Kuram ve Uygulamada Eğitim Bilimleri • Educational Sciences: Theory & Practice - 11(4) • Autumn • 2252-2257

Investigation of Environmental Topics in the Science and Technology Curriculum and Textbooks in Terms of Environmental Ethics and Aesthetics

Canan LAÇİN ŞİMŞEK [a]
Sakarya University

Abstract

In order to solve environmental problems, it is thought that education should be connected with values. For this reason, it is emphasized that environmental issues should be integrated with ethical and aesthetic values. In this study, 6th, 7th and 8th grade science and technology curriculum and textbooks were investigated to find out how much environmental ethics and environmental aesthetics were mentioned in the topics related to environmental education. In the study, a descriptive methodology had been followed; the data were gathered through document analysis and analyzed in line with the determined themes. The themes related to environmental ethics are respect, value, responsibility, participation and compensation. For environmental aesthetics the aesthetic aspects of the visuals, the emphasis on the beauty of nature and the harmony between pictures and the topic were assessed. At the end of the study, it was found that both in the curriculum and in the textbooks environmental topics are generally explained through a nature-centered approach. However, it was seen that environmental ethics and aesthetics were not mentioned enough. It was determined that responsibility and participation elements of environmental ethics were emphasized but respect, value and compensation elements were neglected.

Key Words

Environmental Education, Environmental Ethics, Environmental Aesthetics, Science and Technology Curriculum, Science and Technology Textbooks.

Environmental problems have become one of the most accentuated issues, lately. It is possible to say that this is not only the effect of globalization and media but also the effect of their consequences for people's daily lives. Gaining the understanding of environmental problems are human related, bring along the necessity to raise awareness of individuals about the environment they live in (Erten, 2004). Therefore, environmental education has begun to be included in curricula.

a PhD. Canan LAÇİN ŞİMŞEK is currently an Assistant Professor at the Department of Science Education. Her research interests include environmental education, history of science, concept development and concept teaching. Correspondence: Assist. Prof. Canan LAÇİN ŞİMŞEK, Sakarya University, Faculty of Education, Department of Science Education, Sakarya/Turkey. E-mail: csimsek@sakarya.edu.tr & cananlacin@gmail.com Phone: +90 264 6141033/193.

In curricula, general aims of the environmental education are determined as; raising awareness about environment and its problems, giving information, developing positive attitudes, knowing environmental problems and developing research skills, contributing to the solution of problems and participating (Brause & Wood, 1993; Doğan, 1997; Gruenewald, 2004; Palmer & Neal, 1996; Stapp et. al., 1969, cited in Disinger, 2001). When these purposes are examined, it is seen there is an understanding that suggests if people are aware of their environment and its problems, they become more sensitive about it. Thus, when environmental problems become a current issue, the emphasis on the idea stating that in order to solve problems people should be more conscious is mentioned frequently; however, it is seen in time that being conscious is not enough to solve problems (Erten, 2004). Although since 1960s there have been studies regarding environmental education in curricula, it is

emphasized that the expected efficiency could not be gotten; just giving information is not enough, environmental issues should be integrated with people's values (Lynch, 1998). When the idea stating that people's behaviors shape according to their values (Disinger, 2001) is thought, the necessity to enrich the environmental education with values to raise environmentally sensitive individuals has aroused (Aleixandre & Rodríguez, 2001; Carr, 2004; Davis, 1998; Franson & Gärling, 1999; Gurevitz, 2000; Özdemir, 2007; Thapa, 2001). For this reason, some professional ecologists mentioned that besides being conscious about the problems, ethical and aesthetical values should also be emphasized to solve environmental problems (Bozkurt, 1999; Davis, 1998; Kostova & Atasoy, 2008; Light & Rolston III, 2003; Reiss, 1999; United Nations Educational, Scientific and Cultural Organization [UNESCO], 1978, p. 24, 1997). As a matter of fact, some researchers claimed that one of the factors that make environmental problems this big, is not giving enough importance to environmental ethics and aesthetics (Brause & Wood, 1993; Tont, 1996).

