Eco-Art Place-Based Education

Subjects: Area Studies

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The existing state of the world climate creates the need for an educational programme that incorporates effective proposals for the environment that can be practically implemented. The present environmental education literature has changed due to new study paradigms. Understanding how students relate to nature, how their personal beliefs and behaviours are influenced, and how their actions are affected can provide an increased understanding of how they can contribute meaningfully to global objectives. This paper aims to analyse educational research papers published in the area of environmental art education in order to find the factor with the greatest effect and illuminate how they can help to improve the measures implemented.

eco-art education | empathy | place-based education | environment | art education | pro-environment behaviour | nature study

1. Introduction

Individuals are reliant on Earth's habitats for their entire lifetimes and now face some of the world's most challenging ecological problems (National Academy of Sciences, 2020, World Watch Institute, 2016) [1][2]. Within the context of the ecological crisis, our capacity for growth is disappearing. Orr (1992) stated that "The requirements of water, food, animation or holy inspiration cannot meet our climate" (pp. 263–264) [3]. While there is scientific evidence available to explain the ecological crisis, the behaviour responsible for the severe problems that we face has not fundamentally changed. Despite the increased coverage of environmental concerns in news, magazines, and television, the problems remain unresolved, even though the public and private sectors receive information from us on ecological issues. Many environmental challenges that face society, however, must be discussed and resolved. This can only happen if large-scale community support is given (Miller, 2004) [4]. Environmental education, as advocated by Moser (2007), is needed to ensure that more help is given to initiate collective action and behavioural change in relation to environmental problems [5].

Environmental education aims, based on multidisciplinary expertise, to transform human behaviour into nature-friendly actions and promote environmentally aware decision-making. Its aim is to bring about improvements in social behaviour to achieve environmental regeneration, restoration, and conservation [6]. Environmental education also helps to remedy these circumstances and can play an important role in addressing the major ecological challenges facing the world. Furthermore, art is also viewed through the extension and communication of scientific knowledge, the education of people, and prevailing paradigms. In order to draw attention to significant environmental problems, artists produce art. Art is now seen as a significant means of connecting people with

environmental concerns. Art education is one way to achieve this (Johnson and Manoli, 2007) [7]. Environmental education can also strengthen the influence of ecological learning through art education. For example, ecological literacy should be included in the school syllabus (Orr, 1994) [8]. Researchers have endorsed the argument for environmental education in this regard. The key criterion for including it as a subject is that this education not only improves children's attitudes but could also help society deal with environmental issues (Orr, 1994). The promotion of various approches to educate students about the environment will help to win over their hearts and minds (Graham, 2007) [9].

New studies on topics such as environmental art education and eco-art education will help to promote this approach. Environmental art education is not an independent field, but an aggregation of numerous studies such as art, science, and education in relation to the environment (Orr, 1994). Eco-art education is another name for this. It includes elements such as art education and outdoor and environmental education (Orr, 1994). Eco-art training aims to increase awareness and concern regarding environmental principles such as sustainability (Hansen, 2009) [10]. This new area of study, environmental art education, is currently gaining prominence, because arts play an important role in the sustainability of social activities in school and university programmes (Hansen, 2009). Inspired by eco-art education, this latest trend has been inspired by the environment-related ideas and concerns of activists, e.g., Basia Irland, Joseph Beuys, and Mel Chin (Greenmuseum, 2010) [11]. These activists encourage the public or community through their eco-artwork and by offering new solutions to environmental problems. In the era of environmental concerns, the arts have aimed at tackling environmental issues that, as Wallen (2014) says, are worth exploring in order to find ways to solve the problems that the world has to face [12]. Wallen argues that art can be a significant contributor to the creation of a sustainable society. By its capacity to express thoughts and emotions, eco-art will awaken the consciousness of all human beings. It is also prescribed for students to improve their cognitive skills, representing one of the best platforms to achieve this. Moreover, cultivating environmental empathy encourages a sense of connection.

