

Analysis of the Application of Character Education in Genetic Engineering Materials

Tomi Hidayat^{1*}, Irwandi¹, Nasral¹, Lely Yenita Asmara¹

¹Master of Biology Education Study Program, Universitas Muhammadiyah Bengkulu, Bengkulu, Indonesia.

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Abstract: This study aims to analyze the application of character education in learning biology in Genetic Engineering material at State Senior High School 7 Bengkulu and see what efforts are being made by teachers and schools to instill such character education. This research is qualitative description research with 29 research subjects as grade XII students. The instrument used was in the form of a questionnaire and several interview questions. The results showed that the picture of biology learning character education in Genetic Engineering material in State Senior High School 7 Bengkulu had begun to be embedded but still needed guidance to be more focused on understanding the concepts, impacts, and application of genetic engineering techniques because teachers had not fully applied the teaching methods of character education in class. The picture can be seen in the observation data, questionnaires, and interviews of honest, disciplined, democratic, communicative, and creative values that have begun to develop. Caring, responsibility, and sociality are well entrenched. Independence is still very much needed to be considered while religious have begun to appear. In an effort to create character education attitudes that will be the basis for dealing with scientific and technological progress, the school has also implemented a number of support programs to improve or train character education attitudes.

Keywords: Character education; Genetic engineering; Biology.

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Introduction

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results. Education is a form of embodiment of dynamic human culture and capital for the development of the nation. The development of education is a continuous improvement of education at all levels. Through education will form a generation that is intelligent and has a noble character. Along with the rapid development of the times, education and character are things that cannot be separated from one another. Basically character education concerns ethical and moral values accompanied by the behavior of everyday life (Duckworth & Meindl, 2018).

In developing abilities and shaping the character of the nation's children who will maintain a dignified, faithful, creative, independent, and responsible nation's civilization, a curriculum that will incorporate these values into character education learning is needed (Bates, 2019).

Curriculum content that is integrated with character education will become a pillar that will shape the character of the nation's successor in facing the era of progress and challenges of globalization, the impact of knowledge and technology (Agboola & Tsai, 2012). The school curriculum in addition to teaching the main material in accordance with the field of study, the teachers must also fill it with what character is in accordance with the theme or topic of learning in class or integrated in learning. The character crisis in schools

* Corresponding Author: tomihidayat@umb.ac.id

occurs because learning in schools is only limited to texts and does not prepare students to respond and face life with all its problems (Wiliam, 2000).

The value of character education can be planted in students by families and educational institutions, especially formal education. This can be planted through religious values and social norms as behavioral guidelines. Law Number 20 of 2003 concerning the National Education System in Article 3 states that, National education functions to develop and shape the character and civilization of a dignified nation in the context of educating the nation's life, aiming at developing the potential of students to become human beings who believe and fear God. The Almighty, has noble character, is healthy, knowledgeable, capable, creative, independent, and becomes a democratic and responsible citizen (Cubukcu, 2012).

Good education is education that not only prepares students for a profession or position, but to solve the problems they face in everyday life (Catalano, R. F., Toumbourou, J. W., Hawkins, 2017).

Character education is actually not something new anymore (Bulach, 2002). In recent years, the topic of character education has become a hot topic of discussion among academics and educational leaders. This is evident from the values of character education that have been integrated into several subjects in schools, both religious-based schools and public schools. The values in character education are essentially programmed in everyday life, for example the value of honesty, the value of tolerance, the value of democracy, religious values etc. which can be integrated in science learning. The 2013 curriculum assessment also focuses on character (Anderson & Glover, 2017).

Character education has four basic types of characters that are implemented in the education process, namely, religious-based character education (moral conservation), cultural value-based character education, environmental-based character education (environmental conservation), and character education based on self-potential/humanist conservation (Almerico, 2014). Character education that is applied to biology learning that covers many fields of science will have a very positive value, especially in the application of character education for genetic engineering material. With a soul that has a strong character, it will help the next generation to be wiser in dealing with the goodness and lack of science and technology in the advancement of Genetic Engineering.