Environmental ethics is the systematic investigation of the moral relationships between people and their natural environment (Des Jardins, 2006). It is not about human-human relationships; it comprises the relationships between humans and other living things (plants and animals) (Ünder, 1996). Environmental ethics suppose that moral principles rules people's behaviors toward natural world, therefore, an environmental ethics theory should explain what these rules are, for whom and what people have responsibilities and also should reveal the reasoning behind these responsibilities (Des Jardins, 2006, p. 46). The points that are tried to be emphasized in environmental ethics are; people are responsible for the environment they live in, every living thing has right to live and this should be respected, preserving a life is good whereas restraining and ending a life is bad, actions that will affect all living things life should be avoided, when something happened and badly affected all living things' lives the responsibility for compensation this action should be taken and people also have responsibilities for the living things that will live after them (Ünder, 1991, 1996).

Environmental aesthetics include the aesthetical values of the environment. Appreciating the aesthetics means constructing our relationships with the world again and identifying the objects truly in order to build up more healthy relationships. For people to arrange their place in the world and their relationships with the world and each other, aesthetical perception sensitivity should be revived (Erzen, 2006, p. 13). Environmental aesthetic is different from decorating, physically and stylistically arranging a place. Environmental aesthetics firstly means our perceptions of the environment, the value we give to it, our assessments about it and our relationships with it (Erzen, 2006, p. 53). In this sense, aesthetical values have an important role in preserving the environment (Brady, 2003; Hettinger, 2005). For this reason, environmental ethics ignoring the aesthetic value of the environment is deficient (Robinson, 2009). Aesthetic experiences make students; (*i*) develop an understanding of the existing characteristics of the environment, (*ii*) gain the ability to consider aesthetic aspects of environmental problems and be sensitive about it, (*iii*) be more sensitive about the environment and enrich their relationships with it by developing their abilities to arrange, apply and discuss their personal aesthetic values ("Environmental learning and experience", 2007).

Accordingly, it is obvious that curricula should include both ethical and aesthetical elements. Within an environmental education program comprising of ethical and aesthetical values, students are expected to develop these following understandings: (*i*) Respect: Students should realize that every living thing in the nature has right to live and respect this right. They should know that life of every living thing has a purpose and meaning. (*ii*) Value: Students should know that everything in the nature, living or non-living, has a value; they should stop valuing the things around them according to their benefits for humans. (*iii*) Responsibility: Students should be aware of their existing environment and be responsible for the things happening in that environment. (*iv*) Participation: Students should be sensitive about environmental problems, know the ways to cope with these problems and participate in this struggle actively. (*v*) Compensation: Students should be aware of the necessity to compensate their harms to a living or non-living thing (Tepe, 1999; Ünder, 1996).

Based on the idea that cognitive sensitivity to environment develops at the age of 9-10 and children can be assessed in terms of human-environment relationships at this stage (Arslan, 1997) the importance of environmental education in basic education can be understood better. Being accepted as a period during which children's value and belief system takes shape; an environmental education

program, beginning from these ages, based on ethical and aesthetical values can be a good chance to raise individuals who see themselves as a part of the environment and be at peace with the nature. However, although this is the way it is supposed to be, the research showed that the existing situation is different. In this research, it was found that most of the topics in the curricula from past to present are in the form of "education about environment", (Çakci, & Oğuz, 2010; Gurevitz, 2000; Gülay & Ekici, 2010; Yücel & Morgil, 1988), and the education given is at the aim of "giving information about environment" instead of developing attitude and ability (Srbinovskia, Erdogan, & Ismailia, 2010; Tanrıverdi, 2009). In our country, Laçin Şimşek (2004) has made a study about environmental ethics and aesthetics. In this study, in which 2002 science and technology curriculum and textbooks were investigated to find out to what extend and how environmental ethics and environmental aesthetics were mentioned while explaining the topics related to environment, it was determined that in curricula and textbooks a human centered approach to environmental education is dominant. In another study, which examined the 2004 science and technology curriculum and 4th and 5th grade textbooks in terms of environmental ethics and aesthetics, it was found that in the curriculum and textbooks both human-centered and nature-centered approaches were present; however, nature-centered approach was not supported with ethical and aesthetical values sufficiently (Laçin Şimşek, 2006). Considering these studies in the literature, it is possible to draw a conclusion as elementary curricula are far away from raising the intended and expected "environmentalist person" profile. However, the way the topics are presented in curricula is very important to raise the expected human profile. In curricula, mentioning ethical and aesthetical values within the topics related to environment, involve people's consciences with environmental problems and integrate with moral values are considered to be effective to raise individuals sensitive about environment. Therefore, it is important to examine curricula and textbooks, an important teaching material of educational activities, for these means and to determine how much they refer to environmental ethics and aesthetics.