This sense can be described as a type of compassion, an understanding of nature (Cheng and Monroe, 2012) [13]. Eco-art education allows students to create this knowledge of the environment and helps students to construct an ecological model. Wallen states that the connection between empathy and visual experience builds the link between eco-art education and empathy in environmental art. In addition, the interconnected relationship between viewer and object in art can provide various ecological perspectives that improve the empathy between the viewer and the object of the art. Students' sense of relation to the world can be altered in this area by experiential involvement. Researchers have established an ecologically sensitive art curriculum focused on the opportunity to learn about eco-art and respond to environmental concerns (Anderson and Guyas, 2012) [14]. Current educational circumstances have increased their levels of study to allow students to reflect on and examine important issues in contemporary society and safeguard the importance of eco-art education in schools. Eco-art concerns are complex and can encompass such areas as social systems, the environment, public spaces, common capital objects, and local ties. Currently, many scholars and academics in the field of environmental art are working hard to solve these issues (Inwood 2008) [15]. Art teachers are exploring more innovative ways to develop and implement lessons that discuss complex environmental concerns (Hungerford, 2010) [16]. An innovative way to solve such environmental issues via eco-art education is place-based pedagogy. The ecological framework, with a connection between all

elements, is built on an educational system centred on places. This stress the principle of “listening to the land” and living in harmony without damaging the Earth (Graham, 2007).

Place-based education is structured to make students and teachers change-makers. We need more successful approaches to environmental issues; therefore, art education needs to be paired with environmental education in order to find the best solutions to environmental issues (Graham, 2007). Teachers need to explore the connection between students and nature, climate, and teaching practices that promote environmental concerns (Wallen, 2014). Recently, the Secretary-General of the UN, António Guterres, argued that “rescuing from the COVID-19 crisis represents an opportunity to cope with a global climate emergency and create a sustainable future for all” [17]. He feels that now is the time for leaders to “think bigger and generous”. He warns that “there is no one who is able to self-isolate from the world to deal with devastating climate disorder”, and that human health is dependent on planetary health.

The purpose of this paper is to investigate the new field of eco-art education and elucidate how eco-art education encourages our youngsters to care for the environment. Research papers have been reviewed and synthesised, within a broad variety of pedagogic frames and with reference to the guidelines made at some stage by experts in this area, to the key characteristics and results of research on efficiency and education techniques. It is hoped that analysing the results of numerous researchers can help us to plan and create new studies, that researchers and educators will focus on their practises and discover current patterns and challenging circumstances for eco-art education, and that new awareness will be raised about future activities. This reveals the significance of art education, empathy, and pro-environmental behaviour in eco-art place-based education. This paper will use art to educate ecological literacy with the aim of motivating lifelong pro-environmental behaviours and enhance students’ empathy for nature.

2. Eco-Art

Art describes how nature is valued and viewed by humans. Environmental art evolved from the emerging environmental movement. Wallen (2012) stated that earlier forms of environmental art related more to the conception of art than to ecological principles (Wallen, 2012). Inwood (2013) stated that environmental art is a means to create a respectful relationship between the Earth and the viewer (Inwood, 2013). Eco-art is used by activists to draw attention to significant environmental, political, and public issues. Eco-art education is a very recent development. It is an evolving educational approach that uses art to educate students about ecology, with the aim of promoting a deep understanding and caring attitude in learners which will lead to them changing their long-term environmental behaviours (Inwood, 2013). A researcher of eco-art education described their enthusiasm, stating that eco-art offers a creative technique to promote the principles of environmental education and ecological literacy (Inwood, 2013). It also enhances traditional environmental education using the sensory and creative techniques of art education. Inwood states that the literature in this area is inadequate, with referenced publications offering a poor focus on the practices and issues of eco-art education, particularly in elementary education. There will be less curriculum development in the field. Inwood and Leichnitz provide implications for making art classrooms greener, such as conserving energy by switching off lights, using eco-friendly cleaning products,

utilising non-toxic processes and materials, and minimising the use of human-made materials. Artists should select art materials which do not cause harm and that will not have a negative impact in the future (Weintraub, 2012). Educating students on why and how to understand the life cycle of products and resources is also important and a significant aspect of helping students integrate sustainability into their production of art. In order to develop art with a low environmental impact, the author suggests the use of objects present in nature and motivates the usage of non-traditional materials and the upcycling of objects such as cardboard, plastics, and CDs (Inwood, 2003). To encourage environmentally friendly practices, teachers will offer assistance to students in developing their choices while creating art. This allows students to create through practice and observation. Researchers state that these choices will have an impact on the environment in the future. Making practices greener is the initial step, but the most significant aspect of eco-art education is evaluating the best way to educate students about it (Weintraub, 2012).

