

PAPER • OPEN ACCESS

## Ecopedagogy based learning as an effort to increase student ecoliteration and the development of environmental care characters

To cite this article: S Fadjarajani and R As'ari 2021 *IOP Conf. Ser.: Earth Environ. Sci.* **683** 012046

View the [article online](#) for updates and enhancements.

You may also like

- [Dynamic criticality for infrastructure prioritization in complex environments](#)  
Ryan Hoff, Alysha Helmrich, Abbie Dirks et al.
- [Conceptual development of learning factory for industrial engineering education in Indonesia context as an enabler of students' competencies in industry 4.0 era](#)  
Hauw-Sen Tan, Ivander, Rienna Oktarina et al.
- [An Empirical Study on Competencies Required for a Sustainable Educational Research](#)  
Shakti Priya A and S Sujatha



**ECS** 244<sup>th</sup> Electrochemical Society Meeting

October 8 – 12, 2023 • Gothenburg, Sweden

50 symposia in electrochemistry & solid state science

▶ Deadline Extended!  
**Last chance to submit!**

New deadline:  
April 21  
**submit your abstract!**

# Ecopedagogy based learning as an effort to increase student ecoliteration and the development of environmental care characters

S Fadjarajani<sup>1\*</sup>, R As'ari<sup>2</sup>

<sup>1</sup>Department of Geography Education, Faculty of Teacher Training and Education, Siliwangi University Tasikmalaya, Indonesia

<sup>2</sup>Doctor in Geography Education, School of Post Graduates of Universitas Pendidikan

\*sitifadjarajani@unsil.ac.id

**Abstract.** Excessive exploitation of the modern human environment can ultimately damage the environment and have a negative impact on human life on the surface of the earth. Providing basic knowledge about the environment is very important to increase environmental awareness and solve environmental problems. The idea of eco-literacy can be a practical solution to overcoming these environmental problems. This research was conducted descriptively on schools that have Environmental Education lessons. Data retrieval and analysis is carried out based on eco-literacy achievement competencies of 4 components. Competencies that can be used as a reference for eco-literacy achievements include; head (cognitive), heart (emotional), hands (active), and spirit (connectional). The four competencies can be implemented in the learning process and field learning applications to increase the eco-literacy of students and instill habitual attitudes that care for the environment in everyday life. One effort to increase the eco-literacy of students is through ecopedagogy-based learning. Competencies that can be achieved are; 1) formation of attitudes and concerns based on field studies, 2) increasing understanding, building environmental ethics and morals, and 3) active participation in community life in a continuous manner.

## 1. Introduction

The environment for humans is one of the most important elements in supporting humans to carry out various activities. However, often what humans do in managing the environment is not balanced with the future thinking of the lives of the next generation. This results in the emergence of environmental problems that will be felt by all living things. Environmental conditions will be determined by human behavior and vice versa environmental conditions will affect human life. Therefore, growing the idea of eco-literacy or environmental literacy in various patterns and lifestyles today is certainly very reasonable, because the current global problems of the environment and the creation of sustainable society are the main reasons for the need to foster the idea of eco-literacy.

Humans are now trying to maintain survival to stay sustainable. However, it always has a gap that cannot be reduced between scientific-technological capacity which will still produce serious consequences for life and the environment. This condition has the basis that each individual has intellectual abilities, and assuming that our ego has control over what we think [1]. The idea of eco-literacy certainly needs to be implemented in a variety of programs which will certainly be practical solutions to overcome these environmental problems. From a systemic point of view, the only solution that should be implemented is a sustainable solution. In maintaining balance and preserving the environment, it must be done by all parties who aim to increase knowledge, skills and human awareness



about environmental values and issues of environmental problems and sustainable development. Therefore, the provision of basic knowledge must be done early.

The implementation of the *Lingkungan Hidup* Education Program aims to develop a caring attitude towards the environment and intelligence of students in reading and paying attention to environmental conditions. Students' intelligence on the environment of other terms is known as the word eco-literacy of students. The attitude and behavior of students are important in increasing the eco-literacy of students. Schools that care about the environment function to instill environmental values and build students' intelligence on the environment will also have a direct impact on learning activities in the school.

