Blended Learning Strategy on Disaster Mitigation Learning to Improve Character Care of The Environment

Mustolikh¹*, Dasim Budimansyah², Darshiarjo², Encep Syarief Nurdin²
¹Lecturers of Universitas Muhammadiyah Purwokerto, and Doctor’s Candidate of General and Character Education - Universitas Pendidikan Indonesia.
²Universitas Pendidikan Indonesia

*mustolikh@ump.ac.id

Abstract. Humans are given freedom in managing the earth, but everything must be carried out with a full sense of responsibility. The position of humans is only as users, enthusiastic, or managers, and not the ruler, so humans should not arbitrarily treat the earth. If there is damage to the earth or natural disasters, it must be believed to be the result of human actions, not naturally, because from the beginning, the universe was determined to meet human needs. The research tried to find the way to improve students’ character environment concern on grade XI SMA Negeri 1 Rawalo students using blended learning strategy on disaster mitigation learning. The data were from observation, interview, and documentation. Then, they were analyzed by qualitative analyzing. Blended learning strategy implementation on disaster mitigation learning was effective to improve students’ character environment concern. It could be seen on the class and school situation that had been clean, neat, fresh, and green. This proves that students' concern for the environment can affect the development of student character, especially the character of discipline and responsibility in protecting and caring for the environment.

1. Introduction

Indonesia is an archipelago located geographically at the confluence of three tectonic plates namely the Indo-Australian, Eurasian and Pacific plates. In the southern and eastern parts of Indonesia there are volcanic belts in the form of volcanic mountains. This condition causes Indonesia to potentially be vulnerable to disasters such as volcanic eruptions, earthquakes, tsunamis, floods, landslides, erosion, abrasion, hurricanes, etc. (Indriasari [10]; Royeza [15]; Wicaksono [19]; Desfandi, M. [6]). Central Java Province is ranked as the first ranked disaster-prone region in Indonesia, and Banyumas is one of the most disaster-prone districts in Central Java. This is supported by the data of various
natural disasters that occurred in Banyumas district during the last 5 (five) years from 2014 to 2018, as shown in Table 1.

| No | Disaster type | Amount/ Year | Amount | Percent age (%) |
|----|---------------|--------------|--------|----------------|
| 1  | Flood         | 2 2 11 8 3 26 | 26     | 15.38          |
| 2  | Landslide     | 3 7 26 35 14 85 | 85     | 50.30          |
| 3  | Tornado       | 2 5 13 13 56 | 56     | 33.14          |
| 4  | Drought       | 0 0 0 2 2 | 2     | 1.18           |
|    | Amount        | 7 14 50 66 32 169 | 169   | 100.00         |

Source: BNPB, 2019

The efforts did by the Banyumas Regency BPBD to handle the natural disasters emphasize was less structural mitigation and emphasize non-structural mitigation. Therefore, an important blended learning strategy is carried out, to make people can live harmony with disaster. As Littlejohn, A., & Pegler, C. [13] says in reality on the ground, schools tend to apply hybrid / blended learning compared to face-to-face or just online. Blended learning, conceptually, is not just a combination of face-to-face learning and online learning. But, furthermore is the art of integrating a variety of learning resources and appropriate learning activities where students can interact and build ideas together. Littlejohn and Pegler's opinion emphasizes the concept of active learning that is student centered learning.

2. Literature Review

2.1. Blended Learning (BL)

Blended Learning (BL) is a learning system that combines face-to-face lectures with e-learning based learning systems both offline and online (Meyer [14]; Allen et all [1], and Watson [18]). This system can be regarded as an update because the delivery of material can be done in class and online. This combination of learning can be done well between face-to-face learning where teachers and students can meet face-to-face and meet face-to-face and learning through online media that can be accessed anytime and anywhere. Blended learning becomes a strategy for the problem of limited learning time due to lack of teaching staff, for example, and the ease with which students feel bored in conventional learning processes, in addition to being a demand for the development of increasingly broad and massive information and communication technology. BL was developed because of the weaknesses that arise in face-to-face learning and e-learning if used separately. Therefore, the motivation for using this model is to take advantage of both their advantages and at the same time avoid their weaknesses (Boelens, De Wever, & Voet [4]). BL is also proven more effective in improving learning achievement. In terms of achieving learning outcomes, BL class conditions exceed conventional classroom learning conditions, which is about one third of the standard deviation (g + = 0.334, k = 117, p <0.001) (Bernard, Borokhovski, Schmid, Tamim, & Abrami [2]). A number of other experts based on the results of their research report that the BL system is very relevant to the characteristics of future education approaches and methodologies (Guo [7]; Cai, Yang, Gong, MacLeod, & Zhu [5]. First, learning activities in a flipped classroom. By e-learning facilities, students have more learning opportunities in various places and times and can even study distance. This learning model according to previous
studies have proven to be used to improve the process of acquiring new knowledge (Simonova [16]).