As we know, our planet is in danger. Every day, we can hear about new environmental disasters, such as bushfires in Australia. Our heart cries when we see animals burning in the news. Can these disasters be stopped? Apathy leads to such destruction. We like to pretend that there are no environmental issues or that the problem is natural in the environment. The keywords in this issue are powerlessness, fear, and the sense of disempowerment. It is necessary to provide students with environment education from a young age to encourage them to become protectors of the environment, but due to the poor quality of existing research on eco-art education, researchers and teachers have little help in creating eco-art programmes. They want to be ecologically aware to foster eco-literacy in their students. This paper aims to review different research papers where researchers have examined the advantages of eco-art education. This will also help us to explain why eco-art education is significant and how we can implement it for students. This will enable us to create knowledge and effective connections which are essential for individual learners, helping them become involved in sustainable actions in their homes, communities, and schools. This paper encourages teachers to incorporate art into content learning and content learning into art, so as to create lessons which will help inspire students by ecological and artistic learning.

3. Environment Education

The human population has increased, and its requirements have deteriorated in environmental conditions in terms of technological modification and digitalisation. Some effects of the modern environmental crisis include deforestation, soil degradation, climate change, industry, global warming, mineral resource depletion, and the extinction of certain organisms. This suggests that people lack environmental care. However, the environmental crisis has been declared as a threat to humanity in future. Individuals must take steps to mitigate environmental damage. The public must be made aware of and informed about the environment, its concerns, and the way it must be preserved. When people are given proper information about the environment, they will be more concerned about the dangers to it. This will contribute to a shift in people's behaviour. Larijani proved that education is the best way to address environmental problems (Larijani, 2010) [18]. In their research, the author discussed the need for schools which can achieve better environmental awareness through environmental education (Larijani, 2010). Many researchers have discussed their environmental education concepts. Environmental education is an

appropriate way to raise awareness of environmental concerns and promote environmentally friendly values, with the purpose of inspiring young people to act individually and in collaboration with others to address environmental needs. This is the basis of the research of Hungerford, Peyton, and Wilke (1980), and the United Nations Educational and Science Organization [19]. Peyton (1980) pointed out that environment education is a medium for sustainable growth. Chawla (2009) stated that environmental education can promote environmental values and enhance people's willingness to change their behaviour [20]. Chawla further explained that the novel process of environmental education can connect activism with nature (Chawla, 2009). In the *Journal of Environmental Education*, William (1969), regarded as the first person to discuss environmental education, claimed that it was intended to make the world aware of its biophysical problems and resolve them with a view to the future [21].

3.1. The Origins of Environmental Education

The roots of environmental education date back to about the 18th century, when the importance of caring for nature was declared by Jacques Rousseau. The naturalist Louis Agassiz, many decades later, reiterated Rousseau's idea and asked his students to observe nature alone, not just through books. In the late 19th century, to promote environmental education, these two influential and important scholars initiated "nature study". In this area, Disinger (1985) has three backgrounds: natural studies, art education, and external education. In the early 19th century, a nature study was implemented to inform students and inspire them to gain an understanding of the environment and care for nature using environmental content [22]. In order to build a relationship with the world, students were taught to observe nature (1985). The nature research of Disinger (1985) is one of the more important environmental education backgrounds in which ecological crises can be overcome. Environmental education also includes art education, which takes into account natural research and explores imagination and emotions. Art education played an important role in addressing social, economic, and environmental problems at the time. The importance of preserving nature and expanding the ideas of peace and happiness (Lorbiecke 1996) is stressed by art education [23]. Outdoor education was then developed across important aspects of art education and environmental education (Disinger 1985). Hammerman (1980) cited outdoor education as a motivation to spend significant amounts of time outdoors, merging two forms of education: environmental education and art education [24]. Earlier, environment education in the community was not included in school curricula. In several subjects, for example, different characteristics of the world have been explored in various topics: geography, architecture, design and technology, languages, biology, and social studies (Disinger 1985), as shown in Figure 1. Disinger claimed that environmental education is a novel and influential viewpoint in the education system rather than a creative area. In relation to this, Aydemir (2007) also stressed that a school curriculum that can increase students' understanding of nature, and related issues should be included in an environmentally friendly report. This recent addition is also a major improvement in the structure of education [25].

Figure 1. Environmental education comprises aspects of different subjects (Disinger 1985).

3.2. The Aims and Objectives of Environmental Education

Hungerford and Volk (1990) stated that environmental education's goals and objectives needed to be clarified [26]. The Tbilisi Conference listed five environmental education objectives:

(1). Awareness: help students gain knowledge about environmental concerns and their issues and to enhance their readiness to consider and act on environmental problems;

(2). Knowledge: enable students to gain an understanding of the workings of the world, how people interact with the environment, how environmental concerns emerge, and how they can be resolved;

(3). Values and attitudes: allow students to experience the value of environmental assessment and encourage students to engage in programmes on environmental conservation;

(4). Skills: train students to develop their skills to investigate environmental issues and to solve them;

(5). Participation: enable students to engage in environmental conservation programmes by means of constructive acts. The aim is to help students look at the problem and find a solution from their own viewpoint (Hungerford and Volk, 1990: 8–9; Vreken and Rens, l997:14) [27].

