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Learning Methods on Environmental Education to Improve Pre-Service Teachers' Environmental Literacy

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Abstract

Environmental damage is still happening. The wrong human perspective on the environment that causes this damage continues. Only humans with environmental literacy can solve environmental problems. Environmental education is seen as the most effective way to educate people about environmental issues at all levels of education. Teachers are the front line in the success of education. However, there is no special program to prepare pre-service teachers' environmental literacy on teachers through environmental education. A literature review is used to explore which learning methods are effective in improving attitudes, knowledge, and environmental behaviors for pre-service teacher students in scientific articles published from 2011 to 2021. Scientific articles were source from Google Scholar, ERIC, EBSCOhost, SAGE, Taylor & Francis, Sciencedirect, JSTOR, and Proceeding online. Twenty-one articles were selected from predetermined criteria. From the results of the analysis, learning methods in environmental education that are effectively used to improve the environmental literacy of pre-service teacher students include Environmental Education courses, Outdoor-based learning, Project Based Learning (PjBL), Problem Based Learning (PBL), Science, Technology learning, Engineering, and Mathematics (STEM), Constructivist Learning, Guided Inquiry, Demonstration, Environmental and Sustainability Education (ESE), Pedagogical Experiments, 3R-oriented learning, Contextual Approach based on local wisdom, environmental education based on transformational learning theory, and Integration of drama, film, and educational videos. The choice of method must still be adjusted to the learning material.

Keywords: Literature Review, Prospective Teacher, Environmental Attitude, Environmental Knowledge, Environmental Behavior

INTRODUCTION

Forest and land fires continue to occur (KLHKa, 2018), water quality has not fully improved in recent years (KLHKb, 2018). Whereas future life is determined by the current environment (Marfai, 2019).

The different human perspective on himself and the environment in where he lives is the beginning of the environmental damage that occurs (Keraf, 2011). Environmental Education is seen as the most important means of increasing human understanding and concern for environmental issues (Kospa, H.S.D., 2021). The main learning outcome of environmental education is environmental

literacy (Srbinovskia, M., Erdogan, M., Ismailia, M., 2010). Only environmentally literate humans are able to overcome environmental problems (Köse, S., Gencer, A. S., Gezer, K., Erol, G. H., & Bilen, K., 2011). However, there is no special program on teacher candidate education to prepare environmentally literate teachers. So this research focuses on finding the right method to improve environmental literacy in the form of knowledge, attitudes, and behaviors that support the environment for student-teacher candidates both intracurricular and extracurricular.

METHOD

This study uses a systematic study approach to find out what learning methods and the most effective learning methods are used in order to improve the environmental literacy of prospective teacher students from 2011-2021. Data was obtained from empirical research in the form of scientific articles. Scientific articles were sourced from Google Scholar, ERIC, EBSCOhost, SAGE, Taylor & Francis, Sciencedirect, JSTOR, and Proceeding online. The keywords used to search for scientific articles in these sources include, "teaching method", "environmental education", "environmental education", "environmental literacy", environmental literacy", "environmental attitude", "attitude towards the environment". ", environmental care attitude, “environmental knowledge”, “environmental knowledge”, “environmental behavior”, behavior towards the environment”, “environmental awareness”, “outdoor activity”, “education students”.

The results of the research on the scientific article must meet the criteria; (1) the subject is a student-teacher candidate; (2) the topic of scientific articles discusses learning methods to increase knowledge, attitudes, or behaviors that support the environment; (3) scientific articles published from 2011 to 2021; (4) clear methodology; and the last (5) the instrument used must be valid and reliable.

RESULT AND DISCUSSION

The research subjects in the selected scientific articles are mostly from the science family. This is seen from the number of studies on the subject, not the number of respondents. Of the 21 selected articles, 9 of them examined prospective teachers from the science family. There are prospective teachers from the science clusters who are prospective science teacher students (3), biology teacher candidates (4), physics teacher candidates (1), and chemistry teacher candidates (1)

The majority of research examines the environmental literacy of prospective biology teachers because in the field of biology there are many materials that discuss environmental problems, making it easier for researchers to integrate environmental literacy in their research. In addition, in the biology education study program at several universities, there are special courses on the environment, namely the Environmental Education course (Anita, Y., Nur, M., and Nasir, M., 2020).