Efforts to increase student ecoliteracy require several supporting factors to be carried out in their daily application. One of them is the availability of facilities and infrastructure that will support the achievement of these activities, and support from all stakeholders in the school environment.

## 2. Methods

This research was conducted descriptively on schools that have Environmental Education lessons. Data retrieval and analysis is carried out based on eco-literacy achievement competencies of 4 components. Competencies that can be used as a reference for eco-literacy achievements include; head (cognitive), heart (emotional), hands (active), and spirit (connectional). The four competencies can be implemented in the learning process and field learning applications to increase the eco-literacy of students and instill habitual attitudes that care for the environment in everyday life. One effort to increase the eco-literacy of students is through ecopedagogy-based learning.

This study is intended to determine the implementation and influence of the Environmental Education program as a supportive effort to increase the eco-literacy of students. This research requires truly objective results in describing it more clearly and applying it in daily life at Riyadlul 'Ulum Integrated High School. Therefore, this study uses descriptive research methods. This research was conducted descriptively on schools that have Environmental Education lessons. Retrieval data and analysis is carried out based on the achievement competencies of 4 components. Competencies that can be used as a reference for eco-literacy achievements include; head (cognitive), heart (emotional), hands (active), and spirit (connectional). The life of the students and their learning processes in everyday life. One of the efforts to increase the level of students is through science-based learning.

## 3. Result and Discussion

### 3.1 Influence of Implementation of Environmental Education Programs in Improving Student Ecoliteracy

Riyadlul 'Ulum Integrated High School in Tasikmalaya City despite having an integrated program but the school also implements the Environmental Education Program. In this study, eco-literacy competencies were used as reference material to increase the eco-literacy of students in the Environmental Education program at Riyadlul 'Ulum Integrated High School in Tasikmalaya City. The implementation of the Environmental Education Program at Riyadlul 'Ulum Integrated High School in the City of Tasikmalaya has affected increasing the eco-literacy of students.

Implementing the Environmental Education Program to improve students' intelligence on the environmental conditions or eco-literacy of students can be seen from several aspects. These aspects will affect the increasing knowledge of students in understanding material related to the environment. In addition, it will also affect the improvement of aspects of student attitudes, namely, increased awareness of students towards the environment, activeness aspects in utilizing and managing the environment, and increasing students' enthusiasm in preserving the environment, so that it will lead to the attitude of students who are full of responsibility answer.

*3.1.1. Head/Cognitive.* Increasing eco-literacy or ecological literacy is needed by all people including students to understand, determine attitudes, be active and have high enthusiasm about what to do. This is characterized by an increase in aspects of students' knowledge about the environment. In increasing students' knowledge of the environment, it can be more easily realized and remembered in the minds of students with special subjects regarding environmental education.

This study explains the integration of local content subjects that study environmental education into other subjects, namely craft subjects. Discussion of environmental education material on the craft subjects in it examines the meaning of the environment itself, ecosystems, environmental elements, efforts to prevent environmental pollution, and the meaning of eco-literacy.

Efforts are made to prevent the occurrence of environmental problems in the Riyadlul 'Ulum Integrated High School in the City of Tasikmalaya by doing greening. The process that is done is by making a garden on each edge and front of the school building and planting and making a school garden so that the school will be full of greenery.

*3.1.2. Heart/Emotional.* The importance of increasing the knowledge of students about the environment to make students who have broad insight into understanding environmental conditions, so that the creation of ecological literacy or eco-literacy of students will be created. The study of ecoliteration and environmental sensitivity has shown that one of the main factors that contribute to environmental sensitivity, or empathy for nature at a young age [2]. Increasing the eco-literacy of students will affect the embedded attitude of caring and aware of the current environmental conditions. Riyadlul 'Ulum Integrated High School of Tasikmalaya City integrates environmental subjects into craft subjects, which aims to increase students' knowledge as well as to create caring and aware attitudes towards environmental conditions.