Based on these goals, the idea of environmental education is to help students focus on environmental issues. These goals also demonstrate that environmental education can enable students to think critically about environmental issues and solutions (Hungerford and Volk, 1990). However, in order to achieve these objectives effectively, it is necessary to recognise the role of environmental education in environmental protection (Mistral, 1994:36) [28].

3.3. The Importance of Environmental Education in Environmental Protection

Environmental education primarily aims to provide students with information to study their environment. It is also an environmental conservation tool, and several experts have demonstrated that there are many advantages to incorporating environmental education in the curriculum.

SACOL stated that, due to environmental education, the process described above is successful:

- Increase focus on environmental issues and emphasis on operations;
- This leads to improving environmental knowledge and attitudes;
- This promotes the need to protect the environment by means of a teaching system focused on activities;
- This allows students to understand their biophysical climate;
- This aligns young people’s attitudes with current views (SACOL; 1999:18);
- Environmental education teaches students to avoid environmental practises such as deforestation, pollution, and damage to other living species [29].

Environmental education is an important means to help students better understand the changing conditions of the world (Wilke, 1997) [30]. Students will make decisions and take measures based on their environmental education. This demonstrates how education can sharpen a student’s mind and develop their ability to successfully take action through learning. Furthermore, this area of education improves the interaction between the environment and human beings, thus improving their lived experience. This effect can also be called empowerment. Education that gives students the opportunity to solve problems will transform society in terms of environmental protection. Nevertheless, in the context of environmental education, students must acknowledge their position as environmental guardians (Le Roux; 2001: 60) [31]. Hellden (1995) says that before teachers offer information about the environment, they should understand the mindsets and ideas of their students [32]. The goal of this initiative is to effectively provide the skills and experience which students will use for their own benefit and that of the community. Teachers must begin this process by recognising the various mindsets of pupils and adapting their

lessons accordingly. This is an effective technique for incorporating environmental education in students' curriculum. Researchers have stated that environmental standards and quality can be preserved through this process. In Boyes and Stanisstreet (1998), the researchers argued that environmental initiatives in schools and educational institutions are necessary in order to effectively implement the practice of environmental education. Research has clearly shown that students have vast capacity to improve their level of skills and know-how by being educated about environmental problems and issues [33]. This makes students trustworthy protectors of the environment. Guo and Zhang (2020) conducted a large survey data with ground-level monitoring station data on air quality. They found that male, younger, and better educated people tended to have higher willingness to pay (WTP). They also noticed that people with a greater understanding of sustainability and more environmentally friendly attitudes are ready to pay more. Environmental education can be seen as vital in order to encourage young people to care about their surroundings [34].

3.4. Environmental Education through Teaching Environmental Concerns and Issues

Environmental education information systems should be expanded as students become older. Systems should also preserve their quality standards in an optimal manner. According to this argument, it is important to look at established information and whether it is consistent with the current environment and what changes are needed in order to develop the system in a rational way. According to Gambro and Switzky (1996), students should be informed about the environment and should be made aware of environmental issues [35]. A study conducted by Kansu and Tüysüz (2009) centred on the relevance of environmental education to students through environmental education [36]. The study looked at the substances of batteries and how they relate to environmental degradation and environmental recycling. This was a seminar in which 256 students took part. Some experiments were carried out before and after the study to assess the importance of teaching students about environmental issues. It was found that there were variations between the pre-test as well as post-test results, and that the post-test results were higher than the pre-test results. Researchers proposed that environmental education should be taught at school for students to develop their awareness of environmental issues and encourage them to serve as protectors of the environment. It was mentioned that it is necessary to promote environmental awareness and also to increase our understanding of nature in order to solve environmental problems (Köse et al., 2011) [37]. A study was conducted to examine the environmental attitudes of 376 students called "Climate, Humanity and Society". A total of 203 female students and 173 male students were enrolled from the college. Both sexes were found to have optimistic views about the world. It was agreed that environmental education is a strong means to raise awareness of nature, as well as its problems. In addition, it has been established that this approach could also reduce environmental issues. The perspective is that schools are not the only place where environmental education can be offered to students. Dunlap (2008) claims that out-of-school education has the same value as in-school education in environmental studies, because both improve awareness in various ways [38]. Another view is that environmental studies should proceed from the primary school level to university education, because a continuation of education on this topic will lead to people being more environmentally conscious. Kasapoğlu and Turan (2008, p. 229) suggested that it is necessary to incorporate environmental studies into school curricula in order to increase the involvement of students in environmental activities [39]. On this topic, Köse et al. (2011, p. 94) also referred to the need for environmental studies for children, suggesting that "Schools and educational

