

Role of Education in Awareness on Climate Change

İklim Değişikliği Farkındalığında Eğitimin Rolü

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Abstract

Climate change has become known to societies as its effects have become quite evident and felt on a global scale. At the same time, a lot of research is being done on the subject. On the other hand, there is a complexity about what climate change education (CCE) is, which plays an active role in struggling with the climate change crisis, and there are relatively few studies in the related literature. This situation negatively affects the awareness of CCE and its place as a concept. This study aims to explain CCE as a concept and its role in climate change awareness. In this way, it is hoped that the awareness of CCE will increase, and the study will contribute to the formation of CCE's identity. In this direction, it has been attempted to explain the idea of climate change education and its role in climate change awareness by providing descriptive data on climate change gleaned from a literature review. In order to better introduce the concept, the history of education were examined. It has been concluded that climate change education is of vital importance, and has a very recent history, but there is no common structure about what it is and how it is implemented. It can be said that this situation of CCE reduces its impact on climate change awareness. Based on the research results, it is evident that there is a pressing need for rigorous investigations into CCE.

Keywords: Climate, climate change, climate change education, awareness on climate change

Öz

İklim değişikliği, etkilerinin oldukça belirgin hale gelmesi ve küresel ölçekte hissedilmesi nedeniyle toplumlar tarafından bilinir hale gelmiştir. Aynı zamanda konuyla ilgili pek çok araştırma yapılmaktadır. Öte yandan iklim değişikliği kriziyle mücadelede etkin bir rol oynayan iklim değişikliği eğitiminin (İDE) ne olduğu konusunda bir karmaşa yaşanmakta ve ilgili literatürde görece az sayıda çalışma bulunmaktadır. Bu durum, İDE'nin farkındalığını ve bir kavram olarak yerini olumsuz etkilemektedir. Bu çalışma, bir kavram olarak İDE'yi ve iklim değişikliği farkındalığındaki rolünü açıklamayı amaçlamaktadır. Bu sayede İDE'nin farkındalığının artması ve çalışmanın İDE'nin kimliğinin oluşmasına katkı sağlaması umulmaktadır. Bu doğrultuda, literatür taramasından derlenen iklim değişikliğine ilişkin betimleyici veriler sunulularak iklim değişikliği eğitimi fikri ve iklim değişikliği farkındalığındaki rolü açıklanmaya çalışılmıştır. Kavramın daha iyi tanımlanabilmesi için eğitim tarihi incelenmiştir. İklim değişikliği eğitiminin hayati önem taşıdığı ve çok yakın bir geçmişe sahip olduğu, ancak ne olduğu ve nasıl uygulandığı konusunda ortak bir yapı bulunmadığı sonucuna varılmıştır. İDE'nin bu durumunun iklim değişikliği farkındalığı üzerindeki etkisini azalttığı söylenebilir. Araştırma sonuçlarına dayanarak, İDE konusunda titiz araştırmalara acil ihtiyaç olduğu açıktır.

Anahtar Kelimeler: İklim, iklim değişikliği, iklim değişikliği eğitimi, iklim değişikliği farkındalığı

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Introduction

The occurrence of unusual weather as a result of changes in the climate system's constituent parts can be summed up as climate change (United Nations Environment Programme (UNEP), 2011). The changes discussed with the concept of climate change are the changes caused by humans in addition to the natural changes in the climate system in question (Meteorology General Directorate (MGD), 2021). Human activities are either directly or indirectly connected to climate change, as stated by the United Nations Framework Convention on Climate Change (UNFCCC) (United Nations, 1992). In order to prevent climate change, which is discussed as a problem caused by human activities, it is necessary to include humans in the combat against this problem. A greater likelihood of success in combating climate change is directly proportional to the number of individuals participating in the cause (Öztürk, 2021). The most important step to be taken for this is the training of individuals (Öztürk, 2021; Şıvgın & Afacan, 2020).

If it is desired to change people's behavior about a subject, the first thing to do is to raise awareness. Awareness is a factor that drives individuals to action and is necessary to move them out of certain established patterns of behavior and habits. The change will take place when the awareness created in individuals is supported with knowledge at the same time (Ministry of Environment and Urbanization (MEU), 2012). The necessary change and transformation in the battle against climate change can be realized through education that raises awareness in individuals and empowers them with the necessary knowledge and skills.

