



The Environmental Caring Character through Biology Learning in Senior and Junior High School

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Abstract

This study aims to describe the role of teachers in the planting of environmental cares through biological learning. The study was designed using case study of descriptive-qualitative approach. Research respondents were principals, science and biology teachers, and students in SMP Negeri 1 Batang and SMA Negeri 1 Gringsing. The results show that biology teachers inculcate environmental caring characters that are explicitly present in the syllabus and RPP. Master modeled care for the environment by maintaining the cleanliness of the teachers 'and bathrooms' room. Teachers give response in the form of reprimand / punishment and appreciation (gratitude and praise) to the students related to environmental care. Students carry out cleanliness pickets, conserve electrical energy, and make skills assignments from used goods. It is concluded that teachers play a very important role in the planting of environmental cares. The planting of environmental cares has not been fully integrated in biology learning at SMP Negeri 1 Batang and SMA Negeri 1 Gringsing. Dumpster has not been effectively functionalized. Teachers have not done classroom and drawer hygiene monitoring. The character of environmental care owned by junior high and high school students has not been maximized. There are still some students who throw garbage in drawers, play water, and buy bottled drinks. Based on the conclusions, it is recommended that teachers should instill an environmentally careful character education, streamline waste disposal, teachers conduct classroom cleaners and drawers, and require sanctions for non-compliant students.

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INTRODUCTION

Indonesia has several problems with the environment as reported by the National Disaster Management Agency (BNPb) during early 2017, i.e., the problem of waste, illegal logging, forest fires, poaching of rare and protected animals, and air pollution that cause environmental damage. BNPb data shows the frequency and intensity of the disaster in Indonesia continues to increase from 2002 there are 140 times of recorded disaster events, in 2006 become 740 times, and 2016 to 2,542 times, 95% of the disaster is dominated by hydro meteorological disasters caused by garbage clogging streams, forest fires, and deforestation. Even in the period 2006-2009, the deforestation rate has reached 0.83 million per year and the area of critical land in 2016 reached 24.30 million/ha. This happens because a lot of human actions that do not reflect the love of the environment that cause negative impact. The impact is felt directly by human beings, especially humans. It cannot be denied that the environment and humans have interrelated relationships.

It takes human awareness to not take actions that cause the declining quality of the environment and turn to actions that can preserve the environment. Ways that can be done to establish a good awareness and understanding of the environment such as enlightenment, counseling, guidance, and formal education which is a school (Yafie, 2009).

Schools have a special role to help students understand the impact of human behavior on earth. School should be a model in realizing a healthy and comfortable environment, and become a model in realizing the concerned and cultured environment of the school community which is expected to become an example and transmit the environmental caring character to the community (Defandi, 2015). Schools with a vision and mission that support environmental concerns certainly have their own character-building techniques especially when associated with certain subjects

Character building in the scope of classroom learning can be interpreted as an effort to plan and implement a strategy or learning models aimed at developing academic ability and character building. Character building should be designed by deliberate (by design), not as a companion impact. The characters are illustrated explicitly in the learning steps designed in the form of values, abilities, beliefs, morality, emotional control, and behavior/attitude related directly or indirectly to the nature of the subject (Gusmawati, 2015).

Environmental education material is in the scope of science learning materials specifically Biology. Biology subject makes it possible to link theory with practice that builds students' knowledge of the environment so that the goals of Biology education can be achieved maximally (Husna, 2013). According to Permendiknas RI No. 22 of 2006, Biology subjects are developed through the ability of analytical, inductive, and deductive thinking to solve problems related to the environment.

The cultivation of a caring attitude in biological materials should be trained repeatedly and using different materials. Biology learning process is expected to be able to contribute in the development of a person who cares about the environment as formulated by the Character Education Team of MONE (Ministry of National Education) (2010), that one of the character values in science subject in junior high and biology in high school is environmentally concerned.

The challenge of becoming a Biology teacher is not only to load the students with knowledge and memorization, but also to prepare the young generation for their physical toughness, quality way of thinking, and how to behave towards their natural environment and social environment (Pala, 2011). In such efforts, teachers should be active in implementing environmental education programs. Teachers can motivate students to develop a positive attitude toward the environment (Kaur, 2013).

SMP Negeri 1 Batang is one of the Adiwiyata (independent) schools that became the representative of Batang regency at the provincial level in 2016. This school has long implemented a program of greening and cleaning, some of its activities are one day clean of garbage and gardening. Even in extra-curricular

activities such as Scouts and PMR (youth red-cross) gardening activities are always included. This gardening activity by utilizing the narrow land that is still empty.