institutions should incorporate environmental and environmental studies in their programmes of study: change in climate to raise understanding and inspire children to save nature" (Orr., cited by Stone & Barlow, 2005, p. 1) [40]. He also claimed in his teaching strategies that issues caused by climate change, including global warming and tsunamis, are difficult and alarming for students to fully understand, because they often have no actual knowledge about or real-life relationship to these events. He went on to suggest that educators should clarify how the effects of climate change impact human beings and the Earth by reflecting on some environmental disaster-related events. These events must be dealt with through a holistic approach that acknowledges the need for students to have a healthy relationship with nature if they are to be protectors of the world (Orr, 1994, 2004; Sobel, 1996) [41]. However, students must be told that they are also a part of the "the natural world" (p. 12). Researchers believe that environmental education is critical in addressing environmental issues [42]. Thomas et al. (2018) also stated the need to educate students about environmental issues [43].

4.1.5. The Teaching and Learning Approaches Used for Environmental Education

Environmental education cannot be accomplished in the short term and is a lengthy task. According to Clayton and Myers (2009, pg. 181–182), the attitudes and actions of the student can be influenced by environmental education [44]. They proposed various types of approaches that could be used in environmental education, such as camping, nature walks, and field trips (Volk and MacBeth 1998, listed in Clayton and Myers 2009) [45]. There are a variety of human-made nature parks, such as zoos, parks, nature centres, outdoor learning camps, and environmental education centres in the informal economy. In addition, environmental learning can be achieved through information given through television, newspapers, radio, arts, flyers, social media, magazines, video, books, and new technologies. The most important aspect of environmental education is that people should learn by observing nature, because this cannot be simulated through in-room experiments (Clayton and Myers, 2009, 182). The activities that can aid in the learning process are sketches, paintings, the design of environmental projects, and the creation of a garden of plants and flowers (Clayton and Myers 2009). Stevenson (2008) also acknowledges that learners often learn best when they have direct interactions with nature. It can be established that previous experience or knowledge can be a successful method for environmental education, and also that previous knowledge can be obtained from learning institutions. It is therefore necessary to establish lessons in environmental education with a comprehensive understanding of the necessary learning structure (Stevenson 2008) [46].

3.6. Advantages and the Student Performance of the Incorporation of Environmental Education

Environmental education is a vital aspect of our development, because learners will need to consider the difficulties, they face in addressing environmental issues. There are also several advantages for students who receive environmental education. Ardoin, 2018, stated that with the incorporation of environmental education, the student gains various advantages, including greater interest and commitment, improved motivation, stronger academic performance, and improved social and emotional skills (Ardoin, 2018) [47], as shown in Figure 2. For example, several studies have shown that environmental education encourages students to learn more about the relationship between the environment, oneself, and other topics, such as science, art, and social studies, when

environmental education is incorporated into their everyday learning (Chiarotto, 2011) [48]. Students may relate their education to previous knowledge and link it to their thoughts and emotions, thus becoming more environmentally conscious. They will appreciate the value of environmental impacts and establish a closer relationship with nature. Patterson (2010) explored how the incorporation of environmental education in a school can have an effect on students. The results showed increased reliable test scores and that the students had a profound awareness of the environmental problems in society and felt more inspired to make a difference in the world (Patterson, 2010) [49]. Volk and Cheak (2003) conducted research to assess the advantages of an environmental education programme for students aged 11 to 12 years. They concluded that the participants displayed higher levels of environmental awareness, self-esteem, autonomy, and critical reasoning (Volk and Cheak, 2003) [50]. Janet Dyment and Alan Reid (2005) indicated that outdoor education and environmental education should be linked more closely. They stated that students who spend some time outside or in the community during their studies on environmental education receive several benefits. These students will have improved skills in terms of imagination, focus, and confidence, because of improving their abilities by spending time interacting with the natural world [51]. Larson et al. (2010) conducted a week-long study to assess the use of one-week environmental education programmes on children's environmental guidance in a botanical garden between 10 and 12 years of age. Participants and non-participants were tested. The pre-test scores for both sets of children were identical, but the results of participating and non-participating children the post-test scores were different. The participants were reported to have scored more than the non-participants (Larson et al., 2010) [52]. According to this report, outdoor programmes can promote positive environmental attitudes among students (Larson, 2010). This study demonstrates the benefits of environmental education as an opportunity for children to enjoy environmental learning through outdoor learning (Larson et al., 2010). There are also some examples of studies involving environmental education initiatives which have positive effects on students.