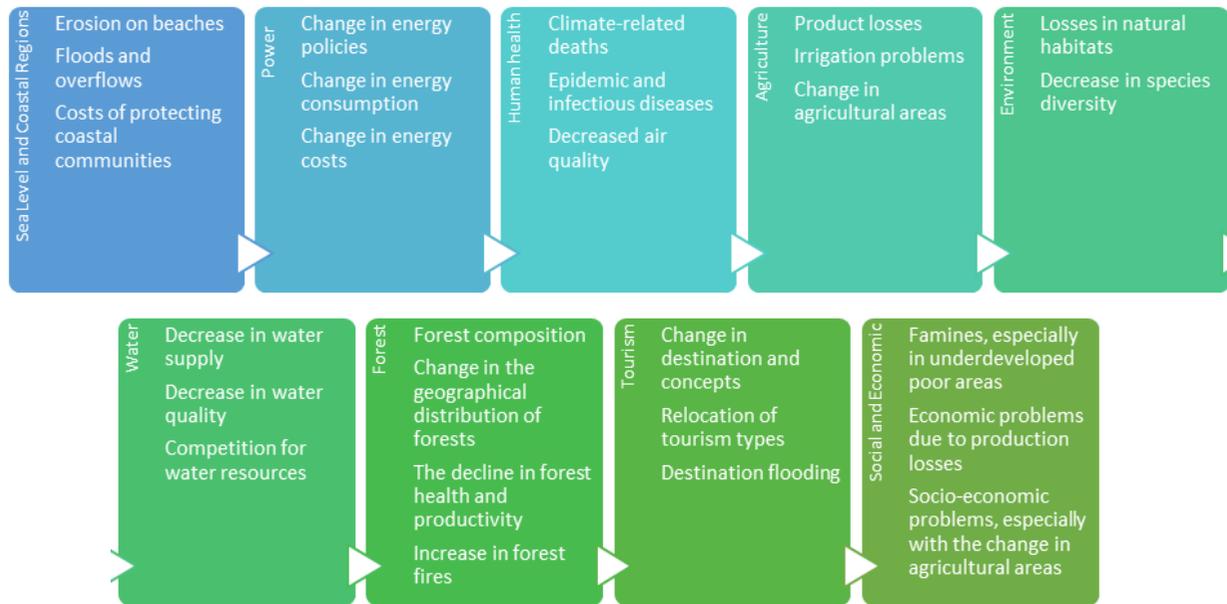
As the effects of climate change increase, the increasing international effort to combat this issue has also contributed to the increase in the scientific literature on climate change. The occurrence of unusual weather as a result of changes in the climate system's constituent parts can be summed up as climate change (Singh, 2020). The starting point of this study is to support the scientific literature on the subject. In this way, it is hoped that the awareness of CCE will increase, and the study will contribute to the formation of CCE's identity. In this study, which aims to introduce the concept of CCE and understand its role in climate change awareness, firstly general information about climate change and its impacts will be given, then awareness on climate change, CCE and its historical development process will be emphasized.

Climate change and its effects

Climate refers to the typical weather conditions of a particular area over an extended period, which considers the variation and average of meteorological factors (The Intergovernmental Panel on Climate Change (IPCC), 2013; UNEP, 2011). Climate is defined by longer-scale mean values and typical variability, as opposed to instantaneous weather conditions (UNEP, 2011). When the various elements in the climate system remain constant, the climatic conditions will also remain constant. Similarly, if one or more components of the system are changes or are replaced, the entire system will be affected and the stability of the system may be compromised, resulting in atypical behavior. This can result in weather conditions that are beyond normal expectations. This whole situation is expressed as climate change (UNEP, 2011). In the UNFCCC, climate change is used to mean "climate change directly or indirectly attributed to human activities that change the composition of the global atmosphere, in addition to natural climate variability observed over comparable periods" (United Nations, 1992). The main concern raised in relation to climate change is the change brought on by human activity. Due to human activities including the burning of fossil fuels, changing land uses, deforestation, and industrial growth, greenhouse gas emissions are rapidly rising. This, in turn, strengthens the existing natural greenhouse effect, causing the earth to warm up more than normal, thus negatively affecting climatic conditions (MGD, 2021). In this respect, climate change is a global problem and requires global answers (Climate Change Committee (CCC), 2021).