Purpose

The purpose of the study is to investigate and discuss 6th, 7th and 8th grade science and technology curriculum and textbooks in order to find out to what extend ethical and aesthetical elements were used to teach the topics related to environmental education. How much environmental ethics and environmental aesthetics were mentioned in the topics related to environmental education

Method

In this study, a descriptive approach was adopted and for this reason document analysis was done. Document analysis is analyzing the written materials having information about the case or cases which are aimed to be investigated (Yıldırım & Şimşek, 2003).

Process

For data collection, 6th, 7th and 8th grade science and technology curriculum and textbooks were investigated with document analysis. The data gathered through document analysis are assessed according to previously determined themes. In this study, the themes for environmental ethics are respect, value, responsibility, participation and compensation. For environmental aesthetics the aesthetic aspects of the visuals, the emphasis on the beauty of nature and the harmony between pictures and the topic were assessed. In the curriculum, the topics which include science-technology-society-environment objectives were determined and assessed. In the textbooks, the topics related to environmental issues were investigated in terms of content and visual quality. In order to obtain reliability (Miles & Huberman, 1994) the curriculum and the textbooks were investigated by two different researchers. Then, the findings of the researchers were compared, and the points on which they have agreement and disagreement were determined. After having discussions, they reached a consensus on every point.

Results

The findings obtained through the investigation of 6th, 7th and 8th grade science and technology curriculum* are as following:

When the curriculum was investigated, it was found that from the 38 objectives in the learning area "science-technology-society-environment", 14 of the objectives are related to environment. It can be said that most of these objectives are considered on a nature-centered approach. However,

* The textbooks and study books examined in this study are listed in the references.

it was seen that within these objectives responsibility and participation elements were emphasized but respect, value and compensation elements were neglected. When the objectives of the unit were examined, it was seen that there are 556 objectives in total; however, only 20 of them are associated with the determined environmental objectives. This situation was thought to be surprising. Moreover, these objectives were also found to be considered on a nature-centered approach and most of them emphasizing to responsibility and participation elements of environmental ethics and neglecting respect, value and compensation elements. It is possible to say that in unit objectives, there is not enough referring to the elements of environmental ethics. Furthermore, both in the objectives of learning area and in the unit objectives, no statement referring to environmental aesthetics was found.

Investigation of the textbooks revealed that although in most of the statements a human-centered approach was followed, it can be said that textbooks have a nature-centered wording. In the topics, environmental problems are addressed from the perspectives of the people and also from the point of both plants and animals. This was thought as a positive step. Because it was previously determined that in the curricula and textbooks prepared in 2002 mostly a human-centered approach was followed (Laçin Şimşek, 2004). On the other hand, although saving other living things life and taking responsibility for this were emphasized, it was seen as a deficiency not to give reasons for them. These statements were not supported with environmental ethics sufficiently. In the expressions including environmental ethics, most of the attention was taken to the participation and responsibility elements, respect, value and compensation elements were neglected. Yet, in order to make students show participation and take responsibility for environmental problems, firstly students should realize that they have to respect and value nature and other living things' right to live and achieve awareness for these. For this to happen, these points should be clearly stated in the expressions; students' attention should be taken to the points that every living thing has right to live, this right should not be intervened, the harms should be compensated in negative situations and these points should also be integrated with students' value system. Because how we solve environmental problems is directly related to how we perceive the problems (Kortenkamp & Colleen, 2001). This is to only way to raise individuals who are sensitive about nature and respectful to other living things and nature. The results of the study of Thompson and Barton (1994) support these ideas. In this study, the researchers found that there is a positive relationship between nature-centered ethical judgment and protective behaviors and being a member of an environmental organization.