SMA Negeri 1 Gringsing is a committed school and systematically develops programs to internalize environmental caring values into all school activities (Green School). The school has a large area of land that can be used as a greenhouse and pharmacy gardens that are managed by students. Greenhouse contains ferns and flowers, pharmacies gardens containing medicinal plants that can be used as a source of student learning

Based on the description above, the environmental caring character must be instilled into the students through the school path, one of them is in biology learning, so that students not only understand the theory but also apply how to create a good, healthy and can reduce the damage that can cause disaster. Schools have a responsibility to shape the student's caring character. So, it is necessary to study the formation of environmental caring character through learning by describing the role of teachers and students' environmental caring characteristic that is formed from biology learning activities.

Based on that problem has been presented, the purpose of this study is to describe the role of biology teachers and students' environmental caring character. Therefore, research on the students' environmental caring character through Biology in junior high and high school

RESEARCH METHODOLOGY

This study is a case study using a descriptive-qualitative approach that describes the condition and description of observation results during the research process in SMP Negeri 1 Batang and SMA Negeri 1 Gringsing. Respondents of this research are principals, Biology teachers, and students of SMP Negeri 1 Batang and SMA Negeri 1 Gringsing. The data taken in this study includes data on teachers' role and students' environmental caring character conducted through the interview, observation, questionnaire, and documentation study. Data obtained from the observation, interview, documentation, and questionnaires tested the validity of data with triangulation of sources and methods. Triangulation of sources is done by comparing data from three sources, namely; principals, teachers, and students. The overall information is reduced according to the focus of the study, furthermore having similarities categorized and included in the triangulation. The categories created are then synthesized, which are linked to categories. The interrelationship between categories is made into a description as a result of the analysis so that it can be interpreted according to the research focus.

RESULTS AND DISCUSSION

Based on the results of the research data analysis, it is known that the role of teachers is very important in the building of environmental caring character of students in schools and teachers also must be able to integrate into Biology learning. So, the education of environmental caring character in SMP Negeri 1 Batang and SMA Negeri 1 Gringsing can be reviewed from two things, which are (1) the role of Sciences/Biology teachers in building the environmental caring character, and (2) the developed students' environmental caring character.

Role of Sciences/Biology Teachers in Building the Environmental Caring Character

Based on the result of research data, it is known that the teacher has been instrumental in building the students' caring character in the school. The science / biology teacher plays a role in instilling environmental cares by integrating environmental caring characters in biology learning, providing examples, and providing responses and reinforcement to students relating to environmental caring characters.

Based on the observation, the science teacher of SMP N 1 Batang has instilled environmental caring character in its learning activities on the interaction material of living creature with its environment,

environmental pollution, and global warming. Students are invited to observe the environment directly or using media such as photos or video. Students are asked to observe the interaction of living creatures in the neighborhood, in accordance with the teacher's RPP.

Senior high school biology teacher is known to have instilled a caring character in almost all materials. For example, in a chapter study of the nervous system, the teacher gives an example of reflex motion and he conveys, "if you see rubbish strewn but just silent, it means your nervous system is less sensitive to stimuli because there is no reflex to clean it." documents in the form of syllabus and RPP of senior high school teachers, are known in the explicitly written syllabus of characters to be constructed and in the lesson plan developed in the learning activities.

The importance of preserving the environment can be known to students from observation activities surrounding environment. Science and biology subjects are linked between the methods and materials provided with the education of environmental caring characters. Teachers get an important role in helping students understand and inculcate the values of environmental caring character so as to be able to cultivate, manage, and preserve the environment wisely, while students play a role to carry out these values in their daily life (Sha'ban, 2014).

In schools, teachers give an example in the application of environmental care because teachers meet most often with students. Based on the observations in junior and senior high schools, teachers have given examples of environmental care attitude. Junior and senior high school teachers are well dressed, taking care of the plants, turning the projector off after they finish using, inviting and asking students to grow crops, and throwing garbage in its place. It is directly modeled by the students. However, the teacher still has not set an example of disposing of waste according to his type in the disposal bin, so the students also do not sort the garbage. Students' habits of disposing of waste according to their type are formed by using modeling techniques (learn and observe directly). Providing examples by teachers provides an increase in student behavior in disposing of waste by type (Anifa et al, 2017).