Prospective teachers from non-science clusters are also researched and their environmental literacy is developed. Most of them come from prospective elementary school teachers (7), prospective geography teachers (2) and some are from prospective sports teachers (1). There are 2 pieces of research that do not explain in detail what field of education teacher candidates are studying for their environmental literacy. Planting the foundation for environmental learning should be done early on so that students have an understanding of the environment (Purnomo, A. 2015), perhaps this is what causes a lot of research related to environmental literacy involving prospective elementary school teachers in non-science clusters so that students from an early age already have an understanding of environmental literacy. environment, be kind to the environment, and behave in an environmentally friendly manner.

The selected scientific articles meet the criteria that research is related to environmental literacy which can be in the form of environmental knowledge, attitudes towards the environment, and also environmental care behavior. Of the 21 selected articles, 8 articles discuss efforts to improve teacher candidates' attitudes towards the environment to be more positive, 9 articles discuss efforts to increase environmental knowledge, 3 articles discuss efforts to increase behavior to be more pro-environmental,

and 2 articles discuss efforts to increase environmental literacy in general. . This improvement effort can be carried out by one type of environmental literacy or two types of environmental literacy at once. Efforts to increase attitudes to be more positive have become a research trend for the last 10 years because of the wrong human perspective on the environment and needs to be corrected (Mutiani, 2017).

Various learning methods have been used as an effort to increase arch literacy in the form of increasing environmental knowledge, attitudes towards the environment, and or pro-environmental behavior. Of the 21 selected scientific articles, 13 learning methods were carried out to improve the environmental literacy of prospective teacher students.

Learning outside the classroom or outdoor learning is a favorite of researchers in increasing the environmental literacy of prospective teacher students. Learning based on the use of learning resources outside the classroom is able to increase the knowledge of prospective teachers on water pollution, soil pollution, air pollution, and energy-saving materials (Amini, R. and Munandar, A., 2010) and materials in Environmental Geography courses. (Purnomo, A., 2015, and Andini, NF, 2018).

The next learning method that is also a favorite among researchers in increasing the literacy of prospective teacher-students is Project-Based Learning (PjBL). PjBL is appropriate for action-oriented learning (Green, C., Medina-Jerez, W., and Bryant, C., 2015). Materials about environmental problems that are accompanied by actions to overcome these problems are indeed the best using PjBL, so that the knowledge and attitudes of prospective teacher students increase for the better (Marpaung, China, Pramudiyanti, and Maulina, D. 2012; Perkasa, M. , Annafi, N., and Mutmainna, PA, 2018).

Learning methods that have succeeded in increasing environmental literacy both attitudes, knowledge, and actions are the Problem Based Learning (PBL) method on environmental physics material (Khanafiyah, S., Yuliant, D., 2013) and on environmental material that has been modified with environmental literacy. (Anita, Y., Nur, M., and Nasir, M., 2020).

Other environmental education lessons that have succeeded in increasing the environmental literacy of prospective teacher students are the STAD and Demonstration models. In the STAD model, students are given the opportunity to collaborate, elaborate, with peers, in group discussions to solve a problem. the group consists of heterogeneous members consisting of men and women as well as various ethnic groups and has various levels of ability with high, medium, and low categories. Consists of 4-5 groups. How to teach by showing how an object works, the object can be an actual object or a model or is called the demonstration method. Both have succeeded in increasing environmental knowledge. However, in the material on environmental issues raised in learning, the demonstration method is better able to increase the knowledge of prospective teacher students on the environment compared to those using the STAD model (Har, E. 2017). STEM has also been used by zlem zçakır Sümen & Hamza alışıcı (2016) to increase student-teacher knowledge about waste and its recycling.