In the textbooks, explanations within the topics are generally supported with nature, plant and human pictures and by this way, it was tried to grab students' attention to aesthetical aspect of environment. However, it was seen as a negation for aesthetic perception that these pictures are generally too small and low quality.

Discussion

Tanilli (1999) refers to two old and opposite philosophies in the history of thought, concerning the environmental problems that have begun in 1970s. The first one is the motto of Ancient Greeks "leave nature as it is". According to Aristoteles, there is only one thing for humans to do; compromise with nature and benefit from it. As opposed to this idea, there is the modern design defending the idea of "command the world" which is announced by Bacon and Descartes firstly. In other words, the ideas of people are owners of the world. It is an undeniable fact that this idea is the reason behind the rapidly increasing environmental problems. Thinking nature as an unlimited source, utilization of it in an unrestricted way and feeling no responsibility for it brought the situation at this point. As realizing this bad condition, efforts to take precautions are accelerated. However, unfortunately presenting information and raising awareness do not bring along the intended sensitivity. people should realize that they are not owners of the world, they are just a component of it who has to learn to live with it concertedly. In this regard, while shaping people's beliefs, attitudes and values behind their behaviors against nature, environmental education should benefit from environmental ethics and environmental aesthetics (Bozkurt, 1999). In this study, which aims to determine to what extend ethical and aesthetical elements were used to teach the topics related to environmental education in 2004 science and technology curriculum and textbooks, it is possible to conclude that there is not enough emphasis on these points. Although it can be said that expressions mentioning environmental ethics are frequently seen in the textbooks, most of these expressions emphasize responsibility and participation elements and neglect respect, value and compensation elements. Moreover, it was as-

sessed as an obstacle in front of giving learners the intended message that most of the expressions are superficial and the reasoning are weak

It is known by everyone that environmental problems cannot be solved with just laws and technology; this problem can only be solved with changing individual behaviors (Erten, 2004). It is stated by various researchers that for behaviors to change, it is not enough to know and be aware of, attitudes and value judgments should also change (Çakci & Oğuz, 2010; Dahlstrand & Biel, 1997; Erten, 2004; Tuncay, 2010; Yücel Işıldar, & Yıldırım, 2008). Many ecologists emphasize that ethical and aesthetical elements should be included in environmental topics (Bozkurt, 1999; Davis, 1998; Kostova & Atasoy, 2008; Light & Rolston III, 2003; Reiss, 1999). Nonetheless, when the studies about environmental education were investigated, it was seen that while dwelling upon cognitive domain, affective domain and values were left out (Gurevitz, 2000). For this reason, in curricula, textbooks and statements related to environmental education stressing ethical and aesthetical elements is very important. Therefore, explanations within the topic should be supported by integrating them with the values and the reasoning of the elements such as protection and responsibility should be clearly expressed through a nature-centered approach. Accordingly, it can be said that it is not sufficient enough to improve just textbooks and curricula, it is also important to raise awareness of book writers and teachers, who have an important role in transferring the information, about environmental ethics and aesthetics. In this regard, it can also be emphasized that mentioning ethical and aesthetical elements within the courses related to environmental education in faculties of education is important and necessary.

References/Kaynakça

Aleixandre, M. P. J., & Rodríguez, R. L. (2001). Designing a field code: Environmental values in primary school. *Environmental Education Research*, *7*, 1, 5-22.

Arslan, M. (1997). Çevre bilincindeki değişimler ve çevre eğitimi. *Eğitim ve Yaşam*, *Güz*, 23-26.

Bozkurt, N. (1999). Dünyamız gelecekte ne kadar yeşil kalabilecek: Felsefe açısından çevre. *Felsefelogos, 1*, 87-92.

Brady, E. (2003). *Aesthetics of the naturel environment*. Edinburg: Edinburg University Press.