The existence of the teacher as a role model of environmental cares is consistent with Peterson and Deal's statement (in Zuchdi, 2010) which states that teacher's role in character education is not only a transferor of science, but also as a transferor of values. Related to this matter can be interpreted by teacher need to show action concrete care of environment with hope of student can more easily understand, follow, and apply environmental care activity in everyday life.

The formation of environmental cares can not be separated from the response of students in performing an action. The response is in the form of reprimands or punishments for students demonstrating environmental damages and appreciation for students demonstrating care or maintenance of school facilities and environments.

Based on observations, science and biology teachers have strengthened at the beginning of the lesson. The teacher asks the students to look under the table, chairs, and check what's in the drawer. Trash is taken by students after being asked by the teacher. The teacher expressed his gratitude after the students cleared the garbage in the classroom.

Teachers reprimand even punishment for students who do environmental damaging measures intended to remind that it is not true and should not be done anymore. The punishment given by junior high school teachers is to ask students to pick up garbage throughout the school environment and high school teachers punish students for bringing plants to school and taking care of them every day. This is done by teachers of junior high and high school to form a stronger environmental caring character, so that students can understand and understand the importance of environmental care in the present and future life.

Provision of punishment to students related to the value of environmental care in accordance with the Ministry of National Education (2010) is a spontaneous activity against the negative actions of students in the strategy of character education implementation that contains the value of environmental care. Spontaneous reprimand or punishment as an attempt to improve attitudes or behaviors that are undertaken immediately for the negative actions of students concerned with environmental care. This spontaneous

action is already owned by the teacher when it sees negative student actions. From these activities, the student can have spontaneous action when seeing his friend performing a negative action on the immediate environment gives a reprimand.

Students who demonstrate the act of caring for or maintaining the facility and the school environment also get appreciation from the teacher. Appreciation given by science teacher in SMP Negeri 1 Batang and biology teacher at SMA Negeri 1 Gringsing in the form of gratitude and praise. Praise is given not only in front of the students, but in front of other students in the hope that other students also take action to care about the environment. Giving appreciation is done spontaneously to eligible students, it will give students confidence that what they do is correct. The hope is that students can maintain and enhance positive actions to the environment.

In addition to punishment and appreciation, teachers should also check. When the teacher asks students to clean the drawer, the teacher should also check whether the drawer has been cleaned or not. This is a reinforcement for students to actually do what the teacher instructs them to do.

Students' Environmental Caring Character

Environmental caring character is seen from the way students maintain the cleanliness and beauty of the classroom environment, save energy, and reduce waste production. Students maintain class cleanliness by carrying out cleanliness pickets. In junior high and high school have been carried out cleanliness picket well every before and finish learning. This is evidenced by the formation of daily picket schedules in both schools, and weekly picket schedule in high school which is held every Friday. The cleanliness picket is still executed even though no teacher is waiting or watching. Student activities in maintaining the cleanliness and beauty of the classroom environment are sweeping across the class floor, chairs placed on the table in reverse, erasing the blackboard, and mopping floors only once a month in junior high. Floor-mopping activities in high school performed every floor looking dirty, because students took off their shoes when they went to class.

There are 20% -30% of students who have not maintained class cleanliness, such as storing garbage in a drawer. Rubbish that is stored in the form of plastic garbage, waste paper, and smelly food wrap. This shows that students do not have a good environmental attitude.

Various hygiene kits were provided by the school in the form of brooms, duster, and ingkrak placed in the back corner of the classroom, erasers on the teacher's desk, garbage can in front of the classroom, water faucet in front of each class that drained clean water, park in front of class, and slogan -logan or hygiene posters in front of the class. Hygiene treatment by students is still not good, seen there are some brooms and broken ingkrak make the class look less tidy.

There are types of non-pit bins located in front of each class and divide in both schools. The garbage bin in junior high school is located in the ceremonial grounds, the front hall of the teachers' room, and the side of the mosque. The location of the garbage can be found in the lobby, the front of the teacher room, and the front of the class XII B.

The waste segregation in junior high and high school is not implemented even though the dumpster has been provided. Trash dumped in the trash is still mixed between organic and inorganic waste. Many of the students do not know why the waste should be segregated by type. This is due to the absence of strict rules and direct example in schools about sorting waste. The behavior of separating the waste according to its type is influenced by the knowledge possessed, the facilities, and the surrounding behavior. In school there are only 9% of students who have knowledge of waste separation (Zakians et al, 2017).