Learning in Environmental Education Lectures (PLH) also modifies it so that it can improve the environmental literacy of prospective teacher students. PLH oriented 3R (Reuse, Reduce and Recycle) on the theme of used goods can improve student-teacher attitudes towards the environment (Aripin, I., 2017). Environmental and Sustainability Education (ESE) is an education that emphasizes environmental and social well-being can help students develop knowledge, attitudes, and values so that they can become responsible and active citizens who contribute to the sustainability of Laura's future Sims, Madeleine Asselin, & Thomas Falkenberg (2020). In addition to the two modifications of environmental education, there are also those who modify it into environmental education based on transformational learning theory. The material in this study in the form of environmental problems and education throughout the ages was able to increase the knowledge of prospective teacher students (Gökhan Uyanık, 2016).

Semra Benzer, Ezgi Güven Yildirim, and Ayşe Nesibe nder (2019); Mustafa Hamalosmanoğlu, Esra Kızılay, and Aslı Saylan Kırmızıgül (2020) carried out film-assisted environmental education lessons to improve the environmental literacy of prospective teacher students. The two research teams were able to improve the attitudes, knowledge, and behavior of prospective teacher students towards the environment with material about environmental problems.

An educational drama was once used by Asst. Prof. Dr. Hamdi Karakaş (2019) to improve the attitudes of prospective teacher students on the dimensions of environmental awareness and success. This drama is used in the study of ecology.

For majors or study programs that do not have special Environmental Education courses, research by conducting Environmental Education courses has been carried out by Deniz Saribas, Zerrin Doganca Kucuk & Hamide Ertepinar (2017). These courses can also vary in duration. A 14-week course such as the one conducted by Deniz Saribasa, Zerrin Doganca Kucukb and Hamide Ertepinarc in 2017 and a 10-week course such as that conducted by Zeynep Aksan Sinop & Dilek elikler in 2019 can actually improve the knowledge and attitudes of prospective teacher students on ecological concepts. , historical developments and causes of environmental problems, and environmental problems and climate change, waste, and waste recycling.

Not always to carry out environmental education is always in environmental education courses. There are several courses that include environmental education such as conservation biology courses. In this lecture, environmental literacy is built through lectures consisting of structured lectures (group assignments, field trips, group work, public lectures), independent work (library studies, activity/practicum reports), and face-to-face (film screenings, practicum, etc.). Lectures, questions and answers, discussions) for seven meetings. The learning process is carried out by presenting contexts based on Acehnese local wisdom (29 pairs of contexts based on Acehnese local wisdom, consisting of forest conservation, plant conservation, agriculture, and plantations 13 pairs and animal conservation 16 pairs) and linking contexts based on Acehnese local wisdom with materials/concepts conservation biology through lecture activities. This method has succeeded in increasing the environmental literacy of prospective biology teacher students significantly (Apriana, E., 2017).

In addition to learning, environmental education can also be integrated into practicum. In an effort to improve environmental literacy, the guided inquiry-based practicum with the help of a guided inquiry-based environmental pollution module that collaborates with video is actually able to improve attitudes towards the environment. The material used in this study is water pollution, soil pollution, and air pollution (Nugroho, P. A. and Puspitasari, Y. D., 2019).

CONCLUSION

Based on the explanation in the discussion, learning methods in environmental education that effectively used in an effort to improve the environmental literacy of prospective teacher students are including Environmental Education courses, Outdoor-based learning, Project Based Learning (PjBL), Problem Based Learning (PBL), Science learning, Technology, Engineering, and Mathematics (STEM), Constructivist Learning, guided inquiry, demonstration, Environmental and Sustainability Education (ESE), Project Citizen, Pedagogical Experiments, 3R-oriented learning, the contextual approach based on local wisdom, environmental education based on transformational learning theory, and Integration of plays, films, and educational videos. The selection of this learning method must still be adjusted to the learning material to be delivered.

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