Method

This research is qualitative research. The research subject was class XII Sains State Senior High School 7 Bengkulu with a total sample of 29 students. The selection of class XII science students in this study was because

Genetic Engineering is a sub-chapter of Biotechnology that is studied in class XII. Data were obtained through questionnaires given to students and results from interviews with teachers in the field of biology studies as well as documentation of academic documents such as syllabus, lesson plans and observations during learning.

The observation sheet used in this study is a questionnaire (questionnaire) about the analysis of character values consisting of 12 items arranged using a Likert scale in the form of a checklist.

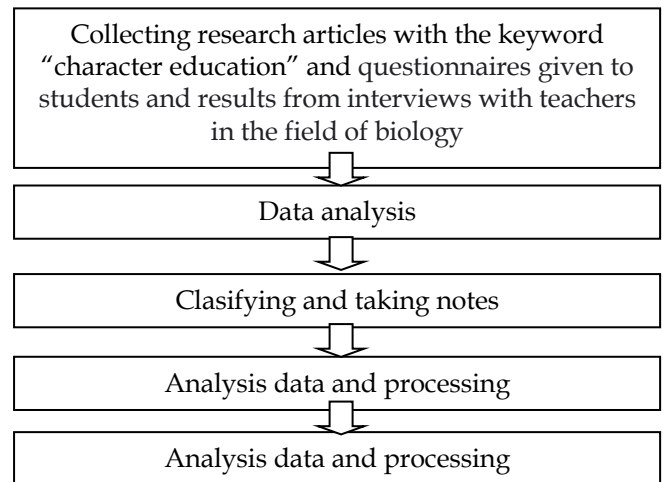


Figure 1. Research Proceedures

The data that has been collected will be analyzed by comparing the number of answer scores obtained from respondents with the total score multiplied by 100%, the data is expressed in percentage form. Data analysis using percentages (students) with the following Formula 1.

$$P = \frac{\sum F}{\sum N} = 100 \% \tag{1}$$

Result and Discussion

Based on the data obtained, information on the description of character education and the implementation of character education is obtained. In this observation, not all character education values were captured by students, only values related to biological content were measured. The values of character education captured include religious values, honesty values, discipline values, hard work, democracy, love of reading, environmental care, responsibility, independence, communicativeness, and curiosity.

When the teacher entered the class to start learning, students had started to sit in the question area, several children took their seats and tried not to make themselves busy. The teacher starts the lesson with Bismillah and begins to explain the material. The teacher tries to reprimand by giving a code. In addition to observing the learning process in the classroom, the

observer also distributed questionnaires through Google Forms to obtain more accurate data regarding the description of character education for children at State

Senior High School 7 Bengkulu. Data on the results of the character education attitude questionnaire obtained through student answers can be seen in Table 1.

Table 1. Questionnaire answer data

Aspects of Character Education captured	Questions	Number of Students Answering			
		A	B	C	D
Religious	Before learning begins, teachers and students always start learning with Bismillah and the Genetic Engineering material is linked to the verses of the Qur'an	1	9	16	3
Honest	I listen to the data and facts about Genetic Engineering very well	12	5	6	6
Discipline	I follow the learning activities on time	13	6	6	4
Democracy	I express my opinion when conducting a Genetic Engineering discussion in class	5	6	15	3
Love to read	Before learning biology in class begins, I usually read the material to be studied first and look for some other literature sources related to the material to be studied.	4	4	17	4
Environmental care	When I find a friend who litters, I immediately reprimand him	10	6	9	4
Responsibility	I complete the task according to the schedule	16	6	3	4
Independent	I took the initiative to ask teachers/friends who understand more than me when they have difficulty understanding Genetic Engineering material	8	5	5	11
Communcative	When I experience an obstacle when working together in a group, then I discuss the obstacle with group members so as to produce a decision which is a joint decision	4	10	9	6
Curiosity	I do a literature study or ask the teacher to find out about everything related to the context of Genetic Engineering that I don't know	3	14	9	3

Descriptions:

- A= Always = very good culture
- B= Often = starting to develop
- C= Ever = starting to look
- D= Never = not seen