Climate change affects all regions of the world (European Commission, 2021). Although these effects are already felt, it is predicted that they will become more severe in the future (Amnesty International, 2022). The effect of climate change, which is more known as "global warming", is not only the increase in temperatures (WWF-Turkey, 2022). With the spread of the average temperature increase (CCC, 2021), the incidence and harmful consequences of extreme weather events, sea level rise, melting glaciers, and ocean acidification are all on the rise (WWF-Turkey, 2022). At the same time, climate change poses a risk to human health and wildlife. It incurs costs for society and the economy (European Commission, 2021). It also deepens inequalities in various ways in terms of human rights. Keeping in mind that any list describing the effects of climate change will be insufficient (Amnesty International, 2022), its potential impacts can be briefly summarized in the table below.

Table 1. Potential impacts of climate change



Source: (Doğan & Tüzer, 2011; Gülbahar, 2008; Şanlı et al., 2017)

The table above also shows how necessary and important it is to combat climate change. Learning what to do about combat and adaptation will be possible with climate change awareness.

Awareness on climate change

Is climate change awareness important? In this section, the discussion will start by using a metaphor. Assume that there is a patient with a fever who is asked to the patient "Is it necessary to reduce the fever?". Fever is defined as a rise in body temperature above normal (Çatakli et al., 2012). This condition is not a disease in itself, it is one of the symptoms of some diseases such as flu, measles, etc. It is a natural and necessary defense mechanism that enables the human body to fight infections (Yiğit et al., 2003). From this standpoint, it may be viewed as a situation that requires no intervention. In this direction, "Is it necessary to reduce the fever?" to the question, "It is not necessary." When the answer is given, what will result in the patient's condition? Research shows that the body temperature should be kept below a certain degree, that is, below 38°C, otherwise the body proteins begin to be damaged (Yiğit et al., 2003). The patient in question may have a seizure due to a high fever, lose some of her brain functions, and even result in the death of the patient if not intervened. (Baskent University Ankara Hospital, 2022; Ministry of National Education, 2015). Similarly, when climate change is seen as a natural process or when the question "Is climate change awareness important?" is answered, "It is not." when climate change development and its effects are left to itself, and when societies are not informed about the issue, as in the case of the patient, this may result in the death of all humanity and even the world. Raising awareness about climate change is essential to reduce the pace of climate change and enable individuals to adapt to its impacts (Barak, 2018). Climate change education comes to the fore in raising awareness of climate change, which is so important.

Climate change education

Although many organizations are dealing with climate change, there is no clear institution or organization that can be called the main actor dealing with CCE (Anderson, 2010). This is a factor that makes it difficult for the CCE to find its own identity. CCE is a phenomenon that has not yet been agreed on what it should be and has just begun to develop its identity (Barak, 2018; McKeown & Hopkins, 2010).

Several definitions have been made in the efforts to develop the CCE identity. One of them defines CCE as "education aimed at teaching the function of natural environments, how individuals can sustainably manage their behavior and ecosystems" (Anderson, 2010). Another definition is "it refers to processes aimed at improving the education system to combat climate change" (Mochizuki & Bryan, 2015). Some researchers state that CCE has an important place in school education (Oversby, 2015). CCE is an education that not only teaches individuals the function of the environment but also teaches them how to

manage their ecosystems and their behavior in a sustainable way (Anderson, 2010). In addition, the goal of this education is to create individuals who are climate and environmentally literate, meaning they comprehend the fundamental principles of the climate system, can acquire scientifically reliable information about the climate, can make informed choices that help mitigate the impacts of climate change, and have adopted environmentally responsible attitudes and behaviors that promote sustainable societies (Barak, 2018).

There is debate about how CCE should be. One of the common views is that since the phenomenon of climate change includes more than one area, the education to be given should have a multi-disciplinary nature. According to UNESCO (2015), curriculum developers should integrate climate change into the curriculum by recognizing it as a multidisciplinary issue. Similarly, Wise (2010) pointed out the disciplinary structure of CCE by stating that climate-related subjects are included in "Earth Science" courses, and subjects related to the effects of climate change on humans and other living things are included in biology and social sciences courses. On the other hand, there is a view that it is not correct to limit the said education only to schools, and that this education should be integrated with lifelong learning and should include all individuals of all ages (McKeown & Hopkins, 2010). However, since climate change contains many intertwined issues and scientific knowledge, it can be difficult for individuals to understand the seriousness of the change. Therefore, it should be taken into account that the use of simple metaphors in education about climate change, which is a complex system, can be misleading and confusing (Öztürk, 2021; Pruneau et al., 2001).