The water tap is provided in front of each class that students have used to wash their hands and water the plants. Most of the existing water faucets can function properly. The drainage stream from the faucet is smooth, supported by a clean drain without plugging as evidenced by the absence of standing water.

The bathrooms in junior and senior high schools are divided into teachers 'and students' bathrooms. The teacher's bathroom is located behind the teachers' room, next to the BK room, and near the library

room. Each divided into 2 separate rooms between men and women. This bathroom looks always clean because the teacher has awareness to maintain cleanliness.

Junior high school students' bathrooms are located behind the classrooms IX B and VII F, each of which is divided into 4 girls' bathrooms and 3 men. Bathroom of 10 high school students. In addition to each classroom building there are 2 bathrooms and each is divided into 2 spaces (separate between men and women). Students do not have the awareness to maintain the cleanliness of the bathroom, the bathroom floor looks crusty and smelly.

Other facilities provided to support the beauty of the classroom environment is the park in front of each class. In junior high, the classroom park is located elongated on the classroom terrace from east to west. The garden has a variety of plants from flowers grown in ordinary pot or hanging pot. The park looks beautiful and neat. Junior high school students take care of this garden by not picking leaves, flowers, or fruit according to the results of interviews with science teachers. All the plants thrive because they are treated and watered every morning by the janitor.

The high school park is in front of every class whose care and planting is the responsibility of the class. There are various plants of flowers planted in pots and on the ground. There are also fruit plants such as mango, rambutan, papaya, and starfruit. Park conditions of each class are different. The park is treated, watered, and cleaned of weeds look neat and the plants thrive. There are 3-4 grade gardens that are not treated and watered so that the plants die.

Character of environmental care can be seen from the attitude of junior high and high school students in saving electrical and water energy. Science Teachers argue, during this junior high school students have responded to turn off the lights when there are lights when lighting in the class enough. Teachers also often ask for help to their students to turn off the projector after it is finished.

Based on the observation, students already have the attitude of saving energy. This is evidenced by the lights off when the lighting in the class is sufficient and the water faucet in front of the classroom or in the bathroom is closed when not in use. Students have shown the habit of using water tap to wash hands though sometimes still doing in less appropriate way (while playing).

Students who have high energy-saving awareness level are more dominated by female students. In addition, female students are more likely to hesitate without warning someone who is not paying attention to energy savings (Akamtis, 2011). In accordance with this research, female students in junior high and high school have a better energy-saving attitude. Visible when the observation of male students using water to play, female students there are reminiscent.

As an energy-saving supporter, the school put slogans containing invitations to water and electricity-saving. Water-saving slogan is affixed to the WC near the water faucet and the electric saving slogan is affixed to the wall above the outlet of each classroom that can be seen by the students.

The habits of students and all the citizens of the school in the use of tap water and bathroom if it is done properly and as it should be more cleanliness of the self. The sustainability of the water source is more awake. This energy-saving culture is not only a normative appeal, but there must be clear rules on energy saving through cooperation between Ministry of Research and Technology and Ministry of Energy and Mineral Resources and Ministry of Defense so as to develop a culture of sustainable energy application (Khotimah, 2017).

One aspect that can be used as an indicator of environmental care in schools is how students minimize waste production. These objects potentially become garbage when not in use. So that SMP Negeri 1 Batang and SMA Negeri 1 Gringsing provide input to students to bring lunch and eat from home. In addition to reducing waste can be nutritional and hygiene. One of the appeals that teachers give to students in order to minimize waste production in schools with the movement held refill bottles and dinner boxes from home. But in fact the appeal has not been done 100%. Still about 40% of junior high school students do not carry on the grounds that nobody is preparing and is not practical.

In high school, 70% of students do not bring refillable bottles from home. Students have no reason to have bottles, carry only when there is a gym lesson, and make the bag gain weight. This is due to the

lack of awareness of students about the importance of minimizing waste production and schools have not provided firm regulations regarding this.

Reducing waste production in schools is done by utilizing used goods into useful skills products (Wibowo, 2009). Junior high and high school instructed the teacher so that in the learning activities can take advantage of used goods as one source of learning. Used goods used as props, wall hangings, and place put items owned by students. IPA Teachers ask students to make interesting skills from used goods and biology teachers ask students to make pots from used bottles that are dropped in front of the class.