Based on the observations that have been made, the data is analyzed by means of the number of answer scores obtained from the respondents with the total

score multiplied by 100%, so that the research data is obtained as Figure 2:

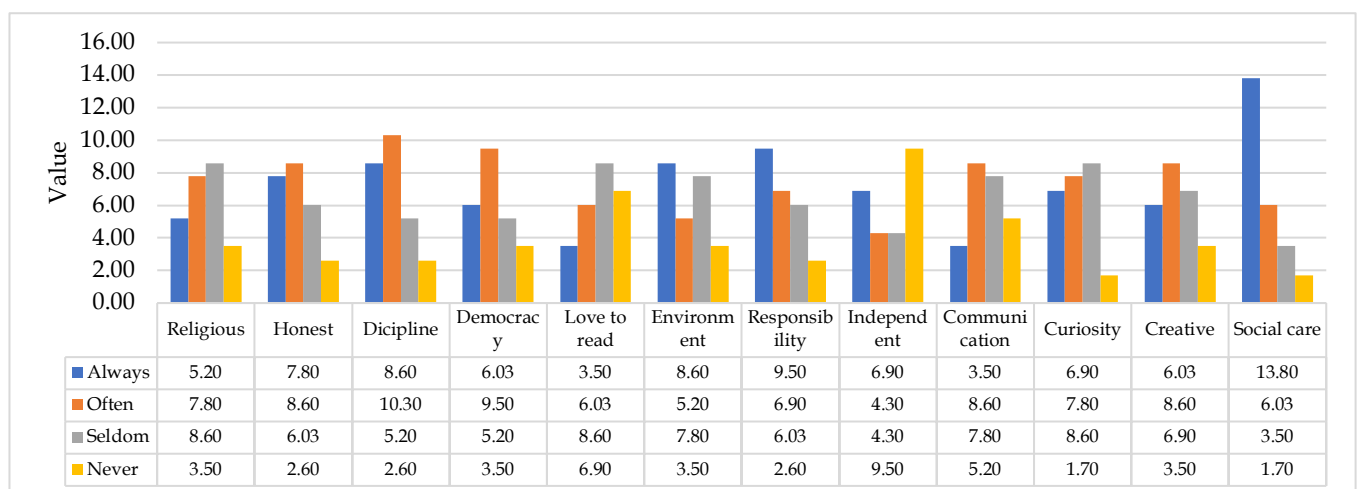


Figure 2. The results of the observational analysis of character education assessment on Genetic Engineering material at State Senior High School 7 Bengkulu.

In order to obtain further information and to support the questionnaire data that have been answered by the students above, interviews were conducted with students of class XII IPA 1. Based on the results of

student interviews, information was obtained that students already understood the impact of Biotechnology and Genetic Engineering on living things and the environment but still need to be guided further

so that students can show a better attitude and character in understanding Biotechnology and Genetic Engineering.

In addition, based on the results of the interview, it was also found that before the biology lesson took place, each class had its own schedule to carry out reciting activities. This is done as an effort to improve students' religious attitudes. The school also instills an attitude of responsibility and care for the environment, upholds the value of discipline (Diadha, 2015).

Overall, from the data obtained, most students already have religious, honest, disciplined, hard-working, democratic attitudes, love to read, care about the environment, responsibility, communicative, creative, and social care (Fatuhurrohman et al., 2017). The character who likes to read and is independent in completing the given task needs to get used to it. One of the suitable methods used to train character education values in children can be done by the habituation method (Hill & Taylor, 2004).

Honesty in students has been well entrenched, this can be seen in the results of the questionnaire which informed about the delivery of data and facts about what was learned had been conveyed honestly and without engineering. Character education can foster an attitude of objectivity, honesty, curiosity, openness, and so on in students (Porter, 2014).

Conclusion

Based on the results of the analysis of character education observations at State Senior High School 7 Bengkulu, it can be concluded that: The picture of character education at State Senior High School 7 Bengkulu is starting to show and some have become well entrenched, such as caring for the environment and caring about social issues. Most students are still not so used to doing things related to the value of character education because teachers have not implemented such teaching methods in the classroom. In an effort to improve student character education, the role of schools and teachers is needed to realize the development of character education.

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