2.2. Disaster Mitigation
Disaster Mitigation, is a series of efforts to reduce disaster risk, both through physical development and awareness raising and capacity building to face the threat of disaster (Article 1 paragraph 6 of Government Regulation No. 21 of 2008 concerning the Implementation of Disaster Management). Disasters are events or series of events that threaten and disrupt people's lives and livelihoods caused, both by natural and / or non-natural factors as well as human factors, resulting in human casualties, environmental damage, property losses, and psychological impacts.

In general, the definition of mitigation is an effort to reduce and / or exclude victims and losses that may arise, and then the emphasis should be given at the stage before the disaster, which is mainly taming / damping activities or known as Mitigation. Based on Law No. 24/2007, Chapter I General Provisions, Article 1 number 9 and Government Regulation No. 21/2008, Chapter I General Provisions, Article 1 number 6, mitigation is an effort aimed at reducing the impact of disasters. Mitigation is a series of efforts to reduce disaster risk, both through physical development and awareness raising and capacity building to face the threat of disaster. Furthermore, on Law No. 24/2007, Chapter I General Provisions, Article 1 number 9 and Government Regulation No. 21/2008, two disaster mitigation events were found, namely structural and non-structural mitigation.

2.3. Character Care on The Environment
Jonathan Webber [8] on *Journal of Philosophy* explained that character is the accumulation of various characteristics that appear in the way of thinking, feeling and acting. Blackford, Katherine M.H., and Arthur Newcomb [3], mentioned the character consists of three interrelated behaviors, namely: (1) know the meaning of goodness; (2) want to do well; and (3) is clearly behaved. These three psychological substances and processes lead to the moral life and moral maturity of the individual. In other words, character can be interpreted as a good personal quality. Hamzah [9] explained that environmental care is an expression of the mental attitude of individuals that is reflected in their behavior. Caring for the environment is one of the characters that must be developed in schools.

Caring for the environment is the attitude and action that always seeks to prevent damage to the surrounding natural environment, and develop efforts to repair natural damage that has already occurred. Environmental care is a character that must be possessed by students. The character of caring for the environment can reflect the concern and sensitivity of students to their environment.

3. Research Methodology
It was qualitative study, it adjusted to the objectives research on improving grade XI students of SMA Negeri 1 Rawalo on environmental care character through a blended learning strategy. It was descriptive research, that described the development of environmental care characters. Data obtained through observation, interviews and documentation, then analyzed qualitatively.

4. Result and Discussion
The implementation of blended learning strategy in disaster mitigation learning in SMA Negeri 1 Rawalo, was effectively applied to the development of environmental care characters, seen from the classroom and school conditions that are clean, neat, fresh and green. It showed that students' concern for the environment can influence the development of student character, especially the character of discipline and responsibility in protecting and caring for the environment. The implementation of the blended learning strategy at SMA Negeri 1 Rawalo, makes: (1) students can freely study the subject matter independently by utilizing the material available online; (2) students can also communicate and discuss with teachers and other students both in the classroom on face-to-face learning and in online discussion forums; (3) online learning activities carried out by students outside face-to-face hours can be managed and controlled well by the teacher, and (4) teachers can provide enrichment material through internet facilities with the help of Google classroom.

The successful implementation of the blended learning strategy in disaster mitigation learning, supported by the vision and mission of SMA Negeri 1 Rawalo, between its vision and mission are: preserving nature and not damaging the environment. Adiwiyata's application at SMA Negeri 1 Rawalo, helped support the successful implementation of the blended learning strategy in an effort to develop a character that cares about the environment. This is in accordance with Krajhanzl's theory [12] which states that the goals intended by the Adiwiyata program is manifestations of environmental care behavior. Some components of Adiwiyata are directly related to the formation of environmental care behaviors which are described through three aspects, namely the level of knowledge, attitudes, and behavior. In the previous theory it was stated that the factors that influence environmental care behavior are very complex and involve many aspects. There is no guarantee that one of the three aspects are good, so the behavior of caring for the environment is also good, the results of the study have also shown similar results. Therefore, researchers agree with Meyer [14] that not always a high level of knowledge will encourage someone to behave in an environmentally conscious manner. A good attitude also doesn't necessarily reflect good actions or behavior. The formation of environmental care behavior is very complex because it involves internal and external factors that are interrelated, in addition there is also a barrier factor for someone to change their behavior.