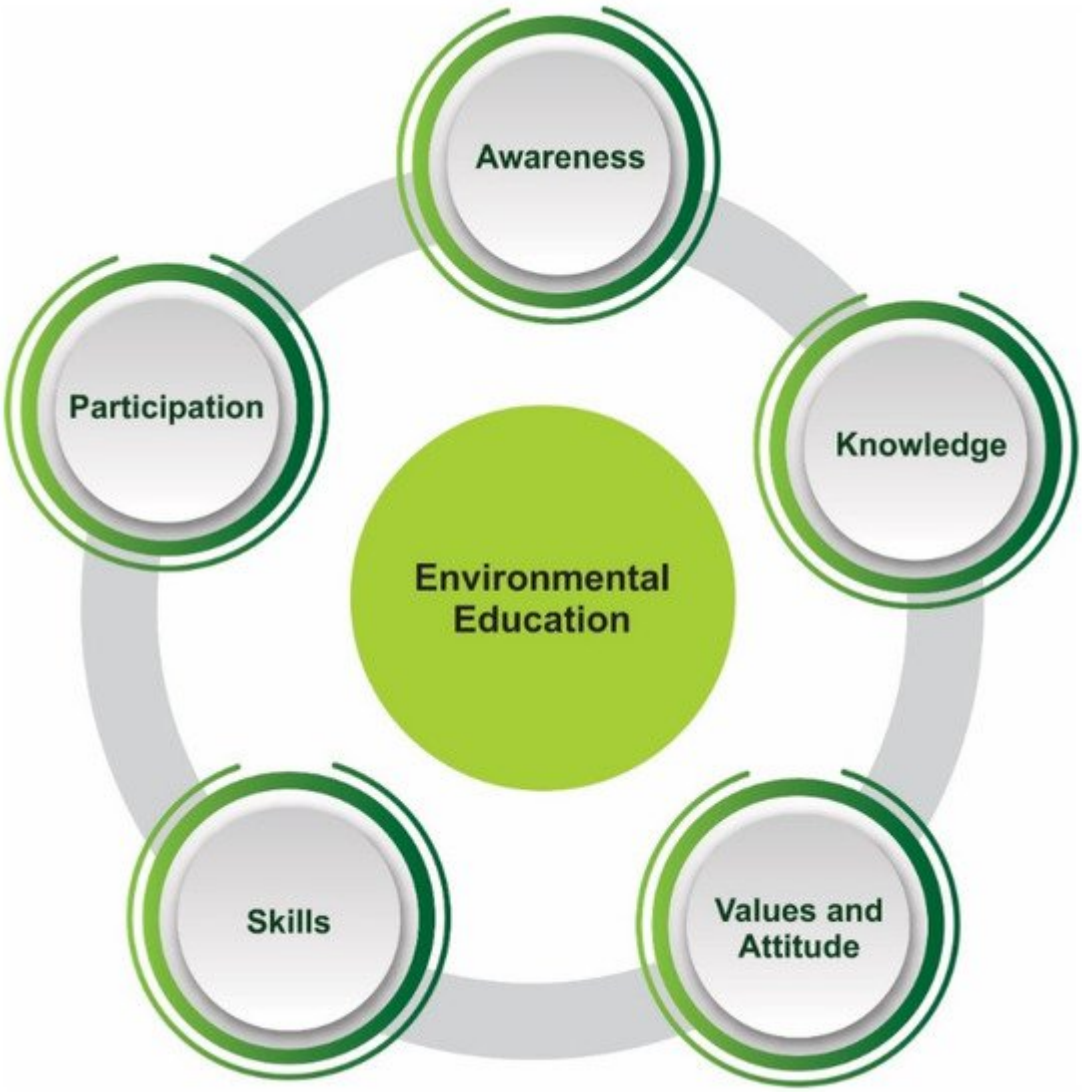

Figure 2. Objectives of environmental education (Hungerford and Volk, 1990).