Knowledge of sustainable waste management relates and positively contributes to attitudes towards waste management. Knowledge is a very important factor for the formation of a person's actions, because from experience and research results turned out that the behavior based on knowledge will be better than not based on knowledge (Gusti, 2015). In both schools, the provision of knowledge about waste management occurs only when the teacher gives the task of making skills from waste / scrap. No follow-up activities such as waste-processing training become something useful beyond school hours, so the students' desire to process and reduce waste production is lacking.

CONCLUSION

Based on the results of research and discussion, it is concluded that teachers play a very important role in the planting of environmental cares. The planting of environmental cares has not been fully integrated in biology learning at SMP Negeri 1 Batang and SMA Negeri 1 Gringsing. Dumpster has not been effectively functionalized. Teachers have not done classroom and drawer hygiene monitoring.

The character of environmental care owned by junior high and high school students has not been maximized. There are still some students who throw garbage in drawers, play water, and buy bottled drinks. Based on the conclusions, it is recommended that teachers should instill an environmentally careful character education, streamline waste disposal, teachers conduct classroom cleaners and drawers, and require sanctions for non-compliant students.

REFERENCES

- Akamtis, Hilal. 2011. Determining Energy Saving Behavior and Energy awareness of Secondary School Student according to Socio-Demographic Characteristics. *Academics Journals*. ISSN 1990-3839
- Anifa, T., H.H. Anward, & N. Erlyani. 2017. Perbedaan Perilaku Membuang Sampah pada Siswa antara Sebelum dan Sesudah Diberikan Live and Symbolic Modelling. *Jurnal Ecopsy*. Volume 4, Nomor 2
- Defandi, M. 2015. Mewujudkan Masyarakat Berkarakter Peduli Lingkungan melalui Program Adiwiyata. *Sosio Didactic: Social Science Education Journal*, 2(1): 31-37.
- Gusmaweti. 2015. Character Building with Student in Science Approach Scientific. *Jurnal IPTEKS Terapan Research of Applied Science and Education*. Volume 8 i4,183-191. Padang: Biology Education Studies Program FKIP Bung Hatta. ISSN:1979-9292.
- Gusti, A., B. Isyandi, S. Bahri, & D. Afandi. 2015. Hubungan Pengetahuan, Sikap dan Intensi Perilaku Pengelolaan Sampah Berkelanjutan pada Siswa Sekolah Dasar di Kota Padang. *Dinamika Lingkungan Indonesia*. Volume 2 Nomor 2. ISSN 2356-2226
- Husna, S. 2013. Penerapan Model Problem Based Learning pada Konsep Perusakan dan Pencemaran Lingkungan Siswa SMA Negeri 1 Sabang. *Jurnal EduBio Tropika*. Edisi Khusus Desember Volume 1 No. 2: 61-120.
- Kaur, S. 2013. Role of Teachers in Imparting Invironmental Education for Sustainable Development. *International Education E Journal*, II(II):10-16
- Khotimah, Khusnul. 2017. Wujud Bela Negara melalui Pendidikan Budaya Hemat Energi. *Jurnal Pertahanan & Bela Negara*. Volume 7 Nomor 3.
- Pala, A. 2011. The Need for Character Education. *International Journal of Science and Humanity Studies*. Volume 3 nomor 2. Turkey: Educational Science Department of Celal Bayar University. ISSN:1309-8063
- Sya'ban, M.F. 2014. Kepedulian Lingkungan dengan Pembelajaran IPA Terintegrasi Kearifan Lokal. *Quantum, Jurnal Inovasi Pendidikan Sains*, Vol.5, No.2:82-86
- Tim Kementerian Pendidikan Nasional. 2010. Pengembangan Pendidikan Budaya dan Karakter Bangsa. Badan Penelitian dan Pengembangan Pusat Kurikulum: Jakarta.
- Wibowo, Istiqomah. 2009. Pola Perilaku Kebersihan: Studi Psikologi Lingkungan tentang Penanggulangan Sampah Perkotaan. *MAKARA, Social Humaniora*, Vol 13, No. 1: 37-47.

- Yafie, A. 2009. *Merintis Fiqh Lingkungan Hidup*. Indonesia: Ufuk Press.
- Zuchdi, D. 2010. Pengembangan Model Pembelajaran Karakter Terintegrasi dalam Pembelajaran Bidang Studi. *Jurnal Cakrawala Pendidikan*, 29 (1): 1-12
- Zakianis, Sabarinah, & I.M Djaja (2017) The Importance of Waste Management Knowledge to Encourage Household Waste-Sorting Behaviour in Indonesia. *International Journal Waste Resour* 7: 309. doi: 10.4172/2252-5211.1000309