This study explains to increase the eco-literacy of students in the aspect of consciousness, then the implementation is carried out in several ways. Among them are by testing when class pickets are absent, self-awareness in consuming food, awareness in disposing of each other's food waste as well as garbage that is spread everywhere, and awareness in attitude and actions taken when faced with the conditions of the school environment exposed problems such as blockage of the drainage channel in the Tasikmalaya City Riyadlul 'Ulum Integrated High School school environment.

Students who already have the spirit of caring for the environment or have deep awareness in themselves, when they see a school drainage channel clogged up with garbage will be responsive to clean it. However, there was a lack of awareness in maintaining the school environment, so students who saw the presence of garbage clogged in the school drainage channel were not immediately responsive to clean it.

*3.1.3. Hands/Active.* Planting a conscious and caring attitude towards environmental conditions will shape the character of students who have the nature of responsibility. Riyadlul 'Ulum Integrated High School of Tasikmalaya City implements the Environmental Education Program to train students' habits in maintaining and preserving the environment. Habituation affects the activeness of students in paying attention to the surrounding environmental conditions.

This study explains that increasing the eco-literacy of students in the aspects of activity can be seen from the daily activities of students such as the responsiveness of students in understanding the environmental conditions around the Tasikmalaya City Riyadlul 'Ulum High School Integrated School, giving rebuke when seeing other people who throw garbage not at the place, find solutions when problems occur in the school environment or in the environment where they live, and are able to use plastic bottles or used goods to be used as a very useful work and can even create an item that has economic value.

Environmental problems at Riyadlul Integrated High School 'Ulum Tasikmalaya City are sometimes affected by flooding problems. Flooding occurs only during the rainy season and heavy rainfall. This happens because the school environment has a sloping topography so that the rainwater that flows on the basketball court in front of the classroom and occupies the lowest position when viewed from the sloping topography. Efforts are being made to prevent the occurrence of sustainable flooding in the Riyadlul 'Ulum Integrated High School in the City of Tasikmalaya by planting trees and trees along the front of the classroom and making drainage channels. Post-flood events have a negative impact on the condition of the school environment as the field becomes muddy and the classroom becomes very dirty. These conditions trigger awareness and activity of students to move and find solutions so that the classroom becomes clean as before. One example of gardening in schools can affect children's vegetable consumption, including increased recognition, attitudes, preferences, and the desire to taste vegetables

[3]. Future research should explore whether the effects persist over time and if and how changes in children's behavior affect their caregiver behavior.

Increasing the activeness of students can also be seen from actions that use plastic waste and plastic bottle waste to be made into work. However, only a small percentage of students are creative in utilizing this waste so that it becomes a work like tablecloths, plastic flowers, flower vases and other decorations that come from plastic bottles.

*3.1.4. Connectional.* The implementation of the Environmental Education Program at Riyadlul 'Ulum Integrated High School in Tasikmalaya City in improving the ecological literacy or eco-literacy of students in addition to influencing students' knowledge, awareness, and activeness, also influences the students' enthusiasm in carrying out all tasks that are the responsibility of each student. each one. Considering living systems, in contrast to mechanical construction, integrated wholeness that is characterized by their relationships, their properties differ from those in smaller parts [4]. The activeness of students in preserving the environment gives a positive influence that will be felt by students, so arises the enthusiasm of students in acting and managing the environment.

This study explains the Implementation of Environmental Education in increasing the eco-literacy of students in Riyadlul 'Ulum Integrated High School in Tasikmalaya City can also affect the increasing enthusiasm of students in preserving the environment. The warmth of students can be seen from daily life due to emotional instability in each of them so that it will have a positive influence on acting and having a responsible attitude.

The increase in eco-literacy in the aspects of students' enthusiasm in Riyadlul 'Ulum Integrated High School in Tasikmalaya City in carrying out their picket assignments is always carried out every day and the implementation of class pick-up tasks is only once a week. The duty of picket is not only the classrooms that must be tidied up but the pages in front of the class must also be tidied up so that the class conditions will feel comfortable. It also has an impact on the increasing enthusiasm of students in learning activities, in addition to the neat surrounding conditions, there is also a variety of greenery in front of the classroom so that the class conditions feel comfortable, fresh and beautiful.