5. Conclusions and Suggestions
5.1. Conclusions
The application of the blended learning strategy to disaster mitigation learning is effectively applied to the development of environmental care characters, seen from the classroom and school conditions that are clean, neat, cool and green. The successful of the blended learning strategy implementation in disaster mitigation learning was supported by vision and mission, as well as the implementation of Adiwiyata in SMA Negeri 1 Rawalo.

5.2. Suggestions
To realize developing the character of caring for the environment is not enough to involve only one modifying aspect or certain parties (for example schools only), for this reason it is necessary to consider all aspects involved and cooperation between all parties.

References
[1] Allen, et all. (1998). *Crop Evapotranspiration*. FAO Irrigation and Drainage Paper.
[2] Bernard, R. M., Borokhovski, E., Schmid, R. F., Tamim, R. M., & Abrami, P. C. (2014). A meta-analysis of blended learning and technology use in higher education: From the general to the applied. *Journal of Computing in Higher Education*. https://doi.org/10.1007/s12528-013-9077-3
[3] Blackford, Katherine M.H., and Arthur Newcomb. (2004). *Analyzing Character*. Gutenberg: eBook.
[4] Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: a systematic literature review. *Educational Research Review*, 22, 1-18. DOI: https://dx.doi.org/10.1016/j.edurev.2017.06.001
[5] Cai, J., Yang, H. H., Gong, D., MacLeod, J., & Zhu, S. (2019). Understanding the continued use of flipped classroom instruction: A personal beliefs model in Chinese higher education. *Journal of Computing in Higher Education*, 31(1), 137–155. https://doi.org/10.1007/s12528-018-9196-y
[6] Desfandi, Mirza. (2015). “Mewujudkan Masyarakat Berkarakter Peduli LingkunganMelalui Progam Adiwiyata”. *Jurnal Ilmu Pendidikan Sosial*. Vol. 2, No. 1,31-37.
[7] Guo, J. (2019). The use of an extended flipped classroom model in improving students’ learning in an undergraduate course. *Journal of Computing in Higher Education*, 31(2), 362–390. https://doi.org/10.1007/s12528-019-09224-z
[8] Jonathan Weber. (2006). *Sarte’s theory of character*, *Europe Journal of Philosophy*. Blackwell Publishing House, UK.
[9] Hamzah, Syukri. (2013). *Pendidikan Lingkungan: Sekelumit Wawasan Pengantar*. Bandung: Refika Aditama.
[10] Indriasari, T. D., Anindito, K., & Julianto, E. (2015). Analisis dan Perancangan Sistem Pengumpulan Data Bencana Alam. *Jurnal Buana Informatika*, Volume 6, Nomor 1, Januari 2015: 73-82
[11] Indrawati, R. (2014). Implementasi pendidikan karakter pada program adiwiyata melalui kegiatan lingkungan berbasis partisipatif di SMK Negeri 1 Turen. Skripsi. Universitas Negeri Malang.
[12] Krajhanzl, J. (2010). Environmental and pro environmental behaviour. *School and Health Journal*, 21, 251-274.
[13] Littlejohn. A. and C. (2014). Pegler, *Preparing for blended e-learning*. Routledge.
[14] Meyer, A. (2015). Does education increase pro environmental behavior? Evidence from Europe. *Journal Ecological Economic*, 116,108-121.
[15] Royeza, Suci Salmaningsih, dkk. (2015). Perkembangan dan Karakteristik Permukiman pada Wilayah Rawan Bencana Gempabumi di Pelabuhan Ratu. *Prosiding Pertemuan Ilmiah Tahunan Riset Kebencanaan Ke-2*. Yogyakarta: Universitas Gadjah Mada.
[16] Simonova, I. (2019). Blended approach to learning and practising English grammar with technical and foreign language university students: Comparative study. *Journal of Computing in Higher Education*, 31(2), 249–272. https://doi.org/10.1007/s12528019-09219-w
[17] Vandeputte, G.E., V. Deryeke, J. Geroms, and J. A. Delcour. 2003. Structural aspects provide insight into swelling and pasting properties. *Journal of Cereal Science*. 38 (1) : 53-59.
[18] Watson. (2003). Corn: chemistry and technology. *American Association of Cereal Chemists*, Inc. St. Paul Minnesota. USA.
[19] Wicaksonoa, Dhoni, dkk. (2015). Analisis Multi Skenario Dampak Tsunami Di Kawasan Pesisir Kabupaten Kulon Progo, Daerah Istimewa Yogyakarta. Prosiding Pertemuan Ilmiah Tahunan Riset Kebencanaan Ke-2. Yogyakarta: Universitas Gadjah Mada.