) Love the homeland; and (6) Honest. The character values have been adjusted to the content of the material presented.

Table 3. Integration of Character Values in Teaching Materials

| No | Materials | Sentences                                                                 | Indicator                                      |
|----|-----------|---------------------------------------------------------------------------|-----------------------------------------------|
| 1  | Biodiversity | the biotic and abiotic elements contained on earth are the responsibility of humans in its maintenance | Responsibility                                 |
|    |           | Biodiversity is one form of power of the Creator of God S.W.T. There is no living thing that is exactly the same for everything | Admiring God’s Creation S.W.T                  |
|    |           | Invitations for discussion                                                | Cooperation, discipline, mutual               |
| No | Materials | Sentences | Indicator |
|----|-----------|-----------|-----------|
|    | Every living thing created by Allah S.W.T has its own uniqueness that distinguishes between one living being with another living creature | respect | Admiring God's creation S.W.T |
| 2  | Biodiversity in Indonesia | Floods and landslides can be avoided by not cutting timber and burning forests indiscriminately. Let's keep forests for the sake of sustainable living. Reforestation is one way to restore nature. | A call to preserve biodiversity | |
|    | Animals will not interfere with human life if the habitat is not disturbed. Therefore it should be as human beings who have a sense that distinguishes with other animals, responsible for the survival of all living things on earth. Let's love Indonesia's rich diversity of living beings. We are proud to be Indonesian children. |    | Love the homeland |
|    | Invitations for discussion | Cooperation, discipline, mutual respect | Responsibility and admiring God's creation S.W.T |
|    | as good citizens we have a responsibility to conserve biodiversity as the gift of God Almighty |    | Responsibility and love for the homeland |
|    | Ceumpala Kuneng or with the national designation of Trichos pyrropygus an identity animal of the province of Aceh which status is almost extinct or rare. Let's preserve by not catching or hunting for sustainable sustainability. |    | Responsibility and love for the homeland |
|    | Biodiversity is heavily protected by the existence of West Aceh government regulations on the prohibition of illegal hunting of protected animals and illegal logging. In this regard, the Government of West Aceh also appealed to the people of West Aceh to obey the rules that have been established and have a sense of love or care for the environment. |    | The invitation of love to the homeland and the environment |
| 3  | Damage and Conservation | Several ways of conserving biodiversity, may already be done by the Government and the community. But in reality, the biodiversity crisis continues to increase from year to year. Who is to blame? | Honest | |
|    | For that it is time for every Indonesian people to watch themselves and look for a space of participation that can be enabled to enable participate in saving biodiversity. The successful implementation of the national |    | Love the environment |
| No | Materials               | Sentences                                                                 | Indicator                |
|----|-------------------------|---------------------------------------------------------------------------|--------------------------|
|    | biodiversity conservation strategy is entirely in the hands of every individual of the Indonesian nation. It is time for the Indonesian generation to care about biodiversity |                                                                         |                          |
| 4  | Values of Biodiversity  | Taking advantage of ecosystem services sufficiently and on an ongoing basis. | Love the environment     |
| 5  | Classification System   | Invitations for discussion                                                | Cooperation, discipline, mutual respect |
[2] A. Pala, “The Need for Character Education,” *Int. J. Soc. Sci. Humanit. Stud.*, vol. 3, no. 2, pp. 23–32, 2011.

[3] J. S. Benninga, M. W. Berkowitz, and P. Kuehn, “the Relationship of Character Education Implementation and Academic Achievement in Elementary Schools,” *J. Character Educ.*, vol. 1, no. 1, pp. 19–32, 2003.

[4] M. Kim and W.-M. Roth, “Rethinking the ethics of scientific knowledge: A case study of teaching the environment in science classrooms,” *Asia Pacific Educ. Rev.*, vol. 9, no. 4, pp. 516–528, 2008.

[5] Rukiyati Sugiyo and L. Andriani Purwastuti, “Local Wisdom-Based Character Education Model in Elementary School in Bantul Yogyakarta Indonesia,” *Sino-US English Teach.*, vol. 14, no. 5, 2017.

[6] M. Situmorang, “Pengembangan Buku Ajar Kimia Sma Melalui Inovasi Pembelajaran Integrasi Pendidikan Karakter Untuk Meningkatkan Hasil Belajar Siswa,” *Struktur FMIPA Univ. Lampung*, pp. 237–246, 2013.

[7] M. Mulyani, “Model Pembelajaran Menulis Berbasis Kearifan Lokal Yang Berorientasi Pendidikan Karakter Studi Kuasi Eksperimen pada Siswa SMPN 2 Kec. VII, Kendusari Magelang,” vol. 1, no. 1, pp. 93–109, 2011.

Retracted