

Development of Environmental Education

Subjects: Environmental Sciences

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Creating an environmentally aware society is not an easy task and requires knowledge about what affects the formation of environmental views. At the same time, to contribute to environmental protection, individuals with different educational backgrounds need to have environmental awareness, because their decisions as future professionals may affect the environment. In this context, environmental education can be used strategically to raise environmental awareness and ultimately to shape environmentally responsible citizens.

Keywords: environmental studies ; sustainable education ; sustainability efforts ; higher education curricula

1. Introduction

Humans comprise a fundamental part of the natural environment and, in contrast to other living organisms, humans can affect the environment in various and lasting ways ^[1]. Human communities and civilizations were eventually differentiated from the natural environment by creating technical systems that were often not in harmony with natural laws. At the same time, humans and the environment have a relationship that is characterized by constant interactions and dependence. Disruptions in this relationship negatively affect not only the environment but also humans. The harmonious co-existence of humans and nature ceased when humans developed their ability to leverage natural resources. This is when humans started to trust their own power and defied nature, neglecting their utter reliance on nature. This was a turning point in human history, and it marked the era in which humans disengaged themselves from nature and pursued growth. Driven by their selfish motives, humans became volatile towards nature even though the adverse impacts of these actions were suffered by humans themselves. Today, humans are required to reverse environmental problems through addressing complex environmental problems and promoting environmental awareness. Environmental problems result from human-driven disruptions to nature; environmental problems, however, trigger the emergence or the exacerbation of social problems leading to an overall deterioration in human life. Examples of problems inextricably linked to social ones involve air pollution, soil erosion, overconsumption, climate change and climate migration ^{[2][3][4]}. These problems are closely linked to the influences occurring in the relationship between humans and nature, as well as humans' decisions and choices. In this regard, the investigation of environmental problems requires more attention on the society–environment nexus.

As environmental problems deteriorate over the course of time, they become multidimensional and require an immediate yet spherical solution. Many scientists propose that solutions should not be limited to scientific applications but should involve knowledge diffusion with the purpose of raising awareness about environmental problems. Awareness is a highly challenging target especially if one considers that humans lose their contact with nature the more they develop technology ^[5]. Environmental issues cannot find sustainable solutions only within scientific progress or the establishment of stricter legislation. It is equally necessary to dedicate efforts to the creation of environmentally responsible citizens and societies. To that end, citizens need to acquire environmental knowledge and skills while shaping positive environmental attitudes and behaviors. In such a process, the role of education is crucial in the effort to inform social groups about environmental issues and to shape pro-environmental attitudes and behaviors among them ^[2].

Pro-environmental attitudes involve various components such as cooperation, the critical study of environmental issues, participation, self-knowledge and the ability to express ideals. Critical thinking guides individuals to reach reasonable assumptions, form 'proper' judgments and make correct choices ^[6]. The objective of modern environmental education is to cultivate critical thinking among members of society and particularly among younger ones as their attitudes will define the future ^[7]. According to the results of a considerable number of studies, environmental awareness begins in childhood. It can be first shaped through the close family circle and then in school, while later, it manifests through young individuals' participation in activities in nature ^[8]. In each stage, the shaping of environmental attitudes is subject to individuals' interaction with their peers and their exposure to media content ^{[8][9]}. According to Ostman ^[10], the media's strong influence should be leveraged to help society attain sustainability because the media play a primary role in informing the

public about environmental issues. At the same time, it appears that young citizens exhibit a pronounced concern and interest in environmental rather than social and political topics. It has been observed, however, that when not interested in political topics, individuals are also not interested in environmental topics because pro-environmental behaviors stem from political ideals.

2. The Development of Environmental Education

It is often argued that the solution to environmental problems depends on individuals' knowledge, interest, skills, attitudes and motives regarding environmental problems. Moreover, it is necessary to fully understand the interdependence between nature and humans and to predict the impact of every action, attitude and choice.

Environmental education seeks to shape citizens that are characterized by knowing and predicting the effects of choices as well as understanding the need for compassion among humans. Since 1970, the establishment of environmental education aims to shape citizens that are active in terms of environmental issues. In the following decade, the theoretical principles of environmental education were applied, and the ideals of environmentally aware citizens developed. According to Hungerford et al. ^[11], environmental education at its core tries to help individuals acquire knowledge about the environment so that they can work towards maintaining balance between living standards and environmental quality. In the 1990s, environmental problems were perceived as a 'side effect' of economic prosperity and the developmental choices of human societies. In this regard, environmental education is also related to the notions of development and evolution, society and economy ^[12]. The solution to environmental problems requires a profound understanding of the complex relationship that exists between the natural and social spheres, as well as the dynamics of factors that affect environmental quality. Although such understandings are critically important, they do not suffice, as individual and collective efforts are also required. In this sense, it is necessary to acknowledge that social problems are part of environmental problems.