References

1. National Academy of Sciences. Climate change: Evidence ad Causes; The National Academies Press: Washinton, DC, USA, 2020.
2. Worldwatch Institute. State of the World: Can a City Be Sustainable; Worldwatch Institute and Island Press: Washington, DC, USA, 2016; p. 414.
3. Orr, D.W. Ecological Literacy: Education and the Transition to a Postmodern World. SUNY Series in Constructive Postmodern Thought; State University of New York Press: Albany, NY, USA, 1992.
4. Miller, C. Resisting empire: Globalism, relocation, relocalization, and the politics of knowledge. In Earthly Politics: Local and Global Environmental Governance; Sheila, J., Marybeth, L.M., Eds.; MIT Press: Cambridge, MA, USA, 2004.

5. Moser, S.C. Communication strategies to mobilize the climate movement. In Ignition: What You Can Do to Fight Global Warming and Spark a Movement; Isham, J., Waage, S., Eds.; Island Press: Washington, DC, USA, 2007; pp. 73–93.
6. Maura, A.E.; Pilotti; Runna, A.G. Sustainable education starts in the classroom. Sustainability 2020, 12, 9573.
7. Manoli, C.C.; Johnson, B.; Dunlap, R.E. Assessing children's environmental worldviews: Modifying and validating the new ecological paradigm scale for use with children. J. Environ. Educ. 2007, 38, 3–13.
8. Orr, D.W. The coming biophilia revolution. Earth Isl. J. 1994, 9, 38–40.
9. Graham, M.A. Art, ecology and art education: Locating art education in a critical placebased pedagogy. Stud. Art Educ. 2007, 48, 375–391.
10. Hansen, E. Island ecology: An exploration of place in the elementary art curriculum. Art Educ. 2009, 62, 46–51, Retrieved from Education Full Text database.
11. Greenmuseum.org. What Is Environmental Art? 2010. Available online: (accessed on 23 November 2020).
12. Wallen, R.; Ecological Art: A call for visionary intervention in a time of crisis. Leonardo 2014, 45, 234–242. Available online: (accessed on 23 November 2020).
13. Cheng, J.C.; Monroe, M.C. Connection to nature: Children's affective attitude toward the environment. Environ. Behav. 2012, 44, 31–49.
14. Anderson, T.; Guyas, A.S. Earth education, interbeing, and deep ecology. Stud. Art Educ. 2012, 53, 223–245.
15. Inwood, H. Mapping eco-art education. Can. Rev. Art Educ. Res. Issues 2008, 35, 57–72.
16. Hungerford, H. Environmental education (EE) for the 21st century: Where have we been? Where are we now? Where are we headed? J. Environ. Educ. 2010, 41, 1–6.
17. Simon, L.; Adam, L.; Michael, T.; Donald, R. Sustainability Education and Environmental Worldviews: Shifting a Paradigm. Sustainability 2020, 12, 8258.
18. Larijani, M. Assessment of environmental awareness among higher primary school teachers. J. Hum. Ecol. 2010, 31, 121–124.
19. Hungerford, H.; Peyton, R.; Wilke, T. Goals of curriculum development in Environmental Education. J. Environ. Educ. 1980, 21, 8–21.
20. Chawla, L. The ecology of environmental awareness and action. In Critical International Perspectives on Participation in Environmental and Health Education; Jensen, B.B., Reid, A., Eds.; Danish University Press: Copenhagen, Denmark, 2009.