### *3.2 Critical Pedagogy in Growing Environmental Awareness*

Critical pedagogy will give birth to critical thoughts as a result of conditions and field findings with what is expected to be with the community at an ideal level. Students must be empowered with strengths that must be built in the form of active participation following their capacity to contribute to environmental justice for all parties. This environment can be a self-organizing system that is integrated with limited tolerance which if broken can begin the process of damage [5].

Bringing up students' critical awareness in environmental education can be done through controversial issues, literary media, various environmental injustices, other living rights, and so on. Some of the contributions that can be explored from the critical pedagogy include: Establishing attitudes and concerns of students with various phenomena in the context of the field that are detrimental to the environment, forming an understanding to always reposition human relations with their environment, form good self-concepts, and build ethics and the moral of the environment, and participate more actively in people's lives earlier so that a better understanding of the environment is built continuously and help become environmental activists.

The environment is not only seen as a space that has resources for every human need. However, the environment as more than an undifferentiated space inhabited by living things, this is the most basic concept of the environment; rather, it is seen as an ecological arena that involves the interaction between the landscape and the living things it occupies [6].

With the implementation of critical pedagogy, the mind grows and develops to criticize various environmental problems, by realizing students have sensitivity and concern for environmental preservation. This will be the provision for students in life in the future, to be able to realize a variety of life that is just, especially in the balance and preservation of the environment.

#### *Student Ecological Literacy*

The importance of fostering the idea of eco-literacy or environmental literacy in various patterns and lifestyles is currently a global environmental issue and is the main reason for the need to foster the idea

of eco-literacy. Through ecological or ecolithic literacy, the closest and simplest things in life-related to the environment begin to be organized and preserved. Therefore, the concept of eco-literacy needs to be instilled in school-age children. Students must be accustomed to having a critical view of the importance of partnering with nature and preserving it for the sake of sustainable survival. Ecoliteration at the same time is a critique of specialization that can dominate education, educational tendencies located indoors and eliminated from the natural environment, decreasing our capacity for aesthetic appreciation, and planting limited abilities to understand existing phenomena [7].

The ecopedagogy movement that has evolved from the thinking of critical pedagogy Paulo Freire which is globally a shared awareness to create a society that is concerned with the balance and preservation of the environment. The eco-literacy center has developed a set of core competencies to help young people develop and live in a sustainable society. This competency relates to knowledge (learning to know), attitude (learning to be), action (learning to do), and relations with humans and the environment (learning to live together). Competencies include Head (Cognitive), namely aspects of knowledge, Heart (Emotional), namely aspects of consciousness, Hands (Active), namely aspects of the activity, and Spirit (Connectional), namely aspects of enthusiasm. The four competencies can be implemented in the learning process and can also be applied in the field to improve the eco-literacy of students and instill habitual attitudes that care about the environment in everyday life. In this study, eco-literacy competencies were used as reference material to increase the eco-literacy of students in the Environmental Education Program at Riyadlul 'Ulum Integrated High School in Tasikmalaya City.

Environmental awareness is needed so that students have the knowledge, attitudes, and friendly life skills with the environment. According to Supriatna, who was stated by Khan that: "Awareness about living in harmony with nature does not only manifest in mere slogans but also must be implemented in daily life through concrete actions that are environmentally friendly. Ecological intelligence can make students apply what is learned about human activities to the ecosystem so that it can reduce damage and preserve the environment. Ecological intelligence can also encourage students to be more creative. Students will be motivated and take the initiative to make or create a work such as used materials or plastic bottle waste to be used as goods having high economic value. Besides, they will also be motivated to take good care of their goods so they are more durable and not easily damaged. Furthermore, if the goods are damaged, students will be motivated and take the initiative to reuse and recycle them to become other types of goods.

Thus, to obtain various types of goods students do not always have to buy new ones, because old items can be reused with creative actions. When they create toys or their items from raw materials for waste, they will become more aware of ecological literacy, which will certainly improve the competence of understanding, attitudes, activities, and the spirit of ecoliteracy.