Over the next few decades of its evolution, environmental education approached the environment as a whole and environmental problems as part of the total environment ^[13]. The environment is defined by various developmental factors and its study puts emphasis on the management of natural resources and, when this management is proper, future sustainability can be ensured ^[14]. Citizen participation in environmental issues is described as a priority in most conventions of education ^[15], because environmental and social sustainability result from collective efforts, attitudes and choices.

3. The Role of Environmental Education

It is often argued that environmental problems could be tackled if people became aware of them. For children and adolescents, environmental awareness could be raised through environmental education programs, and, for this reason, many scholars stress the need to place them at the core of curricula. If such programs are combined with environmental courses and information campaigns, students can learn about pressing environmental problems and shape pro-environmental attitudes ^[16]. Learning about these problems enables young individuals to shape pro-environmental attitudes ^{[16][17]}. In such processes, students should not have a passive role, but they should actively participate in the process. Active participation methods consist of forms of interaction between teachers and students where both parties interact during lessons ^[18]. From this perspective, schools can act as the main means to promote environmental education especially when experiential learning techniques are utilized ^[8].

Throughout the implementation of environmental education programs, students assume an active role in the learning process and are trained in different ways, so that they are able to set targets, take decisions and initiatives, make arguments and develop productive criticism ^[19]. Studies on the subject have indicated that students' participation in environmental education programs has increased their environmental knowledge significantly ^[20], has helped them adopt pro-environmental practices ^[21] and shaped pro-environmental attitudes. It is also necessary to mention that the design of environmental education programs should take into account the perceptions of individuals, because attitudes are affected by perceptions, thereby changing behaviors ^[22]. Environmental education, therefore, provides valuable opportunities for social change while shaping attitudes in line with a more sustainable way of living ^[23]. Environmental awareness lies in the understanding of the environment, the effects of human activities on it and the importance of protecting it ^[24]. In this regard, environmental awareness is a concept that should concern all people that wish to live in a healthy environment. Television shows with discussions about the environment, the analysis of environmental events and the wide array of media that people use these days can play a major role in raising environmental awareness among citizens ^[25].

The coverage of environmental issues in Internet-based applications, platforms and campaigns that aim to draw attention to environmental problems is able to exert great influence and shape perceptions that are positive towards the environment [26]. One can conclude that the media are important in 'awakening' the public about the environment. In particular, the media have remarkable potential in disseminating environmental knowledge and raising environmental awareness. Due to technological progress, media that disseminate information to a wider audience instantaneously have emerged. Meanwhile, the printed media, which are still favored by people of somewhat older ages, contain extensive articles about various environmental topics. In addition, national and international conferences organized or co-financed by international organizations are very appealing to the public and can contribute to raising environmental awareness. Environmental magazines that cover a wide spectrum of environmental topics and include scientific studies also seem to be favored by readerships. Despite being affordable and accessible to citizen majorities, radio programs do not cover environmental problems to an adequate level. On the other hand, television is not only the most widely used medium, but it also includes environmental shows and documentaries that can make a notable impact on citizens' environmental knowledge [27]. Finally, social media can become a useful resource by providing their users with necessary environmental information. At the same time, social media present a notable potential for environmental awareness because they are used regularly by younger individuals and, therefore, they could be leveraged in the effort to raise awareness [28]. This could be achieved by using social media as a platform to exchange ideas about environmental issues, including the adoption of recycling, energy saving and sustainable daily practices [29].

According to Skanavis [30], the media, with their immense influence, are able to raise environmental awareness through environmental programs, materials and discussions about concerning environmental problems. If such information is covered properly and is focused on the true significance and effects of environmental problems, then citizens can be expected to be affected and even take action. The fundamental target of these programs should be to educate and raise awareness among citizens. Interestingly, many television shows have been using popular celebrities as these can draw the attention of the audience and often act as role models.