The United Nations sees education at the center of the solution to climate change. Education is considered an effective strategy for addressing the challenge of climate change (UNEP, 2006). The UNFCCC's article 6 stipulates that countries must prioritize education, training, and public awareness to promote climate change education and understanding (United Nations, 1992).

CCE; It enables us to understand the causes and consequences of climate change, recognize its effects, and create appropriate behaviors by creating behavioral changes in individuals. It not only improves the knowledge of climate change in individuals but also improves their attitude and motivation toward the environment (Anderson, 2010). The necessity to use education to combat climate change was agreed upon by nations aware of what CCE can accomplish (UNESCO, 2015).

Education is the most important step to be taken to be successful in combating climate change (Öztürk, 2021; Şıvgın & Afacan, 2020). Through education, more individuals can join the combat against climate change. With the participation of more individuals, the world may witness a faster transformation (Öztürk, 2021). It would be appropriate to combat a global problem on a global scale.

It supports the requirement of CCE in UNFCCC. As mentioned before, article 6 of the convention points out its importance by encouraging countries to education (United Nations, 1992). At the same time, UNFCCC Former Secretary General Christiana Figueres stated that the beginning of the combat against climate change is the action of individuals and that the way to teach individuals the roles they will undertake in this struggle is through education and training (Şıvgın & Afacan, 2020).

Historical development of climate change education

Climate change education lacks a lengthy historical basis (Barak, 2018, 2020) because the idea is only now beginning to take on a new identity. The combat against climate change itself has an average of forty years of history (Şanlı et al., 2017). When we look at the history of environmental education as a part of climate change education, it is seen that the first important development was the "United Nations Conference on the Environment" held in Stockholm, Sweden in 1972. At this conference, the "International Environmental Education Program" was developed, and the foundations of environmental education were laid (Ünal & Dımişki, 1999). The objectives of environmental education were included in the Belgrade Convention (UNESCO & UNEP, 1976), the final report of the "International Workshop on Environmental Education" held in Yugoslavia in 1975, and the Tbilisi Declaration, the final report of the "Intergovernmental Conference on the Environment" (UNESCO & UNEP, 1977), held in the USSR in 1977.

By the 1980s, scientists and governments began to express the need for a global organization for global problems. The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Society (WMO) and UNEP to provide an independent analysis of the scientific consensus on climate change. Policymakers and scientists around the world recognize the IPCC as the most authoritative and comprehensive body for assessing climate change (Peterman, 2017).

On the other hand, the concept of sustainability was integrated into environmental education and the Earth Summit and

Agenda 21 were held in Rio in 1992 (Alexandru et al., 2013). Agenda 21 includes a section titled "Education, Public Awareness and Education Promotion" (UN. Department of Public Information, 1993). Along with Agenda 21, the "United Nations Framework Convention on Climate Change" was also signed. The convention includes the description of "climate change education". In addition, the parties are required to uphold the following obligations under the heading of "Education, Training, and Public Awareness." (United Nations, 1992).

- a. To the extent possible and in line with national laws and regulations, promote and facilitate the following at the national and, where necessary, subregional and regional levels:
 - i. Developing and launching initiatives to educate the public about climate change and its implications;
 - ii. Public availability of information about climate change and its consequences;
 - iii. Public involvement in addressing climate change and its consequences, as well as devising appropriate answers; and
 - iv. Personnel training in science, technology, and administration;
- b. Organize partnerships and global campaigns, utilizing existing organizations when necessary:
 - i. Creating and exchanging educational and public awareness materials about climate change and its consequences; and
 - ii. Programs for education and training, including staff exchange or secondment, should be developed and implemented, especially for developing nations, in order to enhance national institutions and train subject-matter specialists.

In 2000, the Millennium Declaration was held at the "United Nations General Assembly" (United Nations, 2000) and the Millennium Development Goals were declared to ensure sustainable development. "Ensuring environmental sustainability" is one of these goals. In 2002, the United Nations launched the "Decade of Education for Sustainable Development" program and in the second half of the program (2005-2014), the "Climate Change Education for Sustainable Development" program was launched (Mochizuki & Bryan, 2015).