21. Stapp, W.B.; Bennett, D.; Bryan, W., Jr.; Fulton, J.; MacGregor, J.; Nowak, P.; Swan, J.; Wall, R.; Havlick, S. The concept of environmental education. J. Environ. Educ. 1969, 1, 30–31.
22. Disinger, J. Environmental Education's Definitional Problem. (ERIC Information Bulletin, No. 2.); ERIC/SMEAC: Columbus, OH, USA, 1985.
23. Lorbiecke, M. Aldo Leopold: A Fierce Green Fire; Falcon Publishing: Helena, MT, USA, 1996.
24. Hammerman, E. A Delphi formulation of Environmental Education objectives (Doctoral dissertation, Northern Illinois University, DeKalb, IL, 1979). Diss. Abstr. Int. 1980, 40, 2447.
25. Aydemir, M. The Investigation of Teachers with Respect to Knowledge Level on Environmental Concepts. Unpublished. Master Thesis, Middle East Technical University, Ankara, Turkey, 2007.
26. Hungerford, H.R.; Volk, T.L. Changing learner behaviour through environmental education. J. Environ. Educ. 1990, 21, 8–21.
27. Vreken, N.J.; Rens, J.A. An introduction to Environmental Education; Keurkopie: Potchefstroom, South Africa, 1997.
28. Mistral, R.P. Indian Worldview and Environmental Crisis. Environmental Education for Sustainable Development. Ph.D. Thesis, State University of New York, Albany, NY, USA, 1994.
29. SACOL. Teacher Education: Routes to Competency, Human and Social Sciences in the Classroom. In An Introduction to the Teaching of Human and Social Sciences in South African Schools; Francolin Publishers: Cape Town, South Africa, 1999.
30. Wilke, J.R. Environmental Education. In Teachers Resource Handbook; A practical guide for K12 Environmental Education Corwin Press: San Jose, CA, USA, 1997.
31. Le Roux, K. Environmental Education Process: Active Learning in Schools; University of Natal: Pietermaritzburg, South Africa, 2001.
32. Hellden, G. Environmental Education and pupils' conception of matter. Environ. Educ. Res. 1995, 1, 267–275.
33. Stanisstreet, M.; Boyes, E. High school students' perceptions of how major global environmental issues might cause skin cancer. J. Environ. Educ. 1998, 29, 31–36.
34. Guo, D.; Wang, A.; Zhang, A.T. Pollution exposure and willingness to pay for clean air in urban China. J. Environ. Manag. 2010, 261, 110174.
35. Gambro, J.S.; Switzky, H.N. A national survey of high school students' environmental knowledge. J. Environ. Educ. 1996, 27, 28–34.
36. Kansu, Y.; Tüysüz, C. Creating an environmental awareness to high school students about waste batteries. J. Nat. Appl. Sci. 2009, 13, 123–127.

37. Kose, S.; Savran-Gencer, A.; Gezer, K.; Erol, G.H.; Bilen, K. Investigation of undergraduate students' environmental attitudes. Int. Electron. J. Environ. Educ. 2011, 1, 85–96.
38. Dunlap, R.E. The new environmental paradigm scale: From marginality to worldwide use. J. Environ. Educ. 2008, 40, 3–18.
39. Kasapoğlu, A.; Turan, F. Attitude-behaviour relationship in environmental education: A case study from Turkey. Int. J. Environ. Stud. 2008, 65, 219–231.
40. Stone, M.K.; Barlow, Z. (Eds.) Ecological Literacy: Education Our Children for a Sustainable World; Sierra Club Books and University of California Press: San Francisco, CA, USA, 2005.
41. Sobel, D. Beyond Ecophobia: Reclaiming the Heart of Nature Education; The Orion Society: Great Barrington, MA, USA, 1996.
42. Macarena, E.I.; Isabel, V.L.; Luis, V.A.M.; Francisco, M.C. Environmental Education, an Essential Instrument to Implement the Sustainable Development Goals in the University Context. Sustainability 2020, 12, 7883.
43. Thomas, G.O.; Poortinga, W.; Sautkina, E. Habit discontinuity, self-activation, and the diminishing influence of context change: Evidence from the UK Understanding Society Survey. PLoS ONE 2018, 11, e0153490.
44. Clayton, M. Conservation Psychology: Understanding and Promoting Human Care for Nature. Landsc. Ecol 2011, 26, 297–299.
45. Volk, T.; McBeth, W. Environmental literacy in the United States; North American Association for Environmental Education: Washington, DC, USA, 1998.
46. Stevenson, R.B. A critical pedagogy of place and the critical place(s) of pedagogy. Environ. Educ. Res. 2008, 14, 353–360.
47. Ardoin. Toward an eco-justice pedagogy. Educ. Stud. 2018, 32, 401–416.
48. Chiarotto, L. Natural curiosity: A resource for teachers: Building children's understanding of the world through environmental inquiry. In The Laboratory School at the Dr. Eric Jackman Institute of Child Study; Ontario Institute for Studies in Education, University of Toronto: Toronto, ON, Canada, 2011.
49. Paterson, J. Integrating Environmental Education. Educ. Digest 2010, 75, 38.
50. Volk, T.L.; Cheak, M.J. The effects of an environmental education program on students, parents, and community. J. Environ. Educ. 2003, 34, 12–25.
51. Dyment, J.E.; Reid, A. Gaining Ground: The Power and Potential of School Ground Greening in the Toronto District School Board. 2005. Available online: (accessed on 23 November 2020).

52. Larson, L.R.; Green, G.T.; Castleberry, S.B. Effects of an Environmental Education Program on the Environmental Orientations of Children from Different Gender, Age, and Ethnic Groups. J. Park Recreat. Adm. 2010, 28, 95–113.