Brause, J. A., & Wood, D. (1993). *Environmental education in the school: Creating a program that works!* Washington, DC: North American Association for Environmental Education.

Carr, D. (2004). Moral values and the arts in environmental education: Towards an ethics of aesthetic appreciation. *Journal of Philosophy of Education*, *38* (2), 221-239.

Çakci, I., & Oğuz, D. (2010). Is environmental knowledge enough to motivate the action? *African Journal of Agricultural Research,* 5 (9), 856-860.

Dahlstrand, U., & Biel, A. (1997). Pro-environmental habits: Propensity levels in behavioral change. *Journal of Applied Social Psychology, 27* (7), 588-601.

Davis, J. (1998). Young children, environmental education, and the future. *Early Childhood Education Journal, 26* (2), 117-123.

Des Jardins, J. R. (2006). *Çevre etiği.* Ankara: İmge Kitabevi.

Disinger, J. F. (2001). K-12 education and the environment: Perspectives, expectations and practice. *The Journal of Environmental Education, 33* (1), 4-11.

Doğan, M. (1997). Çevre eğitimi. *Çevre ve İnsan, Mart,* 24-27.

Environmental learning and experience an interdisciplinary guide for teachers. (2007). Retrieved November 29, 2010 from http://www.bced.gov.bc.ca/environment_ed/

Erten, S. (2004). Çevre eğitimi ve çevre bilinci nedir, çevre eğitimi nasıl olmalıdır? *Çevre ve İnsan Dergisi*, *65/66*. Retrieved November 29, 2010 from http://yunus.hacettepe.edu.tr/~serten/makaleler/cevre.pdf.

Erzen, J. (2006). *Çevre estetiği*. Ankara: Odtü Yayıncılık.

Franson, N., & Garling T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology, 19*, 369-382.

Gruenewald, D. A. (2004). A Foucauldian analysis of environmental education: toward the socioecological challenge of the earth charter. *Curriculum Inquiry, 34* (1), 71-107.

Gurevitz, R. (2000). Affective approaches to environmental education: Going beyond the imagined worlds of childhood? *Ethics, Place and Environment*, *3* (3), 253-268.

Gülay, H. ve Ekici, G. (2010). MEB okul öncesi eğitim programının çevre eğitimi açısından analizi. *Türk Fen Eğitimi Dergisi*, *7* (1), 74-84.

Hettinger, N. (2005). Allen Carlson's environmental aesthetics and the protection of the environment. *Environmental Ethics*, *27* (1), 57-76.

Kortenkamp, K. V., & Colleen, F. M. (2001). Ecocentrism and anthropocentrism: Moral reasoning about ecological commons dilemmas. *Journal of Environmental Psychology, 21,* 261-272.

Kostova, Z., & Atasoy, E. (2008). Methods of successful learning in environmental education. *Journal of Theory and Practice in Education*, *4* (1), 49-78.

Laçin Şimşek, C. (2004). Fen bilgisi öğretim programı ve ders kitaplarına göre çevre eğitiminde etik ve estetik değerler. *Değerler Eğitimi Dergisi, 2* (7-8), 127-146.

Laçin Şimşek, C. (2006, Eylül). *Yeni fen ve teknoloji öğretim programı ve ders kitaplarına göre çevre konularının etik ve estetik açıdan incelenmesi*. VII. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi'nde sunulan bildiri, Gazi Üniversitesi, Ankara.

Light, A., & Rolston III, H. (2003). Ethics and environmental ethics. In A. Light & H. Rolston III (Eds.), *Environmental ethics. An Anthology* (pp. 1-11). Oxford: Blackwell Publishing.

Lynch, M. (1998). *Values orientation of an environmental education centre: A case study.* Unpublished doctoral dissertation, McGill University Department of Culture and Values in Education, Montreal.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis*. Thousand Oaks, CA: Sage.

Özdemir, O. (2007). Yeni bir çevre eğitimi perspektifi: "sürdürülebilir gelişme amaçlı eğitim. *Eğitim ve Bilim*, *32* (145), 23-39.