Through the advocacy of the United Nations and the support of UNESCO, numerous countries have taken steps to include climate change education in their curricula. With Turkey becoming a party to the Paris Climate Agreement (Paris Agreement, 2023) on November 4, 2021, which is based on the UNFCCC and aims to regulate the climate change regime after the Kyoto Protocol, climate change education and awareness-raising activities have started to be carried out throughout the country. In this context, climate change training programs are implemented for educational institutions, and training is organized for employees in public institutions and the private sector. In addition, scientific research on climate change is carried out and public information campaigns are organized. For example, the curriculum named "Environmental Education and Climate Change" published by the Ministry of National Education is taught as an elective course in secondary schools (Environmental education and climate change curriculum (Middle School 6th, 7th or 8th Grades), 2022). In addition, schools are organizing activities to educate students about climate change and promote greater awareness of this global issue. There are climate change training programs organized by the Ministry of Environment and Urbanization for those working in public institutions and the private sector (T.R. Ministry of Environment and Urbanization, 2023). In addition, certificate programs on climate change management are organized for those working in the private sector. Many universities and research institutions in Turkey conduct scientific research on climate change. Among these research, there are subjects such as examining the effects and interventions of climate change and creating climate scenarios. There are also public information campaigns on climate change organized by various public institutions and non-governmental organizations. In these campaigns, posters, brochures, videos, etc., describing the effects of climate change and what should be done are used (Climate Change Adaptation Training, 2023; Climate adaptation, 2023; Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2023; Turkey should not surrender to the climate crisis! #2030iklimhedefi, 2023; 'Tomorrow may be too late!' campaign draws attention to climate change, 2023). Despite the implementation of various programs related to climate change education, there is currently no standardized curriculum in place (Barak, 2020).

Conclusion

This study aims to understand the role of education in climate change awareness. In this context, the concept of CCE has been tried to be explained by giving general information about climate change, its impacts, and its awareness. To gain a deeper understanding of the concept and to show the formation of awareness, the history of education has been examined.

As a result of the study, it has been seen that a common definition of the concept of CCE has not been made yet. However,

based on the definitions made above, CCE can be defined as "teaching the management of human behavior to provide sustainable climate conditions". In CCE, first of all, there is a need for an institution or organization that can be called the main actor so that education can gain an identity and act in harmony by providing a consensus in education. This institution or organization should act as the most authoritative body in the planning, implementation, monitoring, and evaluation of the CCE. To solve the climate crisis, which is a global problem that requires struggle and adaptation, CCE must also take a multidisciplinary approach. Different disciplines in each field should be appropriately incorporated into education. Furthermore, while providing this education in schools is crucial, relying solely on schools may not be adequate in the fight against climate change. The participation of individuals in society in this struggle should be increased by making plans within lifelong learning activities. Training such as courses and certificate programs should be developed for each individual. Studies are showing that there is confusion in the education process (Öztürk, 2021; Pruneau et al., 2001). To avoid confusion and to reach healthy information, training of trainers and material development can be beneficial for this training. The implementation of all these, especially the use of digital channels will increase awareness by providing access to all segments of society.

CCE, which is one of the important building blocks of the combat against climate change, has vital importance. Unless measures are taken with education, the climate crisis is dragging the world to death. CCE teaches individuals how to cope with this crisis as well as how to adapt to it. Thanks to this training, individuals can better understand the climate crisis and begin to act on it. In other words, climate change education increases climate change awareness, but the current identity structure of climate change education, which we also discussed in the study, can be said to reduce this effect. Inclusion of climate change and education in school curricula; states investing in climate change education through campaigns, trainings and materials; increasing access to climate change education and social diversity in climate change education, especially through free use on the internet, can increase the impact of climate change education on climate change awareness and reach a wider audience.

Looking at the history of CCE, it is seen that it does not have a very long history. It is included in the UNFCCC, which was signed for the first time in 1992 under the name of CCE, together with the existence of studies on environmental education before. In addition, commitments to be fulfilled regarding CCE are presented to governments in this convention. In this direction, countries have started to include climate change education in their curricula. With the acceptance of the Paris Agreement, Turkey has started to take serious steps on CCE by integrating climate change education into the secondary school curriculum, in-service training seminar programs, scientific competitions, etc. However, there is no common training program yet.

This study was limited to the time period in which it was conducted and only aimed to understand the role of CCE in climate change awareness. Therefore, the training contents currently implemented by various institutions and organizations have not been evaluated. As CCE, it is aimed to raise awareness of the concept.

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