### *3.3. Ecology Concept in Education Implementation*

The concept of competency initially refers to a degree of performance capability that must be demonstrated in a field of work, which is usually adopted in the field of engineering and other professional fields. Where competencies are clearly defined and competence itself is based on knowledge, attitudes, and systems of certain values. The Ecopedagogy in space-timeScapes represented in each example that learning about the environment plays an important role in developing narratives and maintaining values and ecological awareness is a process [8]. This means that competence is not just a skill ability, but involves cognitive, affective, and also a system of values and norms that must be mastered by someone for certain field qualifications or expertise.

Other meanings are multilevel competencies. A competency is formed by several sub-competencies, while sub-competencies are formed by several small tasks. Thus, those formed competencies accumulate into one unit which is a person's competence comprehensively on a field or ability. Competence can be enjoyed because it appears in the form of performance. Competence as a certain level of quality or size, and from what is considered adequate for certain purposes. Performance standards apply to individual students and not to groups of students.

In essence, competence is a combination of knowledge, skills, values, and attitudes reflected in the habit of thinking and acting. With the habit of thinking and acting on an ongoing basis, it allows individuals to be competent in the sense of having the knowledge, skills, and basic values to take action.

### *Ecological Competence*

Ecological competence is very closely related to the formation of knowledge and understanding of students about the environment followed by the development of values and applied in skills and ecological participation in everyday life. Ecological competence is a competence related to aspects related to ecology in the educational context that must be mastered by students in learning. Four main elements that must exist in ecological competence: Knowledge of environmental issues, Knowledge of specific action strategies to be applied to environmental issues, Ability to environmental issues, and Having quality in addressing and good personality attitudes.

The survival of humanity will depend on ecological literacy, the ability to understand the basic principles of ecology and to live accordingly. This means that ecoliteration must be an important skill for politicians, business leaders, and professionals in all fields, and must be the most important part of education at all levels from primary and secondary schools to universities, and continuing education and training for professionals [9].

Ecoliteracy in ecological competence means understanding the principles of natural ecological community organizations and then being able to compile human communities according to the same principles, especially in terms of studying communities both inside and outside of school [10]. Ecoliteration in the context of educational leadership leads us to the understanding that being a leader means being open and accepting the world of the environment so that it can quickly learn from experiences that are in/to the ecological system and in the midst of the most important, other relationships ultimately enable unity shared values between ourselves and others

The concept of ecological competence emphasizes the sensitivity and concern of students to solve environmental problems in everyday life to the formation of ideal perspectives and ethics on the environment. All environmental competencies are knowledge, attitudes, skills, and participation. All of that will be directed at students' understanding of the environment in a broader context so that in the end it will give birth to humans who have high responsibility by being actively involved in solving environmental problems in a wider scope.

### **4. Conclusion**

The school program was carried out in the Riyadlul um Ulum Integrated High School in Tasikmalaya City, namely the Green School and Go Green programs. The implementation of the program is one of the Programs of Environmental Education at the Riyadlul 'Ulum Integrated High School in Tasikmalaya City. Implementation of the Environmental Education Program in Riyadlul 'Ulum Integrated High School in Tasikmalaya City based on a specific vision and mission from the Environmental Education Program. To realize the vision and mission, namely by carrying out several activities such as the implementation of inter-class competition activities, providing trash cans in front of the classrooms, and always preserving the environment.

The implementation of an environment-based curriculum is one example of the implementation of environmentally sound education that can be implemented by every school. The implementation of an environment-based curriculum at the Riyadlul 'Ulum Integrated High School in Tasikmalaya City is to involve each teacher. Teachers who will carry out learning activities must first pay attention to the conditions of the classroom so that when learning takes place students and educators feel comfortable.

Stakeholders are an important element in implementing a policy. The ease of implementing a policy such as the implementation of the Environmental Education Program in Riyadlul 'Ulum Integrated High School in Tasikmalaya City will require the support of all stakeholders in this school. The achievement of environmentally sound school programs will be achieved if there is support from various parties including those in charge of their environmental education

program and the support of all students in the Riyadlul ‘Ulum Integrated High School in Tasikmalaya City.