Palmer, J., & Neal, P. (1996). *The handbook of environmental education*. London: Routledge.

Reiss, M. J. (1999). Teaching ethics in science. *Studies in Science Education, 34,* 115-140.

Robinson, K. W. (2009). *The moral significance of environmental aesthetics and its importance in environmental decision making and policy setting*. Unpublished doctoral dissertation, University of South Carolina.

Srbinovski, M., Erdogan, M., & Ismailia, M. (2010). Environmental literacy in the science education curriculum in Macedonia and Turkey. *Procedia Social and Behavioral Sciences, 2*, 4528–4532.

Tanilli, S. (1996). Çevre, teknik ve felesefe. *Felsefelogos, 1*, 35-39.

Tanrıverdi, B. (2009). Sürdürülebilir çevre eğitimi açısından ilköğretim programlarının değerlendirilmesi. *Eğitim ve Bilim Dergisi*, *34* (151), 89-103.

Thapa, B. (2001). Environmental concern: A comparative analysis between students in recreation and park management and other departments. *Environmental Education Research*, *7* (1), 39-53.

Tepe, H. (1999). Çevre etiği: 'Toprak etiği'mi yoksa 'insan etiği'mi? *Felsefelogos, 1*, 41-55.

Thompson, S. C. G., & Barton, M. A. (1994). Ecocentric and anthropocentric attitudes toward the environment. *Journal of Environmental Psychology, 14,*149-157.

Tont, S. A. (1996). Çevre ve etik. *Bilim ve Teknik Dergisi, 29* (343), 18-21.

Tuncay, B. (2010). *Moral reasoning of pre-service science teachers toward local and non-local environmental problems*. Unpublished master's thessis, Middle East Technical University, Ankara.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (1978, October). *Final Report Intergovernmental Conference on Environmental Education* [Organized by UNESCO in Cooperation with UNEP, Tbilisi, USSR]. Paris: UNESCO ED/MD/49.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (1997, December). *Educating for a sustainable future: A transdisciplinary vision for concerted action*. Report from the International Conference on Environment and Society: Education and Public Awareness for Sustainability, Thessaloniki.

Ünder, H. (1991). *Çevre merkezci görüş ve çevre eğitimi*. Yayımlanmamış yüksek lisans tezi, Ankara Üniversitesi, Ankara.

Ünder, H. (1996). *Çevre felsefesi*. Ankara: Doruk Yayımcılık.

Yıldırım, A. ve Şimşek, H (2003). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin.

Yücel, A. S. ve Morgil, F. İ. (1988). Yüksek öğretiminde çevre olgusunun araştırılması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *14*, 84-91.

Yücel Işıldar, G., & Yıldırım, F. (2008). The effectiveness of environmental education on environmentally- sensitive behaviors. *Eğitim ve Bilim*, *33* (148), 13-26.

Examined Programs and Books/İncelenen Program ve Kitaplar

İlköğretim 6.-8. Sınıflar Fen ve Teknoloji Dersi Öğretim Programı. (2005). Ankara: Milli Eğitim Bakanlığı, Talim Terbiye Kurulu Başkanlığı.

Tunç, T., Agalday, M., Akçam, H. K., Çeltikli Altunoğlu, Ü., Bağcı, N., Bakar, E. ve ark., (2007a). *İlköğretim fen ve teknoloji ders kitabı 6.* Ankara: Milli Eğitim Bakanlığı Devlet Kitapları.

Tunç, T., Bağcı, N., Yörük, N., Gürsoy Köroğlu, N., Çeltikli Altunoğlu, Ü., Başdağ, G. ve ark., (2007b). *İlköğretim fen ve teknoloji ders kitabı 7.* Ankara: Milli Eğitim Bakanlığı Devlet Kitapları.

Tunç, T., Bakar, E., Başdağ, G., İpek, I., Bağcı, N., Gürsoy Köroğlu, N. ve ark., (2008). *İlköğretim fen ve teknoloji ders kitabı 8.* Ankara: Milli Eğitim Bakanlığı Devlet Kitapları.