Future leaders and decision-makers are shaped at a notable level during their academic years, and it is thus highly meaningful to examine university students' environmental views, attitudes and behaviors. A considerable volume of research has focused on students' environmental views and interest. For example, Rosentrater and Burke [31] examined students' environmental attitudes, perceptions and habits at the Iowa State University and observed that students demonstrated adequate levels of interest in environmental topics such as ways to reduce their own footprint and contribute to environmental improvement in general. This pronounced environmental interest, however, was not correlated with students' demographic characteristics. It is also interesting to discuss the findings of Liu and Lin [32], who conducted interviews with university students to examine their views on nature and nature-human relationships, indicating that pro-environmental students held a mixture of worldviews. On the one hand, they perceived humans as part of nature and thus subject to natural laws, while, on the other hand, they thought that humans play a dominant role in nature but may be replaced and that humans should feel responsible for nature and try to preserve natural resources. Erdogan [33] also examined university students' views and found that over half of respondents held pro-environmental views. When examining the effect of attending one environmental course, the same author found only a minimal influence on students' environmental views.

Prabawa-Sear and Baudains [34] performed focus groups in order to investigate the relationships between university students' environmental attitudes and behaviors and indicated a strong relationship between attitudes and behaviors. The relationship between attitude and behavior was further corroborated by Boca and Saracli [35], whose study indicated a positive correlation and also noticed that students engaged often in environmental protection activities such as volunteering and recycling.

In relation to the environmental behavior of university students, Kayawa (2007) used an online questionnaire to examine university students' views on sustainability and indicated that students tend to associate sustainability with their environment while they were positive towards altering their personal habits including purchase habits, recycling and energy/water saving. He et al. [36] compared the environmental knowledge, attitudes and behaviors between two university student samples in developed and less-developed urban regions in China. It was concluded that backgrounds were related to students' levels of environmental knowledge, attitudes and behaviors. The influence of worldviews on environmentally responsible behaviors was confirmed by Inkpen and Bailey [37]. That being said, their study showed that even students classified as 'environmentally aware' were willing to adopt only a few environmentally friendly behaviors and only if such behaviors were considered convenient. Using the Value-Belief-Norm theory, which is based on value frameworks and can account for decision-making processes, Whitley et al. [38] examined the socio-psychological factors that affect university students' environmental behaviors. Their analysis showed that, interestingly, students with biospheric

and altruistic values had a greater likelihood to adopt sustainable behaviors, whereas those exhibiting selfish values were less likely to engage in such behaviors.

Acknowledging that environmental knowledge may have a positive effect on environmental attitudes and perhaps behavior, it has been proposed to include environmental courses in the study programs of departments that are not related to environmental disciplines. To examine the potential outcomes of including environmental courses in non-environmental departments, McMillan et al. ^[39] assessed the impact of an introductory environmental university-level course on the environmental values of students and observed that the course helped students deepen their environmental values and become more eco-centric and less homo-centric. In the context of this course, students participated in various activities but the activities that were the most influential involved exercises whose aim was to become aware of the footprint of personal habits and attended some educational documentaries. The effect of such courses was also indicated by the study of Jurgi-Hage et al. ^[40], where university students' cognitive and behavioral environmental concern was positively affected by the inclusion of formal instruction on the environment. Ayeni ^[41] conducted a study on first-year students at the Cape Peninsula University of Technology in South Africa to investigate how students defined their environment. It was shown that there is considerable differentiation in students' environmental awareness, which was ascribed to gender, age, place of residence, family income and parental education level. If the effects of information provision (such as time spent on social media) are taken into account, however, this differentiation is not that significant. It was concluded that awareness through environmental education should be based on specific objectives and requires a conscious interchange of interests and value systems. Li and Chen ^[42] examined Chinese university students' participation in actions and concluded that college education, environmental organizations and experiences are the most important factors affecting environmental action. In the study of Limo ^[43], 15 public and private universities in Latin America participated. The main conclusion from this study was that there is an important relationship between education for sustainability and students' environmental attitudes. In addition, it was inferred that universities should intervene in campus spaces using sustainable approaches, while students should understand that they are the ones that should take care of the environment. At the same time, students attending the University of Presov in Slovakia were examined in terms of their environmental awareness. In specific, students scored highly especially regarding the cognitive and emotional factors but did not achieve high scores in the behavioral factor. The same study did not detect any strong differences in terms of students' gender. Gur et al. ^[44] investigated the social and academic skills among students attending law and journalism studies in Quetta in Pakistan and indicated that students from both disciplines had about the same skills, while social skills had a positive impact on their academic skills. This study recommended the provision of professional development for faculty members in order to ensure the integrated training of undergraduates. The same study also recommended that educational institutions should place timely and adequate attention so that students' social skills are improved. This could be achieved through the continuous provision of seminars, lectures, sport infrastructures and outdoor spaces.

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