Increasing students' knowledge about the environment in Riyadlul ‘Ulum Integrated High School in Tasikmalaya City by integrating environmental education subjects with craft subjects. Craft lessons as a vehicle to guide students in improving knowledge of environmental education and implementing it in daily life.

Increasing ecoliteracy in the aspect of awareness aims to provide education to all students in Riyadlul ‘Ulum Integrated High School in Tasikmalaya City in forming a conscious and caring attitude towards the environment in the school environment as well as in the environment around the residence of students and other living environments. The implementation is carried out in several ways, including testing when class pickets are not present, self-awareness in choosing the type of food, awareness in disposing of used snacks, and actions taken when faced with the condition of the school environment affected by environmental problems.

The implementation of the Environmental Education Program at Riyadlul ‘Ulum Integrated High School in Tasikmalaya City is one of them to increase the eco-literacy of students in creating students' enthusiasm to always preserve the environment. Increasing the eco-literacy of students in the aspect of activity can be seen from the daily activities of students such as the responsiveness of students in understanding environmental conditions, giving reprimands when seeing other people who dispose of waste improperly, finding solutions when environmental problems occur, and being able to utilize plastic or used goods to be used as a very useful work.

The Environmental Education Program in increasing the eco-literacy of students at Riyadlul ‘Ulum Integrated High School in Tasikmalaya City also has an effect on increasing students' enthusiasm in preserving the environment. The warmth of students can be seen from everyday life, namely from an attitude of responsibility and care for the environment. This is because emotional has embedded in each of them so that it will give a positive influence in acting and having a responsible attitude.

## References

- [1] E. Vargas and Madrazo, "Contemplative dialogue as the basis for a transdisciplinary attitude : Ecoliteracy toward education for human sustainability," *World Futures*, vol. 0, no. 0, pp. 1–22, 2018.
- [2] S. Wheelless and S. S. Herron, "The natural provenance : ecoliteracy in higher education in Mississippi," vol. 18, no. 1, pp. 117–132, 2012.
- [3] M. M. Ratcliffe, K. A. Merrigan, B. L. Rogers, and J. P. Goldberg, "The Effects of School Garden Experiences on Middle School–Aged Students' Knowledge, Attitudes, and Behaviors Associated With Vegetable Consumption," *Health Promot. Pract.*, vol. 12, no. 1, pp. 36–43, 2011.
- [4] F. Capra, "A conceptual framework for ecological economics based on systemic principles of life," *Int. J. Sci.*, vol. 44, no. 6, pp. 831–844, 2017.
- [5] F. Fisher, "EcoLiteracy and MetaResponsibility : ‘ Steps to an Ecology of Mind ’ 1," vol. 18, no. 2, pp. 133–149, 2005.
- [6] A. Margarida, R. Rui, S. Lee, and Á. B. Carvalho, "Ecoliteracy Through Imagery : A Close Reading of Two Wordless Picture Books," pp. 325–339, 2011.
- [7] J. M. Code, "Ecoliteracy and the trouble with reading : ecoliteracy considered in terms of Goethe ’ s ‘ delicate empiricism ’ and the potential for reading in the book of nature," *Environ. Educ. Res.*, vol. 0, no. 0, pp. 1–14, 2019.
- [8] R. A. Dunkley and R. A. Dunkley, "Space-timeScapes as ecopedagogy Space-timeScapes as ecopedagogy," vol. 8964, 2018.
- [9] F. Capra, "The New Facts of Life : Connecting the Dots on Food , Health , and the



Environment The New Facts of Life : Connecting the Dots on Food , Health , and the Environment,” *Public Libr. Quartely*, vol. 28, no. October 2014, pp. 242–248, 2009.

- [10] I. Semetsky, “Ecoliteracy and Dewey ’ s educational philosophy : implications for future leaders,” vol. 12, no. 1, pp. 31–44, 2010.